UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	Docket Nos. 50-329 OM
	)	50-330 OM
CONSUMERS POWER COMPANY	)	Docket Nos. 50-329 OL

TESTIMONY OF
BRUCE H. PECK

My name is Bruce H. Peck. I am Construction Superintendent at the Midland Plant. I received a B.S. degree in Physics from Illinois Institute of Technology in 1965, and a MBA Degree from Central Michigan University in 1975. From 1965 to 1970 I was an officer in the United States Navy in the nuclear submarine program. In 1970 I joined Consumers Power Company and served in various capacities in Company's construction program. For the first two years I held a supervisory position in the construction of a fossil plant at Bay City, Michigan. For the past eleven years I have held a number of construction supervision positions in the Midland Project. For the past year and a half I have been Construction Superintendent.

Shortly after the NRC issued the Notice of Violation and Report on the diesel generator building inspection on February 8, 1983, Mr. Cook asked me to take the lead in developing the Company's Response to the specific items identified in Part B of the Notice of Violation. I and several members of my

staff investigated the circumstances of each of the 32 individual items of non-compliance identified in Part B and developed first draft responses for those items. We went through several review cycles in which members of MPQAD, Bechtel Construction, Bechtel Engineering, Bechtel Project management, and Consumers project management reviewed the drafts for accuracy and completeness.

As a result of our discussions with the NRC Staff in meetings in November and December of 1982 and January, 1983, concerning the October, 1982 to November, 1982 inspection we identified a number of areas of programmatic concern. Our analysis of the 32 specific items set forth in Part B of the Notice of Violation indicated that the items with programmatic implications fell under areas of programmatic concern which the Company had already identified as a result of the meetings with the Staff. The Construction Completion Program has been specifically tailored to address all identified concerns and achieve the necessary improvements. In Attachment 2 of the Company's Response we indicated how the specific portions of the CCP address the generic implications raised by specific remedial actions to be taken to address the individual items. Further details are contained in Attachment 2 of the Company's Response, which is appended to this testimony.

James W Cook
Vice President - Projects, Engineering and Construction

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

March 10, 1983

Mr R C DeYoung
Director, Office of Inspection and Enforcement,
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND ENERGY CENTER PROJECT -
DOCKET NO 50-329 AND 50-330 - MIDLAND PROJECT RESPONSE
TO NRC NOTICE OF VIOLATION EA83-3 DATED FEBRUARY 8, 1983 -
FILE 0485.16 SERIAL 21775

Attached is Consumers Power Company's (CP Co) Response to the Notice of Violation ("Notice") transmitted by J G Keppler's February 8, 1983 letter to J D Selby. In addition to this cover letter, the response consists of attachments in accordance with 10 CFR 2.201, addressing the two violations (Attachments 1 and 2), and a request for mitigation of the civil penalty under the General Statement of Policy and Procedure for Enforcement Actions 47FED.REG. 9987 March 9, 1982 (Attachment 3).

Attachment 1, in addition to specifically providing the items of information requested on page 9 of the "Notice", reports on the results of the Company's investigation into In Process Inspection Notices (IPIN's) and answers the questions on page 2 of Mr Keppler's letter. The Company found that all quality control disciplines had been given the option to terminate an inspection (when multiple nonconforming conditions were observed), document observed findings of the partial inspection on IPIN's, and return work to construction. The Company also found that some individuals would limit reinspection to reported deficiencies. As noted in Attachment 2, the Company admits to the noncompliances listed under Violation B.

The Company admits the two violations and does not contest the basis for imposing a civil penalty, although we respectfully request that the NRC reconsider the amount of the penalty in light of the corrective actions the Company has taken, as set forth more fully in Attachment 3. In late 1982, upon receipt of preliminary information concerning NRC inspection findings, the Company took major corrective actions. We halted most Category I work of the prime contractor pending initiation of an effort to verify previous inspections and statusing of incomplete work. We initiated steps to correct the deficiencies and, as part of an overall program revised production and

quality processes, changed and realigned the management team, and expanded project resources to complete the job. The description of this effort is described in my letter to Mr J G Keppler dated January 10, 1983, regarding the Midland Project Construction Completion Program. We are confident that as we implement these corrective actions the Midland Project will achieve compliance with regulatory requirements.

James W. Cook

JWC/JEB/dlm

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W D Greenwell, Bechtel AA
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D B Miller, Site Manager (3)
J A Mooney, P14-115A
NRC Correspondence File, P24-517
S J Poulos, GEO TECH
J A Rutgers, Bechtel AA
J R Schaub, P14-305
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CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 21775 Dated 3-10-83

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits the response to Notice of Violation.

CONSUMERS POWER COMPANY

By /s/ J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 10th day of March 1983.

/s/ Patricia A Puffer
Notary Public
Bay County, Michigan

My Commission Expires 3-4-86

ATTACHMENT 1

RESPONSE TO NOTICE OF VIOLATION ITEM A

STATEMENT OF VIOLATION (Item A)

"NRC inspectors determined that quality control inspectors were not documenting as nonconformances all of the deficiencies which they observed during their inspections. Inspections were suspended by the QC inspector if too many nonconformances were observed. In-process inspection notices (IPINs) associated with suspended inspections, identified as nonconformances only a portion of the observed deficiencies. Supervisory QC personnel stated that they directed QC inspectors to limit the number of nonconformances documented during an inspection. This directive was verified by discussions with QC inspectors. Several QC inspectors interviewed, confirmed that inspections were closed after reviewing only the deficiencies documented on the IPIN. As a result, measures were not established to prevent the continued installation and use of these nonconforming items. In addition, corrective actions were not implemented to prevent recurrence of these nonconformances."

SUMMARY OF RESPONSE TO VIOLATION (Item A)

1. The violation is admitted.

2. The reasons for the violation are as follows: (1) failure of QC management (a) to recognize potential for adverse impact, on the inspection process, of terminating inspections on activities with multiple deficiencies and partially documenting findings on IPINs, ("return option")*, (b) to communicate specific direction on the use of the "return option" to avoid adverse impacts; (2) lack of sufficient specificity in procedures defining responsibilities of Quality Control Engineer's, (QCEs) signing off on Inspection Report activities; (3) lack of full understanding among all QCEs of responsibilities for inspecting all multiple items before closing IR line activities when conducting follow-up inspections on activities subject to an IPIN.

3. Corrective action in place is as follows: IPINs have been discontinued at the Midland site. QCEs have been instructed by memorandum to complete all activities which have been submitted for inspection regardless of number of nonconforming conditions observed and to document findings on nonconformance reports (NCR's).

4. Planned or in-process corrective actions:

   (a) Procedures PSP 6.1 and PSP 3.2 are being revised in accordance with the direction given in Paragraph 3 above.

   (b) QCEs will be trained in the revision to the procedures in accordance with the general training procedure B-3M-1. During this training, emphasis will be placed on the requirement described in Paragraph 3 above.

(c) All closed inspection report activities upon which IPIN's have been issued will be verified. An investigation of Deficiency Reports* is ongoing to determine whether closed Inspection Reports were affected by this problem.

5. Dates for full compliance

Item a - by March 22, 1983

Item b - start training April 1, 1983

Item c - as part of the verification step in the Construction Completion Program.

DETAILED RESPONSE
Background Information

Inspection activities are defined in specific instructions, Project Quality Control Instructions (PQCIs). These instructions describe how inspections are carried out and the attributes to be inspected. Each inspection activity is documented on an "Inspection Report," (IR) which contains blank spaces to be initialed by the individual Quality Control Engineer (QCE) who conducts this inspection and only after completing the inspection activity. There is a one-to-one correspondence between activities defined in the PQCI and listed on the IR. When all activities on the IR are appropriately initialed, the IR is reviewed and "closed out" by a Quality Control Engineer Level II by signing on a designated line on the IR's last page.

In-Process Inspection Notices (IPINs), instituted on June 1, 1981, were one of two basic types of reports used to document nonconforming conditions observed during primary inspections at the Midland jobsite. IPINs could be used to document deficiencies which were found prior to acceptance of completed work. Nonconformance Reports (NCR), the other basic means of formally reporting nonconforming conditions, were used either before or after acceptance of completed work.

If, during the course of an inspection activity, a QCE found a deficiency, he was required to document the condition. Prior to June 1, 1981, procedures specifically allowed a QCE to return certain deficiencies to construction without documentation, providing the deficiency could be corrected within the same shift. The procedures would not allow the QCE to initial the space corresponding to such an activity on the IR unless and until the deficiency was corrected by project construction or the condition had been properly recorded on an NCR. Activities on an IR that were not initialed were said to be "open." Because the activity could not be "closed" until correction of any identified problem (or submission of an NCR), the "open" activity formed a basis for controlling deficiencies identified during inspections.

* The Deficiency Report ("DR") is a predecessor document to IPINs, and as such is under investigation to determine if corrective action regarding it is warranted.

The IPIN procedure was designed to provide construction with prompt feedback of information concerning deficiencies or incomplete work. A copy of all IPINs was sent immediately after issuance to construction for disposition. When construction made necessary corrections, the IPIN was returned to Quality Control, indicating that the hardware was ready for further inspection. Subsequent inspections which determined that the problem documented on the IPIN had not been corrected, or that other nonconforming conditions existed, would result in further IPINs or NCRs. In any case, an IR activity would remain open until QC had verified all problems were corrected or an NCR was submitted.

The particular practice giving rise to the Notice of Violation involved the termination of inspection activities when multiple nonconforming conditions were observed part way through an inspection. If a QCE conducting an initial inspection determined that parts or components covered by a given inspection activity had a large number of nonconforming conditions, he had the option to terminate his inspection before completing the activity, document the deficiencies observed to that point on an IPIN and return the hardware to construction ("the return option"). Region III determined that items not inspected initially when this return option was exercised may have escaped later inspection. The postulated mechanism for this outcome is as follows: As previously described, once construction had corrected a problem noted on an IPIN, the IPIN was transmitted to Quality Control for further inspections. Procedures then required that the QCE inspect the hardware to determine that corrections of the IPIN-identified deficiency were carried out and that all other items had been inspected before closure of the activity on the IR. Thus, if a return option had been exercised, then before closing out the activity, a QCE would have to inspect not only those hardware items written up on the IPIN, but also all others which he had not satisfied himself as being previously inspected before the initial inspector terminated his inspection. Region III concluded that this may not have been done in all instances, resulting in a possible missed inspection. Region III also faulted the process by pointing out that items beyond those noted on an IPIN which were corrected by construction following a return of the item after a partial inspection were not itemized and submitted for trending analysis.

CPCo INVESTIGATION FINDINGS AND RESPONSE TO NRC QUESTIONS

The Notice of Violation asks the Company to conduct an inspection to determine (1) the extent to which QC supervisors at the Midland site have been instructing QC inspectors to limit findings of deficiencies and (2) the extent to which QC inspectors have been conducting reinspections based only on reported deficiencies.

The Company was informed on January 18, 1983, that the use of the IPIN was a major NRC concern. In response to this meeting on inspection findings a task force was chartered to start an immediate investigation. The task force was composed of a project attorney and two consultants.

When the NRC inspection report was received on February 8, 1983, the task force was directed to carry out the specific inspection requested by NRC. The task force work involved interviews with all QC supervisory personnel and a

majority of the QCE staff. The task force also debriefed the 13 QCEs interviewed by Region III.

It reviewed and evaluated existing quality assurance and quality control procedures and instructions, in light of other information obtained. Finally, in conjunction with MPQAD, it recommended and initiated corrective actions. As a result of the IPIN task force's extensive efforts, the Company has a good understanding of particular inspection practices regarding use of IPIN's at the Midland site.

Virtually all nuclear construction projects have some means of documenting inspections conducted while construction work is in process. IPIN's, used for that purpose at Midland, were established under a system of closed loop procedures requiring that documented conditions be returned to construction, reworked, and then reinspected by QC to verify the implementation of corrective action. The concept behind the use of IPINs is fundamentally sound, and is founded on recognized QA/QC principles, although specific problems existed in connection with the use of a "return option" at Midland.

The return option (defined above) was established to provide a means of returning work to construction, when a QCE would otherwise have to occupy valuable time inspecting and documenting a large number of nonconforming conditions (referred to herein as "punchlisting"), on a hardware item which was actually not ready for inspection. The option permitted the QCE to return the work to field engineering, which had the responsibility for checking the item and ensuring its readiness for inspection in the first instance. Thus, the option was motivated by legitimate concerns and objectives.

Although the option was not established for the purpose of "limiting findings of deficiencies" by QC, obviously, to the extent deficiencies existed in the uninspected portion of the work, they were not recorded during this initial inspection, nor could they be accounted for in the trending analysis. The return option was used in all disciplines, although some supervisors within disciplines elected not to use it in their particular area.

The return option, by itself, would not result in a missed inspection covered by a closed IR activity, so long as the inspector closing out the IR satisfied himself that all items not encompassed by the IPIN and included in the activity were inspected, either by him or by the previous inspector. QC procedures, in fact, required the signer of the IR activity to vouch for the inspection of all items before signing. It is a basic principle of quality control that an inspector should not sign for something he has not verified, either by documentation, inspection, or some other means. The Company found that the answers provided by some individuals indicated a lack of a full understanding of the requirement to satisfy themselves that all items had been inspected before closing out an IR activity subject to an IPIN. The IPIN procedures did not specify exactly how a return option should be handled, either initially or in closing out IR activities, and thus may have contributed to any misunderstandings which existed.

As part of its corrective action, described more fully above, the Company will ensure that procedural shortcomings in defining the requirements for QCE

closure of IR activities are corrected, and will retrain QCEs, emphasizing their responsibilities to conduct full, complete inspections and document all deficiencies before signing off IR activities. The Company also decided to discontinue the "return option" at Midland and require that all initial inspections be completed with non-conforming conditions fully documented. The IPIN form has also been eliminated and all deficiencies will be documented on a revised NCR form. (The particular findings of the extensive Company investigation into the use of IPINs are recited more fully below under responses to the NRC's questions contained in the Notice of Violation.)

Question 1

"Determine the extent to which QC Supervisors at the Midland Site have been instructing QC Inspectors to limit findings of deficiencies."

There are two aspects to this question. A first aspect concerns the extent to which QC Inspectors were instructed not to completely inspect activities prior to turning work back to construction. A second aspect relates to directions, if any, given to QCEs, not to document deficiencies actually observed. Regarding the first aspect, the Company found that QCEs were directed to use a "return option" which resulted in initial inspection activities not being completed. With regard to the second aspect of the question, QC management intended that, in the exercise of a return option, all deficiencies actually seen would be reported on an IPIN. Project management personnel encouraged the use of a return option and QC management, instructed QC leads, who reported directly to them, in its use.

The QC management interviewed by the task force stated that the option was intended to provide a means for returning work to construction and avoid occupying QCE's time punchlisting work for construction. There was no intent to avoid reporting deficiencies, although the inadvertent result of the practice was that deficiencies on the portion of the work not inspected before return would not be documented. QC leads who instructed their personnel to use the option agreed with the QC management's purpose in using the option.

Of the 16 QC leads and supervisors interviewed, one individual was in the documentation area, for which the return option was inapplicable, and eight stated either that the option was not applicable to their activity, or that they had not used it for other reasons. Of the latter, one stated that he had never been told to use the return option.

Two stated that their group had used it only infrequently. One of these understood that all observed deficiencies were to be documented but could not recall whether he had so instructed his group. The other indicated that the only instance when an inspection was halted before completion was when it was obvious that cable insulation damage would require a completely new termination. In this instance the inspection for other termination deficiencies would not be performed, but the observed damage would be documented.

Three individuals indicated regular use of the option. One stated that he had instructed his subordinates to document all observed nonconformances, one

could not recall giving specific instructions but knew that his subordinate's practice was to document all observed nonconformances and one knew that that was the proper practice, assumed that his subordinates did it that way, but could not recall whether he had so instructed them.

Two other individuals were relatively new in the position. One indicated that it was his practice to document everything observed but that it had not been the practice of his predecessor (no longer at the plant). The other continued the practice of his previous supervisor to document all observations.

The task force found that from a quarter to a half of the individual inspectors (QCEs) contacted, depending on the discipline, were aware of and made use of a "return option". A few individuals stated that they documented some, but not all, deficiencies observed in an inspection in which the return option was used.*

The company's corrective action on this point is described above. The company considers it of fundamental importance that all QCEs and supervisors understand the requirement to document deficiencies observed when an item has been submitted for inspection rather than using an "oral" communication process. This aspect will be emphasized in training on the new procedures.

Question 2

"Determine the extent to which QC inspectors have been conducting re-inspections based only on reported deficiencies."

The Company determined, based upon investigation, that almost all QCEs at Midland were completing their inspections properly. However, because a few individuals may not have completed inspections fully, the Company concluded that the NRC inspection finding was valid.

The precise question to be addressed here is whether and to what extent QCEs closed out inspection record activities subject to IPINs which do not encompass the entire activity, without fully inspecting the activity. The

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* Approximately one-half of the QCEs contacted also indicated that in some circumstances they allowed repairs or reworks to take place within a fixed period of time without documenting the deficiences observed during the initial inspection. Virtually all of those utilizing this practice had been advised by their supervisors to do so.

This practice was specifically allowed prior to June 1, 1981, and through an apparent lack of clear communication continued after the option was removed from QC procedures on this date. The upper tier policy document allowed the practice on a one shift basis until February 1983. Since this practice would not lead to missed inspections with regard to use of IPINS, it was not addressed further as part of the task force investigation. An NCR was written on December 10, 1982 regarding the optional practice not to document deficiencies corrected during a one shift period; MPQAD will further track and disposition this issue utilizing the results of the task force investigation.

IPIN task force determined that although a few individuals stated they would not necessarily reinspect all items before closing out the IR activity. There were several reasons for this response. Some would not lead to an inspection miss.

When asked to describe the types of inspections for which they would not reinspect all examples, it became evident that nearly all individuals followed practices which would not have led to an inspection failure. Many individuals stated that they did not reinspect all items when they conducted the initial inspection and remembered items they had previously inspected. Others answered that they limited their reinspection to items covered by the IPIN, but only when the activity covered only one item. Still others limited their reinspection if the inspection of all other items was documented. Thus, in specific circumstances an inspector following all applicable procedures could have limited his reinspection to hardware items encompassed by the IPIN and accomplished a complete inspection of the activity. Only a few individuals appeared to lack sufficient understanding of the requirement that the reinspection verify inspection of all items within an activity.

The IPIN task force concluded that not more than ten percent of the individuals contacted reported unacceptable practices. Although the task force's conclusions on this question were more positive than NRC's from a statistical standpoint, the task force concluded that NRC's inspection finding and notice of violation were valid.

It is the Company's conclusion that the cause of this violation was unclear management direction regarding documentation associated with use of the "return option".

ATTACHMENT 2

RESPONSE TO NOTICE OF VIOLATION ITEM B

OVERVIEW

As a result of the Company's assessment of overall project status in the fall of 1982 and based on information regarding the identified findings from NRC inspections and their generic implications, Project management carefully evaluated the needs for corrective actions. The Construction Completion Program (CCP) was conceived to address all identified concerns and to achieve desired improvements in project performance.

The project presented the Construction Completion Program concept to Region III personnel on December 2, 1982 after having initiated action to implement the plan the previous day. A description of the CCP was sent to the NRC in our January 10, 1983 letter and a public meeting was held with the NRC on February 8, 1983 to discuss the plan. This overview summarizes how major portions of the CCP cover the individual findings of the Notice of Violation and the generic implications of these findings.

The specific portions of the CCP that address the generic implications of the NRC Diesel Generator Building Inspection are as follows:

A. System Team Organization

The organization for completion of construction is being reorganized to emphasize a systems approach. A team made up of construction and engineering personnel (with close QC coordination) will be assigned to complete all work on a specific system or systems. This team concept will also be applied to remaining area work.

The team concept provides for very close coordination between all major activities required to produce and demonstrate a quality product. The development of this organization involves a review of existing field procedures and preparation of improved procedures for defining work requirements. A major element of this approach will be preparation of expanded instructions to the crafts that will improve performance to design and specifications and will insure proper coordination with inspection as the work proceeds. The team members will be trained in the new procedures.

An assessment of current system construction and inspection status will be made by the team prior to initiation of construction activities. This will provide a baseline of existing quality and allow any existing problems to be identified and corrected.

The specific NRC inspection findings* covered by this activity are:

B-1b, B-1c, B-1d, B-1h, B-1j, B-1l through p, B-1q, B-4a and B-6.

B. Review PQCI's and Update As Required

The procedures for carrying out inspections (PQCI's) are being reviewed to insure all important inspection attributes are specifically described and, to the extent practicable, all reference material is incorporated directly in the PQCI.

The specific NRC inspection report findings covered by this activity are:

B-1a, B-1b, B-1c, B-4a, B-4b and B-8a.

C. Review the Inspection Process (See note below on inspection backlog)

The inspection process including construction procedures for initiating inspections will be modified so that:

1. The procedure for documenting non-conformances ensures that all non-conforming conditions are properly identified and tracked.

2. The process for providing instructions for construction activities ensures all required inspections are performed when required.

The specific NRC inspection report findings covered by this activity are:

B-1l-p, B-4b, B-8b(1) and B-8b(2)

D. QC Training and Certification

The QC Department has been reorganized under direct Consumers Power Company control. All QC personnel have been or are undergoing a training program leading to re-certification to the revised PQCI's.

The specific NRC inspection report findings covered by this activity are:

B-1l-p and B-4b.

E. Program Reviews

General QA Program reviews have been initiated in the areas identified below in addition to the specific responses required from the inspections findings. The results of these reviews and any requirements for program revision will be incorporated in CCP activities.

1. Receipt Inspection Review covers findings B-1g and B-3.

2. Material Traceability Review covers findings B-1e, B-1f, B-2a and B-8a.

*Findings are identified by the item designation in the Notice of Violation transmitted by the NRC and letter of February 8, 1983 J G Keppler to J D Selby.

3. Design and Document Control Review covers findings B-1i, B-1j, B-1k, B-2b, B-2c, B-2e, B-5 and B-7.

F. Safety-related classification.

The NRC is reviewing the project licensing position on this issue. This covers findings B-2d and B-2f.

The response to each individual finding follows:

**Note on inspection backlog.

The Company specifically reviewed the NRC concern regarding, "...a backlog of almost 16,000 inspections...", the status of inspection records (IR) as of November 26, 1982 was actually as follows:

IR Issued 190,000; IR Closed 174,000; IR "Open" 16,000

The 16,000 "Open" IR are categorized as follows:

(1) Opened in anticipation of an inspection request but construction not yet ready for inspection, 7,200.

(2) Fully ready for inspection, 1,200.

(3) Open but waiting for next complete step in construction, 5,700.

(4) Open pending NCR/IPIN disposition, 800.

(5) Open pending Level III approval, 700.

(6) Miscellaneous, 400.

Therefore, the actual backlog of inspections is more correctly identified by the 1,200 IRs where construction is done and waiting for inspection.

NCV Item B - 1.a (82-22-02A)

"Installation of diesel generator engine control panels 1C112, 2C111, and 2C112 was not in accordance with the requirements delineated on foundation Drawing 7220-M18-250 in that the foundation bolt washers required by the subject drawing were not installed."

1. The violation is admitted, in part.

2. (1a) No Electrical or Civil QC instruction required specific verification of the bevelled washer installation. Therefore, documented proof that bevelled washers were installed could not be provided since the foundation is grouted. (bevel washers)

   (2a) The inspection records for panels 1C-112, 2C-111 and 2C-112 are open with attributes such as washers and torquing not yet inspected. Therefore, this is not a violation. (flat washers)

3. (1a) NCR M01-9-2-138 was written by MPQAD on October 15, 1982 to document the non-conformance and was closed on December 8, 1982. (bevel washers)

   (1b) FCR M-7026 was written on November 10, 1982 to make the bevelled washers optional, because in this case, bevelled washers did nothing to aid in support or leveling of the panel. The FCR was approved November 23, 1982. (bevel washers)

   (2a) Due to insufficient quantities of flat washers and nuts this portion of the installation was not completed. The field has subsequently procured sufficient quantities to complete the bolt down and are awaiting Construction Completion Program approval to install them. (flat washers)

4. Electrical and Civil PQCI's will be reviewed and revised as applicable to include specific verification for mounting requirements and will incorporate applicable hold points.

5. QC inspection plan E-6.0 and C-1.10 (if required) shall be modified to incorporate full inspection and hold points for all un-installed electrical equipment by March 28, 1983 and required training to the revised plan is scheduled for completion by April 11, 1983. (bevel washers)

NOV Item B - 1.b (82-22-02B)

"Unscheduled pull box associated with conduits 2BN006, 2BN007, and 2BDA002 was not sized in accordance with the requirements delineated on Sheet 42 of Drawing E-42 in that the 12" x 12" x 6" as-built dimensions of the subject pull box did not conform to the 13 1/2" x 12" x 6" dimension requirements delineated on Sheet 42 of Drawing 42."

1. The violation is admitted.

2. (1) Failure of Field Engineering to specify correct size pull box for Construction to install.

   (2) Failure of QC, during inspection of conduits 2BN006, 2BN007 and 2BDA002, to identify non-conforming condition.

3. FCR E-3157 was written on November 8, 1982 and approved on November 17, 1982. This FCR clarified the intent of E-42(Q) SH 42 to include minimum bend radius as a criterion for pull box sizing. Given the revised criteria, the pull boxes cited conform to the requirements, as documented in an NCR written by MPQAD on March 7, 1983.

4. (1) PQCI E-1.0 will be revised to verify and record pull box size and bend radius of cable will be verified on applicable PQCI's.

   (2) Team training programs, required by the Construction Completion Program, will emphasize the importance of following all requirements of design documents.

5. (1) PQCI E-1.0 to be revised by March 29, 1983 and required training is scheduled for completion by April 29, 1983 to verify and record pull box size.

   (2) Reinspection of installed work will be carried out during the implementation of the Construction Completion Program.

NOV Item B - 1.c (82-22-02C)

"The 1'-10" wall to support dimension required by raceway support Drawing E-796(Q), Sheet 2 of 2, Revision 5, for hanger No. 86 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 2'-1 1/2" in lieu of the required 1'-10"."

1. The violation is admitted.

2. Craft, Supervision, Field Engineering and QC did not provide sufficient attention to detail to assure correct locations of P1001 strut on tube steel as delineated on Drawing E-796(Q) SH 2 detail 1.

3. FCN E-7040 was written to approve installed conditions and has been incorporated. NCR M01-9-3-084 was written by MPQAD on March 7, 1983 to document this condition, and for purposes of trending.

4. (1) Revise PQCI E-2.1 and provide QC training to properly inspect supports.

   (2) Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Revision of E-2.1 and required qualification training is estimated to be complete by May 15, 1983.

NOV Item B - 1.d (82-22-02D)

"The 6'-6" wall to support dimension required by raceway support Drawing E-796(Q) Sheet 1 of 2, Revision 11 for hanger No. 14 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 5'-5" in lieu of the required 6'-6"."

1. The violation is admitted.

2. (1) E-796(Q) SH 1 shows the proper dimension for Bay 4 but is incorrect for Bay 3. The dimension shown for Bay 3 is a drafting error.

   (2) The Field Engineer failed to write a FCN to correct drawing for Bay 3 prior to completing the installation of the support.

3. DCN #16 to Drawing E-796(Q) SH 1 was prepared and approved on November 9, 1982 to correct the drafting error. Incorporation has taken place. An NCR was written by MPQAD on March 7, 1983.

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NCV Item B - 1.e (82-22-05A)

"The inspectors identified high strength steel plate placed in the laydown area which was not marked with the material type and grade as required by Field Instruction FIG-9.600, Revision 1."

1. The violation is admitted.

2. Most steel was properly marked and some markings were not exposed, however, some pieces of high strength steel were not properly marked through failure to follow procedures.

3. All steel was re-marked with paint as to clearly show any grades other than A-36. QC inspections have been increased from monthly to weekly. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600.

4. N/A

5. Complete.

NCV Item B - 1.f (82-22-05B)

"The inspectors identified various stock steel shapes in the "Q" area with yellow-colored paint on the ends (indicating the material was "non-Q") and various steel stock shapes in the "non-Q" area without painted ends (indicating "Q" material), contrary to the requirements of Field Instruction Fig-9.600, Revision 1."

1. The violation is admitted, in part.

2. All steel in "Q" area was identified in accordance with procedures but some manufacturers markings led to confusion. Some steel in "non-Q" areas was not marked in accordance with procedures.

3. All steel in "non-Q" area was painted or repainted yellow as to conform with the procedure. QC inspections have been increased from monthly to weekly. To avoid confusion, manufacturers color coding was removed from the ends of steel in question in the "Q" area. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600(Q).

4. Field Instruction FIG-9.600(Q) will be revised to designate the marking requirement for non-Q steel to be a Q attribute.

5. The required procedure revision will be completed by May 1, 1983.

NOV Item B - 1.g (82-22-09A)

"The slots in the muffler support plates were not machined but were determined to be irregular and flame cut, leaving rough slot edges not in conformance with design Drawing M18-425(5)-1."

1. The violation is admitted.

2. These slots were manufactured incorrectly by the vendor prior to receipt at the jobsite. The slots in Diesel Generator muffler supports are required for thermal expansion. The vendor drawing calls for these slots to be machined, but they were torch cut and exceeded required dimensions.

3. Following the NRC inspection, Bechtel NCR 4693 was written to determine if, as fabricated, the slots would perform their intended function.

4. NCR 4693 is currently being reviewed by Project Engineering and the vendor.

5. NCR 4693 expected to be dispositioned by April 1, 1983.

NRC Item B - 1.h (82-22-09B)

"Jacking plates were not installed beneath the center support plates of Bay 1 diesel generator muffler as required by Drawing M18-250-6."

1. The violation is admitted.

2. Jacking plates for Diesel Generator muffler supports were not installed in Bay 1 beneath the center support, as shown in vendor drawings, due to failure to install according to the design drawing.

3. Following the NRC inspection an NCR was written against the condition. A subsequent NCR was also written after the NRC inspection, based on inspections of other Diesel Generator mufflers which resulted in identification of similar deficiencies in Bays 3 and 4. Both NCRs were dispositioned "Use As Is", since loadings from the jacking screws on the concrete were acceptable.

4. Team training programs required by the Construction Completion Program will emphasize the importance of following all requirements of vendor drawings.

5. The implementation of the disposition of NCRs will provide full compliance for the "As Built" condition. Subsequent revisions to vendor drawings required to complete NCR 4738 follow-up actions is forecast for completion by April 1, 1983. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NOV Item B - 1.i (82-22-18A)

"Procedure FID-2.100, (Outstanding FCR/FCN Retirement), Revision 2 was inadequate in that the design drawings were not changed when an FCR/FCN had been retired and no further reference to the FCR existed on the revised drawing. As a result, the retired FCR C-2103 relating to HVAC structural steel was lost and could not be traced to the design drawing to ensure a complete quality record."

1. The violation is admitted.

2. Field Procedure FID-2.100(Q) was inadequate in that it did not contain a requirement to provide for indication on design drawings that applicable FCNs and FCRs had been retired. Retired FCR/FCNs address one time approved deviations to generic design which are not incorporated into base design drawings due to their applicability to a limited number of locations. (It is noted that this procedural deficiency is not the reason the FCR was lost. The FCR was lost due to a clerical error and a copy was obtained from the design office within twenty-four hours. It is also noted that the FCR could be traced to the design drawing through the FCR/FCN retirement computer printout.)

3. Field Procedure FID-2.100(Q) was revised to formalize the practice of requiring design drawings to be annotated with a circled letter "R" denoting a retirement. The Field Document Control Department has performed a 100% review of all drawings, with retired FCR/FCNs against them, to verify compliance to this new requirement.

4. N/A

5. Complete.

NCV Item B - 1.j (82-22-18B)

"Field Sketch CY-1035 which illustrated the bottom gusset plates for HVAC fan supports was not identified as "Q", nor was there a reference to the affected drawing on the sketch as required by Procedure FPD-5.000, (Preparation of Field Sketches.)"

1. The violation is admitted.

2. The requirement for this designation and reference is contained in Field Procedure FPD-5.000 and was not followed. Field Sketch CY-1035 for the Diesel Generator Building HVAC support steel gusset plate was not designated "Q", nor referenced to the original design drawing.

3. Field Sketch CY-1035 has been revised and designated "Q", and referenced to design drawing C-1004. NCR M01-0-2-155 was issued by MPQAD to document the identified discrepancy. Field Procedure FPD-5.000 was reviewed and determined to be adequate in regard to the stated requirement.

   Training of responsible personnel in the specifics of FPD-5.000 has been conducted.

4. A review of other FSKs will be conducted by Field Engineering for compliances with FPD-5.000.

5. The review by Field Engineering will be completed by April 22, 1983.

NCV Item B - 1.k (82-22-18C)

"Procedure FPD-5.000, (Preparation of Field Sketches), Revision 1 did not require design drawings to reference appropriate field sketches to ensure a complete quality record."

1. The violation is admitted.

2. Although field procedures do not control what is placed on design drawings, no cross reference log existed to enable one to readily find what Field Sketches (FSK's) apply to each design drawing.

3. A reverse reference log was created listing applicable civil miscellaneous steel FSK's for each civil design drawing depicting miscellaneous steel.

4. Reverse reference logs listing applicable FSK's will be created for the remainder of all FSK's prepared in accordance with FPD-5.000. FPD-5.000 will be revised to address the requirements for reverse reference logs.

5. FPD-5.000 will be revised by April 15, 1983, addressing these requirements and including an effectivity date of June 15, 1983 for reverse reference logs.

NCV Item B - 1.1,m,n,o,p (82-22-16)

"(l) 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 diesel generator bays. This change was neither reviewed nor properly authorized.

(m) The as-built gusset plate connections in Bay 1 were not built as identified on Detail 3 of Drawing C-1004. The angle braces were welded together as opposed to having separate welds for each brace. This change was neither reviewed nor properly authorized.

(n) None of the sixteen 1/4" bracing angles identified on Drawing C-1004 were constructed utilizing 1/4" material. This change was neither reviewed nor properly authorized.

(o) Drawing C-1004, Detail 2, required the W10 beam-to-beam connection to be welded. In Bay No. 3, a bolted connection was constructed in lieu of the required welded connection, without review nor proper authorization.

(p) The column cover plate identified on FCR C-4401 was not constructed in Bay No. 3 as required. The plate was slotted instead of solid as required. This change was neither reviewed nor properly authorized."

1. The violations are admitted.

2. Diesel Generator Building HVAC fan support steel installation was not done in accordance with the drawings due to a lack of attention to detail during construction and inspection for Items (l), (m) and (n). For Item (o), the specific item was constructed to an earlier approved drawing and failure to identify the discrepancy occurred during the inspection process. For Item (p) the finding was due to the lack of attention to detail during construction.

3. (1) With regard to the undersized gusset plates, a subsequent evaluation by Project Engineering indicated the smaller 1/4" size plates were acceptable. Nevertheless, the plates will be replaced with 5/16" plates by Bechtel per NCR 4690.

   (m) The gusset plate connection in Bay 1 has been removed and will be reworked per NCR 4690.

   (n) The 5/16" and 3/8" bracing angles have been removed and will be reworked per NCR 4690.

   (o) After the NRC inspection, NCR 4690 was written and dispositioned "Use As Is" for bolted connections constructed in Bay 3. It should be noted that these connections were constructed to design drawings approved at that time which allowed bolted connections

NCV Item B - 1.1,m,n,o,p (82-22-16) Continued

(p) NCR 4690 dispositioned the cover plate on the steel column to be "reworked".

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents. In addition, as part of the Construction Completion Program, a review of PQCI's is being done to assure that correct design requirements are specified for inspectors. The Program also calls for a QC inspector recertification program.

5. Specific compliance will be achieved when rework is completed under the Construction Completion Program.

NCV Item B - 1.q (82-22-24)

"A section (approximately 18 x 10 x 4 inches deep) of the primary containment wall in Containment Purge Room 702 was removed (by chipping) without obtaining approval as required by FIG-1.111, Revision 4, Concrete Drilling Permit."

1. The violation is admitted.

2. Field procedures (FIG-1.111, Revision 3) in effect at the time of work did not require concrete drill permits for chipping because damage to reinforcing steel and other embedded items is not as likely as with drilling.

3. (1) Field Procedure FIG-1.111, Concrete Drill Permits, has been revised and approved to include chipping.

   (2) Steps have been taken to insure concrete chipping repairs are performed using approved guidelines. FCR C-5206 was prepared and has been approved by Project Engineering to establish guidelines for concrete chipping repair. This FCR has subsequently been incorporated into Specification 7220-C-231(Q). Field Procedure FPT-3.000, has been revised to specifically include inspection of repairs to chipped areas as part of area turnover. This procedure is being designated as Quality Related, and is currently under review.

   (3) The above steps are summarized on NCR M01-2-154 which was issued by MPQAD to request process corrective action. The Project Engineering response to this NCR concludes there is no safety impact, or affect on quality of the structure, due to the chipping of concrete identified in the Containment Purge Room 702.

4. (1) Field Procedure FPT-3.000 requires approval.

   (2) The chipped area in question requires repair.

   (3) NCR M01-9-2-154 requires closing.

NCV Item B - 1.q (82-22-24) Continued

5. (1) April 15, 1983.

(2) Specific compliance will be achieved when the rework is completed under the Construction Completion Program.

(3) Following rework.

NOV Item B - 2.a (82-22-08)

"Measures were not established for the selection and review for suitability of application of "Q" materials associated with the diesel generator exhaust muffler in that design drawings and specifications did not indicate the material identity of the installed muffler saddle supports and plates."

1. The violation is indeterminate at this time.

2. Material specification and identification is the responsibility of the emergency diesel generator prime vendor. No documentation was available on site to show that the material used in the fabrication of the Diesel Generator exhaust silencers met the requirements for seismic Class I installation.

3. The vendor has been requested to provide the necessary documentation for material traceability and identification of applicable QA requirements applied to the exhaust silencers.

4. A status update and identification of any corrective steps which may be required will be provided by Project Engineering by May 2, 1983.

5. To be determined by results Project Engineering report of May 2, 1983.

NOV Item B - 2.b (82-22-15B)

"Design Drawing C-147 required bolted bracing connections for the di
generator building HVAC bracing gusset plates. Field Sketch CY-1035
to change the design to welded connections in lieu of the specified
connections. This design change was neither properly reviewed nor a

1. The violation is admitted.

2. Note 14 on drawing 7220-C-147 was not clear. It has always been
intent of Project Engineering to allow Field Engineering to subs:
welded for bolted connections when detailing steel bracing conne
however, no specific instructions were provided.

3. FCR C-5174 was issued and approved to clarify that Note 14 on dr
7220-C-147 is applicable to bracing connections.

4. None required.

5. Completed.

NOV Item B - 2.c (82-22-15C)

"Design Drawings C-1004 and C-147 did not specify the sizes of the diesel generator building HVAC fan gusset plates. A "combo" shop work order request was used to design the gusset plates without appropriate review and approval."

1. The violation is admitted.

2. The Diesel Generator Building HVAC fan support gusset plate dimensions were only identified on a field fabrication shop work order. The field sketch for this work was inadequate in that it did not contain necessary details for fabrication.

3. The fan support gusset plate dimensions have been added to field sketch CY-299. FCR C-5174 was issued and approved to clarify on the design drawing the criteria to be utilized for detailing bracing connections.

4. Review all civil miscellaneous steel field sketches to assure that proper information for gusset plates is included and specified in accordance with FCR C-5174.

5. May 2, 1983.

NCV Item B - 2.d (82-22-15A)

"The licensee failed to analyze the four diesel generator building monorails as seismic Category I as described in their commitment to Regulatory Guide 1.29, in Appendix 3A of the FSAR."

1. The violation is admitted in that the Diesel Generator Monorail had not been analyzed seismically through the normal project design process, or after the initial walkdown under specification 7220-L-001(Q) had been performed to verify project compliance to Regulatory Guide 1.29 commitments. The Proximity and Seismic Category II/I Site Walkdown Program described in Specification 7220-L-001(Q) provides method for identification, evaluation and resolution of all potential situations where non seismic Category I commodities are installed above safety related systems, components or structures.

2. The Diesel Generator Building monorails were reviewed during the preliminary walkdown, but were not identified for further analysis due to the walkdown teams verbal understanding that the monorails had been seismically analyzed previously.

3. Seismic analysis was subsequently performed addressing adequacy of the Diesel Generator Building monorails. The analysis concluded that failure of the monorails under seismic loading would not occur.

The training program for all walkdown teams was revised to require that seismic analysis on non-seismic components that would potentially effect safety related structures, systems or components are documented. If documentation is not available at the time of walkdown then the potential interaction must be identified on an interaction identification sheet in accordance with applicable walkdown program requirements.

All areas walked down prior to the revised training program were rewalked to assure that any other non-seismic components that could potentially effect safety related structures, systems or components had documented seismic analysis on file.

NOV Item B - 2.d (82-22-15A) Continued

4. Engineering records will be compiled to support walkdown teams.

5. May 15, 1983

NOV Item B - 2.e (82-22-11)

"The licensee designed and constructed thirty-two diesel generator building exhaust system hangers without ensuring that the applicable requirements for "Q" components were included in the design documents."

1. The violation is admitted.

2. (a) All design documents associated with installation of the Diesel Generator exhaust (B31.1) pipe hangers were not identified as "Q" even though the P&ID identified the piping as "Seismic Category 1" and the FSAR specified the Diesel Generator exhaust system to be safety related.

   (b) In accordance with project commitments any structure system or components identified "Seismic Category 1" is considered "Q" and project quality assurance program requirements should be applied. In general, only ASME III hangers are "Q", however, because of the uniqueness of "Seismic Category 1", B31.1 hangers, Project Engineering failed to translate the "Q" identification through all of the sub-tier documents.

3. The exhaust piping for the Diesel Generators is "Q" as documented in the isometric M-652, SH 1 and P&ID 7220-M-452 Sht 1A & 1B. The applicable hanger sketches have subsequently been revised to identify the supports as "Q". Bechtel Specification 7220-M-326(Q) has been revised to provide special provisions for QC inspections of the "Q" B31.1 support and lists the pipe hangers in question. A review has been performed which determined that no other situation similiar to the Diesel Generator exhaust piping (B31.1-Seismic Category 1) exists in the plant. In addition project confirmed that no other unique situations in the plant exist where Seismic Category 1 structures, systems or components are identified and the quality assurance program requirements had not been applied. There were several instances of drawing inconsistencies that require correction as result of project reviews, and NCR M01-5-2-166 was written by MPQAD to document this item.

NCR Item B - 2.e (82-22-11) Continued

4. (a) Project drawing changes are required to correct inconsistencies identified during project review for B31.1 piping in other project areas that were Seismic Category 1 without being identifed as "Q".

   (b) QC inspection of Diesel Generator exhaust system hangers will be required in accordance with project specification 7220-M-326(Q).

5. (a) Project drawing correction will be complete by June 1, 1983.

   (b) Required Diesel Generator exhaust system hanger inspections and closure of NCR M01-5-2-166 will be completed when the Construction Completion Program is initiated.

NOV Item B - 2.f (82-22-26)

"The licensee purchased Armor Stone for a "Q" portion of the perimeter dike without translating the applicable regulatory requirements into appropriate specifications and design documents."

1. The violation is admitted.

2. Part 2 of enclosure 7 of the NRC letter on Completion of Soils Remedial Activities Review dated May 25, 1982 required that the activities of the Armorstone placement program be "Q" controlled. The Project failed to translate this requirement into the design and procurement documents for this material due to a misunderstanding of NRC requirements.

3. Bechtel drawings C-45, C-109, C-111 and C-112 have been revised to designate the total area of the dike adjacent to the ultimate heat sink as "Q" as opposed to that while was designated "Q" in the initial implementation of the NRC requirements.

4. Technical specification C-209 will be revised as "Q" and will identify the portion of installation work to be done as "Q". In addition, Bechtel drawing C-1096 will be revised to specify the installation of Armorstone to be "Q" in the "Q" designated areas of the dike. No Armorstone has yet been placed in these areas.

5. Full compliance will be achieved when applicable specifications and drawings referred to above are revised as "Q". This will be done by June 1, 1983.

NOV Item B - 3. (82-22-01)

"Source inspections at the panel supplier facility and receipt inspections at the Midland site failed to ensure conformance of the internal wiring within diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 to Procurement Specification 7220-G-5, Revision 1. Paragraph 6.0 of Specification 7220-G-5 states "All electrical wiring . . . within the board enclosure shall conform to the highest industrial standards of design and workmanship." An NRC inspection on October 15, 1982 identified the following examples of defective terminations of internal wiring within the subject panels.

a. The output lead on the Relay Tach device had numerous broken strands at the termination lug.

b. 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.

c. The 1- lead on the CB-1 device did not have all strands inserted into the compression lug."

1. The violation is admitted.

2. The violation occurred due to poor electrical workmanship at the vendors facility, inadequate vendor QC inspection plus inadequate source inspection. Although MPQAD performed an overinspection on the four panels in question, the discrepant conditions had been missed.

3. (1) MPQAD initiated a 100% overinspection program (01E-7B) in July, 1980 to verify workmanship according to vendor workmanship standards and the technical specification. During the overinspection 27 NCR's were written, and 14 have been closed. Seven QAR's were written, and 5 closed. The lack of identification of conditions in this violation by the overinspection program has been investigated and is felt to be an isolated case.

NOV Item B - 3. (82-22-01) Continued

(2) NCR M01-9-2-139, dated October 22, 1982, was issued to track these four panels. MCAR 66 was prepared on December 30, 1982 with Interim Reports No 1 & 2 submitted to NRC Region III on December 30, 1982 and February 25, 1983, respectively. The scope of the MCAR 66 Task Force is to review the NCR's and QAR's written, verify that Project Engineering disposition is consistent between vendors and formulate an action plan that will preclude any further recurrence.

4. Implementation at the vendors facilities of E-24 Revision 0 "Overinspection of Vendor Supplied Printed Circuit Board Assemblies" and E-25 Revision 0, "Overinspection of Vendor Supplied Electrical Equipment/Components" will be carried out by MPQAD and Project Supplier Quality for the few future procurements shipped to the jobsite. Project representatives will witness in-process fabrication, functional testing and final inspection prior to release for shipment depending on the nature of the commodity. E-24 and E-25 were approved February 21, 1983 and February 18, 1983 respectively and have been issued for use.

5. (1) For equipment on site, MPQAD has inspected nearly 100% of all "Q" electrical panels and cabinets. MPQAD overinspection will continue until the source inspection program is fully implemented - forecast completion of overinspection is July 1, 1983.

(2) Programs are now in place to prevent recurrence of poor vendor workmanship for remaining panels and cabinets that are yet to be shipped.

(3) Full compliance will be achieved upon the closure of MCAR 66.

NOV Item B - 4.a (82-22-25)

"An inspection program was not established to ensure segregation of cables installed in horizontal trays which used metal dividers to segregate control and instrumentation cables in accordance with design requirements."

1. The violation is admitted. The violation involved three cables that had been inadvertantly looped in and out of the incorrect side of a divided tray section.

2. The cables in question could have been improperly segregated in the raceway for a variety of reasons: temporary rework situation, installation techniques, etc.

   Although there was no formal program to "train" or tie down cables in horizontal tray sections the current cable reinspection program should have found the discrepant condition. The reinspection program had not yet been implemented in this specific area.

3. (1) NCR M01-9-2-151 was issued November 1, 1982. Supervision was verbally informed and the non-conformance was immediately corrected.

   (2) Generic resolution involves revision of Field Procedure FPE-4.000 (pending approval) which will require an even distribution of cables across the tray, tying cables to rungs within two rungs of a change in direction and Project Engineering disposition of cables that exceed the height of the barrier on a case by case basis.

4. (1) Cable reinspection that is now ongoing is verifying the routing as an inspection attribute. Information developed from the cable reinspection program will be used to verify voltage segregation.

NOV Item B - 4.a (82-22-25) Continued

(2) Final training and tie down of cables will be accomplished (per FPE-4.000) when "Q" cable pulling resumes, at the time the last "Q" cable is pulled through a tray section.

5. (1) MPQAD reinspection is estimated to be complete by June 14, 1983. Review results of reinspection by July 1, 1983.

(2) Approval of Field Procedure FPE-4.000 scheduled for March 18, 1983.

NOV Item B - 4.b (82-22-17)

"Quality Control (QC) inspections failed to ensure that activities affecting quality conformed to design documents in that QC inspections performed on July 1, 1981 and documented on QCIR C210-172 failed to detect and identify nonconformances B.1.(1) through (o) of this Notice of Violation. These nonconformances were associated with installation of the diesel generator building HVAC fan support steel."

1. The violation is admitted.

2. In general, the violation occurred because of a lack of attention to detail during QC inspections and a lack of specificity in the PQCIs. In one case (item o) an incorrect design drawing was used by the QC inspector to perform his inspection.

3. The Construction Completion Program has been instituted.

4. As part of the Construction Completion Program, a review of PQCIs is being done to assure that essential design requirements are specified for inspectors. In addition, the Program calls for a QC inspector recertification program. The verification portion of the Program will verify quality of completed work.

5. Full complianace will be achieved when PQCI reviews and QC inspector recertifications and the verification program are complete.

NCV Item B - 5. (82-22-10)

"The licensee did not implement a maintenance program to prevent five of sixteen installed diesel generator slide bearing muffler plates from accumulating dirt and dust as required by the vendor's manual."

1. The violation is admitted.

2. The requirements to specify cleanliness of these bearing plate surfaces was not established upon receipt of this material. The vendor documents supplied to Project Engineering did not contain a requirement for bearing plate maintenance.

3. Bechtel has initiated a storage maintenance program for the exhaust silencer bearing plates. An NCR was written on March 9, 1983 by MPQAD to track this item.

4. Direction has been given to develop an installation and maintenance program for all flourocarbon bearing plates on site.

5. The maintenance program for the bearing plates will be fully implemented under the Construction Completion Program in conjunction with the closure of NCR 4693 which allows access to the bearings plates.

NOV Item B - 6. (82-22-13)

"During welding of the diesel generator building exhaust piping hanger support steel, the licensee did not verify preheat of existing safety-related structural steel at a temperature of 70°F as required by site specifications and the AWS 1974 Code."

1. The violation is admitted.

2. The ambient temperature was not verified for the welding operation observed by the NRC inspector. Documentation for preheats of all welds made between 32° and 70° were covered by the random preheat verification program contained in PQCI W-1.60. The program in place requires 100% verification for preheat temperature over 70°.

3. Bechtel's "Instuctions to Welders" have been revised to provide preheating instructions, and each welder signs for receipt of these instructions. The welder's rod withdrawal requisitions are also stamped in red with preheat instructions. The in-place verification program will be continued.

4. All Bechtel site welders will be retrained in the site preheat requirements, and all new welders will have this preheat training emphasized as part of their indoctrination.

5. All Bechtel site welders will be re-trained by May 1, 1983.

NCV Item B - 7. (82-22-21)

"Measures were not established to control the distribution of changes (red lines) to hanger isometric drawings in that changes to Drawing 1-652-2-25(Q) were not controlled utilizing the Site Document Control Center."

1. The violation is admitted.

2. The control of Redline changes to work prints was not performed through the Construction Document Control Department, however, it was being done in accordance with established field procedures.

3. Revisions to Bechtel Field Procedures now require all changes (redlines) to piping isometrics and hanger drawings to be controlled utilizing the site Document Control Center.

4. N/A

5. Complete.

NCV Item B - 8.a (82-22-23)

"Measures were not established or implemented to determine if materials ultimately restricted (per Nonconformance Report No 3266) from installation or use in ASME Class I systems were actually installed or used in Class I systems."

1. The violation is admitted.

2. Failure to initially apply QC hold tags on suspect material, and failure to implement disposition of the NCR in a timely manner.

3. A letter was provided to B&W Construction Company, a subcontractor at the Midland jobsite responsible for the majority of Class I piping and hanger installation, on December 11, 1981, identifying restriction on usage of subject material from heats identified on NCR 3266 for Class I use.

   100% of all completed Class I P-2.20 PQCIR documentation packages stored in the vault were reviewed for identification of the nonconforming material identified in NCR 3266. B&W has subsequently re-reviewed their documentation records to ascertain if any of the discrepant material identified through the PQCIR review was installed in the field. Any of the discrepant material is to be removed and replaced with acceptable material.

4. A specific review by a level II QCE of all future Class I P2.20 PQCIRs for discrepant material identified on NCR 3266 is being performed before final acceptance and their subsequent storage in the QC vault.

   A QA survey of all applicable NCRs will be performed in accordance with QA Checklist S-23 to assur. that material control procedures have been adequately implemented and subsequent actions associated with applicable NCR dispositions have been implemented.

NOV Item B - 8.a (82-22-23) Continued

Although not related directly with the above effort or this identified discrepancy, a complete material verification documertation review with special emphasis for ASME NCA 3700/3800 compliance for pipe support material is in process on the project by Bechtel procurement supplier quality group to assure acceptable material documentation for the Midland Project. Miscellaneous material such as rebars, paint, etc, are excluded from this review.

5. Full compliance with be obtained as follows:

Specific Actions - 1) Rework required on Class I supports in field to be complete by March 15, 1983.

2) Review of all new P-2.20 PQCIRs is ongoing.

Generic Actions - 1) Review of all applicable project NCRs by QA to be complete by June 24, 1983.

2) Follow-up actions as result QA survey to be determined later.

General - 1) The review of all material documentation packages for proper verification documentation is an ongoing effort. As stated previously, this is considered additional effort not directly related to resolution of the identified discrepancy.

NCV Item B - 8.b(1) (82-22-12A)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

(1) The diesel generator exhaust hangers were not classfied, designed, or built as "Q" as committed to in the FSAR. (See item 2.e) ..."

1. The violation is admitted.

2. An NCR was not issued because MPQAD failed to act in a timely manner.

3. NCR M01-5-2-166 was written by MPQAD on November 16, 1982 to document the hangers listed on SCN #36 to Specification M-326 as being nonconforming as a result of their original "non-Q" designation.

4. Complete.

5. Complete.

NOV Item B-8.b(2) (82-22-12B)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

... (1) The design of the diesel generator monorail was not analyzed to seismic Category I design requirements as committed to in the FSAR. (See item 2.d.)"

1. The violation is admitted.

2. There was a misunderstanding over whether a nonconforming condition actually existed.

3. On November 16, 1982, a Quality Action Request (QAR) was written to document the condition. A subsequent seismic analysis has been done (Calc #G-44(Q) Revision 1) which documents the acceptability of current design of the subject monorail.

4. Complete.

5. Complete.

ATTACHMENT 3

REQUEST FOR REDUCTION OF CIVIL PENALTY

Pursuant to 10 CFR 2.205, Consumers Power Company respectfully requests that the NRC reconsider the amount of civil penalty proposed to CPCo for the violations cited in the NRC's letter, dated February 8, 1983, J G Keppler to J D Selby. The Company does not contest the validity of the violations and agrees that a civil penalty is warranted, but believes that certain mitigating factors should be considered.

The NRC's criteria for enforcement actions (at 47 Federal Register page 9991, March 9, 1982) sets forth specific criteria for increasing or reducing base civil penalties, and provides in part as follows:

> "2. Corrective Action to Prevent Recurrence. Recognizing that corrective action is always required to meet regulatory requirements, the promptness and extent to which the licensee takes corrective action, including actions to prevent recurrence, may be considered in modifying the civil penalty to be assessed. Unusually prompt and extensive corrective action may result in reducing the proposed civil penalty as much as 50% of the base value shown in Table 1. On the other hand, the civil penalty may be increased as much as 25% of the base value if initiation of corrective action is not prompt or if the corrective action is only minimally acceptable. In weighing this factor consideration will be given to , among other things, the timeliness of the corrective action, degree of licensee initiative, and comprehensiveness of the corrective action - such as whether the action is focused narrowly to the specific violation or broadly to the general area of concern."

We believe that our actions to correct the situation at issue have been timely and have been conceived and organized mainly through our own initiative. Most important, however, is that our program to correct these deficiencies is comprehensive and far reaching.

Shortly after receiving feedback on the NRC's inspection findings, the Company launched major, extensive corrective action. The Company halted the majority of the Category I work of its prime contractor, and laid the groundwork for a verification of past inspections and statusing of incomplete work. The work stoppage resulted in the layoff of more than 1,000 workers. The Company also initiated major, generic corrective action addressing the specific areas of NRC inspection findings. The Company's entire plan is entitled the Construction Completion Program, and included steps responding broadly to the NRC's and Company's areas of concern. This was addressed at length in the Company's letter of January 10, 1983, J W Cook to J G Keppler and further discussed at a Public Meeting with the NRC at Midland on February 8, 1983.

The corrective action undertaken by the Company was not narrowly focused on the specific violations identified by the NRC. The work reduction extended to all major safety related structures on-site, not merely the diesel generator building which was the focus of NRC's inspection. The verification program begins in the auxiliary building, includes the reactor buildings and diesel generator building as well as the service water pump structure.

The Construction Completion Program, which is the organizational basis for the generic corrective action, will encompass and structure the remaining pre-turnover systems and area work to be done at the Midland site, (excepting soils, HVAC and NSSS work). The Company's willingness to accept the NRC's suggestion that we take direct control of the project QC staff formerly under Bechtel supervision extends broadly to the entire job, and involves a major commitment of additional manpower and resources in recertification, training, and inspection activities.

The Company does not contest the NRC's decision to increase the civil penalty on the basis of certain other factors specified in the enforcement guidelines. We request, however, that consideration be given in determining the amount of the penalty to the corrective action taken and planned by the Company.

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

DEC 30 1982

Docket No. 50-329
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 letter confirms the discussions conducted during the meeting on December 2, 1982 between Mr. R. F. Warnick and others of this office and Mr. J. W. Cook and others of your staff regarding the new Construction Completion Plan Consumers Power Company has developed to address the problems identified by Region III during the October through November 1982 inspection of the Diesel Generator Building.

As a result of our discussions, we understand that you have taken or plan to take the following actions:

(1) Halted safety-related work at the Midland site with the exception of the following:

(a) System layup activities

(b) Hanger and cable reinspection activities

(c) Post turnover work activities (not to include design changes)

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(d) Zack HVAC work (subject to resolution of welders qualifications issue)

(e) B&W construction activities

(f) Remedial soils activities

(g) Bechtel engineering activities

(2) An integrated QA/QC organization will be identified and implemented and all QC personnel previously certified by Bechtel will be trained and recertified by CPCo to meet CPCo procedures and commitments.

(3) Teams comprised of engineering and construction personnel will be organized, each responsible for the satisfactory completion of one or more safety systems.

(4) A reinspection program will be developed to provide a system by system reinspection of all safety related systems.

We understand that you will submit a written plan to the NRC describing in detail the actions encompassed by CPCo's Construction Completion Program. We request that this plan also identify the interrelationship between the Construction Completion Plan and your proposed plans for third party independent assessments.

After receipt of your submittal we will hold a meeting with CPCo in the Midland area, which will be open to the public, to discuss the details of your program. Time will also be provided for public comment regarding these issues at the end of the meeting.

Following our review of your submittal, including consideration of comments offered by members of the public, we will make a determination on the acceptability of your program and will determine the appropriate method of documenting your commitments.

Should you have any questions regarding this letter please contact Mr. R. F. Warnick of my staff.

Sincerely,

Original signed by
James G. Keppler

James G. Keppler
Regional Administrator

cc: DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)

RIII	RIII	RIII	RIII	RIII	RIII	IE:HQ	NRR	NRR
RFW for	RFW for	RFW	RFW for	JKP for RBD	JK	By Telephone 12/29		By Telephone
Gardner/sv	Shafer	Warnick	Lewis	Davis	Keppler	Sniezek	Eisenhut	Purple
12/29/82		12/30/82			12/30/82	RFW		RFW 12/29

Warrick

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

FEB 8 1983

Docket No. 50-329
Docket No. 50-330

Consumers Power Company
ATTN: Mr. John D. Selby
President
212 West Michigan Avenue
Jackson, MI 49201

Gentlemen:

This refers to the special inspection conducted during the period October 12 through November 25, 1982, and January 19-21, 1983 of activities at the Midland Nuclear Power Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82. The results of the inspection were discussed during an enforcement conference conducted at the NRC Region III office on January 18, 1983. The report setting forth the results of the inspection and the enforcement conference is enclosed.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). 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.

A separate letter is enclosed that sets forth certain matters of concern and the items of noncompliance found during the inspection. 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.

We will gladly discuss any questions you have concerning these inspections.

Sincerely,

Original signed by
James G. Keppler

James G. Keppler
Regional Administrator

Enclosure: Inspection Report
No. 50-329/82-22(OSC) and
No. 50-330/82-22(OSC)

cc w/encl:
J. W. Cook, Vice President
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)

RIII	RIII	RIII
WWS	D	JGK
Schultz/jp	Davis	Keppler
2/2/83	2/4/83	2/7/83
2-9-83		

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 — 2-1-83
P. A. Barrett

W. Shafer for — 2-1-83
B. L. Burgess

W Shafer — 2-1-83
R. J. Cook

R. N. Gardner — 2/1/83
R. N. Gardner

R B Landsman — 2-1-83
R. B. Landsman

Approved by: W. D. Shafer, Chief — W D Shafer — 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.

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:

Noncompliance	Report Section
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:

Cable Scheme Number	Location of Termination
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 Dawing 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 IR's 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, Sh.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 1, 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 by other (Bechtel) Procurement Supplier Quality Department."

Based on the ASME Subsection NF-2610(b), 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 activites. 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). Inclusively, 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 5.0. 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 caluclations 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. M01-9-2-154 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. M01-9-2-151 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 accomodate 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 Reservior (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.

Warnick

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

FEB 8 1983

Docket No. 50-329
Docket No. 50-330
EA 83-3

Consumers Power Company
ATTN: Mr. John D. Selby
President
212 West Michigan Avenue
Jackson, MI 49201

Gentlemen:

This letter refers to the special inspection conducted by the Office of Special Cases, Midland Section, of this office on October 12 - November 25, 1982, and on January 19-21, 1983 of activities at the Midland Nuclear Power Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82. The results of the inspection were discussed with you on November 10 and 23, 1982, on January 21, 1983 at the conclusion of the inspection and on January 18, 1983 in the Region III office during an enforcement conference between you and others of your staff and me and others of the NRC staff.

The inspection was primarily a physical inspection of installed equipment to verify conformance to approved drawings and specifications. The results of the inspection indicate a breakdown in the implementation of your quality assurance program as evidenced by numerous examples of noncompliance with nine of the eighteen different criteria as set forth in 10 CFR 50, Appendix B. The breakdown was caused by personnel who failed to follow procedures, drawings, and specifications; by first line supervisors and field engineers who failed to identify and correct unacceptable work; by construction management who failed to call for quality control inspections in a timely manner, allowing a backlog of almost 16,000 inspections to develop; and by quality assurance personnel who failed to identify the problems and ensure that corrective actions were taken. As a result, you failed to fulfill your primary responsibility under Criterion 1 of Appendix B to 10 CFR 50 to assure the execution of a quality assurance program. In addition, of particular concern to the NRC is the fact that quality control (QC) supervisors instructed QC inspectors to suspend inspections if excessive deficiencies were found during the performance of inspections. Consequently, not all observed deficiencies were reported, and complete inspections were not performed by all QC inspectors after the reported deficiencies were corrected.

I understand that, because of our findings, you have inspected other areas of the plant and found similar deficiencies. As a result of our findings, your findings, and your assessment of the overall project, you halted certain safety-related work at the Midland site, reduced the work force by approximately 1100

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8302110254

people, committed to building cleanup and system layup, committed to organize teams of construction and engineering personnel responsible for the completion of one or more plant systems, and committed to reinspect safety-related systems. I expect that you will also conduct an inspection to determine the extent to which QC supervisors at the Midland site have been instructing QC inspectors to limit findings of deficiencies and the extent to which QC inspectors have been conducting reinspections based only on reported deficiencies.

To emphasize the need for CPCo management to ensure implementation of an effective quality assurance program that identifies and corrects construction deficiencies, we propose to impose civil penalties for the items set forth in the Notice of Violation that is enclosed with this letter. The violations in the Notice have been categorized as Severity Level III violations in accordance with the General Statement of Policy and Procedure for Enforcement Actions, Appendix C of 10 CFR 2. The base value for a Severity Level III violation is $40,000. However, as a result of your past enforcement history involving quality assurance and the multiple examples of QC deficiencies for the areas inspected, the base civil penalty for each violation is being increased by fifty percent.

After consultation with the Director of the Office of Inspection and Enforcement, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties in the cumulative amount of One Hundred Twenty Thousand Dollars ($120,000).

You are required to respond to this letter and should follow the instructions in the Notice when preparing your response. In your response you should describe the results of your inspections to determine the extent to which QC supervisors instructed QC inspectors to limit findings of deficiencies, the systems affected, and your corrective actions to ensure that all affected systems are adequately reinspected. Your reply to this letter and the results of future inspections will be considered in determining whether further enforcement action is appropriate.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC Public Document Room.

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

Sincerely,

James G. Keppler

James G. Keppler
Regional Administrator

Enclosure:
Notice of Violation and
Proposed Imposition of Civil Penalties

cc w/encl:
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
  Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)
RCDeYoung, IE
JHSniezek, IE
JAxelrad, IE
JTaylor, IE
EJordan, IE
CThayer, IE
JLieberman, ELD
VStello, DED/ROGR
FIngram, PA
JCummings, OIA
JFitzgerald, OI
HDenton, NRR
JKeppler, RIII
Enforcement Coordinators
  RI, RII, RIII, RIV, RV
MWilliams, NRR
JCrooks, AEOD
GKlingler, IE
IE:ES Files
IE:EA Files
EDO Rdg File

RIII	RIII	RIII	RIII	RIII
	I do not concur with increasing the c.p. size of the fine			
KRC for	RFW	WVS	D	JK
Shafer/jp	Warnick	Schultz	Davis	Keppler
2/4/83	2/4/83	2-4-83	2/4/83	2/7/83

NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTIES

Consumers Power Company
Midland Nuclear Power Plant
Units 1 and 2

Docket Nos. 50-329
50-330
Permit Nos. CPPR-81
CPPR-82
EA 83-3

As a result of the inspections conducted at the Midland Nuclear Plant on October 12 - November 25, 1982 and January 19 - 21, 1983, the violations of 10 CFR 50, Appendix B listed below were identified. These violations demonstrate that you failed to exercise adequate oversight and control of your principal contractor, to whom you had delegated the work of executing the quality assurance program. Your failure manifested itself in a breakdown in the implementation of your quality assurance program and, at least in part, caused Consumers Power Company to halt some safety-related work and take other significant actions to provide assurance that safety-related structures and systems are constructed as designed.

As described in item A, QC supervisors instructed QC inspectors to suspend an inspection if an excessive number of deficiencies was observed. Consequently, there was no assurance that a complete inspection was being performed after the reported deficiencies were corrected and we have found several instances in which final QC inspections were based on only the limited deficiencies reported during the initial inspection. In addition, this failure to report all identified deficiencies resulted in incorrect data being fed into your Trend Analysis Program, inhibiting your ability to determine the root cause of deficiencies and prevent their recurrence.

As illustrated in the numerous examples set forth in Item B, personnel failed to follow procedures, drawings, and specifications; first line supervisors and field engineers failed to identify and correct unacceptable work; construction management failed to call for quality control inspections in a timely manner, allowing a backlog of almost 16,000 inspections to develop; and quality assurance personnel failed to identify the problems and ensure that corrective actions were taken.

In order to emphasize the need for improvements in your control of your quality assurance program, we propose to impose civil penalties in the cumulative amount of One Hundred Twenty Thousand Dollars ($120,000).

In accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C) 47 FR 9987 (March 9, 1982), and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205, the particular violations and the associated civil penalties are set forth below:

CIVIL PENALTY VIOLATIONS

A. 10 CFR 50, Appendix B, Criterion X requires, in part, "A program for inspection of activities affecting quality shall be established and executed...to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity."

10 CFR 50, Appendix B, Criterion XV requires, in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation."

Consumers Power Quality Assurance Program Policy No. 15, Revision 12, Paragraph 1.0, requires, in part, "Items, services or activities which are deficient in characteristic, documentation or procedure which renders the quality unacceptable or indeterminate and which is considered significant to safety are identified as nonconformances. Nonconforming items... are identified by marking, tagging, segregating or by documentation. Nonconforming items are controlled to prevent their inadvertent installation or use. Nonconforming items and activities are recorded and are considered for corrective action to prevent recurrence...."

Contrary to the above, during the inspection conducted between October 12 - November 25, 1982 and January 19-21, 1983, NRC inspectors determined that quality control inspectors were not documenting as nonconformances all of the deficiencies which they observed during their inspections. Inspections were suspended by the QC inspector if too many nonconformances were observed. In-process inspection notices (IPINs) associated with suspended inspections, identified as nonconformances only a portion of the observed deficiencies. Supervisory QC personnel stated that they directed QC inspectors to limit the number of nonconformances documented during an inspection. This directive was verified by discussions with QC inspectors. Several QC inspectors interviewed, confirmed that inspections were closed after reviewing only the deficiencies documented on the IPIN. As a result, measures were not established to prevent the continued installation and use of these nonconforming items. In addition, corrective actions were not implemented to prevent recurrence of these nonconformances.

This is a Severity Level III violation (Supplement II)
(Civil Penalty - $60,000)

B. 10 CFR 50, Appendix B, Criterion II requires holders of construction permits for nuclear power plants to document, by written policies, procedures, or instructions, a quality assurance program which complies with the requirements of Appendix B for all activities affecting the quality of safety-related structures, systems, and components and to implement that program in accordance with those documents.

Contrary to the above, Consumers Power Company and its contractor did not adequately implement a quality assurance program to comply with the requirements of Appendix B as evidenced by the following examples:

1. 10 CFR 50, Appendix B, Criterion V requires, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

   Consumers Power Quality Assurance Program Policy No. 5, Revision 12, Paragraph 1.0 states, in part, "Instructions for controlling and performing activities affecting quality of equipment or activities such as...construction, installation...are documented in instructions, procedures...and other forms of documents."

   Contrary to the above, the following instances of failure to accomplish activities affecting quality in accordance with instructions, procedures, specifications, or drawing requirements were identified:

   a. Installation of diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 was not in accordance with the requirements delineated on foundation Drawing 7220-M18-250 in that the foundation bolt washers required by the subject drawing were not installed.

   b. Unscheduled pull box associated with conduits 2BN006, 2BN007, and 2BDA002 was not sized in accordance with the requirements delineated on Sheet 42 of Drawing E-42 in that the 12" x 12" x 6" as-built dimensions of the subject pull box did not conform to the 13½" x 12" x 6" dimension requirements delineated on Sheet 42 of Drawing E-42.

   c. The 1'-10" wall to support dimension required by raceway support Drawing E-796(Q), Sheet 2 of 2, Revision 5, for hanger No. 86 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 2'-1½" in lieu of the required 1'-10".

   d. The 6'-6" wall to support dimension required by raceway support Drawing E-796(Q) Sheet 1 of 2, Revision 11 for hanger No. 14 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 5'-5" in lieu of the required 6'-6".

e. The inspectors identified high strength steel plate placed in the laydown area which was not marked with the material type and grade as required by Field Instruction FIG-9.600, Revision 1.

f. The inspectors identified various stock steel shapes in the "Q" area with yellow-colored paint on the ends (indicating the material was non "Q") and various steel stock shapes in the non "Q" area without painted ends (indicating "Q" material), contrary to the requirements of Field Instruction FIG-9.600, Revision 1.

g. The slots in the muffler support plates were not machined but were determined to be irregular and flame cut, leaving rough slot edges not in conformance with design Drawing M18-425(5)-1.

h. Jacking plates were not installed beneath the center support plates of Bay 1 diesel generator muffler as required by Drawing M18-250-6.

i. Procedure FID-2.100, "Outstanding FCR/FCN Retirement," Revision 2 was inadequate in that the design drawings were not changed when an FCR/FCN had been retired and no further reference to the FCR existed on the revised drawing. As a result, the retired FCR C-2103 relating to HVAC structural steel was lost and could not be traced to the design drawing to ensure a complete quality record.

j. Field Sketch CY-1035 which illustrated the bottom gusset plates for HVAC fan supports was not identified as "Q", nor was there a reference to the affected drawing on the sketch as required by Procedure FPD-5.000, "Preparation of Field Sketches."

k. Procedure FPD-5.000, "Preparation of Field Sketches," Revision 1 did not require design drawings to reference appropriate field sketches to ensure a complete quality record.

l. 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 diesel generator bays. This change was neither reviewed nor properly authorized.

m. The as-built gusset plate connections in Bay 1 were not built as identified on Detail 3 of Drawing C-1004. The angle braces were welded together as opposed to having separate welds for each brace. This change was neither reviewed nor properly authorized.

n. None of the sixteen ¼" bracing angles identified on Drawing C-1004 were constructed utilizing ½" material. This change was neither reviewed nor properly authorized.

o. Drawing C-1004, Detail 2, required the W10 beam-to-beam connection to be welded. In Bay No. 3, a bolted connection was constructed in lieu of the required welded connection, without review nor proper authorization.

p. 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 required. This change was neither reviewed nor properly authorized.

q. A section (approximately 18 x 10 x 4 inches deep) of the primary containment wall in Containment Purge Room 702 was removed (by chipping) without obtaining approval as required by FIG-1-111, Revision 4, Concrete Drilling Permit.

2. 10 CFR 50, Appendix B, Criterion III requires, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components. Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization."

Consumers Power Company Quality Assurance Program Policy No. 3, Revision 12, Paragraphs 3.3 and 3.5 state, in part, "Each group or organization performing detailed design translates the applicable regulatory requirements, design bases, codes, standards, and design criteria into design documents, such as...drawings.... Changes to the design require the same review and approval as the original design by the group or organization delegated lead design responsibility."

Contrary to the above:

a. Measures were not established for the selection and review for suitability of application of "Q" materials associated with the diesel generator exhaust muffler in that design drawings and specifications did not indicate the material identity of the installed muffler saddle supports and plates.

b. Design Drawing C-147 required bolted bracing connections for the diesel generator building HVAC bracing gusset plates. Field Sketch CY-1035 was used to change the design to welded connections in lieu of the specified bolted connections. This design change was neither properly reviewed nor approved.

c. Design Drawings C-1004 and C-147 did not specify the sizes of the diesel generator building HVAC fan gusset plates. A "combo" shop work order request was used to design the gusset plates without appropriate review and approval.

d. The licensee failed to analyze the four diesel generator building monorails as seismic Category I as described in their commitment to Regulatory Guide 1.29, in Appendix 3A of the FSAR.

e. The licensee designed and constructed thirty-two diesel generator building exhaust system hangers without ensuring that the applicable requirements for "Q" components were included in the design documents.

f. The licensee purchased armor stone for a "Q" portion of the perimeter dike without translating the applicable regulatory requirements into appropriate specifications and design documents.

3. 10 CFR 50, Appendix B, Criterion VII requires, in part, "Measures shall be established to assure that purchased...equipment...conforms to the procurement documents. These measures shall include provisions, as appropriate, for...inspection at the contractor or subcontractor source, and examination of products upon delivery."

Consumers Power Quality Assurance Program Policy No. 7, Revision 12, Paragraphs 1.0 and 3.4, state, in part, "The Midland Project Office and the Midland Project Quality Assurance Department verify that procurement requirements are met. This is accomplished through... source evaluation and inspection...receipt inspections are made to verify that the items...conform to procurement requirements not verified by source surveillance or inspection...."

Contrary to the above, source inspections at the panel supplier facility and receipt inspections at the Midland site failed to ensure conformance of the internal wiring within diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 to Procurement Specification 7220-G-5, Revision 1. Paragraph 6.0 of Specification 7220-G-5 states, "All electrical wiring...within the board enclosure shall conform to the highest industrial standards of design and

workmanship." An NRC inspection on October 15, 1982 identified the following examples of defective terminations of internal wiring within the subject panels.

a. The output lead on the Relay Tach device had numerous broken strands at the termination lug.

b. 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.

c. The 1- lead on the CB-1 device did not have all strands inserted into the compression lug.

4. 10 CFR 50, Appendix B, Criterion X requires, in part, "A program for inspection of activities affecting quality shall be established and executed...to verify conformance with the documented...drawings for accomplishing the activity."

Consumers Power Company Quality Assurance Program Policy No. 10, Revision 12, Section 1.0 states, in part, "Inspection and surveillance are performed to assure that activities affecting quality comply with documented...design documents...inspection and surveillance are performed according to written instructions."

Contrary to the above:

a. An inspection program was not established to ensure segregation of cables installed in horizontal trays which used metal dividers to segregate control and instrumentation cables in accordance with design requirements.

b. Quality Control (QC) inspections failed to ensure that activities affecting quality conformed to design documents in that QC inspections performed on July 1, 1981 and documented on QCIR C210-172 failed to detect and identify nonconformances B.1.(1) through (o) of this Notice of Violation. These nonconformances were associated with installation of the diesel generator building HVAC fan support steel.

5. 10 CFR 50, Appendix B, Criterion XIII requires, in part, "Measures shall be established to control the...cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration. When necessary for particular products, special protective environments...shall be specified."

Consumers Power Company Quality Assurance Program Policy No. 13, Revision 12, Paragraph 3.3, states, in part, "Suppliers provide plans...maintain and control items upon arrival at the site."

Contrary to the above, the licensee did not implement a maintenance program to prevent five of sixteen installed diesel generator slide bearing muffler plates from accumulating dirt and dust as required by the vendor's manual.

6. 10 CFR 50, Appendix B, Criterion IX requires, in part, "Measures shall be established to assure that special processes, including welding, heat-treating, and nondestructive testing, are controlled...."

Consumers Power Company Quality Assurance Program Policy No. 9, Revision 12, Paragraph 1.0 states, in part, "Where the required level of quality cannot be measured by inspection only of the item...accomplish these processes under controlled conditions in accordance with applicable codes, standards and specifications using qualified procedures, equipment and personnel." Paragraph 3.3 states, in part, "...Personnel performing special processes maintain records to verify that the required activities were accomplished in accordance with qualified procedures by qualified personnel."

Contrary to the above, during welding of the diesel generator building exhaust piping hanger support steel, the licensee did not verify preheat of existing safety-related structural steel to a temperature of 70°F as required by site specifications and the AWS 1974 Code.

7. 10 CFR 50, Appendix B, Criterion VI requires in part, that "Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings including changes thereto, which prescribe all activities affecting quality...."

The Consumers Power Company Quality Assurance Program Policy No. 6, Revision 12, Paragraph 1.0 states, in part, "Measures are included to assure that documents, including changes,...are distributed according to a controlled distribution to the user functions."

Contrary to the above, measures were not established to control the distribution of changes (red lines) to hanger isometric drawings in that changes to Drawing 1-652-2-25(Q) were not controlled utilizing the Site Document Control Center.

8. 10 CFR 50, Appendix B, Criterion XV requires in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation."

Consumers Power Quality Assurance Program Policy No. 15, Revision 12, Paragraph 1.0, states, in part, "Items, services or activities which are deficient in characteristic, documentation or procedure which renders the quality unacceptable or indeterminate and which is considered significant to safety are identified as nonconformances. Nonconforming items...are identified by marking, tagging, segregating or by documentation. Nonconforming items are controlled to prevent their inadvertent installation or use. Nonconforming items and activities are recorded and are considered for corrective action to prevent recurrence...."

Contrary to the above:

a. Measures were not established or implemented to determine if materials ultimately restricted (per Nonconformance Report No. 3266) from installation or use in ASME Class I systems were actually installed or used in Class I systems.

b. As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report, or other appropriate report. The two nonconforming conditions were:

(1) The diesel generator exhaust hangers were not classified, designed, or built as "Q" as committed to in the FSAR. (See item 2.c.)

(2) The design of the diesel generator monorail was not analyzed to seismic Category I design requirements as committed to in the FSAR. (See item 2.d.)

This is a Severity Level III violation (Supplement II).
(Civil Penalty - $60,000)

Pursuant to the provisions of 10 CFR 2.201, Consumers Power Company is hereby required to submit to the Director, Office of Inspection and Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555 and a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, within 30 days of the date of this Notice a written statement or explanation, including for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons

for the violation, if admitted; (3) the corrective steps which have been taken and the results achieved; (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Consumers Power Company may pay the civil penalties in the cumulative amount of $120,000 or may protest imposition of the civil penalties, in whole or in part, by a written answer. Should Consumers Power Company fail to answer within the time specified, the Director, Office of Inspection and Enforcement will issue an order imposing the civil penalties proposed above. Should Consumers Power Company elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties, in whole or in part, such answer may request remission or mitigation of the penalties. In requesting mitigation of the proposed penalties, the five factors contained in Section IV(B) of 10 CFR Part 2, Appendix C should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate statements or explanations by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. Consumers Power Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedures for imposing a civil penalty.

Upon failure to pay any civil penalties due, which have been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Keppler
Regional Administrator

Dated at Glen Ellyn, Illinois
this 8th day February of 1983

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Mr. Warnick -
Will we be preparing a response to this?
Laura

Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

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

March 10, 1983

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Mr R C DeYoung
Director, Office of Inspection and Enforcement,
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND ENERGY CENTER PROJECT -
DOCKET NO 50-329 AND 50-330 - MIDLAND PROJECT RESPONSE
TO NRC NOTICE OF VIOLATION EA83-3 DATED FEBRUARY 8, 1983 -
FILE 0485.16 SERIAL 21775

Attached is Consumers Power Company's (CP Co) Response to the Notice of Violation ("Notice") transmitted by J G Keppler's February 8, 1983 letter to J D Selby. In addition to this cover letter, the response consists of attachments in accordance with 10 CFR 2.201, addressing the two violations (Attachments 1 and 2), and a request for mitigation of the civil penalty under the General Statement of Policy and Procedure for Enforcement Actions 47FED.REG. 9987 March 9, 1982 (Attachment 3).

Attachment 1, in addition to specifically providing the items of information requested on page 9 of the "Notice", reports on the results of the Company's investigation into In Process Inspection Notices (IPIN's) and answers the questions on page 2 of Mr Keppler's letter. The Company found that all quality control disciplines had been given the option to terminate an inspection (when multiple nonconforming conditions were observed), document observed findings of the partial inspection on IPIN's, and return work to construction. The Company also found that some individuals would limit reinspection to reported deficiencies. As noted in Attachment 2, the Company admits to the noncompliances listed under Violation B.

The Company admits the two violations and does not contest the basis for imposing a civil penalty, although we respectfully request that the NRC reconsider the amount of the penalty in light of the corrective actions the Company has taken, as set forth more fully in Attachment 3. In late 1982, upon receipt of preliminary information concerning NRC inspection findings, the Company took major corrective actions. We halted most Category I work of the prime contractor pending initiation of an effort to verify previous inspections and statusing of incomplete work. We initiated steps to correct the deficiencies and, as part of an overall program revised production and

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quality processes, changed and realigned the management team, and expanded project resources to complete the job. The description of this effort is described in my letter to Mr J G Keppler dated January 10, 1983, regarding the Midland Project Construction Completion Program. We are confident that as we implement these corrective actions the Midland Project will achieve compliance with regulatory requirements.

James W. Cook

JWC/JEB/dlm

CC J G Keppler
J W Cook, P26-336B
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W D Shafer, NRC Region III
R N Gardner, NRC Region III
R J Cook, NRC Resident Inspector Midland Site
R B Landsman, NRC Region III
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Washington, DC 20555

CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 21775 Dated 3-10-83

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits the response to Notice of Violation.

CONSUMERS POWER COMPANY

By /s/ J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 10th day of March 1983 .

/s/ Patricia A Puffer
Notary Public
Bay County, Michigan

My Commission Expires 3-4-86

ATTACHMENT 1

RESPONSE TO NOTICE OF VIOLATION ITEM A

STATEMENT OF VIOLATION (Item A)

"NRC inspectors determined that quality control inspectors were not documenting as nonconformances all of the deficiencies which they observed during their inspections. Inspections were suspended by the QC inspector if too many nonconformances were observed. In-process inspection notices (IPINs) associated with suspended inspections, identified as nonconformances only a portion of the observed deficiencies. Supervisory QC personnel stated that they directed QC inspectors to limit the number of nonconformances documented during an inspection. This directive was verified by discussions with QC inspectors. Several QC inspectors interviewed, confirmed that inspections were closed after reviewing only the deficiencies documented on the IPIN. As a result, measures were not established to prevent the continued installation and use of these nonconforming items. In addition, corrective actions were not implemented to prevent recurrence of these nonconformances."

SUMMARY OF RESPONSE TO VIOLATION (Item A)

1. The violation is admitted.

2. The reasons for the violation are as follows: (1) failure of QC management (a) to recognize potential for adverse impact, on the inspection process, of terminating inspections on activities with multiple deficiencies and partially documenting findings on IPINs, ("return option")*, (b) to communicate specific direction on the use of the "return option" to avoid adverse impacts; (2) lack of sufficient specificity in procedures defining responsibilities of Quality Control Engineer's, (QCEs) signing off on Inspection Report activities; (3) lack of full understanding among all QCEs of responsibilities for inspecting all multiple items before closing IR line activities when conducting follow-up inspections on activities subject to an IPIN.

3. Corrective action in place is as follows: IPINs have been discontinued at the Midland site. QCEs have been instructed by memorandum to complete all activities which have been submitted for inspection regardless of number of nonconforming conditions observed and to document findings on nonconformance reports (NCR's).

4. Planned or in-process corrective actions:

   (a) Procedures PSP 6.1 and PSP 3.2 are being revised in accordance with the direction given in Paragraph 3 above.

   (b) QCEs will be trained in the revision to the procedures in accordance with the general training procedure B-3M-1. During this training, emphasis will be placed on the requirement described in Paragraph 3 above.

(c) All closed inspection report activities upon which IPIN's have been issued will be verified. An investigation of Deficiency Reports* is ongoing to determine whether closed Inspection Reports were affected by this problem.

5. Dates for full compliance

Item a - by March 22, 1983

Item b - start training April 1, 1983

Item c - as part of the verification step in the Construction Completion Program

DETAILED RESPONSE
Background Information

Inspection activities are defined in specific instructions, Project Quality Control Instructions (PQCIs). These instructions describe how inspections are carried out and the attributes to be inspected. Each inspection activity is documented on an "Inspection Report," (IR) which contains blank spaces to be initialed by the individual Quality Control Engineer (QCE) who conducts this inspection and only after completing the inspection activity. There is a one-to-one correspondence between activities defined in the PQCI and listed on the IR. When all activities on the IR are appropriately initialed, the IR is reviewed and "closed out" by a Quality Control Engineer Level II by signing on a designated line on the IR's last page.

In-Process Inspection Notices (IPINs), instituted on June 1, 1981, were one of two basic types of reports used to document nonconforming conditions observed during primary inspections at the Midland jobsite. IPINs could be used to document deficiencies which were found prior to acceptance of completed work. Nonconformance Reports (NCR), the other basic means of formally reporting nonconforming conditions, were used either before or after acceptance of completed work.

If, during the course of an inspection activity, a QCE found a deficiency, he was required to document the condition. Prior to June 1, 1981, procedures specifically allowed a QCE to return certain deficiencies to construction without documentation, providing the deficiency could be corrected within the same shift. The procedures would not allow the QCE to initial the space corresponding to such an activity on the IR unless and until the deficiency was corrected by project construction or the condition had been properly recorded on an NCR. Activities on an IR that were not initialed were said to be "open." Because the activity could not be "closed" until correction of any identified problem (or submission of an NCR), the "open" activity formed a basis for controlling deficiencies identified during inspections.

* The Deficiency Report ("DR") is a predecessor document to IPINs, and as such is under investigation to determine if corrective action regarding it is warranted.

The IPIN procedure was designed to provide construction with prompt feedback of information concerning deficiencies or incomplete work. A copy of all IPINs was sent immediately after issuance to construction for disposition. When construction made necessary corrections, the IPIN was returned to Quality Control, indicating that the hardware was ready for further inspection. Subsequent inspections which determined that the problem documented on the IPIN had not been corrected, or that other nonconforming conditions existed, would result in further IPINs or NCRs. In any case, an IR activity would remain open until QC had verified all problems were corrected or an NCR was submitted.

The particular practice giving rise to the Notice of Violation involved the termination of inspection activities when multiple nonconforming conditions were observed part way through an inspection. If a QCE conducting an initial inspection determined that parts or components covered by a given inspection activity had a large number of nonconforming conditions, he had the option to terminate his inspection before completing the activity, document the deficiencies observed to that point on an IPIN and return the hardware to construction ("the return option"). Region III determined that items not inspected initially when this return option was exercised may have escaped later inspection. The postulated mechanism for this outcome is as follows: As previously described, once construction had corrected a problem noted on an IPIN, the IPIN was transmitted to Quality Control for further inspections. Procedures then required that the QCE inspect the hardware to determine that corrections of the IPIN-identified deficiency were carried out and that all other items had been inspected before closure of the activity on the IR. Thus, if a return option had been exercised, then before closing out the activity, a QCE would have to inspect not only those hardware items written up on the IPIN, but also all others which he had not satisfied himself as being previously inspected before the initial inspector terminated his inspection. Region III concluded that this may not have been done in all instances, resulting in a possible missed inspection. Region III also faulted the process by pointing out that items beyond those noted on an IPIN which were corrected by construction following a return of the item after a partial inspection were not itemized and submitted for trending analysis.

CPCo INVESTIGATION FINDINGS AND RESPONSE TO NRC QUESTIONS

The Notice of Violation asks the Company to conduct an inspection to determine (1) the extent to which QC supervisors [illegible] land site have been instructing QC inspectors to limit findings of [illegible]ies and (2) the extent to which QC inspectors have been conducting reinspections based only on reported deficiencies.

The Company was informed on January 18, 1983, that the use of the IPIN was a major NRC concern. In response to this meeting on inspection findings a task force was chartered to start an immediate investigation. The task force was composed of a project attorney and two consultants.

When the NRC inspection report was received on February 8, 1983, the task force was directed to carry out the specific inspection requested by NRC. The task force work involved interviews with all QC supervisory personnel and a

majority of the QCE staff. The task force also debriefed the 13 QCEs interviewed by Region III.

It reviewed and evaluated existing quality assurance and quality control procedures and instructions, in light of other information obtained. Finally, in conjunction with MPQAD, it recommended and initiated corrective actions. As a result of the IPIN task force's extensive efforts, the Company has a good understanding of particular inspection practices regarding use of IPIN's at the Midland site.

Virtually all nuclear construction projects have some means of documenting inspections conducted while construction work is in process. IPIN's, used for that purpose at Midland, were established under a system of closed loop procedures requiring that documented conditions be returned to construction, reworked, and then reinspected by QC to verify the implementation of corrective action. The concept behind the use of IPINs is fundamentally sound, and is founded on recognized QA/QC principles, although specific problems existed in connection with the use of a "return option" at Midland.

The return option (defined above) was established to provide a means of returning work to construction, when a QCE would otherwise have to occupy valuable time inspecting and documenting a large number of nonconforming conditions (referred to herein as "punchlisting"), on a hardware item which was actually not ready for inspection. The option permitted the QCE to return the work to field engineering, which had the responsibility for checking the item and ensuring its readiness for inspection in the first instance. Thus, the option was motivated by legitimate concerns and objectives.

Although the option was not established for the purpose of "limiting findings of deficiencies" by QC, obviously, to the extent deficiencies existed in the uninspected portion of the work, they were not recorded during this initial inspection, nor could they be accounted for in the trending analysis. The return option was used in all disciplines, although some supervisors within disciplines elected not to use it in their particular area.

The return option, by itself, would not result in a missed inspection covered by a closed IR activity, so long as the inspector closing out the IR satisfied himself that all items not encompassed by the IPIN and included in the activity were inspected, either by him or by the previous inspector. QC procedures, in fact, required the signer of the IR activity to vouch for the inspection of all items before signing. It is a basic principle of quality control that an inspector should not sign for something he has not verified, either by documentation, inspection, or some other means. The Company found that the answers provided by some individuals indicated a lack of a full understanding of the requirement to satisfy themselves that all items had been inspected before closing out an IR activity subject to an IPIN. The IPIN procedures did not specify exactly how a return option should be handled, either initially or in closing out IR activities, and thus may have contributed to any misunderstandings which existed.

As part of its corrective action, described more fully above, the Company will ensure that procedural shortcomings in defining the requirements for QCE

closure of IR activities are corrected, and will retrain QCEs, emphasizing their responsibilities to conduct full, complete inspections and document all deficiencies before signing off IR activities. The Company also decided to discontinue the "return option" at Midland and require that all initial inspections be completed with non-conforming conditions fully documented. The IPIN form has also been eliminated and all deficiencies will be documented on a revised NCR form. (The particular findings of the extensive Company investigation into the use of IPINs are recited more fully below under responses to the NRC's questions contained in the Notice of Violation.)

Question 1

"Determine the extent to which QC Supervisors at the Midland Site have been instructing QC Inspectors to limit findings of deficiencies."

There are two aspects to this question. A first aspect concerns the extent to which QC Inspectors were instructed not to completely inspect activities prior to turning work back to construction. A second aspect relates to directions, if any, given to QCEs, not to document deficiencies actually observed. Regarding the first aspect, the Company found that QCEs were directed to use a "return option" which resulted in initial inspection activities not being completed. With regard to the second aspect of the question, QC management intended that, in the exercise of a return option, all deficiencies actually seen would be reported on an IPIN. Project management personnel encouraged the use of a return option and QC management, instructed QC leads, who reported directly to them, in its use.

The QC management interviewed by the task force stated that the option was intended to provide a means for returning work to construction and avoid occupying QCE's time punchlisting work for construction. There was no intent to avoid reporting deficiencies, although the inadvertent result of the practice was that deficiencies on the portion of the work not inspected before return would not be documented. QC leads who instructed their personnel to use the option agreed with the QC management's purpose in using the option.

Of the 16 QC leads and supervisors interviewed, one individual was in the documentation area, for which the return option was inapplicable, and eight stated either that the option was not applicable to their activity, or that they had not used it for other reasons. Of the latter, one stated that he had never been told to use the return option.

Two stated that their group had used it only infrequently. One of these understood that all observed deficiencies were to be documented but could not recall whether he had so instructed his group. The other indicated that the only instance when an inspection was halted before completion was when it was obvious that cable insulation damage would require a completely new termination. In this instance the inspection for other termination deficiencies would not be performed, but the observed damage would be documented.

Three individuals indicated regular use of the option. One stated that he had instructed his subordinates to document all observed nonconformances, one

could not recall giving specific instructions but knew that his subordinate's practice was to document all observed nonconformances and one knew that that was the proper practice, assumed that his subordinates did it that way, but could not recall whether he had so instructed them.

Two other individuals were relatively new in the position. One indicated that it was his practice to document everything observed but that it had not been the practice of his predecessor (no longer at the plant). The other continued the practice of his previous supervisor to document all observations.

The task force found that from a quarter to a half of the individual inspectors (QCEs) contacted, depending on the discipline, were aware of and made use of a "return option". A few individuals stated that they documented some, but not all, deficiencies observed in an inspection in which the return option was used.*

The company's corrective action on this point is described above. The company considers it of fundamental importance that all QCEs and supervisors understand the requirement to document deficiencies observed when an item has been submitted for inspection rather than using an "oral" communication process. This aspect will be emphasized in training on the new procedures.

Question 2

"Determine the extent to which QC inspectors have been conducting re-inspections based only on reported deficiencies."

The Company determined, based upon investigation, that almost all QCEs at Midland were completing their inspections properly. However, because a few individuals may not have completed inspections fully, the Company concluded that the NRC inspection finding was valid.

The precise question to be addressed here is whether and to what extent QCEs closed out inspection record activities subject to IPINs which do not encompass the entire activity, without fully inspecting the activity. The

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* Approximately one-half of the QCEs contacted also indicated that in some circumstances they allowed repairs or reworks to take place within a fixed period of time without documenting the deficiences observed during the initial inspection. Virtually all of those utilizing this practice had been advised by their supervisors to do so.

This practice was specifically allowed prior to June 1, 1981, and through an apparent lack of clear communication continued after the option was removed from QC procedures on this date. The upper tier policy document allowed the practice on a one shift basis until February 1983. Since this practice would not lead to missed inspections with regard to use of IPINS, it was not addressed further as part of the task force investigation. An NCR was written on December 10, 1982 regarding the optional practice not to document deficiencies corrected during a one shift period; MPQAD will further track and disposition this issue utilizing the results of the task force investigation.

IPIN task force determined that although a few individuals stated they would not necessarily reinspect all items before closing out the IR activity. There were several reasons for this response. Some would not lead to an inspection miss.

When asked to describe the types of inspections for which they would not reinspect all examples, it became evident that nearly all individuals followed practices which would not have led to an inspection failure. Many individuals stated that they did not reinspect all items when they conducted the initial inspection and remembered items they had previously inspected. Others answered that they limited their reinspection to items covered by the IPIN, but only when the activity covered only one item. Still others limited their reinspection if the inspection of all other items was documented. Thus, in specific circumstances an inspector following all applicable procedures could have limited his reinspection to hardware items encompassed by the IPIN and accomplished a complete inspection of the activity. Only a few individuals appeared to lack sufficient understanding of the requirement that the reinspection verify inspection of all items within an activity.

The IPIN task force concluded that not more than ten percent of the individuals contacted reported unacceptable practices. Although the task force's conclusions on this question were more positive than NRC's from a statistical standpoint, the task force concluded that NRC's inspection finding and notice of violation were valid.

It is the Company's conclusion that the cause of this violation was unclear management direction regarding documentation associated with use of the "return option".

ATTACHMENT 2

RESPONSE TO NOTICE OF VIOLATION ITEM B

OVERVIEW

As a result of the Company's assessment of overall project status in the fall of 1982 and based on information regarding the identified findings from NRC inspections and their generic implications, Project management carefully evaluated the needs for corrective actions. The Construction Completion Program (CCP) was conceived to address all identified concerns and to achieve desired improvements in project performance.

The project presented the Construction Completion Program concept to Region III personnel on December 2, 1982 after having initiated action to implement the plan the previous day. A description of the CCP was sent to the NRC in our January 10, 1983 letter and a public meeting was held with the NRC on February 8, 1983 to discuss the plan. This overview summarizes how major portions of the CCP cover the individual findings of the Notice of Violation and the generic implications of these findings.

The specific portions of the CCP that address the generic implications of the NRC Diesel Generator Building Inspection are as follows:

A. System Team Organization

The organization for completion of construction is being reorganized to emphasize a systems approach. A team made up of construction and engineering personnel (with close QC coordination) will be assigned to complete all work on a specific system or systems. This team concept will also be applied to remaining area work.

The team concept provides for very close coordination between all major activities required to produce and demonstrate a quality product. The development of this organization involves a review of existing field procedures and preparation of improved procedures for defining work requirements. A major element of this approach will be preparation of expanded instructions to the crafts that will improve performance to design and specifications and will insure proper coordination with inspection as the work proceeds. The team members will be trained in the new procedures.

An assessment of current system construction and inspection status will be made by the team prior to initiation of construction activities. This will provide a baseline of existing quality and allow any existing problems to be identified and corrected.

The specific NRC inspection findings* covered by this activity are:

B-1b, B-1c, B-1d, B-1h, B-1j, B-1l through p, B-1q, B-4a and B-6.

B. Review PQCI's and Update As Required

The procedures for carrying out inspections (PQCI's) are being reviewed to insure all important inspection attributes are specifically described and, to the extent practicable, all reference material is incorporated directly in the PQCI.

The specific NRC inspection report findings covered by this activity are:

B-1a, B-1b, B-1c, B-4a, B-4b and B-8a.

C. Review the Inspection Process (See note below on inspection backlog)

The inspection process including construction procedures for initiating inspections will be modified so that:

1. The procedure for documenting non-conformances ensures that all non-conforming conditions are properly identified and tracked.

2. The process for providing instructions for construction activities ensures all required inspections are performed when required.

The specific NRC inspection report findings covered by this activity are:

B-1l-p, B-4b, B-8b(1) and B-8b(2)

D. QC Training and Certification

The QC Department has been reorganized under direct Consumers Power Company control. All QC personnel have been or are undergoing a training program leading to re-certification to the revised PQCI's.

The specific NRC inspection report findings covered by this activity are:

B-1l-p and B-4b.

E. Program Reviews

General QA Program reviews have been initiated in the areas identified below in addition to the specific responses required from the inspections findings. The results of these reviews and any requirements for program revision will be incorporated in CCP activities.

1. Receipt Inspection Review covers findings B-1g and B-3.

2. Material Traceability Review covers findings B-1e, B-1f, B-2a and B-8a.

*Findings are identified by the item designation in the Notice of Violation transmitted by the NRC and letter of February 8, 1983 J G Keppler to J D Selby.

3. Design and Document Control Review covers findings B-1i, B-1j, B-1k, B-2b, B-2c, B-2e, B-5 and B-7.

F. Safety-related classification.

The NRC is reviewing the project licensing position on this issue. This covers findings B-2d and B-2f.

The response to each individual finding follows:

**Note on inspection backlog.

The Company specifically reviewed the NRC concern regarding, "...a backlog of almost 16,000 inspections...", the status of inspection records (IR) as of November 26, 1982 was actually as follows:

IR Issued 190,000; IR Closed 174,000; IR "Open" 16,000

The 16,000 "Open" IR are categorized as follows:

(1) Opened in anticipation of an inspection request but construction not yet ready for inspection, 7,200.

(2) Fully ready for inspection, 1,200.

(3) Open but waiting for next complete step in construction, 5,700.

(4) Open pending NCR/IPIN disposition, 800.

(5) Open pending Level III approval, 700.

(6) Miscellaneous, 400.

Therefore, the actual backlog of inspections is more correctly identified by the 1,200 IRs where construction is done and waiting for inspection.

NOV Item B - 1.a (82-22-02A)

"Installation of diesel generator engine control panels 1C112, 2C111, and 2C112 was not in accordance with the requirements delineated on foundation Drawing 7220-M18-250 in that the foundation bolt washers required by the subject drawing were not installed."

1. The violation is admitted, in part.

2. (1a) No Electrical or Civil QC instruction required specific verification of the bevelled washer installation. Therefore, documented proof that bevelled washers were installed could not be provided since the foundation is grouted. (bevel washers)

   (2a) The inspection records for panels 1C-112, 2C-111 and 2C-112 are open with attributes such as washers and torquing not yet inspected. Therefore, this is not a violation. (flat washers)

3. (1a) NCR M01-9-2-138 was written by MPQAD on October 15, 1982 to document the non-conformance and was closed on December 8, 1982. (bevel washers)

   (1b) FCR M-7026 was written on November 10, 1982 to make the bevelled washers optional, because in this case, bevelled washers did nothing to aid in support or leveling of the panel. The FCR was approved November 23, 1982. (bevel washers)

   (2a) Due to insufficient quantities of flat washers and nuts this portion of the installation was not completed. The field has subsequently procured sufficient quantities to complete the bolt down and are awaiting Construction Completion Program approval to install them. (flat washers)

4. Electrical and Civil PQCI's will be reviewed and revised as applicable to include specific verification for mounting requirements and will incorporate applicable hold points.

5. QC inspection plan E-6.0 and C-1.10 (if required) shall be modified to incorporate full inspection and hold points for all un-installed electrical equipment by March 28, 1983 and required training to the revised plan is scheduled for completion by April 11, 1983. (bevel washers)

NOV Item B - 1.b (82-22-02B)

"Unscheduled pull box associated with conduits 2BN006, 2BN007, and 2BDA002 was not sized in accordance with the requirements delineated on Sheet 42 of Drawing E-42 in that the 12" x 12" x 6" as-built dimensions of the subject pull box did not conform to the 13 1/2" x 12" x 6" dimension requirements delineated on Sheet 42 of Drawing 42."

1. The violation is admitted.

2. (1) Failure of Field Engineering to specify correct size pull box for Construction to install.

   (2) Failure of QC, during inspection of conduits 2BN006, 2BN007 and 2BDA002, to identify non-conforming condition.

3. FCR E-3157 was written on November 8, 1982 and approved on November 17, 1982. This FCR clarified the intent of E-42(Q) SH 42 to include minimum bend radius as a criterion for pull box sizing. Given the revised criteria, the pull boxes cited conform to the requirements, as documented in an NCR written by MPQAD on March 7, 1983.

4. (1) PQCI E-1.0 will be revised to verify and record pull box size and bend radius of cable will be verified on applicable PQCI's.

   (2) Team training programs, required by the Construction Completion Program, will emphasize the importance of following all requirements of design documents.

5. (1) PQCI E-1.0 to be revised by March 29, 1983 and required training is scheduled for completion by April 29, 1983 to verify and record pull box size.

   (2) Reinspection of installed work will be carried out during the implementation of the Construction Completion Program.

NOV Item B - 1.c (82-22-02C)

"The 1'-10" wall to support dimension required by raceway support Drawing E-796(Q), Sheet 2 of 2, Revision 5, for hanger No. 86 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 2'-1 1/2" in lieu of the required 1'-10"."

1. The violation is admitted.

2. Craft, Supervision, Field Engineering and QC did not provide sufficient attention to detail to assure correct locations of P1001 strut on tube steel as delineated on Drawing E-796(Q) SH 2 detail 1.

3. FCN E-7040 was written to approve installed conditions and has been incorporated. NCR M01-9-3 084 was written by MPQAD on March 7, 1983 to document this condition, and for purposes of trending.

4. (1) Revise PQCI E-2.1 and provide QC training to properly inspect supports.

   (2) Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Revision of E-2.1 and required qualification training is estimated to be complete by May 15, 1983.

NOV Item B - 1.d (82-22-02D)

"The 6'-6" wall to support dimension required by raceway support Drawing E-796(Q) Sheet 1 of 2, Revision 11 for hanger No. 14 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 5'-5" in lieu of the required 6'-6"."

1. The violation is admitted.

2. (1) E-796(Q) SH 1 shows the proper dimension for Bay 4 but is incorrect for Bay 3. The dimension shown for Bay 3 is a drafting error.

   (2) The Field Engineer failed to write a FCN to correct drawing for Bay 3 prior to completing the installation of the support.

3. DCN #16 to Drawing E-796(Q) SH 1 was prepared and approved on November 9, 1982 to correct the drafting error. Incorporation has taken place. An NCR was written by MPQAD on March 7, 1983.

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NOV Item B - 1.e (82-22-05A)

"The inspectors identified high strength steel plate placed in the laydown area which was not marked with the material type and grade as required by Field Instruction FIG-9.600, Revision 1."

1. The violation is admitted.

2. Most steel was properly marked and some markings were not exposed, however, some pieces of high strength steel were not properly marked through failure to follow procedures.

3. All steel was re-marked with paint as to clearly show any grades other than A-36. QC inspections have been increased from monthly to weekly. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600.

4. N/A

5. Complete.

NOV Item B - 1.f (82-22-05B)

"The inspectors identified various stock steel shapes in the "Q" area with yellow-colored paint on the ends (indicating the material was "non-Q") and various steel stock shapes in the "non-Q" area without painted ends (indicating "Q" material), contrary to the requirements of Field Instruction Fig-9.600, Revision 1."

1. The violation is admitted, in part.

2. All steel in "Q" area was identified in accordance with procedures but some manufacturers markings led to confusion. Some steel in "non-Q" areas was not marked in accordance with procedures.

3. All steel in "non Q" area was painted or repainted yellow as to conform with the procedure. QC inspections have been increased from monthly to weekly. To avoid confusion, manufacturers color coding was removed from the ends of steel in question in the "Q" area. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600(Q).

4. Field Instruction FIG-9.600(Q) will be revised to designate the marking requirement for non-Q steel to be a Q attribute.

5. The required procedure revision will be completed by May 1, 1983.

NOV Item B - 1.g (82-22-09A)

"The slots in the muffler support plates were not machined but were determined to be irregular and flame cut, leaving rough slot edges not in conformance with design Drawing M18-425(5)-1."

1. The violation is admitted.

2. These slots were manufactured incorrectly by the vendor prior to receipt at the jobsite. The slots in Diesel Generator muffler supports are required for thermal expansion. The vendor drawing calls for these slots to be machined, but they were torch cut and exceeded required dimensions.

3. Following the NRC inspection, Bechtel NCR 4693 was written to determine if, as fabricated, the slots would perform their intended function.

4. NCR 4693 is currently being reviewed by Project Engineering and the vendor.

5. NCR 4693 expected to be dispositioned by April 1, 1983.

NOV Item B - 1.h (82-22-09B)

"Jacking plates were not installed beneath the center support plates of Bay 1 diesel generator muffler as required by Drawing M18-250-6."

1. The violation is admitted.

2. Jacking plates for Diesel Generator muffler supports were not installed in Bay 1 beneath the center support, as shown in vendor drawings, due to failure to install according to the design drawing.

3. Following the NRC inspection an NCR was written against the condition. A subsequent NCR was also written after the NRC inspection, based on inspections of other Diesel Generator mufflers which resulted in identification of similar deficiencies in Bays 3 and 4. Both NCRs were dispositioned "Use As Is", since loadings from the jacking screws on the concrete were acceptable.

4. Team training programs required by the Construction Completion Program will emphasize the importance of following all requirements of vendor drawings.

5. The implementation of the disposition of NCRs will provide full compliance for the "As Built" condition. Subsequent revision to vendor drawings required to complete NCR 4738 follow-up actions is forecast for completion by April 1, 1983. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NOV Item B - 1.i (82-22-18A)

"Procedure FID-2.100, (Outstanding FCR/FCN Retirement), Revision 2 was inadequate in that the design drawings were not changed when an FCR/FCN had been retired and no further reference to the FCR existed on the revised drawing. As a result, the retired FCR C-2103 relating to HVAC structural steel was lost and could not be traced to the design drawing to ensure a complete quality record."

1. The violation is admitted.

2. Field Procedure FID-2.100(Q) was inadequate in that it did not contain a requirement to provide for indication on design drawings that applicable FCNs and FCRs had been retired. Retired FCR/FCNs address one time approved deviations to generic design which are not incorporated into base design drawings due to their applicability to a limited number of locations. (It is noted that this procedural deficiency is not the reason the FCR was lost. The FCR was lost due to a clerical error and a copy was obtained from the design office within twenty-four hours. It is also noted that the FCR could be traced to the design drawing through the FCR/FCN retirement computer printout.)

3. Field Procedure FID-2.100(Q) was revised to formalize the practice of requiring design drawings to be annotated with a circled letter "R" denoting a retirement. The Field Document Control Department has performed a 100% review of all drawings, with retired FCR/FCNs against them, to verify compliance to this new requirement.

4. N/A

5. Complete.

NOV Item B - 1.j (82-22-18B)

"Field Sketch CY-1035 which illustrated the bottom gusset plates for HVAC fan supports was not identified as "Q", nor was there a reference to the affected drawing on the sketch as required by Procedure FPD-5.000, (Preparation of Field Sketches.)"

1. The violation is admitted.

2. The requirement for this designation and reference is contained in Field Procedure FPD-5.000 and was not followed. Field Sketch CY-1035 for the Diesel Generator Building HVAC support steel gusset plate was not designated "Q", nor referenced to the original design drawing.

3. Field Sketch CY-1035 has been revised and designated "Q", and referenced to design drawing C-1004. NCR M01-0-2-155 was issued by MPQAD to document the identified discrepancy. Field Procedure FPD-5.000 was reviewed and determined to be adequate in regard to the stated requirement.

   Training of responsible personnel in the specifics of FPD-5.000 has been conducted.

4. A review of other FSKs will be conducted by Field Engineering for compliances with FPD-5.000.

5. The review by Field Engineering will be completed by April 22, 1983.

NOV Item B - 1.k (82-22-18C)

"Procedure FPD-5.000, (Preparation of Field Sketches), Revision 1 did not require design drawings to reference appropriate field sketches to ensure a complete quality record."

1. The violation is admitted.

2. Although field procedures do not control what is placed on design drawings, no cross reference log existed to enable one to readily find what Field Sketches (FSK's) apply to each design drawing.

3. A reverse reference log was created listing applicable civil miscellaneous steel FSK's for each civil design drawing depicting miscellaneous steel.

4. Reverse reference logs listing applicable FSK's will be created for the remainder of all FSK's prepared in accordance with FPD-5.000. FPD-5.000 will be revised to address the requirements for reverse reference logs.

5. FPD-5.000 will be revised by April 15, 1983, addressing these requirements and including an effectivity date of June 15, 1983 for reverse reference logs.

NOV Item B - 1.1,m,n,o,p (82-22-16)

"(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 diesel generator bays. This change was neither reviewed nor properly authorized.

(m) The as-built gusset plate connections in Bay 1 were not built as identified on Detail 3 of Drawing C-1004. The angle braces were welded together as opposed to having separate welds for each brace. This change was neither reviewed nor properly authorized.

(n) None of the sixteen 1/4" bracing angles identified on Drawing C-1004 were constructed utilizing 1/4" material. This change was neither reviewed nor properly authorized.

(o) Drawing C-1004, Detail 2, required the W10 beam-to-beam connection to be welded. In Bay No. 3, a bolted connection was constructed in lieu of the required welded connection, without review nor proper authorization.

(p) The column cover plate identified on FCR C-4401 was not constructed in Bay No. 3 as required. The plate was slotted instead of solid as required. This change was neither reviewed nor properly authorized."

1. The violations are admitted.

2. Diesel Generator Building HVAC fan support steel installation was not done in accordance with the drawings due to a lack of attention to detail during construction and inspection for Items (1), (m) and (n). For Item (o), the specific item was constructed to an earlier approved drawing and failure to identify the discrepancy occurred during the inspection process. For Item (p) the finding was due to the lack of attention to detail during construction.

3. (1) With regard to the undersized gusset plates, a subsequent evaluation by Project Engineering indicated the smaller 1/4" size plates were acceptable. Nevertheless, the plates will be replaced with 5/16" plates by Bechtel per NCR 4690.

   (m) The gusset plate connection in Bay 1 has been removed and will be reworked per NCR 4690.

   (n) The 5/16" and 3/8" bracing angles have been removed and will be reworked per NCR 4690.

   (o) After the NRC inspection, NCR 4690 was written and dispositioned "Use As Is" for bolted connections constructed in Bay 3. It should be noted that these connections were constructed to design drawings approved at that time which allowed bolted connections.

NOV Item B - 1.1,m,n,o,p (82-22-16) Continued

(p) NCR 4690 dispositioned the cover plate on the steel column to be "reworked".

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents. In addition, as part of the Construction Completion Program, a review of PQCI's is being done to assure that correct design requirements are specified for inspectors. The Program also calls for a QC inspector recertification program.

5. Specific compliance will be achieved when rework is completed under the Construction Completion Program.

NOV Item B - 1.q (82-22-24)

"A section (approximately 18 x 10 x 4 inches deep) of the primary containment wall in Containment Purge Room 702 was removed (by chipping) without obtaining approval as required by FIG-1.111, Revision 4, Concrete Drilling Permit."

1. The violation is admitted.

2. Field procedures (FIG-1.111, Revision 3) in effect at the time of work did not require concrete drill permits for chipping because damage to reinforcing steel and other embedded items is not as likely as with drilling.

3. (1) Field Procedure FIG-1.111, Concrete Drill Permits, has been revised and approved to include chipping.

   (2) Steps have been taken to insure concrete chipping repairs are performed using approved guidelines. FCR C-5206 was prepared and has been approved by Project Engineering to establish guidelines for concrete chipping repair. This FCR has subsequently been incorporated into Specification 7220-C-231(Q). Field Procedure FPT-3.000, has been revised to specifically include inspection of repairs to chipped areas as part of area turnover. This procedure is being designated as Quality Related, and is currently under review.

   (3) The above steps are summarized on NCR M01-2-154 which was issued by MPQAD to request process corrective action. The Project Engineering response to this NCR concludes there is no safety impact, or affect on quality of the structure, due to the chipping of concrete identified in the Containment Purge Room 702.

4. (1) Field Procedure FPT-3.000 requires approval.

   (2) The chipped area in question requires repair.

   (3) NCR M01-9-2-154 requires closing.

NOV Item B - 1.q (82-22-24) Continued

5. (1) April 15, 1983.

   (2) Specific compliance will be achieved when the rework is completed under the Construction Completion Program.

   (3) Following rework.

NOV Item B - 2.a (82-22-08)

"Measures were not established for the selection and review for suitability of application of "Q" materials associated with the diesel generator exhaust muffler in that design drawings and specifications did not indicate the material identity of the installed muffler saddle supports and plates."

1. The violation is indeterminate at this time.

2. Material specification and identification is the responsibility of the emergency diesel generator prime vendor. No documentation was available on site to show that the material used in the fabrication of the Diesel Generator exhaust silencers met the requirements for seismic Class I installation.

3. The vendor has been requested to provide the necessary documentation for material traceability and identification of applicable QA requirements applied to the exhaust silencers.

4. A status update and identification of any corrective steps which may be required will be provided by Project Engineering by May 2, 1983.

5. To be determined by results Project Engineering report of May 2, 1983.

NOV Item B - 2.b (82-22-15B)

"Design Drawing C-147 required bolted bracing connections for the diesel generator building HVAC bracing gusset plates. Field Sketch CY-1035 was used to change the design to welded connections in lieu of the specified bolted connections. This design change was neither properly reviewed nor approved."

1. The violation is admitted.

2. Note 14 on drawing 7220-C-147 was not clear. It has always been the intent of Project Engineering to allow Field Engineering to substitute welded for bolted connections when detailing steel bracing connections, however, no specific instructions were provided.

3. FCR C-5174 was issued and approved to clarify that Note 14 on drawing 7220-C-147 is applicable to bracing connections.

4. None required.

5. Completed.

NOV Item B - 2.c (82-22-15C)

"Design Drawings C-1004 and C-147 did not specify the sizes of the diesel generator building HVAC fan gusset plates. A "combo" shop work order request was used to design the gusset plates without appropriate review and approval."

1. The violation is admitted.

2. The Diesel Generator Building HVAC fan support gusset plate dimensions were only identified on a field fabrication shop work order. The field sketch for this work was inadequate in that it did not contain necessary details for fabrication.

3. The fan support gusset plate dimensions have been added to field sketch CY-299. FCR C-5174 was issued and approved to clarify on the design drawing the criteria to be utilized for detailing bracing connections.

4. Review all civil miscellaneous steel field sketches to assure that proper information for gusset plates is included and specified in accordance with FCR C-5174.

5. May 2, 1983.

NOV Item B - 2.d (82-22-15A)

"The licensee failed to analyze the four diesel generator building monorails as seismic Category I as described in their commitment to Regulatory Guide 1.29, in Appendix 3A of the FSAR."

1. The violation is admitted in that the Diesel Generator Monorail had not been analyzed seismically through the normal project design process, or after the initial walkdown under specification 7220-L-001(Q) had been performed to verify project compliance to Regulatory Guide 1.29 commitments. The Proximity and Seismic Category II/I Site Walkdown Program described in Specification 7220-L-001(Q) provides method for identification, evaluation and resolution of all potential situations where non seismic Category I commodities are installed above safety related systems, components or structures.

2. The Diesel Generator Building monorails were reviewed during the preliminary walkdown, but were not identified for further analysis due to the walkdown teams verbal understanding that the monorails had been seismically analyzed previously.

3. Seismic analysis was subsequently performed addressing adequacy of the Diesel Generator Building monorails. The analysis concluded that failure of the monorails under seismic loading would not occur.

   The training program for all walkdown teams was revised to require that seismic analysis on non-seismic components that would potentially effect safety related structures, systems or components are documented. If documentation is not available at the time of walkdown then the potential interaction must be identified on an interaction identification sheet in accordance with applicable walkdown program requirements.

   All areas walked down prior to the revised training program were rewalked to assure that any other non-seismic components that could potentially effect safety related structures, systems or components had documented seismic analysis on file.

NOV Item B - 2.d (82-22-15A) Continued

4. Engineering records will be compiled to support walkdown teams.

5. May 15, 1983

NOV Item B - 2.e (82-22-11)

"The licensee designed and constructed thirty-two diesel generator building exhaust system hangers without ensuring that the applicable requirements for "Q" components were included in the design documents."

1. The violation is admitted.

2. (a) All design documents associated with installation of the Diesel Generator exhaust (B31.1) pipe hangers were not identified as "Q" even though the P&ID identified the piping as "Seismic Category 1" and the FSAR specified the Diesel Generator exhaust system to be safety related.

   (b) In accordance with project commitments any structure system or components identified "Seismic Category 1" is considered "Q" and project quality assurance program requirements should be applied. In general, only ASME III hangers are "Q", however, because of the uniqueness of "Seismic Category 1", B31.1 hangers, Project Engineering failed to translate the "Q" identification through all of the sub-tier documents.

3. The exhaust piping for the Diesel Generators is "Q" as documented in the isometric M-652, SH 1 and P&ID 7220-M-452 Sht 1A & 1B. The applicable hanger sketches have subsequently been revised to identify the supports as "Q". Bechtel Specification 7220-M-326(Q) has been revised to provide special provisions for QC inspections of the "Q" B31.1 support and lists the pipe hangers in question. A review has been performed which determined that no other situation similiar to the Diesel Generator exhaust piping (B31.1-Seismic Category 1) exists in the plant. In addition project confirmed that no other unique situations in the plant exist where Seismic Category 1 structures, systems or components are identified and the quality assurance program requirements had not been applied. There were several instances of drawing inconsistencies that require correction as result of project reviews, and NCR M01-5-2-166 was written by MPQAD to document this item.

NOV Item B - 2.e (82-22-11) Continued

4. (a) Project drawing changes are required to correct inconsistencies identified during project review for B31.1 piping in other project areas that were Seismic Category 1 without being identifed as "Q".

   (b) QC inspection of Diesel Generator exhaust system hangers will be required in accordance with project specification 7220-M-326(Q).

5. (a) Project drawing correction will be complete by June 1, 1983.

   (b) Required Diesel Generator exhaust system hanger inspections and closure of NCR M01-5-2-166 will be completed when the Construction Completion Program is initiated.

NOV Item B - 2.f (82-22-26)

"The licensee purchased Armor Stone for a "Q" portion of the perimeter dike without translating the applicable regulatory requirements into appropriate specifications and design documents."

1. The violation is admitted.

2. Part 2 of enclosure 7 of the NRC letter on Completion of Soils Remedial Activities Review dated May 25, 1982 required that the activities of the Armorstone placement program be "Q" controlled. The Project failed to translate this requirement into the design and procurement documents for this material due to a misunderstanding of NRC requirements.

3. Bechtel drawings C-45, C-109, C-111 and C-112 have been revised to designate the total area of the dike adjacent to the ultimate heat sink as "Q" as opposed to that while was designated "Q" in the initial implementation o the NRC requirements.

4. Technical specification C-209 will be revised as "Q" and will identify the portion of installation work to be done as "Q". In addition, Bechtel drawing C-1096 will be revised to specify the installation of Armorstone to be "Q" in the "Q" designated areas of the dike. No Armorstone has yet been placed in these areas.

5. Full compliance will be achieved when applicable specifications and drawings referred to above are revised as "Q". This will be done by June 1, 1983.

NOV Item B - 3. (82-22-01)

"Source inspections at the panel supplier facility and receipt inspections at the Midland site failed to ensure conformance of the internal wiring within diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 to Procurement Specification 7220-G-5, Revision 1. Paragraph 6.0 of Specification 7220-G-5 states "All electrical wiring . . . within the board enclosure shall conform to the highest industrial standards of design and workmanship." An NRC inspection on October 15, 1982 identified the following examples of defective terminations of internal wiring within the subject panels.

a. The output lead on the Relay Tach device had numerous broken strands at the termination lug.

b. 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.

c. The 1- lead on the CB-1 device did not have all strands inserted into the compression lug."

1. The violation is admitted.

2. The violation occurred due to poor electrical workmanship at the vendors facility, inadequate vendor QC inspection plus inadequate source inspection. Although MPQAD performed an overinspection on the four panels in question, the discrepant conditions had been missed.

3. (1) MPQAD initiated a 100% overinspection program (01E-7B) in July, 1980 to verify workmanship according to vendor workmanship standards and the technical specification. During the overinspection 27 NCR's were written, and 14 have been closed. Seven QAR's were written, and 5 closed. The lack of identification of conditions in this violation by the overinspection program has been investigated and is felt to be an isolated case.

NOV Item B - 3. (82-22-01) Continued

(2) NCR M01-9-2-139, dated October 22, 1982, was issued to track these four panels. MCAR 66 was prepared on December 30, 1982 with Interim Reports No 1 & 2 submitted to NRC Region III on December 30, 1982 and February 25, 1983, respectively. The scope of the MCAR 66 Task Force is to review the NCR's and QAR's written, verify that Project Engineering disposition is consistent between vendors and formulate an action plan that will preclude any further recurrence.

4. Implementation at the vendors facilities of E-24 Revision 0 "Overinspection of Vendor Supplied Printed Circuit Board Assemblies" and E-25 Revision 0, "Overinspection of Vendor Supplied Electrical Equipment/Components" will be carried out by MPQAD and Project Supplier Quality for the few future procurements shipped to the jobsite. Project representatives will witness in-process fabrication, functional testing and final inspection prior to release for shipment depending on the nature of the commodity. E-24 and E-25 were approved February 21, 1983 and February 18, 1983 respectively and have been issued for use.

5. (1) For equipment on site, MPQAD has inspected nearly 100% of all "Q" electrical panels and cabinets. MPQAD overinspection will continue until the source inspection program is fully implemented - forecast completion of overinspection is July 1, 1983.

(2) Programs are now in place to prevent recurrence of poor vendor workmanship for remaining panels and cabinets that are yet to be shipped.

(3) Full compliance will be achieved upon the closure of MCAR 66.

NOV Item B - 4.a (82-22-25)

"An inspection program was not established to ensure segregation of cables installed in horizontal trays which used metal dividers to segregate control and instrumentation cables in accordance with design requirements."

1. The violation is admitted. The violation involved three cables that had been inadvertantly looped in and out of the incorrect side of a divided tray section.

2. The cables in question could have been improperly segregated in the raceway for a variety of reasons: temporary rework situation, installation techniques, etc.

   Although there was no formal program to "train" or tie down cables in horizontal tray sections the current cable reinspection program should have found the discrepant condition. The reinspection program had not yet been implemented in this specific area.

3. (1) NCR M01-9-2-151 was issued November 1, 1982. Supervision was verbally informed and the non-conformance was immediately corrected.

   (2) Generic resolution involves revision of Field Procedure FPE-4.000 (pending approval) which will require an even distribution of cables across the tray, tying cables to rungs within two rungs of a change in direction and Project Engineering disposition of cables that exceed the height of the barrier on a case by case basis.

4. (1) Cable reinspection that is now ongoing is verifying the routing as an inspection attribute. Information developed from the cable reinspection program will be used to verify voltage segregation.

NOV Item B - 4.a (82-22-25) Continued

(2) Final training and tie down of cables will be accomplished (per FPE-4.000) when "Q" cable pulling resumes, at the time the last "Q" cable is pulled through a tray section.

5. (1) MPQAD reinspection is estimated to be complete by June 14, 1983. Review results of reinspection by July 1, 1983.

(2) Approval of Field Procedure FPE-4.000 scheduled for March 18, 1983.

NOV Item B - 4.b (82-22-17)

"Quality Control (QC) inspections failed to ensure that activities affecting quality conformed to design documents in that QC inspections performed on July 1, 1981 and documented on QCIR C210-172 failed to detect and identify nonconformances B.1.(1) through (o) of this Notice of Violation. These nonconformances were associated with installation of the diesel generator building HVAC fan support steel."

1. The violation is admitted.

2. In general, the violation occurred because of a lack of attention to detail during QC inspections and a lack of specificity in the PQCIs. In one case (item o) an incorrect design drawing was used by the QC inspector to perform his inspection.

3. The Construction Completion Program has been instituted.

4. As part of the Construction Completion Program, a review of PQCIs is being done to assure that essential design requirements are specified for inspectors. In addition, the Program calls for a QC inspector recertification program. The verification portion of the Program will verify quality of completed work.

5. Full complianace will be achieved when PQCI reviews and QC inspector recertifications and the verification program are complete.

NOV Item B - 5. (82-22-10)

"The licensee did not implement a maintenance program to prevent five of sixteen installed diesel generator slide bearing muffler plates from accumulating dirt and dust as required by the vendor's manual."

1. The violation is admitted.

2. The requirements to specify cleanliness of these bearing plate surfaces was not established upon receipt of this material. The vendor documents supplied to Project Engineering did not contain a requirement for bearing plate maintenance.

3. Bechtel has initiated a storage maintenance program for the exhaust silencer bearing plates. An NCR was written on March 9, 1983 by MPQAD to track this item.

4. Direction has been given to develop an installation and maintenance program for all flourocarbon bearing plates on site.

5. The maintenance program for the bearing plates will be fully implemented under the Construction Completion Program in conjunction with the closure of NCR 4693 which allows access to the bearings plates.

NOV Item B - 6. (82-22-13)

"During welding of the diesel generator building exhaust piping hanger support steel, the licensee did not verify preheat of existing safety-related structural steel at a temperature of 70°F as required by site specifications and the AWS 1974 Code."

1. The violation is admitted.

2. The ambient temperature was not verified for the welding operation observed by the NRC inspector. Documentation for preheats of all welds made between 32° and 70° were covered by the random preheat verification program contained in PQCI W-1.60. The program in place requires 100% verification for preheat temperature over 70°.

3. Bechtel's "Instuctions to Welders" have been revised to provide preheating instructions, and each welder signs for receipt of these instructions. The welder's rod withdrawal requisitions are also stamped in red with preheat instructions. The in-place verification program will be continued.

4. All Bechtel site welders will be retrained in the site preheat requirements, and all new welders will have this preheat training emphasized as part of their indoctrination.

5. All Bechtel site welders will be re-trained by May 1, 1983.

NOV Item B - 7. (82-22-21)

"Measures were not established to control the distribution of changes (red lines) to hanger isometric drawings in that changes to Drawing 1-652-2-25(Q) were not controlled utilizing the Site Document Control Center."

1. The violation is admitted.

2. The control of Redline changes to work prints was not performed through the Construction Document Control Department, however, it was being done in accordance with established field procedures.

3. Revisions to Bechtel Field Procedures now require all changes (redlines) to piping isometrics and hanger drawings to be controlled utilizing the site Document Control Center.

4. N/A

5. Complete.

NOV Item B - 8.a (82-22-23)

"Measures were not established or implemented to determine if materials ultimately restricted (per Nonconformance Report No 3266) from installation or use in ASME Class I systems were actually installed or used in Class I systems."

1. The violation is admitted.

2. Failure to initially apply QC hold tags on suspect material, and failure to implement disposition of the NCR in a timely manner.

3. A letter was provided to B&W Construction Company, a subcontractor at the Midland jobsite responsible for the majority of Class I piping and hanger installation, on December 11, 1981, identifying restriction on usage of subject material from heats identified on NCR 3266 for Class I use.

   100% of all completed Class I P-2.20 PQCIR documentation packages stored in the vault were reviewed for identification of the nonconforming material identified in NCR 3266. B&W has subsequently re-reviewed their documentation records to ascertain if any of the discrepant material identified through the PQCIR review was installed in the field. Any of the discrepant material is to be removed and replaced with acceptable material.

4. A specific review by a level II QCE of all future Class I P2.20 PQCIRs for discrepant material identified on NCR 3266 is being performed before final acceptance and their subsequent storage in the QC vault.

   A QA survey of all applicable NCRs will be performed in accordance with QA Checklist S-23 to assure that material control procedures have been adequately implemented and subsequent actions associated with applicable NCR dispositions have been implemented.

NOV Item B - 8.a (82-22-23) Continued

Although not related directly with the above effort or this identified discrepancy, a complete material verification documentation review with special emphasis for ASME NCA 3700/3800 compliance for pipe support material is in process on the project by Bechtel procurement supplier quality group to assure acceptable material documentation for the Midland Project. Miscellaneous material such as rebars, paint, etc, are excluded from this review.

5. Full compliance with be obtained as follows:

Specific Actions - 1) Rework required on Class I supports in field to be complete by March 15, 1983.

2) Review of all new P-2.20 PQCIRs is ongoing.

Generic Actions - 1) Review of all applicable project NCRs by QA to be complete by June 24, 1983.

2) Follow-up actions as result QA survey to be determined later.

General - 1) The review of all material documentation packages for proper verification documentation is an ongoing effort. As stated previously, this is considered additional effort not directly related to resolution of the identified discrepancy.

NOV Item B - 8.b(1) (82-22-12A)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

(1) The diesel generator exhaust hangers were not classfied, designed, or built as "Q" as committed to in the FSAR. (See item 2.e) ..."

1. The violation is admitted.

2. An NCR was not issued because MPQAD failed to act in a timely manner.

3. NCR M01-5-2-166 was written by MPQAD on November 16, 1982 to document the hangers listed on SCN #36 to Specification M-326 as being nonconforming as a result of their original "non-Q" designation.

4. Complete.

5. Complete.

NOV Item B-8.b(2) (82-22-12B)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

... (1) The design of the diesel generator monorail was not analyzed to seismic Category I design requirements as committed to in the FSAR. (See item 2.d.)"

1. The violation is admitted.

2. There was a misunderstanding over whether a nonconforming condition actually existed.

3. On November 16, 1982, a Quality Action Request (QAR) was written to document the condition. A subsequent seismic analysis has been done (Calc #G-44(Q) Revision 1) which documents the acceptability of current design of the subject monorail.

4. Complete.

5. Complete.

ATTACHMENT 3

REQUEST FOR REDUCTION OF CIVIL PENALTY

Pursuant to 10 CFR 2.205, Consumers Power Company respectfully requests that the NRC reconsider the amount of civil penalty proposed to CPCo for the violations cited in the NRC's letter, dated February 8, 1983, J G Keppler to J D Selby. The Company does not contest the validity of the violations and agrees that a civil penalty is warranted, but believes that certain mitigating factors should be considered.

The NRC's criteria for enforcement actions (at 47 Federal Register page 9991, March 9, 1982) sets forth specific criteria for increasing or reducing base civil penalties, and provides in part as follows:

> "2. Corrective Action to Prevent Recurrence. Recognizing that corrective action is always required to meet regulatory requirements, the promptness and extent to which the licensee takes corrective action, including actions to prevent recurrence, may be considered in modifying the civil penalty to be assessed. Unusually prompt and extensive corrective action may result in reducing the proposed civil penalty as much as 50% of the base value shown in Table 1. On the other hand, the civil penalty may be increased as much as 25% of the base value if initiation of corrective action is not prompt or if the corrective action is only minimally acceptable. In weighing this factor consideration will be given to , among other things, the timeliness of the corrective action, degree of licensee initiative, and comprehensiveness of the corrective action - such as whether the action is focused narrowly to the specific violation or broadly to the general area of concern."

We believe that our actions to correct the situation at issue have been timely and have been conceived and organized mainly through our own initiative. Most important, however, is that our program to correct these deficiencies is comprehensive and far reaching.

Shortly after receiving feedback on the NRC's inspection findings, the Company launched major, extensive corrective action. The Company halted the majority of the Category I work of its prime contractor, and laid the groundwork for a verification of past inspections and statusing of incomplete work. The work stoppage resulted in the layoff of more than 1,000 workers. The Company also initiated major, generic corrective action addressing the specific areas of NRC inspection findings. The Company's entire plan is entitled the Construction Completion Program, and included steps responding broadly to the NRC's and Company's areas of concern. This was addressed at length in the Company's letter of January 10, 1983, J W Cook to J G Keppler and further discussed at a Public Meeting with the NRC at Midland on February 8, 1983.

The corrective action undertaken by the Company was not narrowly focused on the specific violations identified by the NRC. The work reduction extended to all major safety related structures on-site, not merely the diesel generator building which was the focus of NRC's inspection. The verification program begins in the auxiliary building, includes the reactor buildings and diesel generator building as well as the service water pump structure.

The Construction Completion Program, which is the organizational basis for the generic corrective action, will encompass and structure the remaining pre-turnover systems and area work to be done at the Midland site, (excepting soils, HVAC and NSSS work). The Company's willingness to accept the NRC's suggestion that we take direct control of the project QC staff formerly under Bechtel supervision extends broadly to the entire job, and involves a major commitment of additional manpower and resources in recertification, training, and inspection activities.

The Company does not contest the NRC's decision to increase the civil penalty on the basis of certain other factors specified in the enforcement guidelines. We request, however, that consideration be given in determining the amount of the penalty to the corrective action taken and planned by the Company.

RPW

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

MAY 2 3 1983

Docket No. 50-329 82-22
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 acknowledges receipt of your letter dated March 10, 1983, in response to the Notice of Violation and Proposed Imposition of Civil Penalties sent to you with our letter dated February 8, 1983.

We have reviewed your response to noncompliance Items A and B and have identified the need for additional information regarding Item B.

Regarding Item B.1.a., your response to this item and subsequent items does not address the measures you have taken or plan to take to provide training to craft personnel and engineering personnel to ensure that quality requirements will be recognized and complied with during future installation/construction activities. A revised response addressing this training is necessary.

Regarding Item B.2.a., we reiterate our position that the lack of design documentation which specified the material requirements for the diesel generator exhaust mufflers constituted an item of noncompliance. Please provide any additional information supplied by the vendor regarding the traceability of the exhaust muffler materials, and as appropriate, your corrective actions and the results achieved, corrective actions taken to avoid further noncompliance, and the date when full compliance will be achieved.

Regarding Item B.2.c., your response does not address any revision to the onsite practice of utilizing unapproved, unreviewed field sketches or shop work orders to perform design activities. Please provide an additional response addressing this concern.

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Regarding Item B.4.a., your response is incomplete in that the corrective actions delineated in your response do not include the establishment of an inspection program to ensure required segregation during future cable installations. Please provide an additional response addressing this concern.

Regarding Item B.6., it is our position that a 100% preheat verification be accomplished for preheats of all welds made between 32° and 70° until such time as you establish confidence in the welders' compliance with preheat requirements. In addition, we request that you supply this office with the written evaluation of all welds for which preheat verifications were not previously identified. Please provide an additional response addressing this concern.

We are continuing our review of your response and will complete the review when we receive the additional information requested above. We request that you submit a second letter to this office within 25 days of the date of this letter responding to our concerns regarding Items B.1.a., B.2.a., B.2.c., B.4.a., and B.6. above. This response should be submitted under oath or affirmation.

Your cooperation with us is appreciated.

Sincerely,

Original signed by
James G. Keppler

James G. Keppler
Regional Administrator

cc w/ltr dtd 3/10/83:
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)
Howard Levin (TERA)
Billie P. Garde, Government
Accountability Project

RIII	RIII	RIII	RIII	RIII	RIII	RIII
Gardner/jp	Schultz	Harrison	Warnick	Lewis	Davis	Keppler
Landsman	Cook	Burgess	Shafer	05/18/83		

Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

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March 10, 1983

Mr R C DeYoung
Director, Office of Inspection and Enforcement,
US Nuclear Regulatory Commission
Washington, DC 20555

MIDLAND ENERGY CENTER PROJECT -
DOCKET NO 50-329 AND 50-330 - MIDLAND PROJECT RESPONSE
TO NRC NOTICE OF VIOLATION EA83-3 DATED FEBRUARY 8, 1983 -
FILE 0485.16 SERIAL 21775

Attached is Consumers Power Company's (CP Co) Response to the Notice of Violation ("Notice") transmitted by J G Keppler's February 8, 1983 letter to J D Selby. In addition to this cover letter, the response consists of attachments in accordance with 10 CFR 2.201, addressing the two violations (Attachments 1 and 2), and a request for mitigation of the civil penalty under the General Statement of Policy and Procedure for Enforcement Actions 47FED.REG. 9987 March 9, 1982 (Attachment 3).

Attachment 1, in addition to specifically providing the items of information requested on page 9 of the "Notice", reports on the results of the Company's investigation into In Process Inspection Notices (IPIN's) and answers the questions on page 2 of Mr Keppler's letter. The Company found that all quality control disciplines had been given the option to terminate an inspection (when multiple nonconforming conditions were observed), document observed findings of the partial inspection on IPIN's, and return work to construction. The Company also found that some individuals would limit reinspection to reported deficiencies. As noted in Attachment 2, the Company admits to the noncompliances listed under Violation B.

The Company admits the two violations and does not contest the basis for imposing a civil penalty, although we respectfully request that the NRC reconsider the amount of the penalty in light of the corrective actions the Company has taken, as set forth more fully in Attachment 3. In late 1982, upon receipt of preliminary information concerning NRC inspection findings, the Company took major corrective actions. We halted most Category I work of the prime contractor pending initiation of an effort to verify previous inspections and statusing of incomplete work. We initiated steps to correct the deficiencies and, as part of an overall program revised production and

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quality processes, changed and realigned the management team, and expanded project resources to complete the job. The description of this effort is described in my letter to Mr J G Keppler dated January 10, 1983, regarding the Midland Project Construction Completion Program. We are confident that as we implement these corrective actions the Midland Project will achieve compliance with regulatory requirements.

James W. Cook

JWC/JEB/dlm

CC J G Keppler
J W Cook, P26-336B
R Warnick, NRC Region III
W D Shafer, NRC Region III
R N Gardner, NRC Region III
R J Cook, NRC Resident Inspector Midland Site
R B Landsman, NRC Region III
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Washington, DC 20555

CONSUMERS POWER COMPANY
Midland Units 1 and 2
Docket No 50-329, 50-330

Letter Serial 21775 Dated 3-10-83

At the request of the Commission and pursuant to the Atomic Energy Act of 1954, and the Energy Reorganization Act of 1974, as amended and the Commission's Rules and Regulations thereunder, Consumers Power Company submits the response to Notice of Violation.

CONSUMERS POWER COMPANY

By /s/ J W Cook
J W Cook, Vice President
Projects, Engineering and Construction

Sworn and subscribed before me this 10th day of March 1983 .

/s/ Patricia A Puffer
Notary Public
Bay County, Michigan

My Commission Expires 3-4-86

ATTACHMENT 1

RESPONSE TO NOTICE OF VIOLATION ITEM A

STATEMENT OF VIOLATION (Item A)

"NRC inspectors determined that quality control inspectors were not documenting as nonconformances all of the deficiencies which they observed during their inspections. Inspections were suspended by the QC inspector if too many nonconformances were observed. In-process inspection notices (IPINs) associated with suspended inspections, identified as nonconformances only a portion of the observed deficiencies. Supervisory QC personnel stated that they directed QC inspectors to limit the number of nonconformances documented during an inspection. This directive was verified by discussions with QC inspectors. Several QC inspectors interviewed, confirmed that inspections were closed after reviewing only the deficiencies documented on the IPIN. As a result, measures were not established to prevent the continued installation and use of these nonconforming items. In addition, corrective actions were not implemented to prevent recurrence of these nonconformances."

SUMMARY OF RESPONSE TO VIOLATION (Item A)

1. The violation is admitted.

2. The reasons for the violation are as follows: (1) failure of QC management (a) to recognize potential for adverse impact, on the inspection process, of terminating inspections on activities with multiple deficiencies and partially documenting findings on IPINs, ("return option")*, (b) to communicate specific direction on the use of the "return option" to avoid adverse impacts; (2) lack of sufficient specificity in procedures defining responsibilities of Quality Control Engineer's, (QCEs) signing off on Inspection Report activities; (3) lack of full understanding among all QCEs of responsibilities for inspecting all multiple items before closing IR line activities when conducting follow-up inspections on activities subject to an IPIN.

3. Corrective action in place is as follows: IPINs have been discontinued at the Midland site. QCEs have been instructed by memorandum to complete all activities which have been submitted for inspection regardless of number of nonconforming conditions observed and to document findings on nonconformance reports (NCR's).

4. Planned or in-process corrective actions:

   (a) Procedures PSP 6.1 and PSP 3.2 are being revised in accordance with the direction given in Paragraph 3 above.

   (b) QCEs will be trained in the revision to the procedures in accordance with the general training procedure B-3M-1. During this training, emphasis will be placed on the requirement described in Paragraph 3 above.

(c) All closed inspection report activities upon which IPIN's have been issued will be verified. An investigation of Deficiency Reports* is ongoing to determine whether closed Inspection Reports were affected by this problem.

5. Dates for full compliance

Item a - by March 22, 1983

Item b - start training April 1, 1983

Item c - as part of the verification step in the Construction Completion Program

DETAILED RESPONSE

Background Information

Inspection activities are defined in specific instructions, Project Quality Control Instructions (PQCIs). These instructions describe how inspections are carried out and the attributes to be inspected. Each inspection activity is documented on an "Inspection Report," (IR) which contains blank spaces to be initialed by the individual Quality Control Engineer (QCE) who conducts this inspection and only after completing the inspection activity. There is a one-to-one correspondence between activities defined in the PQCI and listed on the IR. When all activities on the IR are appropriately initialed, the IR is reviewed and "closed out" by a Quality Control Engineer Level II by signing on a designated line on the IR's last page.

In-Process Inspection Notices (IPINs), instituted on June 1, 1981, were one of two basic types of reports used to document nonconforming conditions observed during primary inspections at the Midland jobsite. IPINs could be used to document deficiencies which were found prior to acceptance of completed work. Nonconformance Reports (NCR), the other basic means of formally reporting nonconforming conditions, were used either before or after acceptance of completed work.

If, during the course of an inspection activity, a QCE found a deficiency, he was required to document the condition. Prior to June 1, 1981, procedures specifically allowed a QCE to return certain deficiencies to construction without documentation, providing the deficiency could be corrected within the same shift. The procedures would not allow the QCE to initial the space corresponding to such an activity on the IR unless and until the deficiency was corrected by project construction or the condition had been properly recorded on an NCR. Activities on an IR that were not initialed were said to be "open." Because the activity could not be "closed" until correction of any identified problem (or submission of an NCR), the "open" activity formed a basis for controlling deficiencies identified during inspections.

* The Deficiency Report ("DR") is a predecessor document to IPINs, and as such is under investigation to determine if corrective action regarding it is warranted.

The IPIN procedure was designed to provide construction with prompt feedback of information concerning deficiencies or incomplete work. A copy of all IPINs was sent immediately after issuance to construction for disposition. When construction made necessary corrections, the IPIN was returned to Quality Control, indicating that the hardware was ready for further inspection. Subsequent inspections which determined that the problem documented on the IPIN had not been corrected, or that other nonconforming conditions existed, would result in further IPINs or NCRs. In any case, an IR activity would remain open until QC had verified all problems were corrected or an NCR was submitted.

The particular practice giving rise to the Notice of Violation involved the termination of inspection activities when multiple nonconforming conditions were observed part way through an inspection. If a QCE conducting an initial inspection determined that parts or components covered by a given inspection activity had a large number of nonconforming conditions, he had the option to terminate his inspection before completing the activity, document the deficiencies observed to that point on an IPIN and return the hardware to construction ("the return option"). Region III determined that items not inspected initially when this return option was exercised may have escaped later inspection. The postulated mechanism for this outcome is as follows: As previously described, once construction had corrected a problem noted on an IPIN, the IPIN was transmitted to Quality Control for further inspections. Procedures then required that the QCE inspect the hardware to determine that corrections of the IPIN-identified deficiency were carried out and that all other items had been inspected before closure of the activity on the IR. Thus, if a return option had been exercised, then before closing out the activity, a QCE would have to inspect not only those hardware items written up on the IPIN, but also all others which he had not satisfied himself as being previously inspected before the initial inspector terminated his inspection. Region III concluded that this may not have been done in all instances, resulting in a possible missed inspection. Region III also faulted the process by pointing out that items beyond those noted on an IPIN which were corrected by construction following a return of the item after a partial inspection were not itemized and submitted for trending analysis.

CPCo INVESTIGATION FINDINGS AND RESPONSE TO NRC QUESTIONS

The Notice of Violation asks the Company to conduct an inspection to determine (1) the extent to which QC supervisors at the Midland site have been instructing QC inspectors to limit findings of deficiencies and (2) the extent to which QC inspectors have been conducting reinspections based only on reported deficiencies.

The Company was informed on January 18, 1983, that the use of the IPIN was a major NRC concern. In response to this meeting on inspection findings a task force was chartered to start an immediate investigation. The task force was composed of a project attorney and two consultants.

When the NRC inspection report was received on February 8, 1983, the task force was directed to carry out the specific inspection requested by NRC. The task force work involved interviews with all QC supervisory personnel and a

majority of the QCE staff. The task force also debriefed the 13 QCEs interviewed by Region III.

It reviewed and evaluated existing quality assurance and quality control procedures and instructions, in light of other information obtained. Finally, in conjunction with MPQAD, it recommended and initiated corrective actions. As a result of the IPIN task force's extensive efforts, the Company has a good understanding of particular inspection practices regarding use of IPIN's at the Midland site.

Virtually all nuclear construction projects have some means of documenting inspections conducted while construction work is in process. IPIN's, used for that purpose at Midland, were established under a system of closed loop procedures requiring that documented conditions be returned to construction, reworked, and then reinspected by QC to verify the implementation of corrective action. The concept behind the use of IPINs is fundamentally sound, and is founded on recognized QA/QC principles, although specific problems existed in connection with the use of a "return option" at Midland.

The return option (defined above) was established to provide a means of returning work to construction, when a QCE would otherwise have to occupy valuable time inspecting and documenting a large number of nonconforming conditions (referred to herein as "punchlisting"), on a hardware item which was actually not ready for inspection. The option permitted the QCE to return the work to field engineering, which had the responsibility for checking the item and ensuring its readiness for inspection in the first instance. Thus, the option was motivated by legitimate concerns and objectives.

Although the option was not established for the purpose of "limiting findings of deficiencies" by QC, obviously, to the extent deficiencies existed in the uninspected portion of the work, they were not recorded during this initial inspection, nor could they be accounted for in the trending analysis. The return option was used in all disciplines, although some supervisors within disciplines elected not to use it in their particular area.

The return option, by itself, would not result in a missed inspection covered by a closed IR activity, so long as the inspector closing out the IR satisfied himself that all items not encompassed by the IPIN and included in the activity were inspected, either by him or by the previous inspector. QC procedures, in fact, required the signer of the IR activity to vouch for the inspection of all items before signing. It is a basic principle of quality control that an inspector should not sign for something he has not verified, either by documentation, inspection, or some other means. The Company found that the answers provided by some individuals indicated a lack of a full understanding of the requirement to satisfy themselves that all items had been inspected before closing out an IR activity subject to an IPIN. The IPIN procedures did not specify exactly how a return option should be handled, either initially or in closing out IR activities, and thus may have contributed to any misunderstandings which existed.

As part of its corrective action, described more fully above, the Company will ensure that procedural shortcomings in defining the requirements for QCE

closure of IR activities are corrected, and will retrain QCEs, emphasizing their responsibilities to conduct full, complete inspections and document all deficiencies before signing off IR activities. The Company also decided to discontinue the "return option" at Midland and require that all initial inspections be completed with non-conforming conditions fully documented. The IPIN form has also been eliminated and all deficiencies will be documented on a revised NCR form. (The particular findings of the extensive Company investigation into the use of IPINs are recited more fully below under responses to the NRC's questions contained in the Notice of Violation.)

Question 1

"Determine the extent to which QC Supervisors at the Midland Site have been instructing QC Inspectors to limit findings of deficiencies."

There are two aspects to this question. A first aspect concerns the extent to which QC Inspectors were instructed not to completely inspect activities prior to turning work back to construction. A second aspect relates to directions, if any, given to QCEs, not to document deficiencies actually observed. Regarding the first aspect, the Company found that QCEs were directed to use a "return option" which resulted in initial inspection activities not being completed. With regard to the second aspect of the question, QC management intended that, in the exercise of a return option, all deficiencies actually seen would be reported on an IPIN. Project management personnel encouraged the use of a return option and QC management, instructed QC leads, who reported directly to them, in its use.

The QC management interviewed by the task force stated that the option was intended to provide a means for returning work to construction and avoid occupying QCE's time punchlisting work for construction. There was no intent to avoid reporting deficiencies, although the inadvertent result of the practice was that deficiencies on the portion of the work not inspected before return would not be documented. QC leads who instructed their personnel to use the option agreed with the QC management's purpose in using the option.

Of the 16 QC leads and supervisors interviewed, one individual was in the documentation area, for which the return option was inapplicable, and eight stated either that the option was not applicable to their activity, or that they had not used it for other reasons. Of the latter, one stated that he had never been told to use the return option.

Two stated that their group had used it only infrequently. One of these understood that all observed deficiencies were to be documented but could not recall whether he had so instructed his group. The other indicated that the only instance when an inspection was halted before completion was when it was obvious that cable insulation damage would require a completely new termination. In this instance the inspection for other termination deficiencies would not be performed, but the observed damage would be documented.

Three individuals indicated regular use of the option. One stated that he had instructed his subordinates to document all observed nonconformances, one

could not recall giving specific instructions but knew that his subordinate's practice was to document all observed nonconformances and one knew that that was the proper practice, assumed that his subordinates did it that way, but could not recall whether he had so instructed them.

Two other individuals were relatively new in the position. One indicated that it was his practice to document everything observed but that it had not been the practice of his predecessor (no longer at the plant). The other continued the practice of his previous supervisor to document all observations.

The task force found that from a quarter to a half of the individual inspectors (QCEs) contacted, depending on the discipline, were aware of and made use of a "return option". A few individuals stated that they documented some, but not all, deficiencies observed in an inspection in which the return option was used.*

The company's corrective action on this point is described above. The company considers it of fundamental importance that all QCEs and supervisors understand the requirement to document deficiencies observed when an item has been submitted for inspection rather than using an "oral" communication process. This aspect will be emphasized in training on the new procedures.

Question 2

"Determine the extent to which QC inspectors have been conducting re-inspections based only on reported deficiencies."

The Company determined, based upon investigation, that almost all QCEs at Midland were completing their inspections properly. However, because a few individuals may not have completed inspections fully, the Company concluded that the NRC inspection finding was valid.

The precise question to be addressed here is whether and to what extent QCEs closed out inspection record activities subject to IPINs which do not encompass the entire activity, without fully inspecting the activity. The

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* Approximately one-half of the QCEs contacted also indicated that in some circumstances they allowed repairs or reworks to take place within a fixed period of time without documenting the deficiences observed during the initial inspection. Virtually all of those utilizing this practice had been advised by their supervisors to do so.

This practice was specifically allowed prior to June 1, 1981, and through an apparent lack of clear communication continued after the option was removed from QC procedures on this date. The upper tier policy document allowed the practice on a one shift basis until February 1983. Since this practice would not lead to missed inspections with regard to use of IPINS, it was not addressed further as part of the task force investigation. An NCR was written on December 10, 1982 regarding the optional practice not to document deficiencies corrected during a one shift period; MPQAD will further track and disposition this issue utilizing the results of the task force investigation.

IPIN task force determined that although a few individuals stated they would not necessarily reinspect all items before closing out the IR activity. There were several reasons for this response. Some would not lead to an inspection miss.

When asked to describe the types of inspections for which they would not reinspect all examples, it became evident that nearly all individuals followed practices which would not have led to an inspection failure. Many individuals stated that they did not reinspect all items when they conducted the initial inspection and remembered items they had previously inspected. Others answered that they limited their reinspection to items covered by the IPIN, but only when the activity covered only one item. Still others limited their reinspection if the inspection of all other items was documented. Thus, in specific circumstances an inspector following all applicable procedures could have limited his reinspection to hardware items encompassed by the IPIN and accomplished a complete inspection of the activity. Only a few individuals appeared to lack sufficient understanding of the requirement that the reinspection verify inspection of all items within an activity.

The IPIN task force concluded that not more than ten percent of the individuals contacted reported unacceptable practices. Although the task force's conclusions on this question were more positive than NRC's from a statistical standpoint, the task force concluded that NRC's inspection finding and notice of violation were valid.

It is the Company's conclusion that the cause of this violation was unclear management direction regarding documentation associated with use of the "return option".

ATTACHMENT 2

RESPONSE TO NOTICE OF VIOLATION ITEM B

OVERVIEW

As a result of the Company's assessment of overall project status in the fall of 1982 and based on information regarding the identified findings from NRC inspections and their generic implications, Project management carefully evaluated the needs for corrective actions. The Construction Completion Program (CCP) was conceived to address all identified concerns and to achieve desired improvements in project performance.

The project presented the Construction Completion Program concept to Region III personnel on December 2, 1982 after having initiated action to implement the plan the previous day. A description of the CCP was sent to the NRC in our January 10, 1983 letter and a public meeting was held with the NRC on February 8, 1983 to discuss the plan. This overview summarizes how major portions of the CCP cover the individual findings of the Notice of Violation and the generic implications of these findings.

The specific portions of the CCP that address the generic implications of the NRC Diesel Generator Building Inspection are as follows:

A. System Team Organization

The organization for completion of construction is being reorganized to emphasize a systems approach. A team made up of construction and engineering personnel (with close QC coordination) will be assigned to complete all work on a specific system or systems. This team concept will also be applied to remaining area work.

The team concept provides for very close coordination between all major activities required to produce and demonstrate a quality product. The development of this organization involves a review of existing field procedures and preparation of improved procedures for defining work requirements. A major element of this approach will be preparation of expanded instructions to the crafts that will improve performance to design and specifications and will insure proper coordination with inspection as the work proceeds. The team members will be trained in the new procedures.

An assessment of current system construction and inspection status will be made by the team prior to initiation of construction activities. This will provide a baseline of existing quality and allow any existing problems to be identified and corrected.

The specific NRC inspection findings* covered by this activity are:

B-1b, B-1c, B-1d, B-1h, B-1j, B-1l through p, B-1q, B-4a and B-6.

B. Review PQCI's and Update As Required

The procedures for carrying out inspections (PQCI's) are being reviewed to insure all important inspection attributes are specifically described and, to the extent practicable, all reference material is incorporated directly in the PQCI.

The specific NRC inspection report findings covered by this activity are:

B-1a, B-1b, B-1c, B-4a, B-4b and B-8a.

C. Review the Inspection Process (See note below on inspection backlog)

The inspection process including construction procedures for initiating inspections will be modified so that:

1. The procedure for documenting non-conformances ensures that all non-conforming conditions are properly identified and tracked.

2. The process for providing instructions for construction activities ensures all required inspections are performed when required.

The specific NRC inspection report findings covered by this activity are:

B-1l-p, B-4b, B-8b(1) and B-8b(2)

D. QC Training and Certification

The QC Department has been reorganized under direct Consumers Power Company control. All QC personnel have been or are undergoing a training program leading to re-certification to the revised PQCI's.

The specific NRC inspection report findings covered by this activity are:

B-1l-p and B-4b.

E. Program Reviews

General QA Program reviews have been initiated in the areas identified below in addition to the specific responses required from the inspections findings. The results of these reviews and any requirements for program revision will be incorporated in CCP activities.

1. Receipt Inspection Review covers findings B-1g and B-3.

2. Material Traceability Review covers findings B-1e, B-1f, B-2a and B-8a.

*Findings are identified by the item designation in the Notice of Violation transmitted by the NRC and letter of February 8, 1983 J G Keppler to J D Selby.

3. Design and Document Control Review covers findings B-1i, B-1j, B-1k, B-2b, B-2c, B-2e, B-5 and B-7.

F. Safety-related classification.

The NRC is reviewing the project licensing position on this issue. This covers findings B-2d and B-2f.

The response to each individual finding follows:

**Note on inspection backlog.

The Company specifically reviewed the NRC concern regarding, "...a backlog of almost 16,000 inspections...", the status of inspection records (IR) as of November 26, 1982 was actually as follows:

IR Issued 190,000; IR Closed 174,000; IR "Open" 16,000

The 16,000 "Open" IR are categorized as follows:

(1) Opened in anticipation of an inspection request but construction not yet ready for inspection, 7,200.

(2) Fully ready for inspection, 1,200.

(3) Open but waiting for next complete step in construction, 5,700.

(4) Open pending NCR/IPIN disposition, 800.

(5) Open pending Level III approval, 700.

(6) Miscellaneous, 400.

Therefore, the actual backlog of inspections is more correctly identified by the 1,200 IRs where construction is done and waiting for inspection.

NOV Item B - 1.a (82-22-02A)

"Installation of diesel generator engine control panels 1C112, 2C111, and 2C112 was not in accordance with the requirements delineated on foundation Drawing 7220-M18-250 in that the foundation bolt washers required by the subject drawing were not installed."

1. The violation is admitted, in part.

2. (1a) No Electrical or Civil QC instruction required specific verification of the bevelled washer installation. Therefore, documented proof that bevelled washers were installed could not be provided since the foundation is grouted. (bevel washers)

   (2a) The inspection records for panels 1C-112, 2C-111 and 2C-112 are open with attributes such as washers and torquing not yet inspected. Therefore, this is not a violation. (flat washers)

3. (1a) NCR M01-9-2-138 was written by MPQAD on October 15, 1982 to document the non-conformance and was closed on December 8, 1982. (bevel washers)

   (1b) FCR M-7026 was written on November 10, 1982 to make the bevelled washers optional, because in this case, bevelled washers did nothing to aid in support or leveling of the panel. The FCR was approved November 23, 1982. (bevel washers)

   (2a) Due to insufficient quantities of flat washers and nuts this portion of the installation was not completed. The field has subsequently procured sufficient quantities to complete the bolt down and are awaiting Construction Completion Program approval to install them. (flat washers)

4. Electrical and Civil PQCI's will be reviewed and revised as applicable to include specific verification for mounting requirements and will incorporate applicable hold points.

5. QC inspection plan E-6.0 and C-1.10 (if required) shall be modified to incorporate full inspection and hold points for all un-installed electrical equipment by March 28, 1983 and required training to the revised plan is scheduled for completion by April 11, 1983. (bevel washers)

NOV Item B - 1.b (82-22-02B)

"Unscheduled pull box associated with conduits 2BN006, 2BN007, and 2BDA002 was not sized in accordance with the requirements delineated on Sheet 42 of Drawing E-42 in that the 12" x 12" x 6" as-built dimensions of the subject pull box did not conform to the 13 1/2" x 12" x 6" dimension requirements delineated on Sheet 42 of Drawing 42."

1. The violation is admitted.

2. (1) Failure of Field Engineering to specify correct size pull box for Construction to install.

   (2) Failure of QC, during inspection of conduits 2BN006, 2BN007 and 2BDA002, to identify non-conforming condition.

3. FCR E-3157 was written on November 8, 1982 and approved on November 17, 1982. This FCR clarified the intent of E-42(Q) SH 42 to include minimum bend radius as a criterion for pull box sizing. Given the revised criteria, the pull boxes cited conform to the requirements, as documented in an NCR written by MPQAD on March 7, 1983.

4. (1) PQCI E-1.0 will be revised to verify and record pull box size and bend radius of cable will be verified on applicable PQCI's.

   (2) Team training programs, required by the Construction Completion Program, will emphasize the importance of following all requirements of design documents.

5. (1) PQCI E-1.0 to be revised by March 29, 1983 and required training is scheduled for completion by April 29, 1983 to verify and record pull box size.

   (2) Reinspection of installed work will be carried out during the implementation of the Construction Completion Program.

NOV Item B - 1.c (82-22-02C)

"The 1'-10" wall to support dimension required by raceway support Drawing E-796(Q), Sheet 2 of 2, Revision 5, for hanger No. 86 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 2'-1 1/2" in lieu of the required 1'-10"."

1. The violation is admitted.

2. Craft, Supervision, Field Engineering and QC did not provide sufficient attention to detail to assure correct locations of P1001 strut on tube steel as delineated on Drawing E-796(Q) SH 2 detail 1.

3. FCN E-7040 was written to approve installed conditions and has been incorporated. NCR M01-9-3-084 was written by MPQAD on March 7, 1983 to document this condition, and for purposes of trending.

4. (1) Revise PQCI E-2.1 and provide QC training to properly inspect supports.

   (2) Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Revision of E-2.1 and required qualification training is estimated to be complete by May 15, 1983.

NOV Item B - 1.d (82-22-02D)

"The 6'-6" wall to support dimension required by raceway support Drawing E-796(Q) Sheet 1 of 2, Revision 11 for hanger No. 14 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 5'-5" in lieu of the required 6'-6"."

1. The violation is admitted.

2. (1) E-796(Q) SH 1 shows the proper dimension for Bay 4 but is incorrect for Bay 3. The dimension shown for Bay 3 is a drafting error.

   (2) The Field Engineer failed to write a FCN to correct drawing for Bay 3 prior to completing the installation of the support.

3. DCN #16 to Drawing E-796(Q) SH 1 was prepared and approved on November 9, 1982 to correct the drafting error. Incorporation has taken place. An NCR was written by MPQAD on March 7, 1983.

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents.

5. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NOV Item B - 1.e (82-22-05A)

"The inspectors identified high strength steel plate placed in the laydown area which was not marked with the material type and grade as required by Field Instruction FIG-9.600, Revision 1."

1. The violation is admitted.

2. Most steel was properly marked and some markings were not exposed, however, some pieces of high strength steel were not properly marked through failure to follow procedures.

3. All steel was re-marked with paint as to clearly show any grades other than A-36. QC inspections have been increased from monthly to weekly. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600.

4. N/A

5. Complete.

NOV Item B - 1.f (82-22-05B)

"The inspectors identified various stock steel shapes in the "Q" area with yellow-colored paint on the ends (indicating the material was "non-Q") and various steel stock shapes in the "non-Q" area without painted ends (indicating "Q" material), contrary to the requirements of Field Instruction Fig-9.600, Revision 1."

1. The violation is admitted, in part.

2. All steel in "Q" area was identified in accordance with procedures but some manufacturers markings led to confusion. Some steel in "non-Q" areas was not marked in accordance with procedures.

3. All steel in "non-Q" area was painted or repainted yellow as to conform with the procedure. QC inspections have been increased from monthly to weekly. To avoid confusion, manufacturers color coding was removed from the ends of steel in question in the "Q" area. An NCR was written by MPQAD on March 8, 1983. Procurement personnel responsible for the marking of steel have been retrained to the requirements of FIG-9.600(Q).

4. Field Instruction FIG-9.600(Q) will be revised to designate the marking requirement for non-Q steel to be a Q attribute.

5. The required procedure revision will be completed by May 1, 1983.

NOV Item B - 1.g (82-22-09A)

"The slots in the muffler support plates were not machined but were determined to be irregular and flame cut, leaving rough slot edges not in conformance with design Drawing M18-425(5)-1."

1. The violation is admitted.

2. These slots were manufactured incorrectly by the vendor prior to receipt at the jobsite. The slots in Diesel Generator muffler supports are required for thermal expansion. The vendor drawing calls for these slots to be machined, but they were torch cut and exceeded required dimensions.

3. Following the NRC inspection, Bechtel NCR 4693 was written to determine if, as fabricated, the slots would perform their intended function.

4. NCR 4693 is currently being reviewed by Project Engineering and the vendor.

5. NCR 4693 expected to be dispositioned by April 1, 1983.

NOV Item B - 1.h (82-22-09B)

"Jacking plates were not installed beneath the center support plates of Bay 1 diesel generator muffler as required by Drawing M18-250-6."

1. The violation is admitted.

2. Jacking plates for Diesel Generator muffler supports were not installed in Bay 1 beneath the center support, as shown in vendor drawings, due to failure to install according to the design drawing.

3. Following the NRC inspection an NCR was written against the condition. A subsequent NCR was also written after the NRC inspection, based on inspections of other Diesel Generator mufflers which resulted in identification of similar deficiencies in Bays 3 and 4. Both NCRs were dispositioned "Use As Is", since loadings from the jacking screws on the concrete were acceptable.

4. Team training programs required by the Construction Completion Program will emphasize the importance of following all requirements of vendor drawings.

5. The implementation of the disposition of NCRs will provide full compliance for the "As Built" condition. Subsequent revision to vendor drawings required to complete NCR 4738 follow-up actions is forecast for completion by April 1, 1983. Specific compliance will be achieved when team training is completed under the Construction Completion Program.

NOV Item B - 1.i (82-22-18A)

"Procedure FID-2.100, (Outstanding FCR/FCN Retirement), Revision 2 was inadequate in that the design drawings were not changed when an FCR/FCN had been retired and no further reference to the FCR existed on the revised drawing. As a result, the retired FCR C-2103 relating to HVAC structural steel was lost and could not be traced to the design drawing to ensure a complete quality record."

1. The violation is admitted.

2. Field Procedure FID-2.100(Q) was inadequate in that it did not contain a requirement to provide for indication on design drawings that applicable FCNs and FCRs had been retired. Retired FCR/FCNs address one time approved deviations to generic design which are not incorporated into base design drawings due to their applicability to a limited number of locations. (It is noted that this procedural deficiency is not the reason the FCR was lost. The FCR was lost due to a clerical error and a copy was obtained from the design office within twenty-four hours. It is also noted that the FCR could be traced to the design drawing through the FCR/FCN retirement computer printout.)

3. Field Procedure FID-2.100(Q) was revised to formalize the practice of requiring design drawings to be annotated with a circled letter "R" denoting a retirement. The Field Document Control Department has performed a 100% review of all drawings, with retired FCR/FCNs against them, to verify compliance to this new requirement.

4. N/A

5. Complete.

NOV Item B - 1.j (82-22-18B)

"Field Sketch CY-1035 which illustrated the bottom gusset plates for HVAC fan supports was not identified as "Q", nor was there a reference to the affected drawing on the sketch as required by Procedure FPD-5.000, (Preparation of Field Sketches.)"

1. The violation is admitted.

2. The requirement for this designation and reference is contained in Field Procedure FPD-5.000 and was not followed. Field Sketch CY-1035 for the Diesel Generator Building HVAC support steel gusset plate was not designated "Q", nor referenced to the original design drawing.

3. Field Sketch CY-1035 has been revised and designated "Q", and referenced to design drawing C-1004. NCR M01-0-2-155 was issued by MPQAD to document the identified discrepancy. Field Procedure FPD-5.000 was reviewed and determined to be adequate in regard to the stated requirement.

   Training of responsible personnel in the specifics of FPD-5.000 has been conducted.

4. A review of other FSKs will be conducted by Field Engineering for compliances with FPD-5.000.

5. The review by Field Engineering will be completed by April 22, 1983.

NOV Item B - 1.k (82-22-18C)

"Procedure FPD-5.000, (Preparation of Field Sketches), Revision 1 did not require design drawings to reference appropriate field sketches to ensure a complete quality record."

1. The violation is admitted.

2. Although field procedures do not control what is placed on design drawings, no cross reference log existed to enable one to readily find what Field Sketches (FSK's) apply to each design drawing.

3. A reverse reference log was created listing applicable civil miscellaneous steel FSK's for each civil design drawing depicting miscellaneous steel.

4. Reverse reference logs listing applicable FSK's will be created for the remainder of all FSK's prepared in accordance with FPD-5.000. FPD-5.000 will be revised to address the requirements for reverse reference logs.

5. FPD-5.000 will be revised by April 15, 1983, addressing these requirements and including an effectivity date of June 15, 1983 for reverse reference logs.

NOV Item B - 1.1,m,n,o,p (82-22-16)

"(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 diesel generator bays. This change was neither reviewed nor properly authorized.

(m) The as-built gusset plate connections in Bay 1 were not built as identified on Detail 3 of Drawing C-1004. The angle braces were welded together as opposed to having separate welds for each brace. This change was neither reviewed nor properly authorized.

(n) None of the sixteen 1/4" bracing angles identified on Drawing C-1004 were constructed utilizing 1/4" material. This change was neither reviewed nor properly authorized.

(o) Drawing C-1004, Detail 2, required the W10 beam-to-beam connection to be welded. In Bay No. 3, a bolted connection was constructed in lieu of the required welded connection, without review nor proper authorization.

(p) The column cover plate identified on FCR C-4401 was not constructed in Bay No. 3 as required. The plate was slotted instead of solid as required. This change was neither reviewed nor properly authorized."

1. The violations are admitted.

2. Diesel Generator Building HVAC fan support steel installation was not done in accordance with the drawings due to a lack of attention to detail during construction and inspection for Items (l), (m) and (n). For Item (o), the specific item was constructed to an earlier approved drawing and failure to identify the discrepancy occurred during the inspection process. For Item (p) the finding was due to the lack of attention to detail during construction.

3. (1) With regard to the undersized gusset plates, a subsequent evaluation by Project Engineering indicated the smaller 1/4" size plates were acceptable. Nevertheless, the plates will be replaced with 5/16" plates by Bechtel per NCR 4690.

   (m) The gusset plate connection in Bay 1 has been removed and will be reworked per NCR 4690.

   (n) The 5/16" and 3/8" bracing angles have been removed and will be reworked per NCR 4690.

   (o) After the NRC inspection, NCR 4690 was written and dispositioned "Use As Is" for bolted connections constructed in Bay 3. It should be noted that these connections were constructed to design drawings approved at that time which allowed bolted connections.

NOV Item B - 1.1,m,n,o,p (82-22-16) Continued

(p) NCR 4690 dispositioned the cover plate on the steel column to be "reworked".

4. Team training programs, required by the Construction Completion Program will emphasize the importance of following all requirements of design documents. In addition, as part of the Construction Completion Program, a review of PQCI's is being done to assure that correct design requirements are specified for inspectors. The Program also calls for a QC inspector recertification program.

5. Specific compliance will be achieved when rework is completed under the Construction Completion Program.

NOV Item B - 1.q (82-22-24)

"A section (approximately 18 x 10 x 4 inches deep) of the primary containment wall in Containment Purge Room 702 was removed (by chipping) without obtaining approval as required by FIG-1.111, Revision 4, Concrete Drilling Permit."

1. The violation is admitted.

2. Field procedures (FIG-1.111, Revision 3) in effect at the time of work did not require concrete drill permits for chipping because damage to reinforcing steel and other embedded items is not as likely as with drilling.

3. (1) Field Procedure FIG-1.111, Concrete Drill Permits, has been revised and approved to include chipping.

   (2) Steps have been taken to insure concrete chipping repairs are performed using approved guidelines. FCR C-5206 was prepared and has been approved by Project Engineering to establish guidelines for concrete chipping repair. This FCR has subsequently been incorporated into Specification 7220-C-231(Q). Field Procedure FPT-3.000, has been revised to specifically include inspection of repairs to chipped areas as part of area turnover. This procedure is being designated as Quality Related, and is currently under review.

   (3) The above steps are summarized on NCR M01-2-154 which was issued by MPQAD to request process corrective action. The Project Engineering response to this NCR concludes there is no safety impact, or affect on quality of the structure, due to the chipping of concrete identified in the Containment Purge Room 702.

4. (1) Field Procedure FPT-3.000 requires approval.

   (2) The chipped area in question requires repair.

   (3) NCR M01-9-2-154 requires closing.

NOV Item B - 1.q (82-22-24) Continued

5. (1) April 15, 1983.

   (2) Specific compliance will be achieved when the rework is completed under the Construction Completion Program.

   (3) Following rework.

NOV Item B - 2.a (82-22-08)

"Measures were not established for the selection and review for suitability of application of "Q" materials associated with the diesel generator exhaust muffler in that design drawings and specifications did not indicate the material identity of the installed muffler saddle supports and plates."

1. The violation is indeterminate at this time.

2. Material specification and identification is the responsibility of the emergency diesel generator prime vendor. No documentation was available on site to show that the material used in the fabrication of the Diesel Generator exhaust silencers met the requirements for seismic Class I installation.

3. The vendor has been requested to provide the necessary documentation for material traceability and identification of applicable QA requirements applied to the exhaust silencers.

4. A status update and identification of any corrective steps which may be required will be provided by Project Engineering by May 2, 1983.

5. To be determined by results Project Engineering report of May 2, 1983.

NOV Item B - 2.b (82-22-15B)

"Design Drawing C-147 required bolted bracing connections for the diesel generator building HVAC bracing gusset plates. Field Sketch CY-1035 was used to change the design to welded connections in lieu of the specified bolted connections. This design change was neither properly reviewed nor approved."

1. The violation is admitted.

2. Note 14 on drawing 7220-C-147 was not clear. It has always been the intent of Project Engineering to allow Field Engineering to substitute welded for bolted connections when detailing steel bracing connections, however, no specific instructions were provided.

3. FCR C-5174 was issued and approved to clarify that Note 14 on drawing 7220-C-147 is applicable to bracing connections.

4. None required.

5. Completed.

NOV Item B - 2.c (82-22-15C)

"Design Drawings C-1004 and C-147 did not specify the sizes of the diesel generator building HVAC fan gusset plates. A "combo" shop work order request was used to design the gusset plates without appropriate review and approval."

1. The violation is admitted.

2. The Diesel Generator Building HVAC fan support gusset plate dimensions were only identified on a field fabrication shop work order. The field sketch for this work was inadequate in that it did not contain necessary details for fabrication.

3. The fan support gusset plate dimensions have been added to field sketch CY-299. FCR C-5174 was issued and approved to clarify on the design drawing the criteria to be utilized for detailing bracing connections.

4. Review all civil miscellaneous steel field sketches to assure that proper information for gusset plates is included and specified in accordance with FCR C-5174.

5. May 2, 1983.

NOV Item B - 2.d (82-22-15A)

"The licensee failed to analyze the four diesel generator building monorails as seismic Category I as described in their commitment to Regulatory Guide 1.29, in Appendix 3A of the FSAR."

1. The violation is admitted in that the Diesel Generator Monorail had not been analyzed seismically through the normal project design process, or after the initial walkdown under specification 7220-L-001(Q) had been performed to verify project compliance to Regulatory Guide 1.29 commitments. The Proximity and Seismic Category II/I Site Walkdown Program described in Specification 7220-L-001(Q) provides method for identification, evaluation and resolution of all potential situations where non seismic Category I commodities are installed above safety related systems, components or structures.

2. The Diesel Generator Building monorails were reviewed during the preliminary walkdown, but were not identified for further analysis due to the walkdown teams verbal understanding that the monorails had been seismically analyzed previously.

3. Seismic analysis was subsequently performed addressing adequacy of the Diesel Generator Building monorails. The analysis concluded that failure of the monorails under seismic loading would not occur.

   The training program for all walkdown teams was revised to require that seismic analysis on non-seismic components that would potentially effect safety related structures, systems or components are documented. If documentation is not available at the time of walkdown then the potential interaction must be identified on an interaction identification sheet in accordance with applicable walkdown program requirements.

   All areas walked down prior to the revised training program were rewalked to assure that any other non-seismic components that could potentially effect safety related structures, systems or components had documented seismic analysis on file.

NOV Item B - 2.d (82-22-15A) Continued

4. Engineering records will be compiled to support walkdown teams.

5. May 15, 1983

NOV Item B - 2.e (82-22-11)

"The licensee designed and constructed thirty-two diesel generator building exhaust system hangers without ensuring that the applicable requirements for "Q" components were included in the design documents."

1. The violation is admitted.

2. (a) All design documents associated with installation of the Diesel Generator exhaust (B31.1) pipe hangers were not identified as "Q" even though the P&ID identified the piping as "Seismic Category 1" and the FSAR specified the Diesel Generator exhaust system to be safety related.

   (b) In accordance with project commitments any structure system or components identified "Seismic Category 1" is considered "Q" and project quality assurance program requirements should be applied. In general, only ASME III hangers are "Q", however, because of the uniqueness of "Seismic Category 1", B31.1 hangers, Project Engineering failed to translate the "Q" identification through all of the sub-tier documents.

3. The exhaust piping for the Diesel Generators is "Q" as documented in the isometric M-652, SH 1 and P&ID 7220-M-452 Sht 1A & 1B. The applicable hanger sketches have subsequently been revised to identify the supports as "Q". Bechtel Specification 7220-M-326(Q) has been revised to provide special provisions for QC inspections of the "Q" B31.1 support and lists the pipe hangers in question. A review has been performed which determined that no other situation similiar to the Diesel Generator exhaust piping (B31.1-Seismic Category 1) exists in the plant. In addition project confirmed that no other unique situations in the plant exist where Seismic Category 1 structures, systems or components are identified and the quality assurance program requirements had not been applied. There were several instances of drawing inconsistencies that require correction as result of project reviews, and NCR M01-5-2-166 was written by MPQAD to document this item.

NOV Item B - 2.e (82-22-11) Continued

4. (a) Project drawing changes are required to correct inconsistencies identified during project review for B31.1 piping in other project areas that were Seismic Category 1 without being identifed as "Q".

   (b) QC inspection of Diesel Generator exhaust system hangers will be required in accordance with project specification 7220-M-326(Q).

5. (a) Project drawing correction will be complete by June 1, 1983.

   (b) Required Diesel Generator exhaust system hanger inspections and closure of NCR M01-5-2-166 will be completed when the Construction Completion Program is initiated.

NOV Item B - 2.f (82-22-26)

"The licensee purchased Armor Stone for a "Q" portion of the perimeter dike without translating the applicable regulatory requirements into appropriate specifications and design documents."

1. The violation is admitted.

2. Part 2 of enclosure 7 of the NRC letter on Completion of Soils Remedial Activities Review dated May 25, 1982 required that the activities of the Armorstone placement program be "Q" controlled. The Project failed to translate this requirement into the design and procurement documents for this material due to a misunderstanding of NRC requirements.

3. Bechtel drawings C-45, C-109, C-111 and C-112 have been revised to designate the total area of the dike adjacent to the ultimate heat sink as "Q" as opposed to that while was designated "Q" in the initial implementation of the NRC requirements.

4. Technical specification C-209 will be revised as "Q" and will identify the portion of installation work to be done as "Q". In addition, Bechtel drawing C-1096 will be revised to specify the installation of Armorstone to be "Q" in the "Q" designated areas of the dike. No Armorstone has yet been placed in these areas.

5. Full compliance will be achieved when applicable specifications and drawings referred to above are revised as "Q". This will be done by June 1, 1983.

NOV Item B - 3. (82-22-01)

"Source inspections at the panel supplier facility and receipt inspections at the Midland site failed to ensure conformance of the internal wiring within diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 to Procurement Specification 7220-G-5, Revision 1. Paragraph 6.0 of Specification 7220-G-5 states "All electrical wiring . . . within the board enclosure shall conform to the highest industrial standards of design and workmanship." An NRC inspection on October 15, 1982 identified the following examples of defective terminations of internal wiring within the subject panels.

a. The output lead on the Relay Tach device had numerous broken strands at the termination lug.

b. 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.

c. The 1- lead on the CB-1 device did not have all strands inserted into the compression lug."

1. The violation is admitted.

2. The violation occurred due to poor electrical workmanship at the vendors facility, inadequate vendor QC inspection plus inadequate source inspection. Although MPQAD performed an overinspection on the four panels in question, the discrepant conditions had been missed.

3. (1) MPQAD initiated a 100% overinspection program (01E-7B) in July, 1980 to verify workmanship according to vendor workmanship standards and the technical specification. During the overinspection 27 NCR's were written, and 14 have been closed. Seven QAR's were written, and 5 closed. The lack of identification of conditions in this violation by the overinspection program has been investigated and is felt to be an isolated case.

NOV Item B - 3. (82-22-01) Continued

(2) NCR M01-9-2-139, dated October 22, 1982, was issued to track these four panels. MCAR 66 was prepared on December 30, 1982 with Interim Reports No 1 & 2 submitted to NRC Region III on December 30, 1982 and February 25, 1983, respectively. The scope of the MCAR 66 Task Force is to review the NCR's and QAR's written, verify that Project Engineering disposition is consistent between vendors and formulate an action plan that will preclude any further recurrence.

4. Implementation at the vendors facilities of E-24 Revision 0 "Overinspection of Vendor Supplied Printed Circuit Board Assemblies" and E-25 Revision 0, "Overinspection of Vendor Supplied Electrical Equipment/Components" will be carried out by MPQAD and Project Supplier Quality for the few future procurements shipped to the jobsite. Project representatives will witness in-process fabrication, functional testing and final inspection prior to release for shipment depending on the nature of the commodity. E-24 and E-25 were approved February 21, 1983 and February 18, 1983 respectively and have been issued for use.

5. (1) For equipment on site, MPQAD has inspected nearly 100% of all "Q" electrical panels and cabinets. MPQAD overinspection will continue until the source inspection program is fully implemented - forecast completion of overinspection is July 1, 1983.

(2) Programs are now in place to prevent recurrence of poor vendor workmanship for remaining panels and cabinets that are yet to be shipped.

(3) Full compliance will be achieved upon the closure of MCAR 66.

NOV Item B - 4.a (82-22-25)

"An inspection program was not established to ensure segregation of cables installed in horizontal trays which used metal dividers to segregate control and instrumentation cables in accordance with design requirements."

1. The violation is admitted. The violation involved three cables that had been inadvertantly looped in and out of the incorrect side of a divided tray section.

2. The cables in question could have been improperly segregated in the raceway for a variety of reasons: temporary rework situation, installation techniques, etc.

   Although there was no formal program to "train" or tie down cables in horizontal tray sections the current cable reinspection program should have found the discrepant condition. The reinspection program had not yet been implemented in this specific area.

3. (1) NCR M01-9-2-151 was issued November 1, 1982. Supervision was verbally informed and the non-conformance was immediately corrected.

   (2) Generic resolution involves revision of Field Procedure FPE-4.000 (pending approval) which will require an even distribution of cables across the tray, tying cables to rungs within two rungs of a change in direction and Project Engineering disposition of cables that exceed the height of the barrier on a case by case basis.

4. (1) Cable reinspection that is now ongoing is verifying the routing as an inspection attribute. Information developed from the cable reinspection program will be used to verify voltage segregation.

NOV Item B - 4.b (82-22-17)

"Quality Control (QC) inspections failed to ensure that activities affecting quality conformed to design documents in that QC inspections performed on July 1, 1981 and documented on QCIR C210-172 failed to detect and identify nonconformances B.1.(1) through (o) of this Notice of Violation. These nonconformances were associated with installation of the diesel generator building HVAC fan support steel."

1. The violation is admitted.

2. In general, the violation occurred because of a lack of attention to detail during QC inspections and a lack of specificity in the PQCIs. In one case (item o) an incorrect design drawing was used by the QC inspector to perform his inspection.

3. The Construction Completion Program has been instituted.

4. As part of the Construction Completion Program, a review of PQCIs is being done to assure that essential design requirements are specified for inspectors. In addition, the Program calls for a QC inspector recertification program. The verification portion of the Program will verify quality of completed work.

5. Full complianace will be achieved when PQCI reviews and QC inspector recertifications and the verification program are complete.

NOV Item B - 5. (82-22-10)

"The licensee did not implement a maintenance program to prevent five of sixteen installed diesel generator slide bearing muffler plates from accumulating dirt and dust as required by the vendor's manual."

1. The violation is admitted.

2. The requirements to specify cleanliness of these bearing plate surfaces was not established upon receipt of this material. The vendor documents supplied to Project Engineering did not contain a requirement for bearing plate maintenance.

3. Bechtel has initiated a storage maintenance program for the exhaust silencer bearing plates. An NCR was written on March 9, 1983 by MPQAD to track this item.

4. Direction has been given to develop an installation and maintenance program for all flourocarbon bearing plates on site.

5. The maintenance program for the bearing plates will be fully implemented under the Construction Completion Program in conjunction with the closure of NCR 4693 which allows access to the bearings plates.

NOV Item B - 6. (82-22-13)

"During welding of the diesel generator building exhaust piping hanger support steel, the licensee did not verify preheat of existing safety-related structural steel at a temperature of 70°F as required by site specifications and the AWS 1974 Code."

1. The violation is admitted.

2. The ambient temperature was not verified for the welding operation observed by the NRC inspector. Documentation for preheats of all welds made between 32° and 70° were covered by the random preheat verification program contained in PQCI W-1.60. The program in place requires 100% verification for preheat temperature over 70°.

3. Bechtel's "Instuctions to Welders" have been revised to provide preheating instructions, and each welder signs for receipt of these instructions. The welder's rod withdrawal requisitions are also stamped in red with preheat instructions. The in-place verification program will be continued.

4. All Bechtel site welders will be retrained in the site preheat requirements, and all new welders will have this preheat training emphasized as part of their indoctrination.

5. All Bechtel site welders will be re-trained by May 1, 1983.

NOV Item B - 7. (82-22-21)

"Measures were not established to control the distribution of changes (red lines) to hanger isometric drawings in that changes to Drawing 1-652-2-25(Q) were not controlled utilizing the Site Document Control Center."

1. The violation is admitted.

2. The control of Redline changes to work prints was not performed through the Construction Document Control Department, however, it was being done in accordance with established field procedures.

3. Revisions to Bechtel Field Procedures now require all changes (redlines) to piping isometrics and hanger drawings to be controlled utilizing the site Document Control Center.

4. N/A

5. Complete.

NOV Item B - 8.a (82-22-23)

"Measures were not established or implemented to determine if materials ultimately restricted (per Nonconformance Report No 3266) from installation or use in ASME Class I systems were actually installed or used in Class I systems."

1. The violation is admitted.

2. Failure to initially apply QC hold tags on suspect material, and failure to implement disposition of the NCR in a timely manner.

3. A letter was provided to B&W Construction Company, a subcontractor at the Midland jobsite responsible for the majority of Class I piping and hanger installation, on December 11, 1981, identifying restriction on usage of subject material from heats identified on NCR 3266 for Class I use.

   100% of all completed Class I P-2.20 PQCIR documentation packages stored in the vault were reviewed for identification of the nonconforming material identified in NCR 3266. B&W has subsequently re-reviewed their documentation records to ascertain if any of the discrepant material identified through the PQCIR review was installed in the field. Any of the discrepant material is to be removed and replaced with acceptable material.

4. A specific review by a level II QCE of all future Class I P2.20 PQCIRs for discrepant material identified on NCR 3266 is being performed before final acceptance and their subsequent storage in the QC vault.

   A QA survey of all applicable NCRs will be performed in accordance with QA Checklist S-23 to assure that material control procedures have been adequately implemented and subsequent actions associated with applicable NCR dispositions have been implemented.

NOV Item B - 8.a (82-22-23) Continued

Although not related directly with the above effort or this identified discrepancy, a complete material verification documentation review with special emphasis for ASME NCA 3700/3800 compliance for pipe support material is in process on the project by Bechtel procurement supplier quality group to assure acceptable material documentation for the Midland Project. Miscellaneous material such as rebars, paint, etc, are excluded from this review.

5. Full compliance with be obtained as follows:

Specific Actions - 1) Rework required on Class I supports in field to be complete by March 15, 1983.

2) Review of all new P-2.20 PQCIRs is ongoing.

Generic Actions - 1) Review of all applicable project NCRs by QA to be complete by June 24, 1983.

2) Follow-up actions as result QA survey to be determined later.

General - 1) The review of all material documentation packages for proper verification documentation is an ongoing effort. As stated previously, this is considered additional effort not directly related to resolution of the identified discrepancy.

NOV Item B - 8.b(1) (82-22-12A)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

(1) The diesel generator exhaust hangers were not classfied, designed, or built as "Q" as committed to in the FSAR. (See item 2.e) ..."

1. The violation is admitted.

2. An NCR was not issued because MPQAD failed to act in a timely manner.

3. NCR M01-5-2-166 was written by MPQAD on November 16, 1982 to document the hangers listed on SCN #36 to Specification M-326 as being nonconforming as a result of their original "non-Q" designation.

4. Complete.

5. Complete.

NOV Item B-8.b(2) (82-22-12B)

"As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report or other appropriate report. The two nonconforming conditions were:

... (1) The design of the diesel generator monorail was not analyzed to seismic Category I design requirements as committed to in the FSAR. (See item 2.d.)"

1. The violation is admitted.

2. There was a misunderstanding over whether a nonconforming condition actually existed.

3. On November 16, 1982, a Quality Action Request (QAR) was written to document the condition. A subsequent seismic analysis has been done (Calc #G-44(Q) Revision 1) which documents the acceptability of current design of the subject monorail.

4. Complete.

5. Complete.

ATTACHMENT 3

REQUEST FOR REDUCTION OF CIVIL PENALTY

Pursuant to 10 CFR 2.205, Consumers Power Company respectfully requests that the NRC reconsider the amount of civil penalty proposed to CPCo for the violations cited in the NRC's letter, dated February 8, 1983, J G Keppler to J D Selby. The Company does not contest the validity of the violations and agrees that a civil penalty is warranted, but believes that certain mitigating factors should be considered.

The NRC's criteria for enforcement actions (at 47 Federal Register page 9991, March 9, 1982) sets forth specific criteria for increasing or reducing base civil penalties, and provides in part as follows:

> "2. Corrective Action to Prevent Recurrence. Recognizing that corrective action is always required to meet regulatory requirements, the promptness and extent to which the licensee takes corrective action, including actions to prevent recurrence, may be considered in modifying the civil penalty to be assessed. Unusually prompt and extensive corrective action may result in reducing the proposed civil penalty as much as 50% of the base value shown in Table 1. On the other hand, the civil penalty may be increased as much as 25% of the base value if initiation of corrective action is not prompt or if the corrective action is only minimally acceptable. In weighing this factor consideration will be given to , among other things, the timeliness of the corrective action, degree of licensee initiative, and comprehensiveness of the corrective action - such as whether the action is focused narrowly to the specific violation or broadly to the general area of concern."

We believe that our actions to correct the situation at issue have been timely and have been conceived and organized mainly through our own initiative. Most important, however, is that our program to correct these deficiencies is comprehensive and far reaching.

Shortly after receiving feedback on the NRC's inspection findings, the Company launched major, extensive corrective action. The Company halted the majority of the Category I work of its prime contractor, and laid the groundwork for a verification of past inspections and statusing of incomplete work. The work stoppage resulted in the layoff of more than 1,000 workers. The Company also initiated major, generic corrective action addressing the specific areas of NRC inspection findings. The Company's entire plan is entitled the Construction Completion Program, and included steps responding broadly to the NRC's and Company's areas of concern. This was addressed at length in the Company's letter of January 10, 1983, J W Cook to J G Keppler and further discussed at a Public Meeting with the NRC at Midland on February 8, 1983.

The corrective action undertaken by the Company was not narrowly focused on the specific violations identified by the NRC. The work reduction extended to all major safety related structures on-site, not merely the diesel generator building which was the focus of NRC's inspection. The verification program begins in the auxiliary building, includes the reactor buildings and diesel generator building as well as the service water pump structure.

The Construction Completion Program, which is the organizational basis for the generic corrective action, will encompass and structure the remaining pre-turnover systems and area work to be done at the Midland site, (excepting soils, HVAC and NSSS work). The Company's willingness to accept the NRC's suggestion that we take direct control of the project QC staff formerly under Bechtel supervision extends broadly to the entire job, and involves a major commitment of additional manpower and resources in recertification, training, and inspection activities.

The Company does not contest the NRC's decision to increase the civil penalty on the basis of certain other factors specified in the enforcement guidelines. We request, however, that consideration be given in determining the amount of the penalty to the corrective action taken and planned by the Company.

Warnick

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF PUBLIC AFFAIRS, REGION III
799 Roosevelt Road, Glen Ellyn, Illinois 60137

NEWS ANNOUNCEMENT 83-08
CONTACT: Jan Strasma 312/932-2674
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NRC STAFF PROPOSES $120,000 FINE FOR QUALITY ASSURANCE VIOLATIONS AT MIDLAND NUCLEAR POWER STATION

The Nuclear Regulatory Commission's Region III Office has proposed a $120,000 fine against Consumers Power Company for an alleged breakdown in the quality assurance program at the Midland Nuclear Power Station construction site in Midland, Michigan.

An NRC inspection of equipment installation in the plant's diesel generator building between October 12 and November 25, 1982, identified numerous items of noncompliance with NRC Quality Assurance requirements.

The proposed fine consists of two alleged violations, each carrying a $60,000 penalty.

The first violation is for multiple examples of plant personnel failing to follow procedures, drawings and specifications in the installation of equipment. In one instance, an inspection program was not established to ensure the segregation of electrical cables in accordance with design requirements. In other cases, changes in drawings or specifications were made without proper authorization.

The second violation was the result of the NRC's determination that quality control supervisors instructed quality control (QC) inspectors to suspend inspections when excessive numbers of deficiencies were observed.

The construction being inspected was then turned back to the construction staff for rework. The intent of this practice was to improve construction quality prior to the QC inspections. In some cases, however, the follow-up QC inspections focused only on the previously identified deficiencies, instead of conducting a full reinspection. This practice, therefore, provided no assurance that unreported deficiencies were later identified or repaired. Reinspections will be required for those areas where this QC practice was utilized.

This inspection practice also resulted in incorrect data being fed into the licensee's Trend Analysis Program, thereby inhibiting the utility's ability to determine the root causes of deficiencies and to prevent their recurrence.

In a letter to Consumers announcing the proposed fine, Regional Administrator James G. Keppler said the violations demonstrate the company's "failure to exercise adequate oversight and control" of its principal contractor (Bechtel Power Corporation), which had the responsibility for executing the QA program.

Keppler added that the QA breakdown, in part, caused Consumers to halt some safety-related construction work at the plant last December, and to take "other significant actions to provide assurance that safety-related structures and systems are constructed as designed."

As part of its corrective action, Consumers has proposed a "Construction Completion Program," outlining the steps it will take to complete the Mid-

-More-

add 25 pgs

RFW

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

FEB 8 1983

Docket No. 50-329
Docket No. 50-330
EA 83-3

Consumers Power Company
ATTN: Mr. John D. Selby
President
212 West Michigan Avenue
Jackson, MI 49201

Gentlemen:

This letter refers to the special inspection conducted by the Office of Special Cases, Midland Section, of this office on October 12 - November 25, 1982, and on January 19-21, 1983 of activities at the Midland Nuclear Power Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82. The results of the inspection were discussed with you on November 10 and 23, 1982, on January 21, 1983 at the conclusion of the inspection and on January 18, 1983 in the Region III office during an enforcement conference between you and others of your staff and me and others of the NRC staff.

The inspection was primarily a physical inspection of installed equipment to verify conformance to approved drawings and specifications. The results of the inspection indicate a breakdown in the implementation of your quality assurance program as evidenced by numerous examples of noncompliance with nine of the eighteen different criteria as set forth in 10 CFR 50, Appendix B. The breakdown was caused by personnel who failed to follow procedures, drawings, and specifications; by first line supervisors and field engineers who failed to identify and correct unacceptable work; by construction management who failed to call for quality control inspections in a timely manner, allowing a backlog of almost 16,000 inspections to develop; and by quality assurance personnel who failed to identify the problems and ensure that corrective actions were taken. As a result, you failed to fulfill your primary responsibility under Criterion 1 of Appendix B to 10 CFR 50 to assure the execution of a quality assurance program. In addition, of particular concern to the NRC is the fact that quality control (QC) supervisors instructed QC inspectors to suspend inspections if excessive deficiencies were found during the performance of inspections. Consequently, not all observed deficiencies were reported, and complete inspections were not performed by all QC inspectors after the reported deficiencies were corrected.

I understand that, because of our findings, you have inspected other areas of the plant and found similar deficiencies. As a result of our findings, your findings, and your assessment of the overall project, you halted certain safety-related work at the Midland site, reduced the work force by approximately 1100

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

8302110254

people, committed to building cleanup and system layup, committed to organize teams of construction and engineering personnel responsible for the completion of one or more plant systems, and committed to reinspect safety-related systems. I expect that you will also conduct an inspection to determine the extent to which QC supervisors at the Midland site have been instructing QC inspectors to limit findings of deficiencies and the extent to which QC inspectors have been conducting reinspections based only on reported deficiencies.

To emphasize the need for CPCo management to ensure implementation of an effective quality assurance program that identifies and corrects construction deficiencies, we propose to impose civil penalties for the items set forth in the Notice of Violation that is enclosed with this letter. The violations in the Notice have been categorized as Severity Level III violations in accordance with the General Statement of Policy and Procedure for Enforcement Actions, Appendix C of 10 CFR 2. The base value for a Severity Level III violation is $40,000. However, as a result of your past enforcement history involving quality assurance and the multiple examples of QC deficiencies for the areas inspected, the base civil penalty for each violation is being increased by fifty percent.

After consultation with the Director of the Office of Inspection and Enforcement, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalties in the cumulative amount of One Hundred Twenty Thousand Dollars ($120,000).

You are required to respond to this letter and should follow the instructions in the Notice when preparing your response. In your response you should describe the results of your inspections to determine the extent to which QC supervisors instructed QC inspectors to limit findings of deficiencies, the systems affected, and your corrective actions to ensure that all affected systems are adequately reinspected. Your reply to this letter and the results of future inspections will be considered in determining whether further enforcement action is appropriate.

In accordance with Section 2.790 of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and the enclosures will be placed in the NRC Public Document Room.

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

Sincerely,

James G. Keppler

James G. Keppler
Regional Administrator

Enclosure:
Notice of Violation and
Proposed Imposition of Civil Penalties

cc w/encl:
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)
RCDeYoung, IE
JHSniezek, IE
JAxelrad, IE
JTaylor, IE
EJordan, IE
CThayer, IE
JLieberman, ELD
VStello, DED/ROGR
FIngram, PA
JCummings, OIA
JFitzgerald, OI
HDenton, NRR
JKeppler, RIII
Enforcement Coordinators
RI, RII, RIII, RIV, RV
MWilliams, NRR
JCrooks, AEOD
GKlingler, IE
IE:ES Files
IE:EA Files
EDO Rdg File

NOTICE OF VIOLATION

AND

PROPOSED IMPOSITION OF CIVIL PENALTIES

Consumers Power Company
Midland Nuclear Power Plant
Units 1 and 2

Docket Nos. 50-329
50-330
Permit Nos. CPPR-81
CPPR-82
EA 83-3

As a result of the inspections conducted at the Midland Nuclear Plant on October 12 - November 25, 1982 and January 19 - 21, 1983, the violations of 10 CFR 50, Appendix B listed below were identified. These violations demonstrate that you failed to exercise adequate oversight and control of your principal contractor, to whom you had delegated the work of executing the quality assurance program. Your failure manifested itself in a breakdown in the implementation of your quality assurance program and, at least in part, caused Consumers Power Company to halt some safety-related work and take other significant actions to provide assurance that safety-related structures and systems are constructed as designed.

As described in item A, QC supervisors instructed QC inspectors to suspend an inspection if an excessive number of deficiencies was observed. Consequently, there was no assurance that a complete inspection was being performed after the reported deficiencies were corrected and we have found several instances in which final QC inspections were based on only the limited deficiencies reported during the initial inspection. In addition, this failure to report all identified deficiencies resulted in incorrect data being fed into your Trend Analysis Program, inhibiting your ability to determine the root cause of deficiencies and prevent their recurrence.

As illustrated in the numerous examples set forth in Item B, personnel failed to follow procedures, drawings, and specifications; first line supervisors and field engineers failed to identify and correct unacceptable work; construction management failed to call for quality control inspections in a timely manner, allowing a backlog of almost 16,000 inspections to develop; and quality assurance personnel failed to identify the problems and ensure that corrective actions were taken.

In order to emphasize the need for improvements in your control of your quality assurance program, we propose to impose civil penalties in the cumulative amount of One Hundred Twenty Thousand Dollars ($120,000).

In accordance with the NRC Enforcement Policy (10 CFR Part 2, Appendix C) 47 FR 9987 (March 9, 1982), and pursuant to Section 234 of the Atomic Energy Act of 1954, as amended ("Act"), 42 U.S.C. 2282, PL 96-295, and 10 CFR 2.205, the particular violations and the associated civil penalties are set forth below:

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CIVIL PENALTY VIOLATIONS

A. 10 CFR 50, Appendix B, Criterion X requires, in part, "A program for inspection of activities affecting quality shall be established and executed.. to verify conformance with the documented instructions, procedures and drawings for accomplishing the activity."

10 CFR 50, Appendix B, Criterion XV requires, in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation."

Consumers Power Quality Assurance Program Policy No. 15, Revision 12, Paragraph 1.0, requires, in part, "Items, services or activities which are deficient in characteristic, documentation or procedure which renders the quality unacceptable or indeterminate and which is considered significant to safety are identified as nonconformances. Nonconforming items... are identified by marking, tagging, segregating or by documentation. Nonconforming items are controlled to prevent their inadvertent installation or use. Nonconforming items and activities are recorded and are considered for corrective action to prevent recurrence...."

Contrary to the above, during the inspection conducted between October 12 - November 25, 1982 and January 19-21, 1983, NRC inspectors determined that quality control inspectors were not documenting as nonconformances all of the deficiencies which they observed during their inspections. Inspections were suspended by the QC inspector if too many nonconformances were observed. In-process inspection notices (IPINs) associated with suspended inspections, identified as nonconformances only a portion of the observed deficiencies. Supervisory QC personnel stated that they directed QC inspectors to limit the number of nonconformances documented during an inspection. This directive was verified by discussions with QC inspectors. Several QC inspectors interviewed, confirmed that inspections were closed after reviewing only the deficiencies documented on the IPIN. As a result, measures were not established to prevent the continued installation and use of these nonconforming items. In addition, corrective actions were not implemented to prevent recurrence of these nonconformances.

This is a Severity Level III violation (Supplement II)
(Civil Penalty - $60,000)

B. 10 CFR 50, Appendix B, Criterion II requires holders of construction permits for nuclear power plants to document, by written policies, procedures, or instructions, a quality assurance program which complies with the requirements of Appendix B for all activities affecting the quality of safety-related structures, systems, and components and to implement that program in accordance with those documents.

Contrary to the above, Consumers Power Company and its contractor did not adequately implement a quality assurance program to comply with the requirements of Appendix B as evidenced by the following examples:

1. 10 CFR 50, Appendix B, Criterion V requires, in part, "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

   Consumers Power Quality Assurance Program Policy No. 5, Revision 12, Paragraph 1.0 states, in part, "Instructions for controlling and performing activities affecting quality of equipment or activities such as...construction, installation...are documented in instructions, procedures...and other forms of documents."

   Contrary to the above, the following instances of failure to accomplish activities affecting quality in accordance with instructions, procedures, specifications, or drawing requirements were identified:

   a. Installation of diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 was not in accordance with the requirements delineated on foundation Drawing 7220-M18-250 in that the foundation bolt washers required by the subject drawing were not installed.

   b. Unscheduled pull box associated with conduits 2BN006, 2BN007, and 2BDA002 was not sized in accordance with the requirements delineated on Sheet 42 of Drawing E-42 in that the 12" x 12" x 6" as-built dimensions of the subject pull box did not conform to the 13½" x 12" x 6" dimension requirements delineated on Sheet 42 of Drawing E-42.

   c. The 1'-10" wall to support dimension required by raceway support Drawing E-796(Q), Sheet 2 of 2, Revision 5, for hanger No. 86 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 2'-1½" in lieu of the required 1'-10".

   d. The 6'-6" wall to support dimension required by raceway support Drawing E-796(Q) Sheet 1 of 2, Revision 11 for hanger No. 14 was not correctly translated into the as-built installation of the subject hanger in that the as-built wall to support dimension was 5'-5" in lieu of the required 6'-6".

e. The inspectors identified high strength steel plate placed in the laydown area which was not marked with the material type and grade as required by Field Instruction FIG-9.600, Revision 1.

f. The inspectors identified various stock steel shapes in the "Q" area with yellow-colored paint on the ends (indicating the material was non "Q") and various steel stock shapes in the non "Q" area without painted ends (indicating "Q" material), contrary to the requirements of Field Instruction FIG-9.600, Revision 1.

g. The slots in the muffler support plates were not machined but were determined to be irregular and flame cut, leaving rough slot edges not in conformance with design Drawing M18-425(5)-1.

h. Jacking plates were not installed beneath the center support plates of Bay 1 diesel generator muffler as required by Drawing M18-250-6.

i. Procedure FID-2.100, "Outstanding FCR/FCN Retirement," Revision 2 was inadequate in that the design drawings were not changed when an FCR/FCN had been retired and no further reference to the FCR existed on the revised drawing. As a result, the retired FCR C-2103 relating to HVAC structural steel was lost and could not be traced to the design drawing to ensure a complete quality record.

j. Field Sketch CY-1035 which illustrated the bottom gusset plates for HVAC fan supports was not identified as "Q", nor was there a reference to the affected drawing on the sketch as required by Procedure FPD-5.000, "Preparation of Field Sketches."

k. Procedure FPD-5.000, "Preparation of Field Sketches," Revision 1 did not require design drawings to reference appropriate field sketches to ensure a complete quality record.

l. 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 diesel generator bays. This change was neither reviewed nor properly authorized.

m. The as-built gusset plate connections in Bay 1 were not built as identified on Detail 3 of Drawing C-1004. The angle braces were welded together as opposed to having separate welds for each brace. This change was neither reviewed nor properly authorized.

n. None of the sixteen ¼" bracing angles identified on Drawing C-1004 were constructed utilizing ¼" material. This change was neither reviewed nor properly authorized.

o. Drawing C-1004, Detail 2, required the W10 beam-to-beam connection to be welded. In Bay No. 3, a bolted connection was constructed in lieu of the required welded connection, without review nor proper authorization.

p. 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 required. This change was neither reviewed nor properly authorized.

q. A section (approximately 18 x 10 x 4 inches deep) of the primary containment wall in Containment Purge Room 702 was removed (by chipping) without obtaining approval as required by FIG-1-111, Revision 4, Concrete Drilling Permit.

2. 10 CFR 50, Appendix B, Criterion III requires, in part, "Measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Measures shall also be established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components. Design changes, including field changes, shall be subject to design control measures commensurate with those applied to the original design and be approved by the organization that performed the original design unless the applicant designates another responsible organization."

Consumers Power Company Quality Assurance Program Policy No. 3, Revision 12, Paragraphs 3.3 and 3.5 state, in part, "Each group or organization performing detailed design translates the applicable regulatory requirements, design bases, codes, standards, and design criteria into design documents, such as...drawings.... Changes to the design require the same review and approval as the original design by the group or organization delegated lead design responsibility."

Contrary to the above:

a. Measures were not established for the selection and review for suitability of application of "Q" materials associated with the diesel generator exhaust muffler in that design drawings and specifications did not indicate the material identity of the installed muffler saddle supports and plates.

b. Design Drawing C-147 required bolted bracing connections for the diesel generator building HVAC bracing gusset plates. Field Sketch CY-1035 was used to change the design to welded connections in lieu of the specified bolted connections. This design change was neither properly reviewed nor approved.

c. Design Drawings C-1004 and C-147 did not specify the sizes of the diesel generator building HVAC fan gusset plates. A "combo" shop work order request was used to design the gusset plates without appropriate review and approval.

d. The licensee failed to analyze the four diesel generator building monorails as seismic Category I as described in their commitment to Regulatory Guide 1.29, in Appendix 3A of the FSAR.

e. The licensee designed and constructed thirty-two diesel generator building exhaust system hangers without ensuring that the applicable requirements for "Q" components were included in the design documents.

f. The licensee purchased armor stone for a "Q" portion of the perimeter dike without translating the applicable regulatory requirements into appropriate specifications and design documents.

3. 10 CFR 50, Appendix B, Criterion VII requires, in part, "Measures shall be established to assure that purchased...equipment...conforms to the procurement documents. These measures shall include provisions, as appropriate, for...inspection at the contractor or subcontractor source, and examination of products upon delivery."

Consumers Power Quality Assurance Program Policy No. 7, Revision 12, Paragraphs 1.0 and 3.4, state, in part, "The Midland Project Office and the Midland Project Quality Assurance Department verify that procurement requirements are met. This is accomplished through... source evaluation and inspection...receipt inspections are made to verify that the items...conform to procurement requirements not verified by source surveillance or inspection...."

Contrary to the above, source inspections at the panel supplier facility and receipt inspections at the Midland site failed to ensure conformance of the internal wiring within diesel generator engine control panels 1C111, 1C112, 2C111, and 2C112 to Procurement Specification 7220-G-5, Revision 1. Paragraph 6.0 of Specification 7220-G-5 states, "All electrical wiring...within the board enclosure shall conform to the highest industrial standards of design and

workmanship." An NRC inspection on October 15, 1982 identified the following examples of defective terminations of internal wiring within the subject panels.

a. The output lead on the Relay Tach device had numerous broken strands at the termination lug.

b. 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.

c. The 1- lead on the CB-1 device did not have all strands inserted into the compression lug.

4. 10 CFR 50, Appendix B, Criterion X requires, in part, "A program for inspection of activities affecting quality shall be established and executed...to verify conformance with the documented...drawings for accomplishing the activity."

Consumers Power Company Quality Assurance Program Policy No. 10, Revision 12, Section 1.0 states, in part, "Inspection and surveillance are performed to assure that activities affecting quality comply with documented...design documents...inspection and surveillance are performed according to written instructions."

Contrary to the above:

a. An inspection program was not established to ensure segregation of cables installed in horizontal trays which used metal dividers to segregate control and instrumentation cables in accordance with design requirements.

b. Quality Control (QC) inspections failed to ensure that activities affecting quality conformed to design documents in that QC inspections performed on July 1, 1981 and documented on QCIR C210-172 failed to detect and identify nonconformances B.1.(1) through (o) of this Notice of Violation. These nonconformances were associated with installation of the diesel generator building HVAC fan support steel.

5. 10 CFR 50, Appendix B, Criterion XIII requires, in part, "Measures shall be established to control the...cleaning and preservation of material and equipment in accordance with work and inspection instructions to prevent damage or deterioration. When necessary for particular products, special protective environments...shall be specified."

Consumers Power Company Quality Assurance Program Policy No. 13, Revision 12, Paragraph 3.3, states, in part, "Suppliers provide plans...maintain and control items upon arrival at the site."

Contrary to the above, the licensee did not implement a maintenance program to prevent five of sixteen installed diesel generator slide bearing muffler plates from accumulating dirt and dust as required by the vendor's manual.

6. 10 CFR 50, Appendix B, Criterion IX requires, in part, "Measures shall be established to assure that special processes, including welding, heat-treating, and nondestructive testing, are controlled...."

Consumers Power Company Quality Assurance Program Policy No. 9, Revision 12, Paragraph 1.0 states, in part, "Where the required level of quality cannot be measured by inspection only of the item...accomplish these processes under controlled conditions in accordance with applicable codes, standards and specifications using qualified procedures, equipment and personnel." Paragraph 3.3 states, in part, "...Personnel performing special processes maintain records to verify that the required activities were accomplished in accordance with qualified procedures by qualified personnel."

Contrary to the above, during welding of the diesel generator building exhaust piping hanger support steel, the licensee did not verify preheat of existing safety-related structural steel to a temperature of 70°F as required by site specifications and the AWS 1974 Code.

7. 10 CFR 50, Appendix B, Criterion VI requires in part, that "Measures shall be established to control the issuance of documents, such as instructions, procedures, and drawings including changes thereto, which prescribe all activities affecting quality...."

The Consumers Power Company Quality Assurance Program Policy No. 6, Revision 12, Paragraph 1.0 states, in part, "Measures are included to assure that documents, including changes,...are distributed according to a controlled distribution to the user functions."

Contrary to the above, measures were not established to control the distribution of changes (red lines) to hanger isometric drawings in that changes to Drawing 1-652-2-25(Q) were not controlled utilizing the Site Document Control Center.

8. 10 CFR 50, Appendix B, Criterion XV requires in part, "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation."

Consumers Power Quality Assurance Program Policy No. 15, Revision 12, Paragraph 1.0, states, in part, "Items, services or activities which are deficient in characteristic, documentation or procedure which renders the quality unacceptable or indeterminate and which is considered significant to safety are identified as nonconformances. Nonconforming items...are identified by marking, tagging, segregating or by documentation. Nonconforming items are controlled to prevent their inadvertent installation or use. Nonconforming items and activities are recorded and are considered for corrective action to prevent recurrence...."

Contrary to the above:

a. Measures were not established or implemented to determine if materials ultimately restricted (per Nonconformance Report No. 3266) from installation or use in ASME Class I systems were actually installed or used in Class I systems.

b. As of November 10, 1982, two nonconforming conditions identified by the NRC on October 12, 1982, and confirmed by the licensee on October 19 and 25, respectively, had not been documented on a nonconformance report, a quality assurance report, or other appropriate report. The two nonconforming conditions were:

(1) The diesel generator exhaust hangers were not classified, designed, or built as "Q" as committed to in the FSAR. (See item 2.c.)

(2) The design of the diesel generator monorail was not analyzed to seismic Category I design requirements as committed to in the FSAR. (See item 2.d.)

This is a Severity Level III violation (Supplement II).
(Civil Penalty - $60,000)

Pursuant to the provisions of 10 CFR 2.201, Consumers Power Company is hereby required to submit to the Director, Office of Inspection and Enforcement, U. S. Nuclear Regulatory Commission, Washington, DC 20555 and a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission, Region III, 799 Roosevelt Road, Glen Ellyn, Illinois 60137, within 30 days of the date of this Notice a written statement or explanation, including for each alleged violation: (1) admission or denial of the alleged violation; (2) the reasons

for the violation, if admitted; (3) the corrective steps which have been taken and the results achieved (4) the corrective steps which will be taken to avoid further violations; and (5) the date when full compliance will be achieved. Consideration may be given to extending the response time for good cause shown. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, this response shall be submitted under oath or affirmation.

Within the same time as provided for the response required above under 10 CFR 2.201, Consumers Power Company may pay the civil penalties in the cumulative amount of $120,000 or may protest imposition of the civil penalties, in whole or in part, by a written answer. Should Consumers Power Company fail to answer within the time specified, the Director, Office of Inspection and Enforcement will issue an order imposing the civil penalties proposed above. Should Consumers Power Company elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalties, such answer may: (1) deny the violations listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalties should not be imposed. In addition to protesting the civil penalties, in whole or in part, such answer may request remission or mitigation of the penalties. In requesting mitigation of the proposed penalties, the five factors contained in Section IV(B) of 10 CFR Part 2, Appendix C should be addressed. Any written answer in accordance with 10 CFR 2.205 should be set forth separately from the statement or explanation in reply pursuant to 10 CFR 2.201, but may incorporate statements or explanations by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. Consumers Power Company's attention is directed to the other provisions of 10 CFR 2.205, regarding the procedures for imposing a civil penalty.

Upon failure to pay any civil penalties due, which have been subsequently determined in accordance with the applicable provisions of 10 CFR 2.205, this matter may be referred to the Attorney General, and the penalties, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282.

FOR THE NUCLEAR REGULATORY COMMISSION

James G. Keppler
Regional Administrator

Dated at Glen Ellyn, Illinois
this 8th day February of 1983

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RFW

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

FEB 8 1983

Docket No. 50-329
Docket No. 50-330

Consumers Power Company
ATTN: Mr. John D. Selby
President
212 West Michigan Avenue
Jackson, MI 49201

Gentlemen:

This refers to the special inspection conducted during the period October 12 through November 25, 1982, and January 19-21, 1983 of activities at the Midland Nuclear Power Plant, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-81 and No. CPPR-82. The results of the inspection were discussed during an enforcement conference conducted at the NRC Region III office on January 18, 1983. The report setting forth the results of the inspection and the enforcement conference is enclosed.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). 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.

A separate letter is enclosed that sets forth certain matters of concern and the items of noncompliance found during the inspection. The responses directed by thi 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.

8302110262

We will gladly discuss any questions you have concerning these inspections.

Sincerely,

James G. Keppler
Regional Administrator

Enclosure: Inspection Report
No. 50-329/82-22(OSC) and
No. 50-330/82-22(OSC)

cc w/encl:
J. W. Cook, Vice President
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Ma y Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)

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, Chief
Section 2, Office of
Special Cases
W. D. Shafer 2-1-83

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:

Noncompliance	Report Section
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
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D. D. Johnson, Construction Engineer
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J. S. Kreple, Construction Engineer
G. M. Murray, Construction Engineer
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D. E. Sibbald, Construction Engineer
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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:

Cable Scheme Number	Location of Termination
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 Dawing 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 IR's 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, Sh.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 tha 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 1, 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 by other (Bechtel) Procurement Supplier Quality Department."

Based on the ASME Subsection NF-2610(b), 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 activites. 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). Inclusively, 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 5.0. 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 caluclations 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. M01-9-2-154 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. M01-9-2-151 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 accomodate 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 Reservior (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 noncompliance. 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.

Warnick
File

February 3, 1983
EN - 83-07

OFFICE OF INSPECTION AND ENFORCEMENT
NOTIFICATION OF SIGNIFICANT ENFORCEMENT ACTION

Licensee: Consumers Power Company
Midland Nuclear Power Plant, Units 1 and 2
Docket Nos. 50-329, and 50-330

Subject: PROPOSED IMPOSITION OF CIVIL PENALTY - $120,000

This is to inform the Commission that a Notice of Violation and Proposed Imposition of Civil Penalty in the amount of One Hundred Twenty Thousand Dollars ($120,000) will be issued on or about February 8, 1983 to Consumers Power Company. This action is based on the licensee's failure to implement an adequate quality assurance program as it relates to the installation of electrical, mechanical and civil components in the diesel generator building and the action of quality control (QC) supervisors instructing QC inspectors to suspend inspections if excessive deficiencies were found during the performance of inspections. Consequently, not all observed deficiencies were reported and complete inspections were not performed by all QC inspectors after the reported deficiencies were corrected.

It should be noted that the licensee has not been specifically informed of the enforcement action. The Regional Administrator has been authorized by the Director of the Office of Inspection and Enforcement to sign this action. The schedule of issuance and notification is:

Mailing of Notice	February 8, 1983
Telephone Notification of Licensee	February 8, 1983

A news release has been prepared and will be issued about the time the licensee receives the Notice. The State of Michigan will be notified.

The licensee has thirty days from the date of the Notice in which to respond. Following NRC evaluation of the response, the civil penalty may be remitted, mitigated, or imposed by Order.

Contact: G. Klingler, IE 24923 J. Axelrad, IE 24909

Distribution:

H Street 9:02	MNBB 9:05	Phillips 9:03	EW ____	Willste 9:07
Chairman Palladino	EDO	NRR	IE	NMSS
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	RII ____ RV ____			
	RIII ____			

PRELIMINARY INFORMATION - NOT FOR PUBLIC DISCLOSURE UNTIL FEBRUARY 8, 1983

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2.3.83
9:00

PROBLEMS IDENTIFIED DURING OCTOBER-NOVEMBER, 1982 MIDLAND CONSTRUCTION INSPECTION

1. Heat number traceability in structural steel
2. Discrepancies between design drawings and actual construction
3. Design control problems
4. Design document control problems
5. Receipt inspections failed to identify problems
6. Overinspection (or reinspection) failed to identify same problem as in item 5
7. Cable tray segregation problem
8. Concrete chipping not controlled per procedure
9. Field inspections failed to identify above problems
10. One QC inspection was not correct
11. Almost 16,000 open inspection records (IR's) in plant
12. In Process Inspection Notices (IPIN's) hide extent of problems
13. Not all problems documented on nonconformance reports

Construction Completion Program

1. Evaluation Criteria
2. Reduction in manpower
3. Continuing work

   Hanger and cable reinspection

   Bechtel engineering

   Remedial soils (subject to NRC approval)

   B&W construction

   Zack construction (subject to stop work on welder qualification)

   Post turnover work

   Non-Q work
4. Prepare Aux Building for reinspection

   Remove all construction material and clean all areas

   Place systems and equipment in layup

   Other buildings will follow
5. Train and recertify QC inspectors
6. Prepare inspection procedures and reinspection documentation
7. Assemble teams to complete construction and make system operable. Includes sytem completion superintendent, planner, engineers, general foremen, and craftsmen. Test engineers, project engineers, and QA/QC teams will be independent.
8. MAC and INPO evaluations will proceed. Third party selection and overview.

Bob Warnick

DISTRIBUTION - NRC OPEN ITEMS LIST

R.A.Wells

M.L.Curland (4)

J.K.Meisenheimer

H.P.Leonard

L.E.Davis

J.G.Gilmartin (4)

M.A.Dietrich

E.C.Smith

J.A.Rutgers

J.W.Cook

D.B.Miller (2)

B.H.Peck (6)

P. Corcoran

D. Anderson

BHP
11/22/82

The following comments are applicable to Revision 2, dated 11/22/82, of the NRC Open Items List:

1) The list has been updated and reflects activities which took place on Friday, November 19, 1982.

2) A new status column has been added to describe open/closed status with the NRC and the Project.

3) Please contact me if you have any comments/corrections to the list.

BHP
11/22/82

NRC OPEN ITEMS LIST

Revision No. 2

Date 11/22/82

NRC OPEN ITEMS LIST

1. The purpose of this list is to keep track of Construction related open items from NRC Inspections at the Midland Plant.

2. Guide to using the form:

Item Number - each item/issue is numbered sequentially using the following key:

A - Administrative

C - Civil

E - Electrical

M - Mechanical

S - Soils

Date Initiated - enter the date the item/issue is opened with the NRC.

Description - enter a brief description of the item/issue.

NRC Inspector - name of the NRC Inspector

Responsible Engineer - initials of the responsible Site Management Organization (SMO) - Construction Department individual using the following key: -

JGB - Balazer, JG (ext. 511)

EME - Evans, EM (ext. 417)

DDJ - Johnson, DD (ext. 422)

GBJ - Johnson, GB (ext. 468)

JSK - Kreple, JS (ext. 405)

GMM - Murray, GM (ext. 508)

BHP - Peck, BH (ext. 400)

DWP - Puhalla, DW (ext. 408)

GWR - Rowe, GW (ext. 414)

DES - Sibbald, DE (ext. 418)

TAS - Spelman, TA (ext. 415)

DJV - Vokal, DJ (ext. 404)

RMW - Wheeler, RM (ext. 416)

RHW - Wieland, RH (ext. 408)

Action - briefly describe action planned or being taken.

Due Date - enter a response/item closeout date, where applicable.

NRC Status - enter the status of the item as far as the NRC is concerned.

OPEN - The NRC is awaiting action or information from us.

CLOSED - No other action is required.

Project Status - enter the status of the item as far as we are concerned.

OPEN - We owe the NRC some action or information, or we have a document needing closure (FCR, NCR, etc.)

CLOSED - No other action is required.

BHPeck
11/22/82

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
A-1	10/19/82	Questions on the IPIN's Program.	Gardner	BHP	NRC has agreed to our future resolution to ~~this~~ problem. We still need to address how to correct work done to date. M. Curland is pursuing. ~4000 IPINS issued in ~17 months. ~~[illegible]~~ (June 81) 5-600 open ~12,000 IR's open to 13,000 ~16000 open IR			Open - Need to address past IPIN's.

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
C-1	10/22/82	Monorail over Diesel Generator (Dwg. C-1009 welds not per drawing.	Landsman	JSK	The status of this item is being tracked under M-19B.	-		Closed
C-2	10/22/82	Structural Steel - vendor welds.	Landsman	DDJ	This item was originally found by us - not NRC. Issue will remain open until closed out per schedule prep. and by Bechtel. "Will se"	1/83		Open - Need t close out SCE
C-23	11/10/82	Hole in concrete filled block wall at elevation 645', west side, into degassifier room. Hole was for shielding HVAC duct.	Bruce Burgess	TAS	The following information transmitted to B. Burgess on 11/10/82. A) Spec. 7220-C-231Q Rev 22. See 9.2.3 A&B. B) Dwg. 7220-C-1194Q Rev 2.	-		Closed Ross has Que

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
3 ev. 2	10/22/82	FSK procedure requires reference to design drawing. FSK-CY-1035 does not comply. Also, NRC wants design dwg. to reference assoc. FSK's.	Landsman	DWP	-Issued NCR-M-01-9-2-155 -Eng. Eval. need for FSK/design dwg. cross reference. -FE Review FSK is for similar problems.			Generic Rev will be done OPEN - Need expand scop Becktel will r FSK's (≈420) Will audit othe disciplines.
4 ev. 1	10/22/82	The design drawing C-1004 does not show detail for beam connections.	Landsman	DWP	For beam connectors dwg. C-147 allows field to detail-dwg. C-147 provides criteria for welds not shown on C-1004. No other action required. Contact Steve Harvey.			Closed "We need to ask if he is ... They say "No" (In my un
5	10/22/82	FSK should designate if "Q".	Landsman	DWP	-NCR-M-01-9-2-155 issued. -FE to review FSK's for similar problems.			Generic Open - Need expand scop
6	10/22/82	(Superceded by C-4)						See C-4
7	10/22/82	D/G Bldg. - span change for fan support not per drawing.	Landsman	DWP	Retired FCR entered into this. Span is o.k. Inspector misread drawing. No other action required. Contact Steve Harvey.			Closed. They say Res agr
8	10/22/82	Size of knife blade not specified.	Landsman	DWP	-Detail for bracing to be clarified (FCRC-5174) copy to NRC 11/22/82 -NCR-M-01-9-2-155 issued. -Field to review control of detailing. Located field sketch which showed drawing.			Closed

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
-9	10/22/82	Duplicate QCIR's for dry pack - same as IPIN problem.	Landsman	DWP	Were not duplicates but were revisions. No other action required.			Closed Ros agrees.
-10	10/22/82	Lost FCR for a fan support.	Landsman	DWP	Duplicate FCR reretired. Original could not be found. No other action required. Contact J. Davis.			Generic Open - Cond Audi (MPQAD
-11	10/22/82	Retired FCR - should be annotated on current drawing.	Landsman	DWP	Procedure changed to require retired FCR/ FCN annotation.			Generic Open - Revi Retrofittin
-12	11/5/82	The A-572 beams used in Reactor Bldg. - How does QC verify they are in fact A-572 beams?	Landsman	DWP	Review QCIR for attribute. Contact Steve Harvey/Ed Dutton.	11/8		Cook seemed satisfi Closed
-13	11/5/82	Prior to 1979 what was the material control to keep Q and non-Q steel segregated?	Landsman	DWP	NRC given copies of all old procedures prior to 1979.	11/8		Open - Writ up on other sites. -Comp Midland practice other sites
-14	11/5/82	Detail 3 on dwg. C-1004 shows ¼" angle and 5/16" plate - field measurements indicate small plates.	Landsman	DWP	-NCR written on plates -FE to rework undersized plates.	11/8	How do we know if none of this exists. This was rejected - Yes?	Open - Nee Chronology for FCN and Engineering disposition smaller pla
-15	11/5/82	Provide NRC with QCIR for structural steel for still framing for second floor of D/G Bldg. - Also any CMTR's for framing steel.	Landsman	DWP	Information available for NRC Review.	11/8		Open - Perf Inspection (MPQAD)

EM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
-16	11/10/82	FSK procedure does not allow field to do design. Because connections are designed by Field, the procedure is violated.	Landsman	DWP	EPCo says Proc. not violated. FCR initiated to clarify detailing vs. design. Gave FCR to the NRC on 11/22/82. Field Engr can select bolted or welded connection in some cases			Closed Ross get back with
-17	11/10/82	Material in laydown area does not seem to be segregated or marked per Field Procedure.	Landsman	DWP	Several trips to laydown area with NRC with no open items identified.			~~Open~~ ~~Closed~~ Non C steel has paint. Ron Cook this there may also be problem.
-18	11/10/82	Do the ¼" plates and L's on fan support meet tolerances for ASTM A-6?	Landsman	DWP	Plates meet ASTM-A-6 L's not to be checked per NRC			Closed - Reviewed FER See if Ross is h
-19	11/10/82	Some connection in HVAC fan support was bolted while dwg. called for welded.	Landsman	DWP	NCR written to cover Bay 3. Licensee QC did not identify			Open - Develo dwg./QC sign sequence.
-20	11/10/82	Address why QCIR for fan support steel is closed yet as-built is not per drawing.	Landsman	DWP	QAR written to address concern.			Generic Open -What should QCIR address.
-21	11/10/82	Revision 6 of dwg. C-1004 incorporated FCN-C-335 yet the revision block did not note this.	Landsman	DWP	Correct drawing revision block. Contact D. Anderson/ RLAkers			Closed
-22	10/28/82	Chipping of concrete on CB #1 exterior well at el. 680'.	Barrett	EME	Wrote ~~Referred to~~ NCR M-1-9-2-154. Additional information provided to Mr. Barrett on 11/18/82. Changed Proc ~~Changed~~ Spec			Open - Need close out NC Corrective action shoul address gene concerns.

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
E-1	10/14/82	Generator Control Panel 1C-231 anchor bolts not not installed according to vendor drawing.	Gardner	GWR	FCR M-6655 written on 9/21/82 (lost) re-written on 10/14/82 requesting alternate anchoring detail.	11/26		Open- need close out o FCR.
E-2	10/14/82	Internal wiring separation is inadequate-Panel 1C-232. (RTE-Delta is supplier of 231 and 232 panels to Delaval)	Gardner	GWR	This problem identified on CPCo NCR-075 in June 1981. RTE-Delta on site 11/16/82. Barriers & boxes to be added via DCP. There still are open items that RTE has not addressed relative to this NCR.	11/30		Open- need close out N (MPQAD)
E-3	10/14/82	Foundation bolts for Panel 1C-111 have no traceability	Gardner	GWR	Traceability found and shown to Mr. Gardner.	10/22		Closed
E-3B	10/14/82	Anchor bolt washers missing and cannot verify Bevel washers are there. They don't know if the washers are there. Don't know if they weren't inspected or if inspected & not documented	Gardner	GWR	Insufficient flat washers on site to complete work. FMR-EY9382 to Procurement 11/11/82 ETA 11/22/82. FCR M-7026 written 11/10/82 to request option of using Bevel washers or not. FCR due 11/22/82 for disposition. NCR written.	11/30		Open- need close out F

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
E-4	10/14/82	Defective shop terminations in Panel 1C-111.	Gardner	GWR	NCR written DeLaval Rep to be requested to make site visit to assess defective terminations. SCRE #64 response due 11/22/82.	11/30		Generic Open-Need t close out S
E-5	10/14/82	General concern on channel separation of wiring throughout the plant.	Gardner	GWR	QAR E-191 written on 8/2/82, response was to revise E-47 & E-42 and modify PQCI E 3.0. Resident Engineering to issue clarification DCN by 11/24/82 which supplies all criteria for inspection. Field Engineering to prepare FIE 4.200 to give inspection criteria by 12/15/82.	12/15		Open- Need revise docu ments.
E-6	10/27/82	Mr. Barrett found cable traveling across the tray barrier and then back.	Barrett	GWR	Background information is contained on 11/1 and 11/10/82 updates. FPE 4.000 is being revised - due 11/22/82. FPE will give tie down requirements for horizontal trays, criteria for fill above barrier and will be a retrofit. Appropriate PQCI's will be revised upon issuance of FPE 4.000. Preliminary copy of FPE 4.000 sent to Mr. Barrett on 11/19/82.	11/30		Generic Open- Need procedural revisions.

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
E-7	10/19/82	Valid Finding Dimensions on Drawing E-796 do not agree with as-built conditions.	Gardner	GWR	FCN's 7040 and 8536 DCN #16 to E-796 written and approved. Copies given to R. Gardner on 11/10/82.	11/18		Closed
E-8	10/19/82	valid Pull boxes for conduits 2BN004 and 2BN007 in Bay 4 of the D/G Bldg. appear to be undersized according to E-42 SH 42.	Gardner	GWR	Background information is contained on update of 11/10/82. FCR E-3157 was approved on 11/17/82 and a copy sent to Mr. Gardner on 11/19/82.	11/19		Justified accept Closed Will go back to designer & ch for thermal
E-9	11/2/82	Traceability of base plate material.	~~Gardner~~ Barrett	GWR	According to E-42 SH 100 misc. steel is purchased to C-233Q. C-233Q is a fabrication specification. Bulk material is purchased to G-33Q and approval to purchase bulk materials against G-33Q is granted in C-233Q.	11/18		Open- Bech to review closure of C-233, App
E-10	11/2/82	Mr. Gardner requested approved methods of tray attachments to supports.	Gardner	GWR	Gave Mr. Gardner copy of Husky-Burndy hold down clip detail, specification for hold-down criteria (E-42 sh 8A, Sh 64 & Sh 64A). Welding details being numerous are specified in E-42. Gave Mr. Gardner SHDC-A hold down clip, copy of non Q & Q P.O.'s	11/5		Closed

#	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
	10/14/82	Valid Exhaust system hangers in Diesel Generator Building. Why is this hanger non-Q.	Landsman	JSK Corcoran Lewis Ballweg	They are trying to save the hanger. Hanger drawings have been revised Q. MPQAD has written an NCR (#M01-5-2-166)		Generic	Rutgers says they [redacted] have instituted generic action for this. Looking @ B-3 work
	10/19/82	Strut Support not welded according to drawing 652-1-510.	Landsman	JSK Marl	Hanger Construction not complete.			Closed Do we agree?
	10/19/82	Strut support not welded according to dwg. 652-1-510	Landsman	JSK Marl	Hanger Construction not complete.			Closed
	10/19/82	Item #1 Bill of Material not according dwg. "10x8" tube steel replaced by "10 x10" and not called out on work print 652-1-510.	Landsman	JSK Marl	Hanger Dwg. redlined in Standish Fab Shop due to lack of material. Redline ~~not~~ was included in work print.	This print was not available to NRC (Document control prob) See M-46		Closed They indicate this is satisfied.
	10/19/82	No preheat done to structural steel in Diesel Generator Building prior to welding of exhaust system hangers. H 652 sh 1.	Landsman Cook	JSK Sprague Fredianelli Harrison	PQC1 CW 1.00 does not require verification for preheat less than 70°F. NRC position is that verification of all temperatures should be required. BPCo has written FCR C 5150 to have welding spec changed to reflect pre-qualified AWS spec 1976. Telecon to Paul Barrett 11/18/82 to discuss following PQCI s: P-2.10, PW-1.00, E-2.1 E-1.0, FPW-4.000, CW-1.00, W-1.60.			Generic? ~~Closed~~ Open
	10/19/82	Field Welding Engineer does not keep records of non-Q inspections or what to impact.	Landsman	JSK	NRC observation that non-Q field welding records are not readily accessible.			Closed

EM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
-7	10/20/82	Questions concerning large bore hangers in D/G Bldg. 1. Where is weld rod type specified for stiffener plate welding symbol.	Landsman	JSK	Form 84 civil as called out in weld spec. G-27.			Closed They say Ron says OK
-8	10/20/82	2. Diesel Exhaust snubber 1-652-1-19. No stanchion to plate welding symbol.	Landsman	JSK	Assembly furnished by ITT Grinnell, no FIELD welding required at point in question.			Closed They believe it is satisfied
-9	10/20/82	3. Upper Hangers on Diesel Exhaust system. Have they been inspected by QC. - No	Landsman	JSK Marl	P129 forms have not yet been filled out by FE's. Hangers not released to QC.		What was lag time?	~~Closed~~ Open
-10	10/20/82	4. Stiffener Plates Welded to Structural above hanger in question welded on one side only, is this good Eng'g practice?	Landsman	JSK Corcoran	OK - No Prob. Technically acceptable obstruction would not allow welding to both sides.			Closed
-11	10/20/82	Valid Questions concerning large bore hangers in Diesel Generator Bldg. Is there a redline for snubber 1-652-1-19 showing weld to imbed in bay 2. Similar situation in Bay 1.	Landsman	JSK Marl	ECR 6925 written to cover installation.	11/4		Closed
-12	10/20/82	Bay 2 left side beam attachment for spring hanger, although weld-there is a gap between two welded pieces is this acceptable redline to 1-652-1-501.	Landsman	JSK. Sprague	Weld is okay, at least 7/16".	11/4		~~Closed~~ Open They say Ron says OK

EM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
I-13	10/19/82	Number on hanger FSK is not the same as number on ISO that references detail no. (1-652-1-19) US. 2-652-1-19. Field drafting error.	Landsman	JSK Marl	M652 Sh 1 Rev. 9 Fl corrected problem.	11/4		OK Closed
I-14	10/19/82	Valid Procedure for the time limit on forwarding SPEC changes from Ann Arbor.	Landsman	JSK JDavis Gilmartin	BPCo internal memo directing FE that two days will be allowed for tech. review prior to distribution.	11/4		Closed
I-15	10/19/82	Painting requirements for welds. Painting inside cont. is Q. Painting outside is non-Q. Is painting of Q welds required to maintain the integrity of the weld. No	Barrett	JSK Riat Corcoran	BPCo has determined that based on metallurgical review of the problem that painting is not required to maintain integrity of the weld. (~~Need to confirm this with Barrett~~).	11/9		Closed
-16	10/28/82	VALID Control of distribution of redline changes should go through Document Control not Field Engineering as is presently done.	Barrett	JSK Gilmartin JDavis	BPCo has developed flow charts of the existing and proposed methods of handling drawing changes to route through D/C. Copy of flow charts forwarded to NRC.	11/22		Open
-17	10/28/82	Is there a program to control removal of temporary hangers?	Barrett Cook	JSK Pulito	BPCo presently has several methods of controlling temporary. They include: 1. System Punchlist 2. System Walkdown 3. Hanger Walkdown 4. PSDIV Section 5.8.1 This program will be explained to RCook NRC	11/15		Open ~~Closed~~

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
M-18	10/28/32	Material traceability problem. Material purchased from non-approved vendor. (NCR3266)	Barrett	JSK Corcoran Marl McClure Anderson Detrich	Telecon to Barrett 11-18-82 did not resolve concern. Additional information is being gathered by DAnderson.			Open will co Barrett
M-19 A	10/22/82	Monorail over diesel generator. Why is this Non-Q? They say it should have been designed seismic class II & built non-Q.	Landsman	JSK Corcoran Anderson Senn	MPQAD has written a QAR (#F228). Calculations to show siesmic analysis has been performed have been reviewed by NRC. 2 over 1 generic issue.			Open
M-19 B	10/22/82	Monorail over diesel generator. Welds do not conform with what's on dwg. C-1009 (This item was C-1).	Landsman	JSK Corcoran Anderson Senn	Welds conform with symbols on dwg. however, interpretation of weld symbols pertaining to the extent of weld must be clarified for the NRC.			Open
M-20 A	11/10/82	No Prob. The diesel engineer exhaust silencer is designed to move horizontally on 2,1/8" stainless bearing plates. 4,1/16 bearing plates have been installed.	Burgess	JSK Kilizzek Marl	Vendor dwgs. M-18-357-1 and M-18-358-2 shows flourocarbon bearing plate detail.			Closed
M-20 B	11/10/82	Will dirt between the plates hinder the movement.	Burgess	JSK	5 of 16 flourogold bearing plates are sufficently warped to allow inclusion of dirt. Top flourogold plate is larger than the bottom to preclude the inclusion of dirt. BPCo will develop a program to blow out before T/O. (continued)			Open ~~Closed~~

M #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
20 B (continued)					Vendor brochure FC-5015-3 states that plates should be protected from contamination.			
21 A	11/10/82	Support bearing plates in Bay 1 are not large enough to be welded to exhaust silencer support. Dwg 7220-M18-250-5 calls for bearing plates to be welded.	Burgess	JSK Kiliszek Marl	FCR 7047 written to cover stitch welds. All plates are welded per dwg.			Open
21 B	11/10/82	VALID Why are there slots in the center support on the silencer in Bay 4.	Burgess	JSK Kiliszek Marl	Dwg. M-18-425-4 shows detail and notes to enlarge center holes in field to clear anchor bolts where necessary.			Open
22 A	11/10/82	VALID Exhaust silencer has calculated horizontal growth of .532" per dwg. M-18-250-5. The slots in the bearing supports are not uniform in all bays and may not allow predicted thermal expansion.	Burgess	JSK Kiliszek Marl	NCR 4693 has been written to rework plates. Slots were torch cut and not machined to dimensions shown on dwg.		Design problem- Should it be anchored in center of slide on the ends. Or one slotted on	Open
22 B	11/10/82	Why didn't the QC receipt inspection program catch the slot problem.	Burgess	JSK Kiliszek Marl	Receipt Inspection Program was not required to inspect to that detail.			Open
23 A	11/10/82	VALID Center support beneath exhaust silencer in Bay 1 is not grouted completely and may put additional load on exhaust pipes.	Burgess	JSK Kiliszek Marl Anderso	Silencer was installed prior to exhaust pipes. Pipes were then fitted to silencer from engine.			Open

ITEM #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
M-23 B	11/10/82	No Problem What does the lack of grout in center support do to harm the outside flourocarbon bearing support plates. How much weight can they stand.	Burgess	JSK Kiliszek Marl	OK Calculations done by BPCo field eng'g show load to be about 31 PSI. Brochure for flourogold bearing plates show that they can withstand 500PSIat 400°F.			OK Closed
M-23 C	11/10/82	VALID Vendor dwg M-18-250-6 show jacking plates to be in - bedded in concrete beneath support jacking screws. What effect does jacking screws have on bare concrete. Show calculations to prove concrete strength was adequate to support jacking without failure.	Burgess	JSK Kiliszek Marl	NCR 473B also written NCR 4694 has been written against installation of jacking plates. Not all plates are missing. D. Anderson is doing concrete calcs. 9 out of 48 missing			Open
M-24	11/10/82	VALID Center silencer support drawing M-8-250-5 shows that anchor bolts have one nut while there are actually two units installed in field.	Burgess	JSK Kiliszek Marl	Extra nuts have been removed.			OK Closed
M-25	11/10/82	VALID M-18-250-5 notes that support plate set screws should be removed after grouting and they have not been.	Burgess	JSK Kiliszek Marl	Set screws have been removed.			OK Closed
M-26	11/10/82	Starting air lines in Bay 2. What year of the ASME code are these lines constructed to? What year of the ASME code are these lines examined to?	Barret	JSK DAnderson	Starting air lines were supplied by Grinnell. Table 3. 2.4 of the FSAR states that "shop fabricated piping 2½" and larger is designed to the 1981 ASME code summer '73 addendum. (continued)			Closed

M #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
26 (continued)					Table 3.2-3 of the FSAR states that the Emergency Diesel generators (supplied by Delaval are designed 1974 ASME code, summer '76 addendum. The 1981 code states that section III piping 4" and less does not require NDE more stringent than visual. The 1974 code changes the size to 2" and less. QAR F-222 has been written by MPQAD.			

M #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
1	8/9/82	Develop Procedure For Construction Coordination Forms.	Gardner	GMM	Ready to close. Resolve with Gardners next visit.	11/5		Closed
2	7/15/82	Provide NRC with our procedures to drill with Revert.	Gardner	DES	SWP Procedure issued-More-trench procedure needs revision.	11/11		Open
3	9/22/82 Item of Noncompliance.	BWST Crack Grouting	Landsman	DWP	Review MPQAD			Closed - Sent response to NRC
4	9/22/82 Item of Noncompliance.	Slope layback	Landsman	GMM	Review MPQAD response			Closed - Sent response to NRC
5	9/22/82 Item of Noncompliance.	Petcock location	Landsman	DES	Review MPQAD response			Closed - Sent response to NRC
6	9/24/82	Why is EPA moving up? Resolve question with R. Landsman.	Landsman	GMM	Prepare response by 11/1/82.	11/5		Open
7	10/22/82	Temporary underpinning beneath T.B. "Q". Define on C-45.	Landsman	DES	Addressed w/NRC on 11/4/82. Work to be board order plus MPQAD 1 & 2.	11/11		Open
8	10/22/82	Baffle & Perimeter Dike Q?	Landsman	RHW	Same as S-7	11/11		Open

M #	DATE INITIATED	DESCRIPTION	NRC INSP.	RESP. ENG.	ACTION	DUE DATE	NRC STATUS	PROJECT STATUS
-9	10/22/82	Letter to NRC on C-45 review for "Q".	Landsman	RHW	Mooney to send letter-need follow up.	11/5		Open

Systems Interaction

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 3, 1983

Docket Nos. 50-528, 529, 530, 361, 289
362, 437, 275, 323, 483,
389 and 370

MEMORANDUM FOR: Chairman Palladino
Commissioner Gilinsky
Commissioner Ahearne
Commissioner Roberts
Commissioner Asselstine

FROM: Darrell G. Eisenhut, Director
Division of Licensing

SUBJECT: DIFFERING PROFESSIONAL OPINION REGARDING SYSTEMS INTERACTION AND SAFETY CLASSIFICATION (BN 83-57)

In accordance with present NRC procedures regarding Board Notifications, the enclosed is provided for your information. This information is applicable to all nuclear power plants.

This information relates to Board Notification 83-17 and 83-44, which were issued on February 18, 1983 and April 4, 1983, respectively. These dealt with the staff position regarding unresolved safety issue A-17. The enclosed differing professional opinion deals with certain aspects of existing policy and practice in the areas of systems interaction and safety classification.

The staff will keep you informed regarding the resolution of this differing professional opinion.

Darrell Eisenhut

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: OPE
OGC
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MAY 23 1983

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24 pp.

cc: The Atomic Safety and Licensing Boards for:

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Callaway (Gleason, Bright, Kline)
Comanche Peak 1 & 2 (Bloch, Jordan, McCollom)
Midland 1 & 2 (Bechhoefer, Cowan, Harbour)
Palo Verde 2 & 3 (Lazo, Callihan, Cole)
Perry 1 & 2 (Bloch, Bright, Kline)
San Onofre 2 & 3 (Kelley, Hand, Johnson)
Seabrook 1 & 2 (Hoyt, Harbour, Luebke)
Shoreham (Brenner, Carpenter, Morris)
Waterford 3 (Wolf, Foreman, Jordan)
Zimmer (Frye, Hooper, Livingston)
Indian Point (Gleason, Paris, Shon)

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Diablo Canyon 1 & 2 (Moore, Johnson, Buck)
Fermi 2 (Eilperin, Gotchy, Moore)
San Onofre 2 & 3 (Eilperin, Gotchy, Johnson)
Waterford 3 (Eilperin, Johnson, Kohl)
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MEMORANDUM FOR: Franklin D. Coffman, Jr., Leader
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FROM: James H. Conran, Senior Systems Engineer
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SUBJECT: DIFFERING PROFESSIONAL OPINION

The purpose of this memorandum is to submit formally, in accordance with NRR Manual Chapter 4125, a statement of differing professional opinion regarding certain aspects of existing policy and practice in the areas of systems interaction and safety classification. Many, but not all, aspects of the matters at issue herein were addressed by me earlier in an affidavit dated February 9, 1983, to the Shoreham Hearing Board.

Enclosure 1 to this memorandum sets forth the detailed statement of my differing professional opinion in the areas identified above in the format suggested in Section C of NRC Appendix 4125. In order to avoid needless repetition therein of the detailed treatment given already in the earlier affidavit to matters also of concern in the immediate context, Enclosure 1 draws to the maximum extent possible on the presentation of issues provided in the affidavit. Accordingly, the earlier affidavit is incorporated into this differing professional opinion as Appendix A; and Appendix A and Enclosure 1 are appropriately cross- referenced in order to facilitate their use together. Points addressed to the attention of NRC management in the immediate context that were not treated explicitly in the affidavit to the Shoreham Board are denoted by asterisks in Enclosure 1. Minor changes and editorial-type corrections made to the earlier affidavit since it was executed on 2/9/83 are indicated by a bar in the right margin.

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Attachements: See next page

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Attachments:
Enclosure 1. Detailed Statement of Differing Professional Opinion.
Enclosure 2. Excerpt from Statement of Staff Views to Shoreham Board, dated 2/22/83.
Enclosure 3. Memo, dated 3/9/79, Rubinstein to Bradford, "Probabilities That the Next Major Accident Occurs Within Prescribed Intervals".
Enclosure 4. Technical Paper, by D. Rubinstein, dated 2/4/81, "A Statisticians View of NRC Statistics".
Enclosure 5. Technical Paper (Draft), by D. Rubinstein, dated 10/26/81, "Random Thoughts on Uncertainties, Risk Analysis, and Nuclear Regulation".
Enclosure 6. Note, dated 3/18/82, Conran to Coffman, "Comments on Draft Letter (Hanauer to Cooper -NUPPSCO)....and Related Matters".
Enclosure 7. Excerpt from Rebuttal Testimony on Contention 7B, dated 7/1/82, by J. H. Conran.
Appendix A - Affidavit of James H. Conran, dated 2/9/83, to the Shoreham ASLB.

cc: R. J. Rawson, ELD
w/Attachments

Enclosure I

STATEMENT OF DIFFERING PROFESSIONAL OPINION

I. Systems Interaction Topic

Issue A. Significant Extension of Schedule for Resolution of USI A-17 Without Appropriate Review or Justification

1. Management View or Position

The staff's program for resolution of USI A-17 has failed to achieve resolution of the systems interaction issue by now, in accordance with the schedule established as reasonable and acceptable when the program was initiated. Notwithstanding, management considers the program to be progressing satisfactorily and emphasizes at this point the "confirmatory" nature of the program.[1] [2] Accordingly:

a. management proposes at this point to continue pursuit of resolution of USI A-17 by following basically the same

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[1] See Statement of Staff Views to the Shoreham Hearing Board, dated 2/22/83.

[2] (Excerpt attached as Enclosure 2.)
Also see NRC Staff Supplemental Testimony on Contention 7B (Shoreham OL Proceeding), dated 3/10/83, at p. 5 & p. 14.

approach and program plan employed to date, despite failure of that approach to achieve resolution of the important safety issue involved in the time allotted, and

b. management proposes to simply slip again, significantly, the schedule for resolution of USI A-17, without proper review and consideration of the possible need to accelerate the resolution of this issue and the possible consequences of failing to do so.

SEE APPENDIX A, AT P. 4 AND P. 10-11

2. Differing Professional Opinion

a. Systems interaction in nuclear power plants is designated as both a Priority Category "A" generic safety concern and an Unresolved Safety Issue (i.e., USI A-17). As such, by NRC policy and the agency's own definitions, the issue involved:

o is a matter that poses important questions regarding adequacy of existing requirements, for which

resolution is judged necessary to provide a potentially significant decrease in the risk to public health and safety, and whose resolution is likely to result in NRC action,[3] and

- o involves a generic concern judged by the staff to warrant priority attention in terms of manpower and funds, that should be pursued promptly to obtain early resolution that could provide possible significant increase in assurance of public health and safety.[4] [*]

b. In view of the importance ascribed to the systems interaction issue and the indicated need for prompt treatment and early resolution (as seen from A.2.a above), failure to achieve resolution of USI A-17 within the period established (by consensus) as acceptable should be treated as an important safety issue in itself. Accordingly, the decision regarding schedule and approach to be followed from this point for resolution of USI A-17 should be made only after

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(3) See NUREG-0510 at p. 10
(4) See NUREG-0510 at p. 11 and p. 49 (Table 1 - Priority Category "A" Definition).
(*) See NUREG-0885 at p. 5 (Commission 1983 Policy and Planning Guidance).

full review and appropriate consideration of the possible safety implications involved in further delay.

SEE APPENDIX A, AT P. 3-9, AND P. 11-12.

c. To assure that there is not further significant delay in resolving the systems interaction issue, an augmented and accelerated approach should be adopted at this point for resolution of USI A-17. Efforts should continue as planned under the current program, for development and demonstration by the staff of improved, efficient methods for comprehensive broad-scope systems interaction evaluations (for later application in all facilities, if found necessary). Additionally, however, all licensee and NTOL applicants should be required to perform limited systems interaction evaluations of their facilities (scope to be established by agreement with staff) using currently-available techniques. This would better ensure early availability of actual in-plant systems interaction data required by the staff to determine the need for full-scope systems interaction studies generically.

This approach would make the program less vulnerable to significant delays resulting from plant-specific operating problems and licensing-related difficulties (as has occurred repeatedly under the current approach), because availability of the required data would no longer be dependent upon completion of studies in just a few "participating" facilities. At the same time, utilities would not be unduly burdened by an immediate requirement for full-scope, comprehensive systems interaction studies that might not be justified at this time.

*d. In the absence of compelling current indication that the definitions and policy indicated in A.2.a above (regarding the nature of items designated Unresolved Safety Issue and/or Priority Category "A") no longer apply to the systems interaction concern, management should not now characterize USI A-17 as merely or principally "confirmatory" in nature.

3. Possible Consequences if Differing Professional Opinion is Not Adopted

If the underlying causes of unexpected events in reactor operating experience, such as common cause/common mode failure, are not addressed effectively (e.g., by timely resolution of USI A-17), the likelihood of a serious accident occurring could become unaccpetably high.

SEE APPENDIX A, AT P. 6-7.

(See also A.4.b below for a more quantitative approach to treatment of the stated concern)

4. Related Efforts and Other Information Pertinent to Resolution of Differing Professional Opinion

a. The ACRS has considered the systems interaction issue in the broad licensing context since 1974, and has made specific recommendations on several occasions regarding the kinds of less-than-full-scope systems interaction evaluations that could be usefully undertaken in both operating plants and NTOL facilities. (See, for example ACRS letters dated 1/8/82 and 3/9/82, regarding systems

interaction matters.) The ACRS should be consulted in deciding finally the course of action to be taken from this point in pursuing the systems interaction issue.

*b. Mr. David Rubinstein, a statistician and member of the RRAB staff, has described previously (in a separate context) the "prediction interval method" for putting an upper bound on the probability that (given "X" number of reactor years of operation without a major accident) the next major accident will occur within a specified number of years.[b] That statistical method provides an alternate way of addressing the concern expressed qualtitatively in A.3 above regarding urgency of timely resolution of USI A-17; and it could provide another useful perspective and additional insights in the difficult process of developing a consensus judgment

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[b] See memo, dated 3/9/79, Rubinstein to Bradford, "Probabilities That the Next Major Accident Occurs Within Prescribed Intervals" (See attached, Enclosure 3).

now regarding the general question of acceptable schedule and proper course to be followed from this point in resolving USI A-17, and, more specifically, regarding whether or not an accelerated approach should be taken now in that regard.

Issue B. Disproportionate Emphasis and Priority Given PRA to The Detriment of Systems Interaction Program

1. Management Policy or Practice

There have been clear indications over the last ~2 years of significant decrease in emphasis by NRC management on systems interaction as a licensing-related safety issue requiring early resolution and warranting priority attention in its own right. Concurrently, increased emphasis and high priority has been given to PRA-related programs/activities that are only of a development nature. Examples or manifestations of management attitude and practice in this regard include:

a. abolishment of the Systems Interaction Branch in early 1981, and an accompanying sharp reduction in the number

of NRC technical staff assigned to systems interaction efforts within NRR (PRA programs and activities within NRR were not similarly affected),

SEE APPENDIX A, AT P. 16-17.

*b. assignment currently of significantly greater numbers of NRC technical staff (either full time or part time) in support of PRA-related development type programs and development activities than are assigned to the licensing-related USI A-17 effort.

*c. completion, or near-completion, to date of ~15 or more broad-scope PRA studies at reactor facilities under NRC cognizance (including both operating reactors and NTOL plants), whereas not one broad-scope systems interaction study planned in connection with USI A-17 has yet been completed at any facility.

d. withholding/delay (from October 1981 to present) of NRR approval for implementation of the important methodology demonstration phase of the systems interaction program because of (i) cost-benefit concerns, and (ii) lack of any showing that significant "risk-benefit" was to be gained from the systems interaction studies planned in pursuit of resolution of USI A-17.

SEE APPENDIX A, AT P. 19-21, and P. 24.

e. protracted effort (from October 1981 to present) to merge the systems interaction program with the NREP program for cost-benefit advantage, without regard to adverse effect on the more important licensing-related objective (i.e., resolution of USI A-17).

SEE APPENDIX A, AT P. 16-21.

f. progressive blurring of the distinction between systems interaction (a licensing-related USI) and PRA (a developmental-type activity), and a growing tendency to treat systems interaction as <u>just</u> a subordinate part of PRA.

SEE APPENDIX A, AT P. 22-24.

2. <u>Differing Professional Opinion</u>

a. Under the current system of NRC rules and procedures for reactor licensing, the systems interaction issue (i.e., USI A-17) is a matter that <u>must</u> be addressed in determining compliance with existing rules to assure adequate safety. The same cannot be said regarding NRC's PRA-related programs and acitivities. That is an important distinction that should be taken into account and weighted more heavily in determining the relative

importance and priorities of systems interaction and PRA-related programs. NRC should continue to pursue PRA-related development programs intended to improve understanding of the risks associated with operation of reactors. Disproportionate emphasis and priority has been given to PRA, however, in the last ~2 years by NRC management; and this has operated to the serious detriment of the systems interaction program, and resulted in inordinate delay in the resolution of USI A-17.

SEE APPENDIX A, AT P. 16-18.

*b. Greater emphasis should be given (e.g., in the Safety Goal Implementation Plan) to the fact that incomplete treatment of systems interaction is a major potential source of uncertainty in PRA, and that further study of the possible need for significant improvement in that regard (e.g., as planned in the USI A-17 program) must be completed before final consideration will be given to approval for use of PRA in licensing applications currently proscribed.

*c. Proper balance should be restored with respect to importance ascribed and priorities given to systems interaction and PRA-related programs by NRC management,

reflecting consideration of the important distinction between those two major areas of activity, as indicated in B.2.a above. Specifically, NRC management should:

- o assign higher priority than is currently given to programs for resolution of the systems interaction issue, and provide increased management support and attention to assure expedited treatment and early resolution of the important licensing-related safety issue involved,
- o assign greater numbers of NRC technical staff to systems interaction work (e.g., comparable to staffing levels dedicated to systems interaction work prior to April 1981),
- o review the effectiveness of the current organizational setup within NRR for conduct of systems interaction programs (e.g., consider seriously a return to the organizational structure and alignments in effect at the outset of the II.C.3 program).

SEE APPENDIX A, AT P. 8.

*d. Schedules for performance of programs for resolution of USI A-17 should be established and implemented so as not to be dependent upon, or subordinate to, PRA-related program schedules in any way that would delay achievement of necessary USI A-17 program objectives.

SEE APPENDIX A, AT P. 8 AND P. 21.

*e. Requirements for cost-benefit analyses should not be imposed (or applied) in a way that delays excessively, or interferes with prohibitively, the conduct and timely completion of programs for resolution of Unresolved Safety Issues (in this instance, USI A-17).

SEE APPENDIX A, AT P. 21-22.

f. Estimates of risk-benefit to be gained from doing comprehensive systems interaction analyses, based solely on extrapolations of current PRA results/data, cannot be regarded as accurate or dependable. Since that is the only basis currently for such estimates, risk-benefit should not be used at this time as a decision criterion by management in determining whether or not to approve systems interaction studies proposed in connection with the USI A-17 program.

SEE APPENDIX A, AT P. 24-26.

*g. Lack of effective communication of systems interaction information and perspectives, to all levels of management and to all cognizant staff (both intra-and-inter office) may have been an a factor in the development of the conditions described in preceding Sections A.1 and B.1. Measures should be taken to assure proper flow of communications in that regard, and also to assure dissemination of alternative views regarding the state of development and usefulness of both PRA and systems interaction analysis methods and techniques. Neither are so highly-developed or refined that both cannot continue to profit from the free exchange of the full range of views on the important matters involved.

3. Possible Consequences if Differing Professional Opinion is Not Adopted

*a. If proper balance is not restored with respect to importance ascribed and priorities assigned to systems interaction and PRA-related programs, and if other specific corrective measures are not implemented as indicated in Section A.2 and B.2 above, further inordinate delay in the resolution of USI A-17 will likely result (with possible increased likelihood of serious accident).

SEE APPENDIX A, AT P. 6-7.

*b. If, in advance of resolution of USI A-17, NRC management continues to encourage initiation and performance of current-state-of-the-art PRAs (i.e., without comprehensive systems interaction analyses as an integral part), unnecessary and excessive costs may result for the licensees or applicants involved when/if the performance of separate comprehensive systems interaction analyses (and integration of PRA and systems interaction results) later become necessary (as has happened to PASNY in the case of Indian Point-3).

(See sections 4.c and 4.d below for further development of the point addressed here.)

4. Related Efforts or Other Information Pertinent to Resolution of Differing Professional Opinions

*a. Comments offered by the ACRS and individual ACRS members (in the context of review of Safety Goals Policy Statement, Safety Goal Implementation Plan, and Severe Accidents Policy Statement), (') regarding treatment in PRA of uncertainties due to systems interactions and premature acceptance/use of current PRA methods and results in licensing, should be given further consideration in the light of all the preceding. The Committee should be consulted in resolving this differing professional opinion.

(') See ACRS letters dated June 9, 1982; September 15, 1982; September ~~28~~ 14, 1982; and January 10, 1982.

*b. Alternative views expressed earlier and separately by Mr. David Rubinstein, RRAB regarding quality or adequacy of current treatment of uncertainties in PRA, and uncritical acceptance of current PRA results[8,9,10] are pertinent and should be considered in the resolution of this differing professional opinion.

*c. Preliminary indications from work being done currently at the Indian Point-3 facility are that great effort and expense will be required to fully factor the results of a broad-scope systems interaction study for a given facility into a full-scope PRA for the same facility, where those two efforts have been conducted as separate activities (as at Indian Point-3).

*d. Information submitted recently to the staff on the Indian Point-3 docket indicates that the findings from comprehensive systems interaction analyses may affect significantly the results obtained from current-state-of-the-art PRAs. Results obtained from the systems interaction evaluation of the Indian Point-3 AFW system,

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(*) Paper dated 2/4/81, "A Statisticians View of NRC Statistics". (See attached, Enclosure 4.)

(*) Paper, dated 10/26/81, "Random Thoughts on Uncertainties, Risk Analysis and Nuclear Regulation," (See attached, Enclosure 5.)

when factored into the Indian Point-3 PRA, nearly doubled the system failure rate for AFW (even after modifications were made to the plant to improve/remove interactions identified).[10]

Corresponding seismic core melt frequency was not found to change appreciably for the case recomputed; but it should be noted that systems interaction search results for other IP-3 systems (in particular, systems that provide alternate cooling in the event of AFW system failure) are only now being separately evaluated in the final phase of the systems interaction analysis effort, and were not factored into the recomputation of IP-3 PRA results that was done at this time.

Also, core melt frequency was not recomputed at this time for the case in which the IP-3 PRA model was modified to include the AFW systems interactions, but fixes were not made to the plant to remove/improve interactions found. (That case would clearly provide the better comparison and more accurate measure of the full impact i.e., "risk-benefit, of systems interaction analyses on PRA results.)

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[10] See PASNY submittal dated 2/7/83, at p. 4-14 of Attachment II.

II. Safety Classification Topic

Issue C. Insufficient Priority Given to Resolution of Known Safety Classification Problems

1. Management Position or Practice

*a. The use of the safety classification terms "safety-related", "safety-grade", and "important to safety" inconsistently or interchangeably by individual staff members was recognized as a problem by NRR management ~2-3 years ago. The immediate problem was dealt with effectively by issuance of guidance to the NRR staff in the form of "standard definitions" for the terms involved (derived directly from the language of the regulations themselves).[12] NRR management has not acted expeditiously, however, in following up that action with additional remedial measures that were also prudently indicated, and which were recommended specifically,[13] i.e.:

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[12] See Memos, dated 11/20/81, Denton to All NRR Personnel and Denton to Mattson, Eisenhut, Vollmer, et al, "Standard Definitions for Commonly-Used Safety Classification Terms.

[13] See Note, dated 3/18/82, Conran to Coffman, "Comments on Draft Letter Hanauer to Cooper -NUPPSCO)....and Related Matters"; and attached routing slip. (See attached - Enclosure 6).

- o modification of the regulations to more clearly delineate for all interested and affected parties the general safety classification definitions that are already included (diffusely or reconditely) in the language of the regulations
- o development of more formal and detailed guidance (e.g., Reg. Guides or SRP sections) for use by licensees/applicants and all NRC staff (not just NRR), in applying these terms correctly in specific design and licensing review applications.

*b. Reasons given for not pursuing more vigorously the followup measures indicated and recommended were:

- o resource availability problems, given the magnitude of the (projected) effort to develop/issue formal guidance documents,
- o NRR guidance, although not distributed officially outside NRC (and not binding in present form even if distributed) has been circulated widely (albeit informally) outside the agency so the staff's view/position with regard to definition for the terms involved is widely-known anyway,
- o no safety problems or serious potential safety problems are known to have resulted from lack of the more formal and detailed guidance recommended,

- o the "problem" involved was thought to be simply or chiefly a "language" problem (i.e., resulting simply from inconsistent or mistaken usage of words applied in treating or discussing safety classification concepts embodied in the regulations that are for the most part mutually understood and agreed upon.

2. Differing Professional Opinion

a. Testimony developed recently in the discussion of safety classification issues in the Shoreham hearing indicates clearly now that lack of unambiguous, detailed guidance regarding the definition and proper application of the classification term "important to safety" can lead to confusion and misunderstanding with respect to the intent of the regulations, and to the development of circumstances that appear to have significant potential adverse safety implications. Specifically, in the Shoreham case cited the applicant has interpreted the term "important to safety" to be equivalent to the term "safety-related" (as both the staff and the applicant understand the term "safety-related"), and has applied that interpretation throughout the design and construction of their facility.

Under this interpretation the applicant, in effect, does not acknowledge any requirements under the regulations for plant features designated by the staff "important to safety, but not safety-related." Said another way, the minimum set of safety requirements recognized by the applicant under this interpretation is considerably smaller than the minimum set o safety requirements recognized by the staff. Such a fundamental difference of understanding regarding what is required minimally by the regulations for adequate safety clearly has significant potential for adverse safety impact. The full implications of the situation indicated in the preceding (particularly in the context of operating facilities) has not yet been completely sorted out;[14] but NRC should give high priority now to an effort to do that. At a minimum the measures recommended below should be implemented in remedy of the situation indicated.

SEE APPENDIX A, AT P. 30-33.

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[14] See Rebuttal Testimony dated 7/1/82 by J. H. Conran to the Shoreham ASLB, at p. 6-7. Enclosure 7

*b. NRC should take action promptly to determine the following regarding all licensees/applicants:

- o if all licensees/applicants are aware of the safety classification definitions in the regulations for the terms safety-related and important to safety, as indicated in Ref. 12,
- o if there is common understanding of the safety classification concepts involved in the terms safety-related and important to safety, irrespective of "language-type" differences that may exist/persist in the usage of these terms by individuals,
- o if there is mutual understanding between the staff and licensees/applicants regarding what is actually required minimally under the regulations to provide reasonable assurance of public health and safety,
- o. if there is indication of any incorrect classification and/or treatment of plant structures, systems, and components as a result of misunderstanding or confusion regarding proper usage of the safety classification terms involved.

*c. NRC should give higher priority now to implementing additional (followup) measures recommended previously, but not yet acted upon, as indicated in C.1.b above.

*d. NRC should complete expeditiously now efforts already initiated for development of a listing of structures, systems, and components "important to safety, but not safety-related" (analogous to the listing of safety-related things in Reg. Guide 1.29), to facilitate proper understanding and application of the intent of the regulations by those who have not previously understood and applied the term "important to safety" in the same way as the staff.

*e. NRC should give high priority now to completion of the joint effort initiated in September 1982 by the staff and industry to develop a safety classification standard for endorsement finally by the staff in a Reg. Guide. This has never been done, and has contributed to the persistence of this problem for many years.

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

.....

In the Matter of

LONG ISLAND LIGHTING COMPANY
(Shoreham Nuclear Power Station,
Unit 1)

Docket No. 50-322(OL)

.....

AFFIDAVIT OF JAMES H. CONRAN

I, James H. Conran, being duly sworn, depose and state that:

QUALIFICATION OF WITNESS

1. I am an employee of the U. S. Nuclear Regulatory Commission (NRC). My present position is Senior Systems Engineer, Reliability and Risk Assessment Branch, Division of Safety Technology within the Office of Nuclear Reactor Regulation. A copy of my professional qualifications is bound into the transcript of the Shoreham Hearing at p. 6538.

APPENDIX A

PURPOSE OF AFFIDAVIT

1. The purpose of this affidavit is to identify for the Board (1) areas in which I believe that testimony which I provided earlier in the litigation of Contention 7B requires (or may require) amending and/or supplementing, and (2) changes that have occurred in facts or circumstances material to the matters at issue in Contention 7B which give rise to the need for amending and/or supplementing the testimony involved. The affected testimony falls into two general topic areas, systems interaction and safety classification.

SYSTEMS INTERACTION TOPIC

2. Change to Testimony and General Circumstance Dictating Change

Consistent with the Appeal Board's decision in North Anna[1], staff's testimony on systems interaction in the Shoreham hearing included a discussion of Unresolved Safety Issue A-17, with the specific objective of demonstrating "justification for operation" of Shoreham despite pendency of that USI. I was the principal author of the portion of staff's written testimony covering systems interaction, and was a principal witness in presenting the staff's position on that issue before the Board. My testimony in that regard was based necessarily on my understanding, at the times that that testimony was written

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[1] See ALAB-491 8 NRC 245 (1978)

and presented, of the state of the staff's program for resolving USI A-17, and more specifically on my understanding of such parameters as scope, schedule, priority, and resources allocated to that program. These parameters determine the rate of progress and actual results that can be achieved, or be reasonably expected, at any given time; they are, therefore, important indicators or measures of the adequacy of any USI program, and of the prospects for timely resolution of the issue involved.

Despite unfavorable developments that had occurred with respect to these important parameters in the systems interaction program in the months preceding the presentation of staff's testimony on Contention 7B in the Shoreham hearing, I had remained hopeful at that point regarding the ultimate outcome of events in the systems interaction area and regarding the prospects for resolution of USI A-17 on some reasonable and still acceptable schedule. But there has been further decline in the months since; and the cumulative effect is now such that I can no longer continue, in good conscience, to support the position that the staff's systems interaction program provides currently an adequate basis for the "justification for operation" conclusion required under North Anna, as indicated in my earlier testimony.

3. Background and Baseline At Outset of the Program for Resolution of USI A-17

As alluded to in the preceding, it is necessary to go back in time further than my participation in the Shoreham hearing last summer to set the background and to establish the baseline against which are drawn my current judgments regarding the adequacy of staff's systems interaction program. To recount briefly the relevant background, the judgment by staff management and the Commission that the systems interaction issue is a legitimate safety concern, serious enough to warrant designation as an Unresolved Safety Concern (i.e, USI A-17), was documented as early as 1977;[2] and a program for resolution of this issue was initiated in May 1978.[3] That initial judgment and action by NRC management in this regard was reconfirmed and reinforced in the aftermath of the TMI-2 accident by a strong recommendation of the Lessons Learned Task Force[4] (of which I was a member), and by further action by staff management and the Commission,[5] to strengthen the existing, on-going USI A-17 program. In early 1980, the Commission approved for inclusion in the TMI-2 Action Plan a provision for an augmented and expedited systems interaction program; and a separate, dedicated organizational unit (the Systems Interaction Branch) was set up within the Division of Systems Interaction, NRR to plan and coordinate the conduct of the new, augmented program. By mid-1980, the new Systems Interaction Branch had developed the

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[2] See NUREG-0410

[3] See NUREG-0510 at p. A-12

[4] See NUREG-0585, Section 3.2 and Recommendation 9

[5] See NUREG-0660, Item II.C.3

program plan for the augmented (II.C.3) systems interaction program.[6] The expanded program included (i) studies in which staff-developed methodologies were to be applied on a trial basis in selected plants late in the construction and OL licensing process, and (ii) other studies, (already committed to by the owners of the Diablo Canyon 1 & 2, and Indian Point-3 facilities, to be initiated in mid-1980 and early-1981, respectively) employing methodologies developed by the utilities involved. The results of all these efforts, taken together, were intended (i) to provide the basis for resolution of USI A-17, and for the development by the staff of additional requirements and regulatory guidance for systems interaction studies (if required) for application to all reactors, within about 2½ years, and (ii) to provide useful information and insights to be factored into decisions regarding implementation of the National Reliability Evaluation Program (NREP).[7]

With the preceding background (by way of further establishing the "baseline" alluded to earlier for current judgments of program adequacy) the decisions and actions taken by staff management and the Commission to this point in the systems interaction chronology can be characterized as follows:

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[6] See Memo, dated 11/21/80, Stolz to Rubenstein, "SIB/DSI FY 81 Resource Projection"

[7] See NUREG-0660, Item II.C.2

a. Baseline Consideration #1

The decisions and actions taken established the systems interaction program, in a very real sense, as a necessary regulatory activity i.e., as a USI program[8] which under existing rules must be addressed in reactor licensing safety evaluations.... (as contrasted to other highly desirable programs and activities, such as probabilistic risk assessment, safety goal development, etc., also provided for in the TMI-2 Action Plan, but which need not be so addressed)

b. Baseline Consideration #2

The decisions and actions taken indicated clearly that staff management and the Commission intended timely resolution of this important issue. The period of time in which it was thought initially that this could be accomplished was 1-1½ years. However, it was found that the fault tree methodology which had been developed in the pre-TMI phase of the USI A-17 program was not suitable for general, broader application in systems interaction analysis, (as had been counted on)[9]; so about a year was added to the time period that had initially been contemplated for program performance, to allow for search-and-development of possible alternative methodologies by the staff. It should be said, however, that allocation of even ~2½ years for resolution of such a complex unresolved safety issue necessarily implied and, indeed, required

[8] See NUREG 0510, at p. 10, p. 11, and p. 49 (Table 1-Category A definition)

[9] See Memo, dated 5/20/80, Angelo to Kniel, "Summary of Meeting with Sandia...to discuss...Task A-17"

assignment of high priority, and strong commitment to the USI A-17 program by staff management and the Commission.

c. Baseline Consideraton #3

With regard to the question implicit in the specification (as in Baseline Consideration #2, above) of the period of time to be allowed (at the outset) for the program to achieve timely resolution of USI A-17 (i.e., How to determine what is reasonable in that regard in view of the urgency of the matter?), the general concern underlying can be stated as follows:

> "Things unanalyzed" in the design of reactor plant systems (e.g., common mode/common cause mechanisms, and the effects of non-safety component failure) can lead to "things unexpected" in the operation of reactor facilities (e.g., occurrence of unanticipated events, including some serious enough to be termed accident precursors). And no matter how well trained or capable reactor operating personnel are (i.e., given some finite unreliability rate in operator actions), if the "unexpected" happens often enough (and it does, based on operating experience reports) for long enough, the likelihood of a serious accident (like TMI-2) can become unacceptably high.

The judgment, then, regarding what is a "reasonable" period of time to allow for resolution of the systems interaction issue involves

somehow qualitatively (i) consideration of the rate of occurrence of unexpected events (in particular, serious precursor events) and (ii) a sense that the time allowed for resolving underlying causes of such events ought not to exceed some prudent fraction of the "average interval" for occurrence of such events, based on experience and observation. To say the obvious, that is a very difficult judgment for any individual to make, and should not, therefore, be left to ad hoc individual judgment. Such a difficult judgment on such a complex, important safety issue should properly be evolved (as <u>was</u> done in the series of events leading up to initiation of the II.C.3 systems interaction program; see Baseline Consideration #5) through a broad-based consensus forming process. As a strong corollary, once established in the proper manner (as described above, and in Baseline Consideration #5),schedules specified for the resolution of important safety issues (e.g., USI A-17) ought to be regarded seriously, and ought <u>not</u> to be overturned or extended significantly except on the basis of an equivalent process. More specifically, significant extensions should not be permitted or condoned simply by virtue of <u>default</u> on performance of the schedule established by consensus.

d. Baseline Consideration #4

Consistent with the high priority assignment and timely resolution objective for the augmented, post-TMI systems interaction program (see Baseline Consideration #2 above), although the II.C.3 program was to be closely coordinated with other programs (such as IREP[10] and NREP[11]), the schedules for the completion of studies intended to lead to the resolution of USI A-17 were established initially so as not to be linked to, or dependent upon, IREP/NREP program schedules in anyway that would delay achievement of the necessary USI-related objectives. Further indication of such intent is seen in the fact that the management of the systems interaction program (II.C.3) was established initially separate from the management of the IREP (II.C.1) and NREP (II.C.2) programs (i.e., with the program management involved in each case reporting to the Office Director and Executive Director levels through different chains of command).

e. Baseline Consideration #5

The decisions and actions taken in establishing both the initial USI A-17 program in 1978, and the augmented, post-TMI systems interaction program (II.C.3) in 1980, were taken within the context of an existing, established regulatory structure and process in which well-established (approved) deterministic criteria and requirements define what is adequate safety unless/until changed by due process

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[10] Interim Reliability Evaluation Program (IREP). See NUREG-0660, Item II.C.1

[11] See NUREG-0660, Item II.C.2

(i.e., the process outlined here). Those decisions and actions were based broadly on widely-shared qualitative judgments regarding the importance of the issue involved and the necessity for prompt action and timely resolution (see Baseline Consideration #3). The decisions involved were evolved through a highly-visible and open consensus forming process, which included full opportunity for review internally by cognizant NRC staff and ACRS.

4. Changes in Material Facts or Circumstances Affecting Testimony

Having established in the preceding the background and baseline which form the basis for my understanding of the staff's system interaction program, and against which I form judgments regarding its "status" and adequacy of any given point, I identify, in the following, significant changes that have occurred with respect to these baseline facts and circumstances which affect my earlier testimony. Some of the changes identified occurred before my Shoreham testimony, and some after; but all bear materially on the question of current validity of my earlier testimony. And I believe that all must be considered together to understand fully my current position in this matter.

a. Excessive Delay in Resolution of USI A-17

The most significant deficiency of the current system interaction program impacting the validity of my earlier testimony is that, although we are now nearly at the end of the period of time allocated for the resolution of USI A-17, we are nowhere near to achieving resolution of this important safety issue, along the current track and at the current pace. My optimistic estimate, in that regard, is that that goal is still 2-3 years off without significant reordering of priorities and re-constitution of the II.C.3 program along the lines suggested herein. I conclude, therefore, that the program cannot be regarded or characterized as adequate (specifically in the sense required to be addressed under North Anna; see Baseline Considerations #2 and # 3).

To be somewhat more specific, although notable progress has been achieved in the development of promising "candidate" systems interaction methodologies by the staff (as planned), demonstration or trial of those methodologies has not yet been done (or even begun). And while there have been hopeful developments recently with regard to getting those efforts underway finally (on the basis of initiatives taken/supported by the Director, NRR himself), it is clear that the completion of the demonstration phase of the II.C.3

program will take significantly longer to complete than initially planned (e.g., perhaps an additional 1-2 years). Also, although extensive, broad-scope systems interaction search efforts have now been completed at the Diablo Canyon and Indian Point-3 facilities using utility-developed methods, it now appears certain (i) that the planned submittal of unevaluated Indian Point-3 search results to the staff in late 1982 or early 1983, will now be delayed until late 1983 (due to hearing related considerations and complications), and (ii) that the final submittal of evaluated Diablo Canyon search results, which had been expected in late 1982 is now delayed indefinitely (due to well-known licensing-related difficulties that have arisen in that case).

In full view of these circumstances, the prevailing staff view seems to be to "stay the course"; i.e., continue along the current track at whatever pace can be achieved to eventual resolution of USI A-17, whenever that may occur. Under this view the program could be considered adequate currently simply because there is some systems interaction work currently underway (albeit well behind schedule), and because there is "no evidence" that drastic measures must be taken to hasten resolution of the system interaction problem. My view, instead, is that there is "no evidence" that the consensus judgments, regarding the seriousness of the safety

concern involved and the need for timely resolution (i.e., in the time period allocated and agreed upon at the outset; see Baseline Considerations #2 and #3), were that wrong in the first instance. The decision to delay or extend the schedule for resolution of USI A-17 is, by its very nature, a major safety decision and should not be made by default, or by a few individuals on the ad hoc "no evidence" basis indicated. (See Baseline Consideration #3)

I believe, therefore, that the proper course of action at this point is (i) to recognize the inadequacy of the current state of the program, and (ii) to "call the question" for reconsideration, and submit it to the same decision making process that established initially the time to be allowed for resolution of USI A-17 (See Baseline Consideration #5). In that respect, I would favor strongly this time around a currently-appropriate variation on the original recommendation made by the Lessons Learned Task Force in 1980 in this regard,[12] and the similar recommendation made by ACRS in January 1982[13], to wit: Require all licensees and OL applicants to begin limited systems interaction reviews of their facilities immediately, using methods now known and documented for use or

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[12] See NUREG-0585, Section 3.2 and Recommendation 9

[13] See ACRS letter dated ~~1/18/82~~ 1/8/82, "Systems Interactions"; also see ACRS letter dated 3/9/82, "Report on SI Study for Indian Point -3."

trial (even though not completely evaluated at this time). The reasons for favoring now the more direct and immediate approach are (i) failure to resolve the systems interaction issue in the three years that have passed since inception of II.C.3 (or in the five years since USI A-17 was initiated) by employing a less direct and immediate approach, and (ii) clear indication now that licensees do not need to wait on the staff any longer to develop and demonstrate workable systems interaction methodologies that can produce safety-beneficial findings and results.

In this regard it is noted that, while the staff (for whatever the reasons) has not developed and applied workable systems interaction methodologies in the time allotted initially under the II.C.3 program, three utilities have done so (i.e., at Diablo Canyon, Indian Point-3, and most recently the Perry facility). Although the results of these efforts have not yet been fully-evaluated by the utilities involved and reviewed by the staff, in several instances on the basis of licensees' own prudent judgment, modifications to facility designs have already resulted from these system interaction reviews.

So a broad scale effort involving limited-scope systems interaction reviews in all operating facilities and NTOL plants could both (i) produce safety beneficial plant specific findings (as has already been done) and (ii) at the same time provide much more expeditiously and extensively actual systems interaction data and information needed by the staff for making final decisions regarding the possible need for more comprehensive systems interaction reviews generically. Suitable arrangements could be made between the staff and each utility regarding the scope of review to be done at each facility, and regarding the choice of methodology to be applied, (including choice of one of the staff's candidate methodologies, if mutually agreed).

As a final point regarding this particular aspect of changes in circumstances that have affected my earlier testimony, it might seem that the conclusions drawn at this time in this affidavit, regarding inadequacy of the program because of failure to resolve USI A-17 on the schedule initially established (i.e., about now), could have been drawn as easily 6-8 months ago as now (i.e., during the preparation and presentation of my earlier Shoreham testimony).[14] Such is not the case. Although (as alluded to in Section 2 above)

[14] See, for example, Transcript of TMI-1 Appeal Board proceeding at p.300, for for reaction of Appeal Board just to the changes of circumstance outlined for them in the affidavit cited in footnote 19.

there had been unfavorable developments in some aspects of the systems interaction program in the months preceding my participation in the hearing (described in further detail in Section 4.b following), the program in other important aspects was showing significant progress and results. For example (i) the Indian Point-3 systems interaction program plan was approved in early March 1982, and was underway and proceeding very well by early April, (ii) the matrix-based dependency analysis methodology development effort was launched in late Spring 1982, and (iii) prospects were very bright for the staff receiving extensive actual systems interaction review results from both Diablo Canyon and Indian Point-3 by late 1982. Additionally, there seemed to be real hope of getting the badly-lagging methodology demonstration phase of the program back on track and moving as a result of a development that occurred in early May 1982. At that time, there came down from the Chairman's office a request for a briefing on the status of the system interaction program. I interpreted this as a hopeful sign because it indicated a show of interest, initiating at the Commission level, in the state of the program; and it seemed a very real possibility that this timely show of interest from that level could result in a turning point, especially for the methodology demonstration program which was lagging at that point.

So it can be seen, I believe, that at the time of my involvement and participation in the Shoreham hearing there were still a number of reasons to support the (hopeful) view that the staff's system interaction program, although experiencing some serious difficulty, was still adequate at that point.

b. De-emphasis on Systems Interaction Program Objective

In March 1981, the Systems Interaction Branch (SIB) of the Division of Safety Integration (DSI) was abolished, and all but two of the nine SIB professionals working on systems interaction were assigned to other licensing-related activities within NRR. I was one of the two remaining former SIB members who were transferred to the Reliability and Risk Assessment Branch (RRAB) of the Division fo Safety Technology (DST) to try to continue the II.C.3 systems interaction program. RRAB is the organizational unit within NRR with lead responsibility for PRA-related activities, such as NREP.

The most obvious thing that can be said regarding this development is that, insofar as organizational "stature" and allocation of resources reflect the real importance ascribed and priority assigned to a given project/activity in the minds of NRC management, this development indicated a significant decrease in the perceived importance of systems interaction

issue on their part, and correspondingly in the "effective" priority assigned to the program for resolving that issue. Concerns along these lines were expressed by me and other systems interaction staff to both SIB/DSI and RRAB/DST management at the time. And it was apparently also in this same vein that the TMI-1 Hearing Board raised questions regarding the motivation for, and possible effects of, this action.[15] All were reassured that any concerns in this regard were misplaced.

Despite such reassurances and the assumed good intentions underlying them, the effects of that action ultimately proved detrimental, as feared. Beginning at that point (gradually at first, but more noticeably as months passed) there began to develop in the management of the systems interaction program at all levels within NRR a noticable lack of emphasis on the completion of the II.C.3 systems interaction program (and resolution of A-17) on the basis and schedule established at the outset of that program.

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[15] TMI-1 Hearing Transcript at 15,615-15.629

More and more with time, the new organization seemed to lose sight of the fact that both the need and schedule for timely resolution of USI A-17 had been established at the outset by a broad consensus, based on the widely-shared judgment that the seriousness of the safety concern involved warranted an expeditious effort to resolve it. By contrast, at the same time that this apparent decline of emphasis and sense of urgency was occurring with respect to the systems interaction concern, increased visible emphasis was placed by staff management, and even the Commission, on PRA-related programs and activities. (e.g., quantitative safey goal development). It is in this respect that it simply must be said, at this point, that what has resulted is an inappropriate imbalance with regard to the importance being placed by RRAB/DST and NRR management currently on what is essentially "nice" (i.e., PRA-related activities) as compared to what must still be regarded, under existing rules and established procedures for reactor licensing, as "necessary" (i.e., programs for resolution of USI A-17).

These changes in attitudes on the part of management towards the importance, urgency, and priority of the system interaction concern are a major factor in my judgment of the adequacy of the systems interaction program currently, particularly with respect to prospects for resolution of USI A-17

at any reasonable time in the future, without a significant reordering of priorities and program redirection. (See Baseline Considerations #1, #2, #3, and #5).

The following specific examples are illustrative of the preceding general observations, I believe:

(1) Withholding/Delay of Final Approval for Implementation of Systems Interaction Methodology Demonstration

In October 1981, approval was given by DST to a proposal for initiation of the methodology demonstration phase of the II.C.3 program. In this proposal, approval by NRR was requested regarding final selection of the NTOL pilot plants in which candidate systems interaction methodologies were to be tested.[16] No action was taken (either approval or denial) by NRR at that time; and the effort stalled at that point, apparently over concerns that developed in connection with cost-benefit estimates required for the expected review by the Committee for the

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[16] See Memo, 10/28/81, Murley to Denton, "Implementation of Systems Interaction Interim Guidance".

Review of Generic Requirements (CRGR) of any NRR approval action on this proposal. In February 1982, however, in a letter from Mr. Dircks to ACRS (which required concurrence by NRR)[17] it was noted that "...the staff proposes to begin soon with reviews of four NTOL plants using two methodologies ..." That seemed surely to indicate some movement toward final approval of the proposal to initiate the studies described to the ACRS. However, more weeks passed with no final action on the request.

Meanwhile, (as also noted in the letter to ACRS), RRAB and DST management began considering various options for combining the systems interaction program with an already envisioned NREP/SEP combined review program. At this point still, the emphasis was said to be on expediting the resolution of USI A-17, as well as achieving cost-benefit advantages (to help in gaining acceptance/approval from (CRGR), by combining unnecessarily duplicative aspects of the three programs

[17] See Letter dated 2/12/82, Dircks to Shewmon, "Systems Interactions".

done separately). Apparently the promise seen by NRR in this approach was great enough that NRR approval of the October 1981 DST proposal on initiaiton of the NTOL pilot plant methodology effort was delayed again, while the combined program idea was developed and explored further. That process has continued since;[18] but to date no final approval has been given by NRR for implementation of any methodology demonstration studies under any option. In the process, however, the initially proposed NTOL pilot plant alternative, approved by DST in October 1981 was discarded altogether. (I first learned that this was official in August 1982; a statement in this regard was inserted into an affidavit that I was preparing to the TMI-1 Appeal Board[19] in response to their request for a report on the status of the II.C.3 System interaction programs). As a final comment, it is noted pointedly that the notion of expediting the resolution of USI A-17 and achieving cost-benefit advantages by combining the program for resolution of USI A-17 with planned PRA-related programs did not work out well in any respect. I believe the basic error involved was in RRAB, DST and NRR management (i) not taking a more

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[18]See, for example, Memo dated 9/16/82, Ernst to Miraglia, "Revised CRGR Letter SEP Phase III/NREP", and Enclosures 1 & 2.

[19]See Affidavit dated 8/6/82, James H. Conran to TMI-1 Appeal Board.

aggressive posture with CRGR in presenting the II.C.3 related program proposal on its own merits, i.e., as a necessary program for timely resolution of a USI, and (ii) not resisting the post-facto imposition of a cost-benefit criterion in a way that delayed excessively the progress of that necessary program. (See Baseline Considerations #1, #2, #3, #4, and #5).

(2) Systems Interaction Analysis "Just a Part of PRA"

Even before being transferred to RRAB, I had begun to explore, in the context of my review of the Program Plan for the Indian Point-3 Systems Interaction Study the so-called systems interaction/PRA "interface", to try to understand better the relationship between the PRA which was already being performed (during 1980 - 1981) at the Indian Point facility and the proposed systems interaction study proposed at Indian Point-3.[20] As a result of my study of the interface question, I concluded, that the inter-system dependency information developed in a systems interaction analysis is important

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[20]See Shoreham Hearing Transcript, at p. 7534.

in assuring the accuracy of PRA results; to such degree, in fact, that systems interaction analysis must be regarded logically as a prerequisite to PRA.[21] (ACRS also made a similar observation in January 1982).[22] In documenting my conclusions in this regard, and in discussing this matter with RRAB and DST management, however, I took great pains to point out even more importantly that systems interaction analysis has inherent value completely aside and apart from PRA; because its results can be used readily and effectively to improve safety (in the context of the current "deterministic" licensing approach), even if PRA is never done.

I objected explicitly to the tendency that I saw within the organization to think of system interaction analysis as "just a part of PRA," because that tends to subordinate systems interaction analysis (a "necessary" program under existing rules and established procedures for reactor licensing, for resolution of USI A-17) to PRA-related programs and objectives (which do not have

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[21] See "Meeting Summary and Status Report" for July 24, 1981 ..." by J. H. Conran, at p. 3-4.

[22] ACRS Letter, dated 1/8/82, "Systems Interaction"

that "necessary" aspect to them in the established system). The culmination of this tendency manifested itself, I believe, in the abortive efforts (described in 4.b (i) above) to combine the II.C.3 systems interaction program methodology demonstration studies with NREP, without regard to the impact on the schedule for timely resolution of USI A-17. (See Baseline Considerations #1, #2, and #4)

(3) Use of Unreviewed Risk-Based Decision Criterion

Another manifestation of the "way of thinking" addressed in 4.b(2) above, is the informal, ad hoc use of an unreviewed risk-based decision criterion in deciding important aspects of the USI A-17 program performance. It appears that this practice figured, at least partly, in the decision to withhold final approval on implementation of the methodology demonstration phase of the II.C.3 program. A partial basis cited recently for withholding final approval in that instance was that the systems interaction staff had not shown that the "risk benefit" to be gained by doing systems interaction analyses would be significant enough to justify the effort and expense of trying. Such reasoning amounts to overturning, without due process, a major safety decision

made previously, on the basis of widely-share qualitative judgments, by post-facto application of an unestablished, quantitative risk-based criterion, (See Baseline Consideration #5). It is questionable also on the basis of the following considerations:

- o Inadequate treatment of common-cause failure is an acknowledged major source of uncertainty in quantitative estimates of risk based on current probabilistic risk analysis methods.
- o Systems interaction study is to a very great extent the pursuit of efficient methods to treat comprehensively and effectively common-cause or dependent failure.
- o The use, therefore, of quantitative risk estimates based (necessarily) on current risk analysis methods (flawed as they are by uncertainties arising from inadequate treatment of common-cause or dependent failure), as a basis for deciding to delay or halt system interaction studies that could eliminate or reduce significantly such uncertainties, seems at, best self-defeating, and at worst questionable logically.

Said another way, USI A-17 must be resolved before either (i) the current deterministic licensing basis and process, or (ii) PRA and quantitative safety goals, can be applied with the improved confidence sought in reactor licensing today (because they are both "flawed" by the same source of uncertainty, i.e. common-cause or dependent failure. So we should get on with it. What we need now as before is an adequate program to address this "joint" problem expeditiously and effectively.

c. Shoreham Specific Considerations

It should be said that any concern regarding the adequacy of the staff's generic systems interaction program has added significance in the Shoreham case. It must be recalled that LILCO has taken the position that the PRA that has been performed at the Shoreham facility has, in effect, resolved USI A-17. It seems fair to conclude, therefore, that if the staff does not effectively pursue timely resolution of USI A-17 through its II.C.3 systems interaction program, the concern involved is not likely to be pursued further by positive dedicated programs by LILCO.

There is, further, another possible synergistic-type consideration arising from LILCO's position on the safety

classification and safety classification terminology matter at issue between staff and LILCO (addressed in following sections of this affidavit). It is now clear that LILCO truly does not understand what is required minimally for safety, in the same way the staff (and the regulations) construe that phase. LILCO's position in that matter makes it less clear, then, whether systems interactions concerns have been treated adequately at Shoreham. For example, it may be that the difference between the positions of LILCO and the staff, regarding the claim that the Shoreham PRA resolves satisfactorily (for Shoreham) the systems interaction concern, derives from this fundamental difference in understanding of what is required minimally for safety (i.e., "How little, actually, is enough?") rather than from theoretical, matters-of-degree type arguments regarding the question "How far beyond what-is-required is enough?" (as seemed to be suggested in the discussions at the hearing regarding dependency analysis and walkdowns in the Shoreham PRA)[23] This question would seem to bear heavily on the determination of whether LILCO has satisfied what is required under North Anna, regarding USI A-17, especially in this situation where the staff's "contribution" in that regard is called into question.

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[23]See Shoreham hearing transcript at p.6653, p.7500, p.7634 and p.7847

SAFETY CLASSIFICATION TOPIC

6. General Statement of Amendment to Testimony

At the time of my participation in the Shoreham hearing, it was not clear to me, as it is now,(with more time to consider thoroughly all of the testimony of Applicant's witnesses, and its full implications) that LILCO truly does not understand what is required minimally for safety by NRC under the regulations (i.e., what is considered necessary and sufficient to provide reasonable assurance of no undue risk to the health and safety of the public in the operation of a facility). Coming to the discussions of these matters in the hearing with the background described extensively in my testimony, I was predisposed to think of the defect in Applicant's stated position regarding the safety classification term "Important to Safety" as simply a "language problem". That is to say, at bottom, I believed that, although we subscribed to a different set of words to describe them, both the staff and Applicant understood in basically the same way the fundamental safety concepts underlying the terms "Important to Safety" and "Safety-Related" (as the staff apply those terms). Considerable effort was made by counsels for the staff and Applicant, while Contention 7B was being argued, to work out what were perceived as resolvable language differences (as contrasted to fundmental lack of mutual understanding

regarding what is required minimally for safety). I participated in those efforts, and upon several occasions responded to cross-examination by counsel for Applicant in that context and spirit, suggesting that we may have achieved near-meeting of the minds by the end of argument of Contention 7B. I recognize now, that we are, in fact, not near a meeting of the minds on the very important fundamental safety concept at root in this matter. As a general statement of amendment, therefore regarding my testimony in that respect, it should be said that, to the extent that the Board or Parties might rely on such statements regarding "meeting of the minds" in my hearing testimony to determine outcome on Contention 7B, they should not do so.

7. Basis for Amendment of Testimony

The further understanding that I have developed in this regard is based on the following:

a. opportunity to consider longer and review more thoroughly the testimony of Applicant's witnesses,

b. involvement in the review of recent proposals by LILCO to the staff for resolving differences left outstanding at the end of argument of the safety classification and safety classification terminology issue in the hearing, particularly regarding non-safety Q.A.

c. synergistic consideration of a) and b).

In that context I was struck by how little movement could be seen in LILCO's six month old differences with the staff on these matters.

With a license at stake, and that long to think about and work on it, it seemed remarkable to me that there would not have been more substantive effort on LILCO's part to develop or promote improved mutual understanding on what I had thought were only language differences. The staff, for example, has continued the effort to develop a listing of "Important to Safety" structures, systems and components; and, recently, a draft report containing preliminary results of that effort has become available.

In pondering these questions further, I carefully reviewed the testimony of Applicant's witnesses again (in particular, testimony at p. 5425-5449 of the Shoreham hearing transcript), in which staff counsel sought to establish by cross-examination equivalency between staff's and Applicant's understanding of the fundamental safety-concepts involved, even though the language applied was different. In that review, I finally recognized that,in responding to counsel's questions, Applicant's witnesses invariably couched their responses in a way that acknowledged some safety relevance to the specific examples provided by counsel of things "Important to Safety, but not Safety-Related", but carefully avoided acknowledgement or recognition that such items had enough safety relevance or importance to number them among that category of things required minimally for safety by the regulations.

8. Implications of Amendment to Testimony

Having come to this realization and fuller understanding of these matters, I believe the full implications of this can be summarized as follows:

a. The concerns that occupied me chiefly at the time of the hearing focused most heavily on the implications of language differences, (i) with respect to impact on staff's ability to rely on Applicant's affidavits in the audit review context, thus complicating significantly (if not prohibitively)staff's ability to come to a finding of "reasonable assurance..." through the usual, established audit review process, and, (ii) with respect to possible impact on staff's ability to obtain information required for its regulatory function during operation of Shoreham, as contemplated under Part 21 (because the Applicant might not realize that he had to report information regarding failure of some component which he did not "call" Important to Safety, but staff did).

b. My concern at this point is more serious, however. I no longer believe that our differences involve only a language problem to be sorted out mechanically. There now appears to be a substantive defect in Applicant"s true understanding of what is really required minimally to protect public health and safety. A language problem could be remedied simply by imposition of a definition; (or possibly even by a much more

complicated alternative scheme proposed by LILCO). But understanding of the fundamental safety concepts underlying the usage of the term "Important to Safety" in the regulations cannot be imposed, (as for example by a condition to license). Understanding must be developed, and demonstrated, I believe.

Therefore, I believe that a condition for (i.e., prerequisite to) a license in this case should be development by LILCO of a listing of "Important to Safety" structures, systems and components for Shoreham, as a vehicle and means for developing and demonstrating the requisite understanding of what is required minimally for safety in the operation of Shoreham. In the construction and design phase, the very detailed SRP and Regulatory Guide information can perhaps provide a "safety net" or "backstop", to mitigate serious misunderstandings regarding staff's (and the regulations') safety classification terms. However, in the operation of a facility there is little that would act effectively in a similar way (i.e., as a backstop), either in the regulations, or in staff's procedures and activities. There must be understanding of what is necessary minimally for safety as a prerequisite for safe operation. And because Applicant's understanding in that regard is so clearly called into question, by their own

testimony, I believe there should be demonstration of remedy before licensing. The staff's preliminary (draft) listing of structures, system and components "Important to Safety" (referred to above) could be used as the starting point of an effort to do that, and could enable completion of such effort on a basis that would not have to interfere with licensing schedule.

C. Need for Additional Testimony

Mr. Conran's February 9, 1983 affidavit, if received in evidence, will significantly modify evidence proffered by the Staff in support of its position in the proceeding. Fairness requires that the Staff be permitted the opportunity to supplement the record directly affected by Mr. Conran's modification of his position. The Staff is prepared to offer additional testimony on each of the two subjects addressed by Mr. Conran's affidavit. The receipt in evidence of this additional testimony is in the interest of a full and fair hearing record upon which a decision can be made. The Staff proposes to offer this testimony by affidavit.

1. Systems interaction (A-17)

The Staff is preparing additional testimony on the subjects of the status and progress of the Staff's program in support of unresolved safety issue A-17 and the basis for the Staff's position that Shoreham can be operated safely despite the pendency of unresolved safety issue A-17. That testimony will be sponsored by Ashok C. Thadani, Branch Chief of the Reliability and Risk Assessment Branch, and Franklin D. Coffman, Section Leader of the Systems Interaction Section within the Reliability and Risk Assessment Branch. The principal points of that testimony are expected to be as follows:

1. the Staff's current licensing requirements provide reasonable assurance of no undue risk to public health and safety from potential adverse systems interactions;

2. unresolved safety issue A-17 is confirmatory in nature;

3. the Staff's program on A-17 is progressing satisfactorily toward resolution;

4. no plant-specific systems interaction analyses are or should be required until completion of the Staff's program determines whether they are necessary and justified.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 09 1979

MEMORANDUM FOR: Commissioner Bradford

THRU: Roger H. Moore, Chief, Applied Statistics Branch, MPA
Norman M. Haller, Director, MPA
Lee V. Gossick, Executive Director for Operations

FROM: David Rubinstein, Applied Statistics Branch, MPA

SUBJECT: PROBABILITIES THAT THE NEXT MAJOR ACCIDENT OCCURS WITHIN PRESCRIBED INTERVALS

Apparently your request of January 31, 1979, to Saul Levine and John Austin for "the correct way to state the statistical significance of ... 400 reactor years of operation without major accident" has received fairly widespread attention in the Commission. I believe most of the concerned persons addressed this problem in terms of upper confidence limits for the rate of a major accident or from the point of view of hypothesis testing. An alternative way of addressing this problem is through a prediction interval. As used here the prediction interval focuses on the next major accident. It puts an upper bound on the probability that the next major accident will occur within a specified number of reactor years. Alternatively, it will give a lower bound of the probability that the next major accident will occur after a specified number of reactor years. On the basis of some assumptions discussed below we may say for example:

a) The probability is less than .5 that the next (i.e., the first) major accident occurs within the next 400 reactor years.

b) The probability is less than .05 that the next major accident occurs in the next 21 reactor years.

c) The probability is larger than .5 that the next major accident will occur after the next 400 reactor years. This is equivalent to statement (a).

The column headed by I in Table 1 and the graph with the triangles in Figure 1 give more detailed results of the prediction interval method. The results are given for both reactor years and time expressed in calendar years; a calendar year is taken equivalent to 70 reactor years. At present there are approximately 70 commercial operating reactors.

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ENCLOSURE 3

The results suggest perhaps unwarranted pessimism because of

a) conservative features in the analysis

b) large statistical variability of times to first (or next) major accident

c) lack of engineering considerations.

The prediction intervals are derived under the assumptions that major accidents occur as a Poisson process; i.e., at a constant rate and independently. These assumptions provide perhaps a reasonable approximation; however, this is not readily demonstrated. The prediction interval as used here does have one conservative feature in that it "equates" the time to the first major accident with the time cumulated to date without major failure. My gut feeling is that this conservatism is likely to outweigh possible non-conservatisms in the assumptions. [I also see the possibility of obtaining more assurance based on somewhat plausible speculation about such matters as early high failure rates (often called infant mortalities) or relative occurrence rates of subclasses of accidents. Careful and detailed examination of existing failure data might provide support for such speculation.]

On the basis of the simplistic assumption of a Poisson process one can readily compute the probability distribution of the time to the next major accident for any specified value of the occurrence rate of major accidents. [In contrast the method of prediction intervals does not require knowledge or postulation of the value of occurrence rates to make probability or confidence statements about the waiting time to the first occurrence.] Table 1 and figure 1 also provide probabilities relating to the waiting times to the next major accident for the major accident rates listed below:

A) One per 170 reactor years; this corresponds to the 90% upper confidence limit based on 400 reactor years with no major accident.

B) One per 580 reactor years; this corresponds to the 50% upper confidence limit based on 400 reactor years with no major accident.

C) One per 4,000 reactor years; this is an approximate amalgam of WASH-1400 and other "upper bounds", and the 50% upper confidence limit based on about 2,800 reactor years without major accident. Some persons make claims of from 2,500 to 3,000 relevant (in some sense) reactor years free from major accidents.

D) One per 1,000,000 reactor years; this has been included here as some sort of holy grail.

In line with your request, I took a very pragmatic approach and deliberately played down the theoretical aspects. I shall be happy to try to clarify them if you so desire; in particular, the precise interpretation of prediction intervals. I am appending a brief mathematical derivation in case mathematically inclined persons will read this memo.

One can duplicate similar computations for the time to the second major failure, third major failure, etc. To some persons the picture for later major accidents might appear somewhat less alarming. Again if you have interest in such computations, the Applied Statistics Branch can provide these.

David Rubinstein

David Rubinstein
Applied Statistics Branch
Division of Technical Support
Office of Management and
Program Analysis

cc: Chairman Hendrie
Commissioner Gilinsky
Commissioner Kennedy
Commissioner Ahearne
Lee R. Abramson
Dan Lurie
Susan B. Young
Saul Levine
John Austin

LEGEND TO TABLE 1

Probabilities that the Next Major Accident Occurs Within Prescribed Intervals

t is time expressed in either reactor years or calendar years.

$P(Y \leq t)$ is the probability that the next major accident occurs at or before time t.

Column I gives upper bounds for $P(Y \leq t)$ as obtained by the prediction interval method on the basis of 400 reactor years free from major accidents.

Columns A, B, C, and D give exact values for $P(Y \leq t)$ for given occurrence rates of major accidents as explained on pages 2 and 3.

θ is the reciprocal of the failure rates used in columns A, B, C, and D. It is also the mean time between major accidents.

LEGEND TO FIGURE 1

Probabilities that the Next Major Accident Occurs Within Prescribed Intervals

The time scale in reactor years is given on the bottom and in calendar years on top. These scales are logarithmic and scientific notation is used for the large numbers; thus 5(4) is $5 \times 10^4 = 50{,}000$.

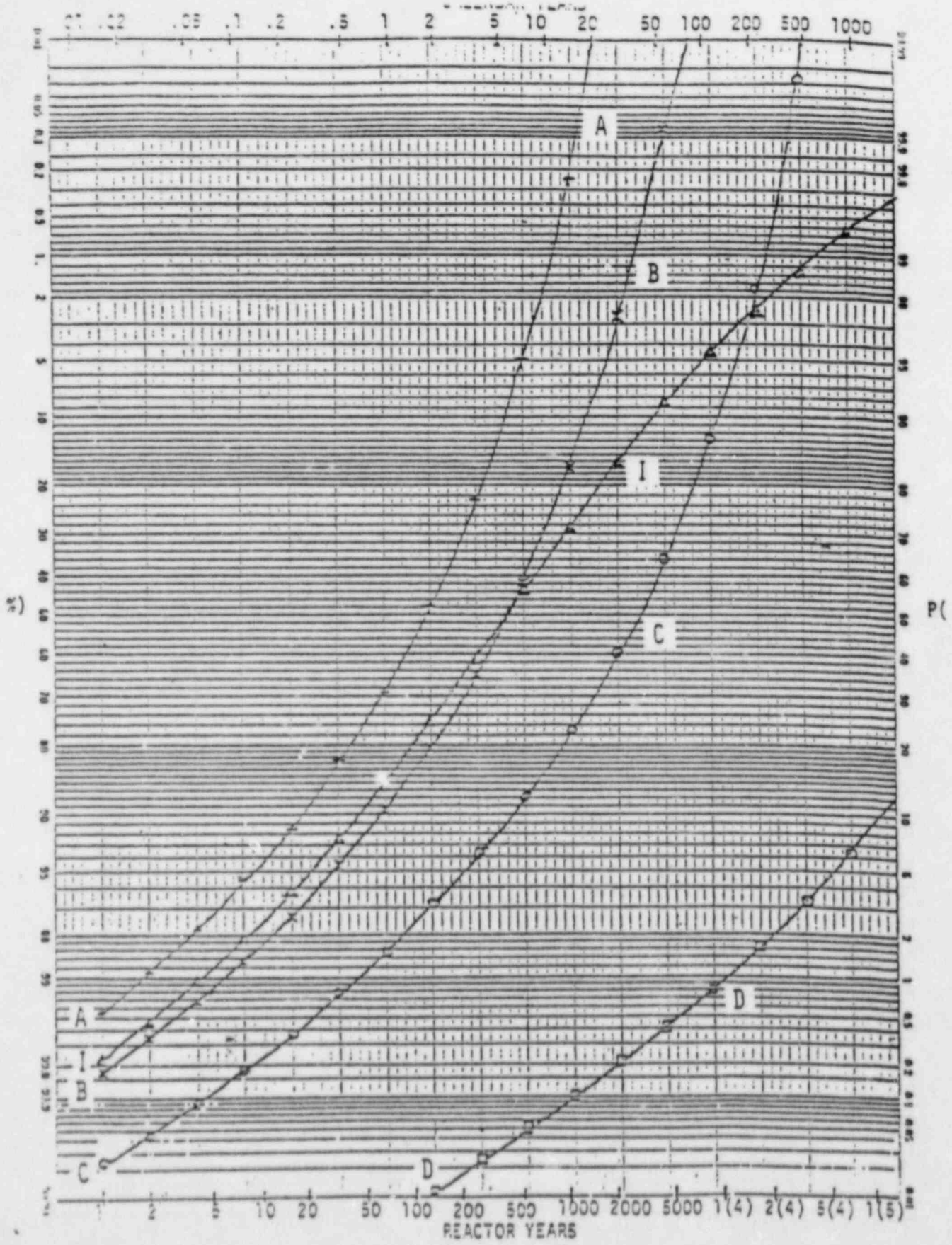
The graphs are plots of $P(Y \leq t)$ against the P scale on the right. The Q scale gives the complementary probability $1 - P = P(Y \geq t)$. Both scales express probabilities in percent; neither scale is linear.

The graph passing through the triangles (Δ) refers to the prediction interval. The other graphs are: + for case A(θ = 170); X for case B(θ = 580); O for case C(θ = 4,000); and $\square$ for case D(θ = 1,000,000).

TABLE 1

PROBABILITIES THAT THE NEXT MAJOR ACCIDENT OCCURS WITHIN PRESCRIBED INTERVALS

t	t		P(Y ≤ t)			
REACTOR YEARS	CALENDAR YEARS	I	A	B	C	D
			θ 170	580	4000	1000000
1.	.01	0.002	0.006	0.002	0.000	0.000
2.	.03	0.005	0.012	0.003	0.000	0.000
5.	.07	0.012	0.029	0.009	0.001	0.000
10.	.14	0.024	0.057	0.017	0.002	0.000
20.	.29	0.048	0.111	0.034	0.005	0.000
50.	.71	0.111	0.255	0.083	0.012	0.000
100.	1.4	0.200	0.445	0.159	0.025	0.000
200.	2.9	0.333	0.692	0.293	0.049	0.000
500.	7.1	0.556	0.947	0.580	0.118	0.000
1000.	14.	0.714	0.997	0.823	0.221	0.001
2000.	29.	0.833	1.000	0.969	0.393	0.002
5000.	71.	0.926	1.000	1.000	0.713	0.005
10000.	140.	0.962	1.000	1.000	0.918	0.010
20000.	280.	0.980	1.000	1.000	0.993	0.020
50000.	710.	0.992	1.000	1.000	1.000	0.049
100000.	1400.	0.996	1.000	1.000	1.000	0.095
200000.	2800.	0.998	1.000	1.000	1.000	0.181
500000.	7100.	0.999	1.000	1.000	1.000	0.393
1000000.	14000.	1.000	1.000	1.000	1.000	0.632
2000000.	28000.	1.000	1.000	1.000	1.000	0.865
5000000.	71000.	1.000	1.000	1.000	1.000	0.993


.02
.05
.1
.2
.5
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2
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10
20
50
100
200
500
1000
A
B
I
C
D
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I
B
C
D
2
5
10
20
50
100
200
500
1000
2000
5000
1(4)
2(4)
5(4)
1(5)
REACTOR YEARS
P(

Mathematical Derivation

The prediction interval based on accident free observation time resembles Laplace's Law of Succession. However, the following derivation is independent of the Law of Succession.

Assumption: Major accidents occur as Poisson sequence with parameter λ.

Definitions:

1) t_o is an arbitrary exposure time to risk of major accidents.

2) $X_{(1)}$ is the time to the first major accident. Note that $X_{(1)}$ may be smaller or larger than t_o.

3) $X^* = \min[t_o, X_{(1)}]$.

4) $Y = X(t_o)$ is the waiting time to the next major accident starting from t_o.

Theorem: For $k > 0$, $P[Y \leq kX^*] \leq 1 - \frac{1}{k+1}$.

Proof: From the assumption of a Poisson process it follows that Y is independent of X^*. For positive k, the probability

$$P[Y \leq kX^*] = \int_0^\infty P[X^* \geq y/k] \lambda \exp(-\lambda y) dy$$

$$\leq \int_0^\infty P[U \geq y/k] \lambda \exp(-\lambda y) dy ,$$

where U is a random variable exponentially distributed with parameter λ. Note that $X^* \leq X_{(1)}$. Also,

$$\int_0^\infty P[U \geq y/k] \lambda \exp(-\lambda y) dy = P[U \geq Y/k] = P[Y/U \leq k] .$$

Since Y/U has an F distribution with 2 and 2 degrees of freedom and the density of $F_{2,2}$ is $f(t) = (1 + t)^{-2}$, it follows that

$$P[Y \leq kX^*] \leq 1 - \frac{1}{k + 1} . \qquad (1)$$

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 04 '85

MEMORANDUM FOR: Those on Attached List

FROM: David Rubinstein
Applied Statistics Branch
Office of Management and Program Analysis

SUBJECT: A STATISTICIAN'S VIEW OF NRC STATISTICS - A PRESENTATION TO THE ASA ADVISORY COMMITTEE ON NUCLEAR RESEARCH

The enclosed transcript of my talk to the ASA Ad Hoc Committee on Nuclear Research might be of interest to you.

David Rubinstein

David Rubinstein
Applied Statistics Branch
Office of Management and Program Analysis

Enclosure:
As stated

cc: See attached list

8502260540

ENCLOSURE 4

Distribution

NRC

E. Abramson
H. Bassett
T. Abell
R. Bernero
W. Bivins
J. Burns
M. Cullingford
S. Conver
W. Dooly
F. Goldstein
S. Hanauer
J. Griesmeyer (ACRS)
J. Johnson
R. Hartfield
J. Kent
L. Lancaster
T. Kirk
M. Messinger
W. Minner
S. Moglewer
F. Rowsome
A. Thadani
J. Telford
L. D. Ong
A. El-Bassioni
W. Vesely
H. Ornstein

R. Easterling
T. Fine
R. Mensing
R. Moore

A STATISTICIAN'S VIEW OF NRC STATISTICS*

MR. RUBINSTEIN: Since Carl started to talk about where I fit in, let me say that I belong to the Applied Statistics Branch which is the central consulting group on statistical problems, serving all of NRC. We are not part of the risk assessment group, and we have been relatively little involved in risk assessment. Sometimes we get involved either because we push our noses into it and occasionally because we are asked to.

As I was listening to the various speakers. I wanted to change my speech, but I sort of gave up. I may repeat certain things which other speakers have said. Please forgive me for that.

I should like to start on an upbeat note. There have been improvements in NRC uses of statistics. I seem to sense a refreshing quickening of pace; at this meeting and at a meeting last month on risk assessment, I noticed much more concern for the subleties of statistical problems and much more recognition and acknowledgment that the past performance has been less than perfect. This quickening of pace, might be called acceleration -- I should like to call it "a jerk." In common speech a jerk is a sudden change in force or acceleration. Engineers use the word "jerk" or "jerk function" to denote the derivative of acceleration. One might speculate that the current large value of the jerk function is caused by anticipation of the judgment which you are going to pass. Regardless of the merit of this speculation, the very fact that NRC has invited you to look over its shoulder is an extremely good omen. I am confident that your advice and guidance will help to keep the jerk, and perhaps the jerk of the jerk, positive for considerable time to come.

(Laughter)

A review of statistics at NRC is an ambitious undertaking I cannot do justice to. It covers a considerable time span; it covers many practitioners at NRC as well as practitioners outside of NRC. The latter include groups working under contract to NRC, as well as employees of vendors and licensees who are required to demonstrate some aspect of performance or safety. Often NRC licensing does rely on analyses performed by outsiders.

---

*An edited transcript of a talk given by David Rubinstein on Nov. 7, 1980 in Washington, D.C., to the ASA (American Statistical Association) Ad Hoc Committee on Nuclear Regulatory Research.

Despite the introductory and sincere upbeat note, there is still much room for improvement in NRC's statistical applications. I shall deal in a broad brush fashion with some of the troublesome issues. I want to emphasize the word broad brush; NRC statistics is not a simple monolith. I indicated already evolution over time and that statistics is practiced in one form or another by many individuals within and outside NRC. Obviously the various individuals and groups do not perform uniformly well, nor does each perform uniformly well in all instances.

Despite diversity of application and quality, some deficiencies can be found rather frequently in statistical applications in the nuclear field. First I shall speculate on why there are rather frequent shortcomings, and then discuss some of the specific issues, and finally end with some more or less philosophical questions.

I believe that the penetration of the AEC and NRC by statisticians has been minimal and rather late. The full subtlety and complexity of statistical problems in the nuclear field has not been appreciated by many in the nuclear field, and this includes managerial personnel. There is widespread belief that physical scientists with some acquaintance of statistical methods can handle statistical problems adequately. This point relates to my next observation.

A technological, or perhaps even technocratic attitude, seems rather prevalent in the nuclear field. If there is a problem, there is a technological fix. Associated with this attitude or philosophy is an action-oriented approach that is not overly concerned with intellectual considerations; pragmatic considerations will do. Oftentimes, I am concerned whether the methods are even good pragmatism. The activist approach, whether pragmatically sound or not, is reinforced by pressure to provide answers and to provide them quickly.

Before I turn to some of the specific issues, I would like to point out that statistics is at least a moderately successful science because of somewhat precise concepts and somewhat rigorous methodology. Unfortunately, in the nuclear field, statistical concepts and methods get often blurred. It is now well known that the Lewis Committee called WASH 1400 inscrutable. Leaving WASH 1400 aside, I find much of the statistics in the nuclear field inscrutable, or vague. In fact, I -- and I believe other statisticians will -- find some analyses inscrutable, vague, questionable or wrong that might not have been regarded so by the Lewis Committee.

Yesterday, we already noted the confusion of rates, probabilities, and expected values. There were some incisive comments made about choosing distributions for maximum floods, and I would like to note that it was an NRC non-statistician who pointed out that we are frequently concerned with mixtures of populations.

Among other items of concern I find:

1. Confusion between random variables and parameters is common even when no Bayesian approach is intended.

2. Best estimate is a term that is extremely vague and frequently used. It could come from data or from subjective belief. It could be a mode, a mean, a median a 50 percent confidence limit -- usually an upper confidence limit -- or what strikes somebody as best without clear elucidation of what is best. It may only be a matter of coincidence that the best estimate is the minimum variance estimate in a particular class of estimates.

3. You will often hear the word "uncertainty"; a term that nuclear people seem to be particulary fond of. The first major technical report I reviewed in NRC used the word "uncertainty" where I think the following terms might have been more appropriate:

a) Random variable, or perhaps a variation thereof such as random error or measurement error;

b) Standard deviation;

c) Confidence limit;

d) Error or bias; and perhaps here one could even become more specific whether this was an error in a parameter value or an error in the mathematical model;

e) It was also used in that report for the density or distribution function.

At times I just did not know what the intended meaning of the word was, and I am not sure that the authors always knew what they were talking about. Other uses and misuses include the following:

a) The word "uncertainty" is also used as an equivalent to what is called an upper bound, and this term is not well-defined. It seems to denote a large or very large value in a not-clearly-specified set of values. In nuclear jargon, "upper bound" is not a literal upper bound.

b) Finally, "uncertainty" is used as sort of a catchall phrase for what one might call Bayesian uncertainties.

c) And, lo and behold, sometimes "uncertainty" is used as the condition of being in doubt. This particular usage of the word I prefer.

d) Regardless of the varied nature of the uncertainties, they often are sum-root-squared to yield "total uncertainty." While there is frequent recognition in the nuclear field of the diversity of uncertainties, much sloppiness and confusion still exist.

Now let me turn to some methodological problems. Bayesian statistics of one sort or another is widely used. The material that was distributed to you contains some examples and critiques. I do not wish to elaborate on these in detail. However, even at the risk of repetition, I should like to point out that often the Bayesian framework is not clearly formulated and there is considerable sliding between Bayesian statistics and frequentist statistics, and it can go both ways perhaps through several cycles in a particular analysis. Often there is no explicit mention or an indication of an a priori distribution, and even when a report starts with an a priori distribution, it may not end with an explicit posteriori distribution or probability. The probabilities seem to have become absolute.

Another technical problem of NRC is that of components or variance. Often we work in NRC with generic values which are evaluated and applied over presumably similar classes. Plant to plant variabilities may be ignored, or differences between different components may be ignored. The ignored variation may be the dominant contributor to variability and Bill Vesely in his talk clearly recognized this. There has been some progress in dealing with the complex random structure of the things NRC has worked with, but more systematic exploration, clarification, and proper analysis of the random structure is indicated. Model II, or mixed models of the analysis of variance are not well recognized in NRC. For that matter, Model I may be ignored.

As Bill Vesely pointed out, human factors and common cause problems are important, or perhaps even dominant contributors, to risk. It is extremely difficult to model these convincingly and to find appropriate data for estimation of parameters. In NRC terminology, there are great uncertainties with respect to these areas. This leads to some philosophical questions.

In view of large and not necessarily well understood uncertainties, can one properly quantify uncertainties? How should numerical analyses be used? How should they be communicated? The subject of communication is a large one in itself.

A related question is what should be the proper role of subjective judgment in governmental policy and regulation and how should one deal with subjective judgments and how should they be presented to the public and the political representatives?

I was going to stop here, but Mike Cullingford stimulated me to say that perhaps we shouldn't argue about whether we want Bayesian statistics or classical statistics. Perhaps we should ask the question, what is good scientific inference?

Thank you.

DRAFT

October 26, 1981

Random Thoughts on Uncertainties, Risk Analysis, and Nuclear Regulation

David Rubinstein

Note: This paper reflects the views of the author. It should not be construed as a policy statement of the Nuclear Regulatory Commission.

ENCLOSURE 5

DRAFT

Random Thoughts on Uncertainties, Risk Analysis, and Nuclear Regulation

David Rubinstein

1. Introduction

Okrent's testimony [Ref 1] stimulated me to write some of my thoughts on uncertainty, risk analysis, and judgment in nuclear regulation. These thoughts represent my personal view. Except as noted below, I do not attempt to review other people's work in this area. I shall use Okrent's testimony and a paper [2] cited therein as a point of departure for developing my views.

I shall offer my reaction to the issues raised by Okrent and develop my own perspective on those issues which I think NRC should consider. This report has been written primarily for NRC insiders. However, to accommodate likely outside readers, I may explain some matters familiar to NRC personnel. Here I convey the topic of Okrent's testimony by citing its opening sentence.

> "My understanding is that the general focus of discussion for my appearance before the Nuclear Safety Oversight Committee today is to be the matter of how the Nuclear Regulatory Commission (NRC) makes decisions concerning the public health and safety in the presence of very considerable technical uncertainty."

Before getting on with the subject matter I should like to acknowledge that I have had little direct responsibility for probabilistic risk assessment at NRC. I have been an observer more or less on the fringes of NRC risk assessment. While this may indicate shortcomings, it may also provide a detached perspective.

In Section 2, I shall comment on Okrent's testimony and on how it fits into the evolution of probabilistic risk analysis at NRC. I discuss my personal view of the role of uncertainty in nuclear regulation in Section 3. Section 4 will elaborate on some shortcomings of analyses other than large uncertainties; it also deals briefly with the role of judgment in regulation and Okrent's call for criteria for judgment.

2. A Partial Review of Okrent's Testimony and of the Evolution of Risk Analysis at NRC

First I should state that I greatly appreciate Okrent's testimony. It comes closer to my own philosophy than any other NRC document I have read on this subject matter. On basic issues of NRC decision making, Okrent and I may be cousins, but not necessarily kissing cousins. I look upon Okrent's testimony as a stage in an evolution of how AEC/NRC deals with risk. I shall offer a grossly over-simplified outline of this evolution. This outline may do injustice to those who, in NRC jargon, have remained determinists or who have, contrary to the prevailing tendency (or just lip service), drifted toward "determinism". (In NRC, the "determinists" place relatively little reliance on probabilistic risk analysis for regulatory purposes; they rely primarily on "judgment".)

The evolution has the following stages:

A. "All-is-safe" stage: The conception that nuclear power is safe with relatively little formal analysis as backup.

B. "Wash-1400" stage: Development and frequent use of "scientific" or "technical" approach primarily by "probabilistic risk assessment" with loads and loads of fault trees. Still marked disagreement on the relative merits of judgment and probabilistic risk assessment.

C. "Post-Lewis-Committee" stage: Greater reliance on probabilistic risk assessment (and peer review) with strong admonition for evaluation and statement of uncertainties - even more fault trees.

I shall discuss below how Okrent is at least in an advanced part of the Post-Lewis-Committee stage.

In his introduction Okrent notes that there is profound uncertainty in many regulatory activities. In the body of his testimony he makes the additional points related to specific cases of NRC regulatory activity or the lack thereof. Among these are:

1) Advocacy for more plant specific analysis and decisions.
2) Tough questioning of action criteria related to probabilities of severe core damage, and of permitting plants to be operated under some stated circumstances.
3) Critique of imprecise terminology used in risk assessment.
4) Critique of inconsistencies in regulatory prescriptions.

Observations such as these have been made before. What gives Okrent's testimony special force is the cohesiveness and toughness of the entire testimony. It is in contrast to more typical (and lenient) attitudes and standards under the Post-Lewis-Committee stage. The final portion of Okrent's concluding comments also seem to indicate a change. To quote:

> "...Despite these potentially serious difficulties with probabilistic analysis, it appears that an effort to quantify the risks, or the increment in risk, associated with a particular safety issue is a worthwhile part of the process leading to decision. The assumptions must be clearly stated. The uncertainties should be defined, as possible. Criteria for judgment should be developed and independent peer review should be used.
>
> "Ah yes, how should we expect the NRC to make decisions on matters like hydrogen and non-seismically qualified auxiliary feedwater systems, which involve an atmosphere of technical uncertainty?
>
> "With difficulty." [Emphasis added.]

The words I underlined seem to convey something less than an absolute faith in probabilistic risk assessment. First, I shall briefly discuss the reference to judgment. Even in the Post Lewis tradition, judgment has been called for with varying emphasis ranging from the notion that probabilistic analysis should categorically supplant judgment to actual reliance on probabilistic analysis only if it confirms one's prior judgment. Such extreme positions may be rarely stated, but I believe they come close to some persons' outlook or behavior. Undoubtedly, Okrent calls for judgment and he calls for the development of criteria for judgment. One plausible implication of that recommendation is that prob-

abilistic risk assessment is not always trustworthy; therefore we must use judgment and attempt to rationalize and formalize the judgment process. The call for the development of criteria for judgment again seems to go beyond Post Lewis stage. I shall return later to this aspect.

I also wish to comment on the final phrase "With difficulty." I have heard speakers in the Post Lewis era give eloquent and penetrating description of the difficulties with probabilistic risk assessment and yet conclude with an optimistic prognosis of its use. What Okrent finds is difficulty from beginning to end. However, in the context of his testimony the phrase "With difficulty" seems to imply a hope or expectation of success. Because of this implication, I may part company with Okrent. In any case the phrase is not precise. Nor is the sentence "...to make decisions on...non-seismically qualified auxiliary feedwater systems." Is it just a matter making decisions or is a matter of making good decisions-with difficulty? (Presumably, Okrent meant good decisions.) What does difficulty mean? Can NRC solve the problem in one year, or in ten years. How many man-years or man-millenia are required? Would it require giant shake tables on which critical configurations of piping could be stressed with simulated earthquakes? Would it require eight full scale experimental power plants -- each with an additional outer containment building and machinery to absorb radioactive iodine? Perhaps we should opt for nine experimental power plants. With eight nuclear power plants we can run a full factorial of three factors, each at two levels. With nine we could accommodate a Graeco-Latin square with three levels for four factors; however, we could not estimate interactions. Neither design would provide a clean estimate for error; therefore should we double these numbers to achieve replication in each cell?

The last few sentences have been deliberately couched in statistical jargon and are facetious in this context. However, they are valid teasers. What constitutes plausible evidence (never mind scientific or compelling evidence) as a basis for regulatory action? How much should a probabilistic risk assessor know about statistics and the principles of design of experiments-even if he does not conduct experiments?

3. A Personal View on Uncertainty in Nuclear Regulation

The Post Lewis idea that we will substantially advance nuclear regulation if we just quantify the uncertainties (and have peer review) is in my opinion more a matter of illusion than substance. The tautology "If one does not know, one does not know" has obviously a much firmer basis, and, in my opinion, has more relevance to regulation. I do not believe that we can quantify uncertainties in a meaningful way over the whole range of regulatory problems. I find the following proposition difficult to accept as a general rule. We may not understand a phenomenon very well and are therefore uncertain about it; yet at the same time we understand it and our process of thinking about it so well, that we know the nature of the error in our thinking and therefore can quantify the uncertainty. I find empirical confirmation of my somewhat philosophical probing in an occasional gesture by some NRC engineers. The arm is raised with an open hand; the arm is pulled down and the hand is closed - the value of interest and its uncertainty was pulled out of the air.

I have not undertaken a review of studies on uncertainty. In his testimony, Okrent cites a study of his [2] which at least in some respects is similar to what I read or heard elsewhere. In his testimony, Okrent summarises that "... seven [respondents, i.e.] seismologists and geologists making their judgments independently, usually differed by a factor of 10^{-3} to 10^{-4} in their estimates of return frequencies for wide range of earthquakes at eleven different reactor sites." Reference [2] also deals briefly and rather vaguely with respondents' assessment of their uncertainty. While it is not clear what they understood by uncertainty (standard deviations (of what random variable or population), maximum error, or whatever*), from a pragmatic point of view their estimates of the occurrence rates and their assessments of the "uncertainties" in their estimates are not consistent. Of two respondents one "...generally estimated an uncertainty of 10-20%", and another, "...of a factor of two in the probabilities per year." However, on several estimated return frequencies they differed by as much as a factor of 1000. Other respondents' (vaguely stated) estimates of uncertainty also do appear too small in terms of the spread of the

* Are they personal uncertainties, or are they in some sense objective? Are they dependent on specific theories which in turn may not be firmly established? Were such theories shared by several or all assessors?

estimated probabilities among all respondents.

While the case study of Okrent may be a rather extreme example, I believe that on many NRC problems

a) the uncertainty is large - one, two, or perhaps even three or more orders of magnitude:
b) the nature of the uncertainty is vague
c) whatever the conceptual basis of uncertainties they are mis-estimated from a common sense point of view and often under-estimated or grossly underestimated.

Often these large and not well understood uncertainties need to be combined and propagated into a "final" uncertainty with no compelling prescription for combining and propagating uncertainties. Frequently one would expect that in some sense the uncertainty of the final result is larger than that of any of its inputs and therefore very large and that points (b) and (c) above are also amplified. Let me combine all these aspects of uncertainty under the label uncertainty complex.

There are many more or less specific facets of uncertainty that merit consideration. Later on I shall deal with some psychological aspects of analysis which relate to uncertainty. For sake of brevity I shall deal with only one more aspect under the label of futurology. The primary purpose of risk analysis is to assess future risk. While it is indeed reasonable to project from the past and present such projections are not error free. Reliability growth is a very plausible effect and most likely the dominant one. However, there are also potential adverse changes the likelihood of which is speculative.

1) Bathtub curve: most of the reliability data is from commercial reactors less than 20 years old. There is a possibility that some failure rates of vital components or systems could rise sharply after 20 years.
2) State of emergency plans 5 to 10 years hence.
3) A presumed safety feature backfires.
4) Sabotage from dissatisfied labor or terrorists.
5) Several years of successful operation bringing about complacency.
6) Economic conditions promoting shortcuts.

This list could probably go on; quite possibly if a very detrimental change were to come it might not be even thought of now.

There are various ways of viewing the uncertainty issue in nuclear regulation. Okrent in his first sentence says "...(NRC) makes decisions concerning the public health and safety in the presence of very considerable technical uncertainty." My reaction is that the NRC decision process is beset with an overwhelming uncertainty complex. It brings to mind the emperor without clothes. This must be an uncomfortable position for NRC as it would be for any regulating agency. However, it is not a circumstance about which NRC needs to be apologetic. We are in a new domain with many phenomena about which dependable knowledge has not been obtained. As Okrent points out in his introduction many regulatory agencies are regulating under similar circumstances. In fact, uncertainty complexes beset our lives as individuals as well as collectively as a nation. They range from difficulties in raising children to problems of national defense. The latter may affect the likelihood of nuclear war which in comparison would make any nuclear power plant catastrophy look puny.

If my assessment of the NRC uncertainty complexes is correct, then NRC has three broad choices.

a) It can take the current type of risk analysis at face value, make regulations in accordance with their results, and bluff on the validity of its decisions.
b) It can start or continue with vigorous efforts to make the probabilistic risk analysis more rigorous and convincing.
c) It can explicitly acknowledge profound uncertainty and regulate with recognition of this limitation.

These options are not mutually exclusive. One can use various shadings of these options, and the shadings may vary with the circumstances as indeed is the case now. Superficially option (b) appears attractive. However, I believe that in terms of "reasonable" precision many of our problems are intractable and will continue to be so. I would expect

only a slow nibbling away at a problem here or there. Option (a) does have the advantage that in principle it maintains a stronger degree of authoritativeness than option (c). Undoubtedly it is tough to regulate without an air of authoritativeness. However, option (a) may lead to bad decisions and may not be viable in the democratic process in which NRC must function. This brings us to facing up to option (c). In a fashion option (c) was or is operative for persons who favor the judgmental approach to regulation. Option (c) in my view does not necessarily call for judgmental approach. The intended thrust of option (c) is that both judgment and probabilistic risk assessment are very limited tools for assessing nuclear risks or for optimizing benefits against penalties with respect to nuclear energy.

4. Some Additional Discussion of Analysis and Judgment

I do not attempt here to resolve what role a highly fragile risk analysis should play in regulation, and in particular its relationship to or in competition with judgment.* This subject matter is outside my area of competence. I can only present some ideas related to it and state what my inclinations are. Before doing that I shall summarize some points that weaken the case for probabilistic risk analysis.

Particularly in difficult problems, mathematical analysis provides its own straightjacket. The analyst will only use methods he or she knows and that do not require an inordinate amount of effort. Thus certain types of failures will be treated as independent, constant failure rates will be postualted, or generic values will be applied to differing members of a class. Even if the analyst is sophisticated enough to use one of the few models for dependence, he or she is still limited to the few known models, all of which have limitations. The phenomena of nuclear power plants are very complex; many cannot be dealt with realistically with workable models. The thought processes of the analyst may in part be dictated or influenced by the medium of his choice; i.e., the mathematics that is practically available to him. This applies to the best analyst as well as the poorest; even though the former can deal more deftly with limitations and will generally

* C. Bennett and M. Ernst pointed out that it is the relationship or interaction between analysis and judgment that is paramount; I agree. Nevertheless, there are differing views on the relative reliance to be placed on each.

have more awareness of the limitations. The straightjacket idea is illustrated by the rather frequent and sometimes unjustified criticism directed at the mathematical analyst: "You have a beautiful solution to the wrong problem."

Analysts differ in their awareness of the limitations of their analyses and in their efforts to report that awareness. Some become so engrossed with their achievements that they do not see the shortcomings. Others while perhaps recognizing the shortcomings may not report them; in fact some may present their analysis with puffery. Perhaps the majority will state briefly and rather inconspicuously some of the assumptions and limitations of the analysis. It is my impression that only a minority of analysts at NRC drive home with force and proper elucidation the limitations of their analysis. The analyses are provided directly or indirectly to "users" which may be colleagues, supervisory personnel, the commissioners, or ultimately the public. Even if limitations of the analysis are serious and stated forcefully, the user has a strong tendency to take the results at face value - particularly if they confirm his predilection, or seemingly help him to get out of a dilemma. Analysis no matter under what label (mathematical, statistical, risk) has a ring of authority and authenticity. It is often unquestioningly accepted by the lay analyst. In fact even capable analysts are affected by the halo effect of "analysis". Unless

a) they give other persons analysis careful scrutiny

b) had experiences with the type of analysis under review,

they might accept the results with less reservations than they deserve.

Besides the wrong psychological impact, analyses often have unjustified staying power. Early analyses become the basis of later analyses, thus relieving the later analyst of having to deal with the tough issues of not well understood phenomena. It is much easier to cite than to investigate and think through difficult problems. Individuals and institutions will defend their analyses and insist they are valid, discounting evidence

to the contrary. While I sense in NRC lessening rigidity in the defense and use of past analyses, the problem of unjustified staying power is still with us.

If formal analysis has so many limitations-I do not claim a complete catalogue of them - are the results of judgment to be trusted more than those of formal analysis? As I indicated earlier I lack competence to answer this question. For the sake of discussion let me speculate. It is conceivable that a knowledgeable person with a subtle mind might provide better answers for the following reasons. He or she:

a) is not bound by the formalism of analysis
b) brings to bear conscious and unconscious knowledge and wisdom; and
c) has a broader perspective on the problem than the formal analyst.

On an intellectual level I am not convinced by such speculation, and even if true in some or most cases, how do we decide which are these cases? Also, how do we decide who is the most knowledgeable, wise, and subtle person to provide this judgment? Yet on an emotional level, I tend toward judgment over analysis in nuclear regulation for the following reasons:

1) Too much credibility is given to analysis.
2) The staying power of analysis is too strong.
3) The judgment and its limitations are often more readily understood than the analysis.

While some of the same causes for points (1) and (2) also function for judgment, I believe that they function less intensively for judgment. I believe that judgment will in general be accorded less unjustified authority and less staying power than analysis.

Okrent states "Criteria for judgment should be developed...". NRC has difficulty developing criteria for good analysis. I believe it is even more difficult to develop criteria for good judgment. Despite the bleak outlook, such an effort may be worthwhile. I believe it should be combined with a review of the philosophy of regulation, in particular with option (c), namely that NRC explicitly acknowledge profound uncertainty,

and regulate with recognition of this limitation. The review group should have profound thinkers and good pragmatists (not necessarily mutually exclusive). It could conceivably be supported by several regulatory agencies having common problems.

5. Postscript

It might be inferred from the text above that I believe that probabilistic risk analysis is useless, or nearly so, for regulatory purposes. This is not my point at all. I expressed my concern with various limitations of analysis and its misuse particularly with respect to uncertainties. I do believe that probabilistic risk analysis does have a vital role to play in NRC regulations. The why and how of this role I prefer not to tackle in this document. Some issues of risk analysis in NRC are raised in my talk to the ASA Ad Hoc Advisory Committee on Nuclear Research (3).

6. Acknowledgments

Dr. Carl Bennett, Mr. Malcolm Ernst, Mr. William Maher, Mrs. Esther Rubinstein, Mr. Joel Rubinstein, and Mr. Norman Wagner provided constructive criticism. I thank them for their help.

7. References

1. David Okrent, Testimony to the Nuclear Safety Oversight Committee, January 20, 1981, Santa Barbara.

2. A Survey of Expert Opinion on Low Probability Earthquakes, Annals of Nuclear Energy, Volume 2, pp 601-614, 1975.

3. David Rubinstein, A Statistician's View of NRC Statistics, edited transcript of talk to the ASA (American Statistical Association) Ad Hoc Advisory Committee on Nuclear Research, November 7, 1980, Washington, D. C.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

3/18/82

NOTE TO: Frank Coffman

FROM: Jim Conran

SUBJECT: COMMENTS ON DRAFT LETTER (HANAUER TO COOPER-NUPPSCO)...AND RELATED MATTERS.

The Draft letter looks ok to me as is; but a bit more should be said about the pot that is boiling here. I have talked to Carl Johnson, RES (NRC's representative on the NUPPSCO Committee referred to in the incoming) regarding the safety classification/terminology issue involved here. He sent to me the draft of NUPPSCO's proposed "alternative definitions" (see attached) plus a Minority Report reflecting the views of dissenting members of the NUPPSCO Committee (also attached). My comments to him regarding these matters were:

(a) The proposed definitions may be consistent (as claimed) with Denton's "standard definitions" (approved by Denton on 11/20/81 - see attached); but it would surely involve a very substantial review effort to demonstrate/prove that point. And even if that were done, in my opinion we would not have "gained" anything; we would only then have additional, new safety classification terms which we would then have to try to get everybody to learn and use consistently.

(b) We really don't need any new (alternative) safety classification terms defined; we just need standardization (consistency), within both the staff and the industry, in the usage of the terms already included in the regulations and existing regulatory guidance document (e.g. Reg. Guides, SRPs, NUREGs, etc.). That was the purpose of Denton's 11/20/81 memo to all NRR people. The need to take the next obvious step (i.e. incorporating Denton's standard definitions into the "DEFINITIONS" sections of the regulations so that staff and industry must/can use them consistently) is readily apparent from the NUPPSCO dissenter's usage of the term "Important to Safety" in the Minority Report.

(c) Although I am not, and we (NRR) should not be, receptive to the proposed new "alternative" safety classification language, the underlying or associated industry effort to understand the relative safety importance of reactor plant components, and to establish a basis for sorting those components into various categories, should be of great interest to us. I think Hanauer is right in wanting to talk with industry about their approach, categorization bases, etc. This more interesting and potentially useful aspect of the industry effort in developing the new proposed standards ANS 51.1 and ANS 52.1, is apparently spelled out in considerable detail in those draft standards; so I have asked Carl to obtain and send to us copies of them prior to the (rescheduled) Hanauer meeting with NUPPSCO members. That kind of info is clearly related to,

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ENCLOSURE 6

and would probably be valuable input to a number of RES and NRR "importance ranking" type efforts already underway (e.g. A-1297 (RRAB); A-1295 (RRAB); Walt Haass' Graded Q.A. Development effort just getting underway with EGG as contractor; RES long-term importance ranking/graded Q.A. effort just getting underway with Sandia as contractor; etc.).

Our (RRAB and DST) proper course for the future regarding this general topic should be to propose that Denton's "standard definitions" be formally incorporated into the appropriate "DEFINITIONS" section of the regulations (e.g. 10 CFR 50 Appendix A and Appendix B, and 10 CFR 100 Appendix A). This would clarify to the public and the industry (as well as to the entire NRC staff) that we (NRC) know what our regulations and regulatory guidance mean , and that we intend to enforce consistent interpretation and application of them. At the same time, we must be sensitive to the industry's concern (as reflected in the NUPPSCO Minority Report) that by clarifying and insisting on consistent usage of the language of our regulations, we are "changing the meaning" of that language (e.g. important to safety) in order to sneakily ratchet or broaden the scope of the existing regulations. For that reason, the same language Denton used in his 11/20/81 letter to ALL NRR to emphasize that point should be included in the "Discussion" section of the Proposed Rule that would incorporate his "standard definitions" as I have suggested.

To really wrap this thing up right, we should also initiate the development of another Reg. Guide and another SRP section to provide further detail/discussion/guidance to both the staff and the industry regarding proper application of Denton's "standard definitions." I know that Thadani and Ernst have been somewhat reluctant to involve us heavily in this kind of activity in the past because of our severely limited resources; but the passage of time has indicated clearly, I believe, that if we (who happen to know best the "background" of the development of Denton's "standard definitions") don't take the initiative in getting done what I am recommending, it simply isn't going to get done. And, as you know, a great deal of support has developed for getting it done (e.g. from ELD, RES, ACRS, and ASLB, TMI-1 Board) as a result of our having addressed these issues in a number of different contexts over the past 1½ years. This is not just "word smithing"; what is involved is the precise meaning of the specific language that describes some of the most fundamental concepts of our regulatory structure and philosophy. We really ought to get it (consistently) right, sometime soon.

Jim

cc: J.Conran Chron

ROUTING AND TRANSMITTAL SLIP

Date 7/12/82

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Frank Gillman		
2. Ashok Thadani		
3. Mel Ernst		
4. Steve Hanauer		
5.		

	Action		File		Note and Return
	Approval		For Clearance		Per Conversation
X	As Requested		For Correction		Prepare Reply
	Circulate		For Your Information		See Me
X	Comment		Investigate		Signature
	Coordination		Justify		

REMARKS

I would like to request that the personal views expressed in my note be sent forward with the concurrence package as it goes back up the line. Specifically, I would like to raise again for DST/RRAB management reconsideration the question of whether we should not be taking more initiative in the course of action recommended.

JAC

DO NOT use this form as a RECORD of approvals, concurrences, disposals, clearances, and similar actions

FROM: (Name, org. symbol, Agency/Post)	Room No.—Bldg.
Jim Conran	310
	Phone No. 2-7111

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
Prescribed by GSA
FPMR (41 CFR) 101-11.206

☆ U. S. GPO:1977-0-241-530/3238

EXCERPT FROM

REBUTTAL TESTIMONY ON CONTENTION 7B, DATED 7/1/82,
BY. J. H. CONRAN TO THE SHOREHAM ASLB

A. The Staff does not believe it is acceptable for the language differences indicated in the statements on p. 55 of Applicant's testimony to go unresolved because of certain unacceptable implications of the different usage of the safety classification language of the regulations. These implications obtain not only with regard to Shoreham licensing but also with regard to the efficacy of the Staff's approach and methods of safety review in more general application. There are at least three such implications:

1. Because the Staff conducts an audit review, reliance must be placed on commitments by Applicants that all portions of the regulations are complied with (see, e.g., FSAR § 3.1.2.1). It is critical that these commitments mean what the Staff understands them to mean if the Staff's determination of "reasonable assurance" (which finding must be made in accordance with 10 C.F.R. § 50.35(c) in order to license a facility) is to be meaningful in the sense intended in the regulations.

2. It is clear under the Staff's understanding of "important to safety" (but not under Applicant's) that there exists in the regulations a requirement under GDC 1 for a QA program for certain non-safety-related structures, systems and components (i.e., those important to safety).

3. Under Applicant's construction of "important to safety," the obligations imposed by 10 C.F.R. Part 21 might be more narrowly construed than would be the case under the Staff's broader definition of that term.

These examples demonstrate why agreement on the safety classification definitions provided by the Denton definition is extremely significant.

* U.S. GOVERNMENT PRINTING OFFICE: 1983-381-299:133

RFW

MAY 20 1983

Docket No. 50-329
Docket No. 50-330

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

Gentlemen:

Thank you for your letter dated May 6, 1983, informing us of the steps you have taken to correct the noncompliance which we brought to your attention in Inspection Report No. 50-329/83-03(OSC); 50-330/83-03(OSC) forwarded by our letter dated April 7, 1983. We will examine these matters during a subsequent inspection.

Your cooperation with us is appreciated.

Sincerely,

"Original signed by R. F. Warnick"

R. F. Warnick, Director
Office of Special Cases

cc w/ltr dtd 5/6/83:
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan
Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)
Howard Levin (TERA)
Billie P. Garde, Government
Accountability Project

RIII	RIII	RIII	RIII	RIII
RFW	RFW	RFW	RFW for	RFW
Gardner/jp	Landsman	Harrison	Shafer	Warnick
05/18/83				

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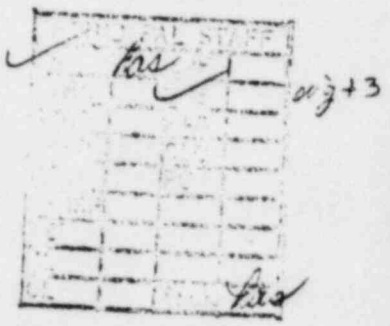
Consumers Power Company

James W Cook
Vice President - Projects, Engineering and Construction

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



May 6, 1983

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

MIDLAND NUCLEAR COGENERATION PLANT
INSPECTION REPORT NO 50-329/83-03(OSC) AND 50-330/83-03(OSC)
FILE: 0.4.2, 0485.16 UFI: 70*01, 42*05*22*04 SERIAL: CSC-6688

Reference: (1) J G Keppler letter to J W Cook, dated April 7, 1983
Inspection Report No 50-329/83-03(OSC) and 50-330/83-03(OSC)

This letter, including Attachment 1, provides our response to Reference 1, which transmitted the subject Inspection Report and which requested our written response to the items of noncompliance therein. Reference 1 also requested that reviews of our quality program be performed to ensure that no other informal documents, such as the Attachment 10 form, are being used to identify nonconforming conditions that are not included in our corrective action system. On March 4, 1983, Consumers Power Company initiated, with the issuance of MPQAD Quality Action Request F-292, action to review Bechtel instructions, guidelines and procedures for proper quality classification. These actions are continuing and we are correcting problems as they are identified. When the quality classification of these documents is established, we will initiate additional reviews to ensure that the practices identified in these documents are consistent with the Quality Assurance Program requirements. Special emphasis will be placed on identifying informal documents used to control nonconforming conditions. The extent of the review effort, our findings, and the corrective action will be reported at a later date. Management personnel have been alerted to the necessity of preventing the occurrence of other informal documents for identifying nonconformances. In addition, Inspection personnel have been instructed to identify and report all observed nonconformances using the appropriate official documents provided within the established nonconformance/corrective

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action system. We consider these actions, when complete, will resolve this issue.

Consumers Power Company

By James W. Cook
James W Cook

Sworn and subscribed to before me on this 6th day of May, 1983.

Patricia A Sullivan
Notary Public

My commission expires 2-4-86

JWC/BHP

CC: RFWarnick, NRC Region III
JJHarrison, NRC Region III
RNGardner, NRC Region III
RJCook, NRC Senior Resident Inspector, Midland Site
RBLandsman, NRC Region III
BLBurgess, NRC Resident Inspector, Midland Site

BCC RCBauman, P14-314B
WRBird, P14-418A
FWBuckman, P14-113A
JEBrunner, M-1079
NRC Corres File, P24-517
MLCurland, Midland
LEDavis, Bechtel-Midland
MADietrich, Bechtel-Midland
GFEwert, Midland
FDField, Union Electric
WJFriedrich, Midland
MEGibbs, IL&B
WDGreenwell, Bechtel Ann Arbor
DEHorn, Midland
EMHughes, Bechtel AA
KEMarbaugh, Midland QA/NO
BWMarguglio/DJones, JSC-220A/206B
JKMeisenheimer, Midland
DBMiller, Midland (3)
JAMooney, P14-115A
JARutgers, Bechtel Ann Arbor
PSteptoe, IL&P
DATaggart, Midland
RAWells, Midland
RCWilliams, IL&B Washington
REWhitaker, Midland

CONSUMERS POWER COMPANY'S RESPONSE TO
US NUCLEAR REGULATORY COMMISSION, REGION III
INSPECTION REPORT NO 50-329/83-03(OSC) & 50-330/83-03(OSC)

Appendix (Notice of Violation) to Inspection Report No 5-329/83-03(OSC) and 50-330/83-03(OSC) provides items of noncompliance to 10 CFR 50, Appendix B. The NRC statement and our response for each item of noncompliance are given below:

NOV Item A.1.a & b (83-03-01A)

"Measures were not established to control the issuance of Administrative Guidelines which described activities affecting quality. The Administrative Guidelines were not reviewed for adequacy or approved for release by the licensee. Two examples were:

a. Administrative Guideline M4.00, Piping System Walkdowns, Revision 0, October 28, 1982.

b. Mechanical Guidelines for System Turnover, Revision 1, no date."

Response

(1) Corrective Action Taken and Results Achieved:

This item is associated with identified concerns which have been documented by MPQAD Quality Action Request F-292 issued March 4, 1983 and also documented by the Biennial Audit Finding AMS-83-9-7F issued March 23, 1983 which formally documented the nonconforming condition of procedure classification. Follow-up actions from the above have identified some Bechtel site administrative instructions and guidelines as not properly classified. These instructions and guidelines have been identified and are currently being reviewed and processed by the procedures review team as part of the Construction Completion Program (CCP). These guidelines are/will be submitted for Consumers Power Company Site Management and MPQAD approval as needed to support quality-related activities. All Q-Listed administrative guidelines are being changed to be field instructions or field procedures or are being incorporated into field procedures or field instructions.

(2) Corrective Action Taken to Avoid Further Noncompliance:

Refer to response given for NO Item D.2.b, c and d.

(3) Full compliance will be achieved by July 1, 1983.

NOV Item A.2 (83-03-01A(2))

"The CPCo Soils Section was using an out-of-date drawing C1424, Revision 2, instead of Revision 3 to review and approve underpinning Pier 11 work."

Response

(1) Corrective Action Taken and Results Achieved:

a. Discrepant drawing was corrected by Document Control Center on the day notified, February 4, 1983.

b. All controlled design documents in the Construction Department were audited against the current drawing index. This verification disclosed that 97 documents were missing or outdated and that 160 document changes were similarly discrepant. The Construction Superintendent was notified and discrepant drawings were removed from the active file until corrected. Corrections were completed February 24, 1983.

c. The CPCo - Site Management Office (SMO) Construction Department uses remedial soils work drawings and procedures for reviews of work, and changes to work, in conjunction with the NRC and CPCo Work Authorization Procedure, dated August 12, 1982. All design changes for remedial soils activities are reviewed by SMO - Construction to determine if the change requires NRC review and authorization to proceed, or to continue, with the work. Since several documents and document changes were determined to be discrepant, it is possible that reviews of work were not properly conducted by SMO - Construction. After the documents were brought up to date by the Document Control Center, SMO - Construction personnel went back and reviewed all current revisions to drawings. It was determined that no modifications to, or reauthorizations of, previously submitted Work Authorizations were required as a result of this review.

(2) Corrective Action Taken to Avoid Further Noncompliance:

a. Evaluation disclosed that a large part of the problem was attributed to untimely and inconsistent response to additional distribution requirements. Midland Project Procedures Manual, Bulletin, Comm-14, is being revised to simplify the flowpath of requests and to specify the method for backfitting additional distribution requests. This is targeted for completion by June 1, 1983.

b. The Construction Department files will be audited at least once every three months to verify accuracy.

c. Document Control Center personnel will be retrained on the processing and filing of design documentation. This step was completed March 15, 1983.

d. All other controlled document files maintained by the Document Control Center will be audited for similar discrepancies.

NOV Item A.2 (83-03-01A(2)) Continued

(3) Full compliance will be achieved June 1, 1983.

NOV Item B (83-03-01A(1))

"On September 22, 1982 during audit M01-333-2, auditors determined that unofficial Attachment 10 Forms were being used by QC Inspectors to document nonconformances and deficiencies instead of using In Process Inspection Notices. This audit finding was drafted in pencil, however, the finding was not included in the above audit report and there was no evidence that a management review of this finding was conducted."

Repsonse

(1) Corrective Action Taken and Results Achieved:

The improper use of Attachment 10 forms should have been specifically referenced in the Audit Finding. The Audit Finding cited was issued as Audit Finding Number M01-333-2-14F (Action Item S-1739) dated October 20, 1982. The draft Audit Finding and the issued Audit Finding both cited the noncompliance with Bechtel Field Procedure FPB-6.000, Paragraph 5.2.2. The issued Audit Finding stated, "Systems are being turned over for pressure testing to Quality Control for inspection with items found to be incomplete or not yet installed," which was the concern cited in the draft finding via the form of an Attachment 10. The Attachment 10 was a Field Engineering form. It was not referred to in the final Audit Finding Report in part because the manner in which it was being used had been stopped immediately after the auditors had identified the practice. This effectively accomplished immediate corrective action, and MPQAD management was aware of the finding and action. In addition, the MPQAD site auditing section will perform audits with attention to reporting observations in light of this violation.

(2) Corrective Action Taken to Avoid Further Noncompliance:

a. The corrective action reported in (1) above is complete with regard to auditing requirements.

b. Correction action to be taken in regard to previously issued Attachment 10 forms is described in the response to NOV Item C.

c. An ongoing review of project programs and procedures to check for informal documents being used for identification of nonconformance is being conducted.

(3) a. Full compliance has been achieved.

b. Full compliance has been achieved.

c. Full compliance will be achieved upon completion of the review effort.

NOV Item C (83-03-01C)

"A determination of significance and corrective action was not taken on approximately 500 Attachment 10 forms which were written by QC Personnel and were identified as containing nonconformance and deviations that were adverse to quality."

Response

(1) Corrective Action Taken and Results Achieved:

A review has been performed to determine the significance of having utilized the Attachment 10 forms. Twenty (20) Attachment 10s (completed prior to September 1982) were selected for review along with the corresponding test packages. As a result of the review, it has been concluded that:

a. Discrepancies were either reworked prior to the hydrostatic test or documented on NCRs and so noted on the Attachment 10.

b. All discrepancies were resolved and properly documented during installation inspections performed prior to performance of the hydrostatic test. Consequently, corrective action was taken on all Attachment 10 identified nonconformances.

c. Performance of the hydrostatic test PQCI/IR T-1.00 was not compromised by the use of Attachment 10 forms.

In addition, completed hydrostatic test packages are being reviewed under a separate evaluation initiated as a result of routine quality assurance activities. This review will also evaluate the completeness and acceptability of the installation records (ie QCIR/IR's) necessary to support the performance of the hydrostatic tests. Any discrepancies associated with these records will be identified as part of this review and appropriate corrective actions taken.

(2) Corrective Action Taken to Avoid Further Noncompliance:

Use of Attachment 10 forms to identify deficiencies was stopped immediately after discovery by the MPQAD audit in September, 1982. Inspection personnel have been and are continuing to be instructed through the MPQAD training and certification program to document all observed nonconformances in accordance with approved nonconformance procedures.

(3) Full compliance has been achieved.

NOV Item D (83-03-01D)

"'Q' activities, including the performances of load calculations for 'Q' electrical conduit hangers, were being accomplished in accordance with non-'Q' work procedures/instructions."

Response

(1) Corrective Action Taken and Results Achieved:

a. Classification of Procedures:

The procedural aspects of this item have been documented by Quality Action Request F-292 issued March 4, 1983 and also documented by the Biennial Audit Finding Report AMS-83-9-7F issued March 23, 1983 (which formally documented the nonconforming condition of procedure classification).

MPQAD has reviewed Field Procedures for proper quality-related classification including proper "Q" and "non-Q" designations of quality-related procedures. This review has resulted in the identification of thirty-three Field Procedures initially assessed as incorrectly classified "non-Q". Other than incorrect classification, no items of noncompliance with procedural content were identified. These procedures are currently being revised as part of the Construction Completion Program in support of the system, area and hanger teams.

With regard to the inclusions of proper "Q" notations within the procedure's margin to indicate the specific portions of the procedure as quality-related, MPQAD has reviewed and identified approximately 30 additional typical procedural sections (in addition to the section of FPE 3.000 cited in the Inspection Report) that were not correctly classified as quality-related. The review did not identify any item of noncompliance with procedural content. Since the correct classification for procedural sections has been a problem, this practice is being revised to identify whether the procedure contains quality-related content and eliminate the practice of identifying subportions or paragraphs of the procedure as "Q" or "non-Q". Specifically, Bechtel Field Procedure FPG-1.000, Revision 3, entitled "Initiating and Processing Field Procedures, Instructions and Administrative Guidelines and Specifications," will be approved by May 10, 1983 to reflect this action.

NOV Item D (83-03-01D) Continued

b. Load Calculations

Field Procedure FIE-3.320 is a procedure developed to number the seismic raceway hangers, not to verify the adequacy of the hanger to support the load. This procedure should not have been used to calculate hanger loadings. NRC M01-9-3-152 has been issued to identify the need for specific requirements to perform and document results of the verification of the adequacy of loads on class 1E hangers. The actual instructions for performing the load calculations are provided in the Project Engineering Drawings E42b(Q) and E39(Q). These are the only documents which have this information in them. It consists of weights per length of raceway and allowable load tables for different types of raceway supports. Calculations were performed; however, in the vast majority of cases, supports do not require written calculations per se due to large capacity of support compared to small actual loading. FPE-3.000, Paragraph 5.1, states that the raceway "shall be installed in accordance with the latest issued for construction layout drawings and referenced details as well as 7220-E42 and E-42B ..."

FIE-3.320 will be revised to clarify its intended purpose and scope. A new quality-related field procedure is being developed to address the controls and verification of the adequacy of the loading of class 1E hangers.

(2) Corrective Action Taken to Avoid Further Noncompliance:

a. As stated above, the mechanism to establish specific portions of a procedure as "Q" is being eliminated and will be reflected in a revision to Bechtel Field Procedure FPG-1.000 which will be approved by May 10, 1983.

b. Internal MPQAL Procedures are being revised to establish MPQAD review criteria for Bechtel-Site Procedures, Instructions and Guidelines. The MPQAD Procedure will provide a means for reviewing non-quality-related procedures on a periodic basis to ensure their appropriate classification. This procedure, entitled "MPQAD Review and Approval of Bechtel-Site Procedures, Instructions, and Guidelines" (Procedure N-6), is scheduled for approval by May 16, 1983.

c. With regard to audits of procedures, instructions and guidelines, MPQAD Procedure F-1M, entitled, "Audits," is being revised to clarify that audits verify that quality-related activities are governed by quality-related procedure or instructions and that such procedures or instructions are correctly classified as "quality-related." This procedure is scheduled to be approved by June 1, 1983.

NOV Item D (83-03-01D) Continued)

d. All Field Procedures (both Q and Non-Q) are being submitted to MPQAD for review.

e. FIE-3.320 will be revised to clarify its intended purpose and scope.

f. A new quality-related field procedure, being developed, will address the controls and verification of the adequacy of the loading of Class 1E hangers.

(3) a. All existing Bechtel Field Porcedures have been reviewed for proper classification. This activity is complete. All revisions to Field Procedures will be submitted to MPQAD for review in accordance with new requirements. This activity is ongoing.

b. Full compliance for the specific procedures referred to in 2a, 2b, 2c, 2e and 2f, above is scheduled for completion by approximately June 15, 1983.

Warnick

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

APR 07 1983

Docket No. 50-329
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 inspections conducted by Messrs. B. L. Burgess, R. J. Cook, R. N. Gardner, R. B. Landsman, and W. D. Shafer of this office on January 22 - February 20, 1983 of activities at Midland Nuclear Power 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. R. A. Wells and others 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.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as specified in the enclosed Appendix. A written response is required.

Regarding examples B and C of the item of noncompliance relating to the Attachment 10 Forms which were used to document nonconformances instead of using the required corrective action forms, the staff considers that these violations are similar to the previous In Process Inspection Notice violation for which escalated enforcement action was taken. We have decided not to pursue escalated enforcement in this matter because these violations occurred within the same time frame as those for which the escalated enforcement was taken on February 8, 1983. However, you are requested to review your quality program and ensure that no other informal documents are being used to identify nonconforming conditions that are not being included in your corrective action system. Please provide a sworn statement attesting to your review effort and the findings made therein.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosure(s), and your response to this letter will be placed in the Public Document Room.

8304120542

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Original signed by
James G. Keppler

James G. Keppler
Regional Administrator

Enclosures:
1. Appendix, Notice of Violation
2. Inspection Report No. 50-329/83-03(OSC) and No. 50-330/83-03(OSC)

cc w/encls:
DMB/Document Control Desk (RIDS)
Resident Inspector, RIII
The Honorable Charles Bechhoefer, ASLB
The Honorable Jerry Harbour, ASLB
The Honorable Frederick P. Cowan, ASLB
The Honorable Ralph S. Decker, ASLB
William Paton, ELD
Michael Miller
Ronald Callen, Michigan Public Service Commission
Myron M. Cherry
Barbara Stamiris
Mary Sinclair
Wendell Marshall
Colonel Steve J. Gadler (P.E.)
Howard Levin (TERA)

Concurred in by
IE Enforcement (Klingler)

RIII	RIII	RIII	RIII	RIII	RIII	RIII	RIII	RIII
Gardner/np	Landsman	Shafer	Warnick	Schultz	Davis	Lewis	Keppler	PAWLIK
03/30/83				4-6-83	4/6	4/6	4/6/83	

STONE & WEBSTER ENGINEERING CORPORATION

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United States Nuclear Regulatory Commission
Midland Site Resident Inspection Office
Route 7
Midland, MI 48640

February 18, 1983

J.O. No. 14358
Ref. MPF 21

Attention Mr. R. Cook

RE: DOCKET NO. 50-329/330
MIDLAND PLANT - UNITS 1 and 2
INDEPENDENT ASSESSMENT OF AUXILIARY BUILDING UNDERPINNING
REPORT NO. 21

A copy of the Independent Assessment of the Auxiliary Building Underpinning Weekly Report No. 21 for the period February 6, 1983 through February 12, 1983, is enclosed with this letter. Included, as an attachment, are the minutes of the daily meetings held during the week between members of the Assessment Team and Site Engineering, Construction and Quality Assurance personnel.

If you have any questions with respect to this report, please contact me at (617) 589-2067.

Very truly yours,

A. S. Lucks
ASL/WK

A. Stanley Lucks
Project Manager

Enclosures

ASL/ka

J.O. NO. 14358
Midland Plant
Units 1 and 2
Independent Assessment
Auxiliary Building Underpinning

Weekly Report No. 21

February 6, 1983 through February 12, 1983

Personnel on Site

Stone & Webster Engineering Corporation (SWEC)

S. Lucks	2/8 - 2/9
S. Rossier	2/8
W. Kilker	2/7 - 2/8
L. Rouen	2/7 - 2/12
P. Barry	2/7 - 2/12

Parsons Brinckerhoff, Quade and Douglas (PBQD)

P. Parish	2/7 - 2/12

Meetings Attended

Date	Represented	Purpose
2/7 through 2/11	Stone & Webster Bechtel Consumers Power Parsons (2/7 - 2/11)	Daily Meetings
2/8	Stone & Webster Bechtel Consumers Power Mergentime	FIVP proofload jacking coordination
2/11	Stone & Webster Bechtel Consumers Power Mergentime	Weekly Soils Review

Activities

Construction - The telltales were installed in pier W12. Forming was completed and concrete was placed from the bottom of the bell to the top of the pier. Concrete mix C-1c was used. This mix was previously tested and approved for use on the main plant construction. Concrete was pumped to the pier and a trunk was utilized within the pier to place the concrete. The vertical free fall of the concrete was controlled as the placement progressed and the concrete was continuously vibrated to insure consolidation.

Installation of reinforcing steel was started in pier E12.

The proofload jacking of the Unit 1 FIVP was performed.

Quality Control, Documentation and Records -

1. Reviewed the over-inspection report for pier W12 rebar installation and splicing.
2. Reviewed splicer qualification test results.
3. Reviewed production "sister splice" test results.
4. Observed the installation and inspection of reinforcing in pier E12.
5. Reviewed trial mix data for the concrete mix to be used in pier E12.
6. Observed batching of concrete for pier W12.
7. Observed placement of pier W12 concrete.
8. Observed testing of pier W12 concrete.
9. Observed Unit 1 FIVP proofload jacking.

Observations

Construction - The concrete placement for pier W12 was in accordance with the specifications and procedures. Concrete was properly placed and vibrated.

Reinforcing steel for pier E12 was clean and installed properly. The tapered threaded ends of the reinforcing were protected and in good condition prior to installation.

The proofload jacking of the Unit 1 FIVP was well planned and organized. It was accomplished in accordance with the drawings. A transcription error on the Combined Calibration Record for one of the jack points resulted in a load that was slightly lower than that specified for the 90, 95 and 98% load increments. The resolution of this problem was immediately coordinated between the Resident Structural Engineer, the Project Engineering Representative, the Field Engineers and the Quality Assurance and Quality Control Representatives. The situation was corrected prior to attaining the 100% load increment and the intent of the proofload jacking was accomplished.

Quality Control, Documentation and Records - A review of the splicer qualification records showed that one splicer was not fully qualified. MPQAD had already issued a non-conformance report on this item. The review of production splice test results and the over-inspection reports for reinforcing steel installation indicated these items to be in compliance with the project requirements.

A review of the data for Concrete Mix C-5c showed that the mix did not meet the qualification requirements of ACI-301. This was identified by the Assessment Team as NIR No. 5.

The contractor elected to use a previously approved concrete mix for pier W12 instead of Concrete Mix C-5c.

Non-Conformance Identification Reports

Status of previous issues: (NIR numbers on longer listed have been closed-out during previous week.)

NIR No.	Description	Date (Opened)	(Closed)
4	Welding Qualification Procedure	12/29/82	2/8/83
5	Concrete Mix Qualification	2/10/83	

W E Kelley
Project Engineer

A. S. Zaudke by WK
Project Manager

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 7, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	W. Kilker	R. Sevo	------
	J. Fisher		W. Lytle	
	J. Gaydos			

1. J. Fisher said all NCR on materials in pier W12 including access drift will be dispositioned before concrete is placed in the pier.

2. Plasticized concrete will be used for pier W12 if all of the trial mix design criteria can be met in time.

3. E. Cvikl explained the need for washers on the bolts for the steel lagging.

4. J. Fisher stated that a specification change has been issued to require vibrating of all concrete.

5. J. Gaydos said truck mixer uniformity tests are scheduled to be made with the plasticizer additive.

6. J. Fisher said the requirments for minimum strength on mud-mat mixes is being re-evaluted.

7. In response to a Team question, E. Cvikl said spreading of steel sets in done in the direction of the adjacent piers (i.e., east/west) to produce an arching effect. On some future piers spreading will be on the long sides.

8. J. Fisher and W. Kilker discussed a clarification of defining use of and need for backpacking as stated in daily meeting note of January 18. Backpacking will be performed to avoid loss of ground and all voids will be backpacked unless the RGE agrees it is not necessary.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 8, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	E. Cvikl	W. Kilker	R. Oliver	R. Weiland
	J. Gaydos	A. Lucks	J. Shah	
	D. Lavelle	L. Rouen		
		Parsons		
		P. Parish		

1. Dave Lavelle described the on-going process of qualifying the plasticized concrete mix for use in the underpinning.

2. R. Oliver said further discussions with engineering are required on closing-out the NCR on channel welding.

3. J. Gaydos stated truck mixer uniformity tests were completed yesterday. Results will be available today.

4. In response to previous discussions on Carlson meter installation J. Gaydos will prepare short description.

5. Dave Lavelle said there had been two "round-map" meetings on concrete placement. W. Kilker said the Team should be informed of these meetings ahead of time.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 9, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	R. Sevo	-----
	E. Cvikl	S. Lucks		
	J. Kelleher	P. Barry		
		Parsons		
		P. Parish		

1. The disposition to the NCR for the reshore channel in the west access drift is due February 9, 1983.

2. Calibration data was submitted for equipment to be used in the addition of plasticizer to concrete.

3. J. Kelleher said truck mixer uniformities were performed today.

4. The Team raised questions about the preliminary road map for concrete placement. R. Sevo said that the questions are answered in the Revision No. 12 of the Mergentime procedure.

5. The Assessment Team questioned Spec C-195 statement that jackloading of FIVP - on hold. E. Cvikl is to provide answer.

6. The Team questioned what requirements are used for the development of concrete mixes. J. Kelleher is to provide answer.

7. The Team also questioned the adequacy of the Mergentime rebar splicing procedure, to define what functions are to be performed by the qualified splicer. J. Fisher will investigate.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 10, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen	G. Carpenter	-----
	E. Cvikl	P. Barry		
	D. Lavelle			
	J. Gaydos			
	D. Hemmelberger			
	V. Patankar			

Parsons

P. Parish

1. Additional mixer uniformity tests will be performed on the truck mixers using a mix with the working slump range.

2. Received requested mix design information.

3. FIVP proof load jacking is not on hold. The details are on drawing No. C-1494.

INDEPENDENT ASSESSMENT TEAM MEETING WITH BECHTEL

Date: February 11, 1983

Attendees:	Bechtel	Stone/Webster	MPQAD	CPCo
	J. Fisher	L. Rouen		G. Murray
	E. Cvikl	P. Barry		
		Parsons		
		P. Parish		

1. NIR #5 was written on the approval of mix C-5c since trial mix data did not meet ACI-301. Bechtel will use another concrete mix for placement of pier W12 today.

2. Stone/Webster considered the mixes with and without HRWR separate mixes requiring separate qualifications. The requirement for the qualifications of mix with HRWR is based on ACI-301 Section 3.8.2 and ACI-212 Section 1.5.2.

3. Stone/Webster questioned if two sets of cylinder tests would be taken, if concrete used for a pier placement included trucks with and without HRWR. Bechtel will advise.

5. Stone/Webster asked if mix E-4c approved by an SCN on December 1, 1982 is still approved for use in underpinning. Bechtel will advise. If the mix is still approved, Stone/Webster would like to review the test data on this mix.

6. Stone/Webster asked if the mix to be used for pier W12 placement was approved mix. Bechtel stated it was approved mix that had been used during plant construction. Stone/Webster asked for the test data for mix approval on this mix.