



**Consumers
Power
Company**

*Orig. file
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James W Cook
Vice President - Projects, Engineering
and Construction

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

February 9, 1981

Mr J G Keppler, Regional Director
Office of Inspection and Enforcement
US Nuclear Regulatory Commission
Region III
799 Roosevelt Road
Gler Ellyn, IL 60137

MIDLAND NUCLEAR PLANT
INSPECTION REPORT NO 60-329/80-32 AND 50-330/80-33
FILE: 0.4.2 UFI: 73*60*13 SERIAL: 11184

Reference: (1) NRC Letter, J G Keppler to J W Cook, dated January 12,
1981

This letter, including all attachments, provides Consumers Power Company's response to Reference 1, which transmitted the subject Inspection Report and which requested our written statement regarding two items of noncompliance and the unresolved items described in Sections 3(c) and 3(d) of the Inspection Report.

This letter was originally signed on February 6 in accordance with the 25-day response in your Reference 1. However, after it had been signed it was discovered that these letters now are required to be notarized based on a new Commission procedure. It was not possible to accomplish that procedure on the 6th.

Consumers Power Company

Dated February 9, 1981

By *James W. Cook*
James W Cook, Vice President

Sworn and subscribed to before me on this 9th day of February, 1981

Barbara Ransom
Notary Public, Jackson County, Michigan
My commission expires September 8, 1984

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CC: RJCook, USNRC Resident Inspector
Midland Nuclear Plant (1)

CONSUMERS POWER COMPANY RESPONSE
TO NOTICE OF VIOLATION
DESCRIBED IN NRC INSPECTION REPORT
NO 50-329/80-32 AND 50-330/80-33

Item 1 from Appendix A (Item of Noncompliance 50-329/80-32-06 and 50-330/80-33-06) provides:

"10 CFR 50, Appendix B, Criterion XVI states, in part, that 'Measures shall be established to assure that conditions adverse to quality such as...deficiencies...are promptly ...corrected. The measures shall assure that the cause...is determined and corrective action taken to preclude repetition.'

"Consumers Power Co. QA Program, Policy No. 16, corrective action states, in part, that 'corrective action is that action taken to correct and preclude recurrence of significant conditions adverse to the quality of items...Conditions or trends observed or identified which are adverse to quality are considered for correction action...'

"The 'FSAR Re-review Procedure' instructions for Block 8 requires that 'the engineering design documents against which the FSAR review package is to be reviewed are listed by the primary review engineer.'

"CPCO Audit No. M-01-53-0 states, in part, 'the following significant items were revealed by this audit...in many instances not all of the design documents were listed as required by the instructions for performing the re-review.'

"Contrary to the above, CPCO did not initiate preventive action to preclude repetition of not identifying design documents for the remaining re-review packages as evidenced by the inspectors review of other FSAR re-review packages which did not include all of the design documents. In addition, interviews with some of the primary reviewers indicated that they were not reviewing the FSAR for technical accuracy against references at the end of the FSAR chapter as required by the procedure. Based on the above, the adequacy of the FSAR re-review is in question.

"This is a Severity Level IV violation (Supplement II)."

CPCo Response

The FSAR re-review program was an extensive as well as intensive effort to re-review the FSAR as outlined in the response to Question 23, Part (2) ((50.54(f))). This effort spanned 18 months and involved three companies - Bechtel, Consumers Power Company and Babcock and Wilcox. Bechtel, alone, spent in excess of 10,000 manhours on this effort prior to its completion in September, 1980. The other companies spent comparable time as the responsibility for particular FSAR sections dictated. These efforts resulted in a substantial clarification and upgrading of the content of the FSAR.

The Consumers Power Company response to Question 23, Part (2), Section 5.0, 50.54(f), made a commitment to perform two audits of the FSAR Re-review Program - one in-process audit, and one final audit. The in-process audit was commenced in March 1980, and the final audit was commenced in November 1980. In both instances, the audit teams included certified auditors from CPCo and Bechtel, and technical specialists from CPCo, Bechtel and B&W Licensing Groups. Both audits were directed by certified audit team leaders from CPCo, and the audit teams included personnel with expertise in electrical, civil, nuclear and mechanical disciplines.

Due to the uniqueness, scope and magnitude of the FSAR Re-Review Program, the audit teams decided, in the planning phase preceding each audit, to divide each into two parts, ie 1) a general audit for compliance to the Re-Review Instructions; and 2) a Technical Evaluation. The general audits were conducted using a statistically established sample of completed re-review packages. The audit teams then selected secondary sample packages from those already audited and submitted them to qualified discipline engineering personnel for technical evaluation. The technical evaluators were given the re-review instruction sheets and were requested to perform a secondary re-review on each of the selected packages to determine the effectiveness of the initial re-review.

Completion of the general portion (Part 1) of the in-process audit (conducted in March 1980) revealed an anomaly concerning Block 8 of the re-review data form. The instructions for Block 8 indicated that the primary reviewer was to list the design documents to be reviewed in Block 8 and then to indicate by circling yes or no, whether any conflicts existed between the design document and the FSAR section for which the re-review package had been prepared. The reviewer was then to indicate the necessary resolution for any conflicts that might exist. The general audit revealed that Block 8 had been completed in a variety of ways. Some primary reviewers had listed design documents which contained conflicts (and had indicated required resolution) and also design documents which did not contain conflicts. Other primary reviewers had listed only those design documents which contained conflicts (and had indicated required resolution). Still other primary reviewers had not listed any design documents for the reason provided by the paragraph below.

Some of the re-review packages were of such a nature as to require review by two or more interfacing disciplines (ie, civil, mechanical, and nuclear). Some of the packages required inter-company interface review (ie, Bechtel/B&W). In these instances, the primary reviewer (as determined by the general disciplinary nature of the FSAR section involved) did not know what design documents were involved in the interface review, and he was forced to rely on the interface reviewer to supply that information. Therefore, whenever a package was sent for interface review, the interface reviewer also received a copy of the same re-review instructions which had been provided to the primary reviewer. The interface reviewers understood this situation and proceeded to list design documents related to their portion of the re-review package. Again, the interface reviewers sometimes listed documents both with and without conflicts, and sometimes they listed only those documents which contained conflicts.

The results of the in-process general audit implied that while all reviewers understood the intent of the re-review program and proceeded to list design documents containing conflicts with the FSAR, they often did not understand the Block 8 instructions to require a listing of documents which did not contain conflicts with the FSAR.

It was decided to attempt to validate this observation by proceeding to select for review (by the Part 2 technical staff evaluators) those packages which in the audit team's view appeared most likely to contain design document conflicts, and for which no (or only a few) conflicting design documents had been listed. These packages were then submitted for technical evaluation. The results of this effort demonstrated that, while some additional non-conflicting design documents were added to some of the lists, in no case were any additional conflict-containing design documents listed by the technical evaluators. The audit team accepted these results as verifying that the re-reviewers did in fact understand the program intent and were effectively identifying and resolving conflicts between the design documents and the FSAR.

At this point in time (completion of the first, or in-process audit), the following conditions existed:

1. 600 packages, out of a total of 986, had been completed, and any required FSAR Changes Notices had been written;
2. 79% of all re-review packages had been issued and had progressed into and/or beyond the interface review point; and
3. While there appeared to be some misinterpretation of Block 8 requirements, all re-review engineers appeared to understand the intent of the re-review program and were adequately identifying and resolving design document/FSAR conflicts.

Based on the above conditions, it was decided that:

1. Any attempt to rewrite the Block 8 instructions at that time would inject unwarranted confusion into the highly complex 3-company (over 200 individuals involved) re-review effort;
2. Imposing a requirement to redo Block 8 listings on all existing packages was unnecessary based on the results of the In-Process Audit Technical Evaluation;
3. Based on decision 2 above, changing the Block 8 listing instructions for the few unissued packages was unwarranted; and
4. The above decisions would be re-evaluated based upon results of the final audit at the completion of the re-review program.

During the general portion of the final audit and as expected, the Block 8 anomaly was still present. Investigations by the second audit team supported the conclusions reached during the in-process audit; namely, that the re-review engineers in all three companies appeared to have thoroughly understood the program intent and had identified and established resolution for design document/FSAR conflicts. As in the case of the in-process audit, the second

audit team selected a number of packages which appeared most likely to contain unidentified conflicts. There was, however, one significant difference--the second audit team increased the selected sample size to almost twice the number of packages for technical review than had been submitted during the in-process technical evaluation. This fact, coupled with a much smaller re-review package population (386 versus 600), provided a greatly increased confidence in the results.

As of the date of this response, all but two of the re-review packages submitted for the final technical evaluation have been returned. Again, as with the in-process audit, no additional design document/FSAR conflicts have been identified. During a telephone contact (on 1/30/81) with the B&W technical evaluators, it was indicated that as a result of an initial cursory review they did not anticipate any additional design document/FSAR conflicts in the remaining two re-review packages.

As indicated in the two audit reports, both audit teams totally concurred in the observation that the re-review engineers had understood the re-review intent and had conscientiously and effectively accomplished that intent.

Based on the foregoing discussion, and pending final results of the technical evaluation of the two remaining re-review packages, CPCo believes that the changes to the Block 8 instructions or to the manner in which the re-review engineers were utilizing Block 8 on the re-review form, at the time of or subsequent to the in-process re-review audit, would have injected confusion and disruption into the re-review process and was, therefore, not only unwarranted, but would actually have been detrimental to the successful achievement of the FSAR re-review program objective. It was therefore decided to postpone any action decision until the final technical evaluation had been completed.

In addition to the matter regarding instructions for, and usage of, Block 8 of the FSAR re-review form, Item 1 of Appendix A also addresses a concern that some primary reviewers did not review the FSAR for technical accuracy against the references at the end of the FSAR chapter, as required by the re-review procedure.

As described in earlier paragraphs of this response, the same re-review instructions were provided to both primary and interface reviewers, and while the instructions do not always clearly delineate between primary and interface reviewers' responsibilities, the results of the two re-review audits indicate that all reviewers apparently understood that the primary review instructions implicitly applied to the interface reviewers for all actions pertinent to the interfacing portions of the review. On this basis, the primary reviewer understood that the interface reviewer would make all listings and review all documents related to the interface review. The primary reviewers also believed the interface reviewers to be most technically qualified for such actions. Therefore, the primary reviewers made no attempts to list design documents or review end-of-chapter references which were related to the interface review. The interface reviewers also understood these conditions and complied with them.

CPCo therefore maintains that based on the foregoing discussions, and pending results of the final technical review of the two remaining re-review packages, the FSAR re-review effort was adequately accomplished in a conscientious, effective and professional manner.

Given the conclusion that the decision not to change to re-review process was proper, then the Company should not have been cited for failure to initiate corrective action to preclude repetition of the condition. The citation should have been given for failure to have revised the procedure to reflect the actual process.

Item 2 from Appendix A provides:

"10 CFR 50, Appendix B, Criteria III, states, in part, that 'Measures shall be established to assure that...design bases...are correctly translated into specifications...and for the identification and control of design interfaces...these measures shall include the establishment of procedures...for the review of documents involving design interfaces.'

"Consumers Power Co. QA Program, Policy No. 3 states, in part that 'Each group...performing detailed design translates the applicable regulatory requirements...design criteria into design documents, such as specifications...procedures. The design organization...establishes and controls the interface with other design organizations.'"

Each of the three parts of this item (parts a, b, and c) are responded to separately on the following pages.

Item 2, Part a (Item of Noncompliance 80-32-02/80-33-02) stated:

"Bechtel EDPI 4.25-1, Section 6.1, states, in part, 'Each originating design group shall maintain a log of all documents which are routed to personnel external to the design group. These logs shall be retained... providing visibility of the project's design interface control.'

"Contrary to the above, Bechtel civil project engineering group did not maintain a coordination log of specification and specification change notices as evidenced by our review of soils related specifications C-211 and C-210."

CPCo Response

The specific documents which generated this Item of Noncompliance were identified and discussed in I&E Report, Section 3.b, first paragraph, which stated:

"It was determined based on a review of specification C-208, Revision 20, Materials Testing Services, Section 9, Soils Testing and C-211, Revision 12, Technical Specification for Backfill, that the civil project engineering group is not maintaining a complete coordination log of specifications and specification change notices."

At present, there are three separate coordination logs in the civil discipline. These logs are maintained by three different people. The drafting supervisor maintains the coordination log for drawings and drawing change notices. The remaining documents are divided between two coordination logs which are maintained by discipline aides.

Revision 20 of Specification 7220-C-208, Materials Testing Services, incorporated Specification Change Notices (SCNs) 10002 through 10005 and Field Change Request (FCR) C-2613. SCNs C-208-10003, -10004, and -10005 were coordinated and entered into the SCN coordination log. SCN C-208-10002 was merely the correction of a typographical error and the group supervisor determined that it did not require coordination (EDPI 4.25.1, Paragraph 4.2). FCR C-2613 was a rewording of SCN C-208-10004, without change of technical content. Hence, FCR C-2613 did not require coordination. In situations where all "changes which affect the technical content of the document" have been coordinated, the revision to the document incorporating these same changes does not necessarily require coordination. (For example, a revision to a specification would not require coordination if that revision were incorporating a Specification Change Notice which, by itself, had previously been coordinated.)

It appears the correct log was not shown to the NRC inspector to demonstrate these facts, nor were the SCN/FCR content and interdependencies explained.

Subsequently, a more detailed review of the coordination of Specifications 7220-C-208, Revision 20, and 7220-C-211, Revision 12, revealed that the civil project engineering group did maintain a complete coordination log of specification change notices and revisions for Specifications 7220-C-211, Revision 12 and 7220-C-208, Revision 20 as required by the engineering department procedure.

The response to Part c of this violation further discusses procedural revisions

being made to this area of the procedures.

Further discussion of Part a of Violation 2 was contained in I&E Report, Section 3.b, second paragraph, which stated:

"Interviews with cognizant Bechtel personnel indicated that it is up to the originator of the document to transmit the design document to the coordinator clerk to log it in as being interfaced with the appropriate groups. It was determined from reviewing the interface log that the originator of the documents are not aware of this requirement and documents are not being interfaced with other design groups as required by the procedure. In addition, Regulatory Guide 1.64, Quality Assurance Requirements for the Design of Nuclear Power Plants and ANSI N45.2.11-1974, Section 10 requires design interface records to be maintained.

The originator of the design documents is responsible for getting it coordinated and entered into the coordination log. All technical personnel undergo EDP training within their first six months on a nuclear power project. One of the EDP training sessions explains design interface control and stresses its importance. In addition to the formal training, all originators of design documents in the civil discipline have occasionally been informed and reminded of EDPI 4.25.1 requirements by the DQE (Discipline Quality Engineer).

Hence, all originators of design documents are aware of these requirements, and to the extent evaluated in the previous discussion, have been implementing the procedures.

The project position on regulatory Guide 1.64 is given in FSAR Chapter 17 (Section 17.1.1.11) and EDPI 4.25.1 is responsive to the regulatory requirements for maintenance of design interface records.

Item 2, Part b (Item of Noncompliance 80-32-03/80-33-03) stated:

"ANSI N45.2.11, Paragraph 4.1 required that applicable design inputs are correctly translated into specifications drawings, procedures or instructions. In addition, Paragraph 7.0 requires that documents including changes are reviewed for adequacy.

"Consumers Power Co's 50.54(f) response, Page I-17, Paragraph 4(a) required that specification change notice (SCN)-9004 be issued to require a laboratory comparison test to be performed for each field density test. SCN-9004 was initiated on 4/13/79.

"Contrary to the above, Revision 16, dated 3/24/79, to the present Revision 20 of specification C-208 did not correctly translate SCN-9004 as a requirement into the specification. Revision 16 permitted laboratory density tests to be performed at a frequency as determined by the geotechnical engineer rather than for each field density test performed."

CPCo Response

The commitment for providing additional control over the frequency of laboratory compaction tests as stated in the Response to Question 1 (Appendix I, Page I-13, Paragraph A.4 and restated in the Response to Question 23 (Pages 23-30, Remedial Action 2, is as follows:

"Selection of proctor curves will no longer be a problem because each field density test will be accompanied by a separate laboratory standard compaction test which will provide a direct comparison. This has been directed by a letter to U.S. Testing and has also been reflected in SCN C-208-9004 dated April 13, 1979."

The referenced SCN (C-208-9004) states: "(The frequency for laboratory compaction tests shall be: 'for every field density test performed or as directed by the onsite soils engineer.'"

The phrase used in the responses, "each field density test will be accompanied by a separate laboratory standard compaction test," was an oversimplification of the requirement identified in SCN-C-208-9004. The SCN required the laboratory compaction test for each field density test, but it also allowed the frequency to be modified on a case-by-case basis by the onsite geotechnical soils engineer. This alternative to the one laboratory compaction test for one density test requirement would be implemented by the onsite soils engineer when, in his judgment, an additional laboratory compaction test is not warranted. A typical case would be when two small but separate backfill operations are going on concurrently and the backfill material is the same for both locations, two lab tests may not be justified.

At the time the SCN was being incorporated into the specification, an effort was being made to get the onsite geotechnical soils engineer intimately and

actively involved in the soils operation. Hence, an active role for the onsite geotechnical soils engineer was written into the specification. Therefore, the SCN was not incorporated verbatim. Both the SCN and the specification provided the onsite geotechnical soils engineer with control of the laboratory compaction test frequency. The SCN implied this control, the specification explicitly delineated it. The variation in wording was, therefore, not considered to affect the intent and no additional interface coordination was required for the specification revision. Therefore, the procedural requirements for interface coordination were followed.

To provide consistency and clarify intent, the Response to Question 23, Pages 23-30, Remedial Action 2 will be revised to read, "...each field density test for cohesive material (unless otherwise directed by the onsite geotechnical soils engineer) will be accompanied by a separate laboratory standard which will provide a direct comparison." and Specification 7220-C-208, Table 9-1 will be revised to require a laboratory compaction test for each field density test for cohesive material, unless otherwise directed by the onsite geotechnical soils engineer.

The response to Question 23 will be revised in Revision 11 scheduled for submittal February 1981. Specification 7220-C-208 will be revised by the end of March 1981.

The I&E Report, Item 3.c(1) next to last paragraph said that, "This (lack of verbatim incorporation of SCN 9004 occurred because adequate design interface controls had not been implemented...." The response to Item 2, Part c addresses this point and provides a corrective action.

Item 2, Part c (Item of Noncompliance 80-32-01/80-33-01) stated:

"ANSI N45.2.11, Paragraph 8.2 requires that design changes be reviewed and approved by the same groups or organizations which reviewed and approved the original design documents.

"Consumers Power Co. 50.54(f) response, Page 23-11 committed to revise existing design control measures and require design interfaces on design changes. EDPI 4.25.1, Revision 7 added Section 4.2 which states, 'It is the responsibility of the originator of a design change to effect coordination of the change with all groups which reviewed and/or used the original or subsequent revisions of that design document.'

"Contrary to the above, Revision 8 to EDPI 4.25.1 permits the group supervisor to waive the design interface requirement by adding to Section 4.2, 'as determined by the group supervisor of the discipline which originated the document.' Revision 8 does not establish adequate measures as required by ANSI N45.2.11 or as committed per 50.54(f) response."

CPCo Response

EDPI 4.25.1 will be revised to state: "It is the responsibility of the originator of a design change to effect coordination of the change (whether technical or editorial) with all groups which are affected by, or involved with, the revised portion of the document."

This change will accomplish two objectives:

- 1) It removes the discretionary proviso included in Rev 8.
- 2) It revises the intent to include editorial changes.

For example, a minor wording change in a portion of a mechanical valve specification which discusses the set points for the valve operators may not "affect" control systems because of the minor nature of the wording change, but it would "involve" control systems because set points is a topic they are involved with.

Additionally, a civil specification may contain requirements pertaining to both soils and metals. A change to the soils section would be coordinated with Geotech but there would be no reason to coordinate that change with M&QS (Materials and Quality Services). Likewise, a change which revised only the metals portion would be coordinated with M&QS, but not Geotech.

This change to EDPI 4.25.1 will be accomplished by mid-March 1981.

CONSUMERS POWER COMPANY RESPONSE
TO UNRESOLVED ITEMS
DESCRIBED IN NRC INSPECTION REPORT
NO 50-329/80-32 AND 50-330/80-33

Attachment 2
Serial 11184

This response addresses the unresolved items described in Paragraph 3(c) and 3(d) of I&E Reports 80-32 and 80-33. (Unresolved Items 80-32-04/80-33-04; 80-32-05/80-33-05)

With regard to the unresolved items pertaining to project Specification 7220-C-208: (Unresolved Items 80-32-04 and 80-33-04)

I&E Report, Item 3.c(2):

"Specification C-208, Section 9.1.1 should be reworded to remove confusion which exists about the word "compaction". This section should read: Modified proctor tests on cohesive material shall be performed in accordance with ASTM D 1557, Method D."

CPCo Response

Section 9.0 of Specification 7220-C-208 delineates the requirements for testing subgrades, embankments and structural backfill. Subsection 9.1.1 indicates the laboratory compaction test to be performed in accordance with ASTM D 1557, Method D. The ASTM Test D 1557 is considered to be a laboratory compaction test as defined in ASTM D 653 and the suffix "Method D" indicates the required energy for the compaction test. Since the specification explicitly refers to the ASTM test designation, there is no reason for confusion.

The early soils investigations done during 1978 and 1979 revealed that confusion was experienced due to the usage of "Modified Proctor" when referring to the compaction test. There were two different compaction criteria for cohesive soils; one was the Modified Proctor discussed herein (ASTM D 1557, Method D) with 56,255 ft-lbs/ft³ of compactive energy, the other a Bechtel Modified Proctor described within the project specifications and resulting in 20,000 ft-lbs/ft³ of compactive energy. The term "Modified Proctor" was common to both and contributed to the usage of one standard when the other was intended.

The specification, therefore, was revised to delete the words "Modified Proctor" to eliminate such confusion.

Based on the above discussion, Specification 7220-C-208 has previously been reviewed and revised to address this concern and is now considered clear with no revision necessary.

I&E Report, Item 3.c(3):

"Section 9.1.3 (first paragraph) does not specifically indicate how ASTM D 1556 has been modified by USBR DES E-24. In addition, why does the specification prohibit the use of the nuclear density device for measuring in-place field density? This device is an industry accepted method with a standard ASTM designation."

CPCo Response

Specification 7220-C-208, Section 9.1.3 specifies that certain onsite field and laboratory tests shall be done:

"Field Density Tests for sands and fine material in accordance with ASTM D 1556, and on gravels with the above as modified by USBR DES E-24 as described in USBR Earth Manual. The nuclear density devices shall not be used to determine density."

The ASTM D 1556 test can only be performed on soils containing particles not larger than 2 inches (50.8 mm) in diameter. The USBR Designation E-24 is basically the same as ASTM D 1556, but includes specific procedures and details for obtaining in situ density tests for materials like gravel with particle sizes larger than 2 inches.

Although the intent of the existing wording in Section 9.1.3 is correct, the wording will be clarified to read: "Field density tests for sands and fine material shall be in accordance with ASTM D 1556. Field density tests for gravels (with particle size more than 2 inches) shall be done in accordance with USBR E-24 (USBR Earth Manual), unless otherwise directed by the onsite geotechnical soils engineer."

Specification 7220-C-208 will be revised by the end of March 1981.

A nuclear device used for determining in-place moisture and density requires that a periodic correlation be established using other methods such as ASTM D 1556 for in-place density and ASTM D 2216 for moisture content. The nuclear devices also require frequent calibration.

The frequency of correlation and calibration tests, and reliability of test results offset the advantages of the nuclear device, and to produce consistent results and minimize confusion and nonconformances, it was decided to use only one type of test method.

I&E Report, Item 3.c(4):

"Section 9.1.3 (second paragraph) assumes a specific gravity of 2.75. The actual specific gravity should be known and used as is the industry practice."

CPCo Response

Plotting the in-place density test against a zero air voids curve corresponding to a specific gravity provides a quick check on the validity of the test results. There are other checks, such as comparison of in-place moisture content with optimum, and review of tests over 101% of maximum dry density, which have to be performed to meet the specification requirements.

The specific gravity of 2.75 was determined, by the geotechnical engineers, to be representative of the types of cohesive materials used at the site. This determination was based on the available laboratory test data.

Specification 7220-C-208, Section 9.1.3 specifies a sequence to be followed in the event the initial check indicates a potential problem. Thus, the actual specific gravity is determined whenever it is needed to resolve a questionable test result. A specific gravity test for each in situ density test is therefore considered unnecessary.

I&E Report, Item 3.c(5):

"Section 9.1.3(c) should also include: if the results still plot to the right of the ZAV curve the test should be rejected and a new density test performed."

CPCo Response

Section 9.1.3(c) of Specification 7220-C-208 delineates the requirements for each in situ density test for the testing subcontractor. The final approval or rejection of the tests is made by quality control and the onsite geotechnical soils engineer. Therefore, it is implied that the onsite geotechnical soils engineer will make the appropriate decision. However, to preclude any misinterpretations of the specification, the additional clarification suggested by the NRC inspector will be added to the specification by the end of March 1981.

I&E Report, Item 3.c(6):

"Section 9.1.3(d) uses the phrase 101% compaction. This should read 101% of maximum proctor density. This section also permits the on-site geotechnical engineer "to evaluate" the results of the tests that exceed 101% proctor density for cohesive material and 105% for cohesionless material. This section should include the qualitative acceptance criteria and/or instructions to be used for the basis of this evaluation. "

CPCo Response

Section 9.1.3(d) will be reworded to state, in part: "When in-place densities are equal to or exceed 101% of maximum dry density, determined in accordance with ASTM D 1557, Method D, for cohesive materials and 105% relative density for cohesionless materials, determined in accordance with ASTM D 2049, the onsite geotechnical soils engineer shall be notified. The ..."

Specification 7220-C-208 will be revised by the end of March 1981.

The criteria for evaluating the test results showing densities of 101% for cohesive soil and 105% or greater for cohesionless material will be included in a separate instruction to the onsite geotechnical soils engineer. This instruction will be issued by the end of March 1981.

With regard to the unresolved items pertaining to project Specification 7220-C-211 (Unresolved Items 80-32-05 and 80-33-05):

I&E Report, Item 3.d(1):

"Section 8.1 does not specify the type of material to be used beneath Category 1, safety related structures. This should be included in this specification."

CPCo Response

Most of the major Category I, safety-related structures are founded on glacial till. Much of the fill material used under Category I, safety-related structures is part of the basic plant area fill, which was placed by a subcontractor, under a different specification. When that subcontract was completed and the subcontractor moved off site, Specification 7220-C-211 was revised to cover any fill still to be placed.

Specification 7220-C-211, Section 8.1 specifies the material requirement for "structural backfill" and Section 8.2 specifies the material requirements for "plant area backfill." These two terms are defined (Sections 1.1 and 1.2, respectively) as:

1.1 STRUCTURAL BACKFILL

The term "structural backfill" as used in this specification includes backfill materials to be placed within 3 feet of the exterior wall of any plant area structure. Materials used as described above may, subsequent to such usage, also support part of another structure.

1.2 PLANT AREA BACKFILL

The term "plant area backfill" as used in this specification shall include placement of all embankment materials required to construct the fill in the plant area, berm backfill, and dikes within the plant area except backfill materials to be placed within 3 feet of any plant area structures. Sand from offsite sources may be used in backfill areas inaccessible to motorized rollers.

Section 8.2 specifies the material to be used beneath Category I, safety-related structures. Together, these two sections specify the types of fill material that may be used anywhere on the site.

Currently, no additional Category I structures are planned to be built on any fill other than the existing fill within the plant area. Since the entire plant area is at approximately the planned finish grade, if any Category I structure is to be constructed, it will be necessary to excavate the already existing fill. The excavation and subsequent backfilling will be done under the supervision of the onsite geotechnical soils engineer.

I&E Report, Item 3.d(2):

"Section 8.1.1 does not specify the type of material to be used around pipes and duct banks. The specification should specify or refer to appropriate instructions."

CPCo Response

The type of material to be used around the Category I pipes is indicated on Drawing 7220-C-130(Q) Underground Piping Sections and Details, and the drawing cross-references Specification 7220-C-211.

The Category I duct banks are considered as concrete structures and the

Specification 7220-C-211 covers the requirements for backfilling around such structures.

I&E Report, Item 3.d(3):

"Section 8.3.2 (third paragraph) states, 'the uncompacted lift thickness of the backfill material shall be determined by the on-site geotechnical soils engineer...' The on-site soils engineer should not have to determine the lift thickness when Attachment No 1 to specification C-211 specifies the requirement for each type of equipment based on equipment qualification tests.

CPCo Response

Specification 7220-C-211 will be revised by the end of March 1981, to delete the third paragraph of Section 8.3.2.

I&E Report, Item 3.d(4):

"Section 8.5.2 permits the use of rubber-tired rollers to compact structural backfill and sand. Attachment No. 1 to specification C-211 does not indicate rubber-tired rollers as having been qualified and rubber-tired rollers should not be used to compact structural backfill and sand."

CPCo Response

Section 8.5.2 of Specification 7220-C-211 does not permit the use of any compaction equipment. It only indicates the types of compaction equipment that are suitable or desirable for compacting the types of backfill material. This does not mean that this equipment has been qualified by demonstrating their ability to compact the backfill materials. It should be noted that Section 8.5.1 of Specification 7220-C-211 requires that all of the proposed compaction equipment be qualified and approved on the basis of their demonstrated ability. Furthermore, Section 8.6.2 of Specification 7220-C-211 requires that the compaction equipment listed in Attachment 1 shall be used to obtain the required compaction effort. The rubber-tired roller is not the only type of equipment that is not included in Attachment 1, the power tampers are also not included. Section 8.5.2 of Specification 7220-C-211 refers to a spectrum of compaction equipment that are desirable, but Attachment 1 lists specifically the type, model and other characteristics of each qualified compaction equipment that is to be used for compaction. In general, rubber-tired rollers are considered by the industry to be effective and are preferred for compacting cohesionless soils. The NRC inspector's report does not indicate the reason for restricting or excluding the use of rubber-tired rollers. However, if a rubber-tired roller is proposed to be used for compaction, it will have to be qualified before its use.