

We would like to request a delineation of those proposed study team members who have worked on projects for which Bechtel was the prime contractor, or in which Bechtel had a significant role in the design or construction.

Personnel Exceptions

1. Jeffrey A. Schmidt - Please clarify role to the PS&E Diablo Canyon audit.
2. Patrick A. Nevis - What Sargent & Lundy project is his experience?
3. Gregory S. ... - ... involvement with Bechtel and its subsidiary.

C. TERA Corporation

We strenuously reject the notion that TERA is capable of the dual role of Independent Design Verification and Construction Program (IDVCP) and management auditor. We believe it compromises both TERA's IDVCP effort and the management audit.

We expect the staff will agree with TERA's conflict of interest and reject their role.

II. Protocol

We agree that any management audit has a 'clear need for prompt access to all information required for the conduct of the audit. (Proposal, Sec. VIII) We also agree that it would be inappropriate to notify the NRC prior to each contact with CPEO.

Our disagreements with the proposed protocol center around:

1. The submission of draft reports, recommendations, or findings to CPEO. (Proposal, Protocol)
2. The conduct of meetings regarding findings or conclusions in advance of completing its report.
3. The retention and transmittal of support audit documentation.

III. Competence

We are presently reviewing the history and performance of this company through contacting the parties involved in the projects listed by CPEO. Our review will be presented as an addendum to our prepared comments to the CPEO proposal.

IV. Objective and Scope (Chapter I); Approach & Workplace (Chapter II);
Representative Issues and Questions to be Addressed in Interviews (Chapter VII)

We are confused at the above-listed chapters. The thrust of the audit does not address the problems which led to the NRC decision to require the audit in the first place.

DD 82-04 states that:

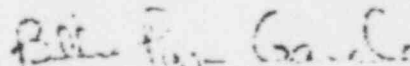
Since the start of construction, the facility has experienced significant quality assurance (QA) problems. Although the licensee took corrective actions in each case, problems continue to be experienced in the implementation of QA program. (DE at 1)

The specific order^{2/} requires a plan to include:

- (1) An appraisal conducted by an independent management consultant organization retained by the licensee to evaluate the licensee's current organizational responsibilities, management controls, communications systems and practices, both at Midland site and between the corporate office and the site. The appraisal shall include a review of the licensee's site and corporate construction management and supervisory personnel involved in the Midland project to determine their capability and competency for managing construction activities consistent with regulatory requirements.

The plan, as submitted, does not comply with the above requirements. It contains only a "forward look" at the personnel and plans for finishing the Midland plant. The failure to include any "backward" look to determine the cause of the problem, makes the entire proposal a waste of everyone's time.

Sincerely,



Billie Farmer Garde
Citizens Clinic Director

^{2/} In view of the foregoing, pursuant to Sections 103, 161(i), 161(o) and 182 of the Atomic Energy Act of 1954, as amended, and the Commission's regulations in 10 CFR Part 2 and 10 CFR Part 50.

MRR

1. Midland

Consumers Power Company has released the enclosed Press Release noting its Board of Director's endorsement of continued construction of Unit 2 of the Midland Plant, and announcing revised schedule and cost information. The Company's new schedule for Unit 2 commercial operation is December 1986 (previously February 1985). The Press Release does not mention fuel load dates. However, assuming the same differential from F.L. to C.O. as in the Company's previous schedule would indicate a Unit 2 FL date about July 1, 1986 (previously Oct. 1984). The Company's cost for Unit 2, with needed common facilities, upon completion is estimated to be \$3.95 billion (previous estimate for both units was \$4.43 billion).

The Board of Director's cautions that agreements with the Michigan Public Services Commission and elected state officials are still needed and discussions to this end will continue.

No direct mention of Unit 1 is made in the Press Release.

2. Point Beach Nuclear Plant, Unit 1

On April 7, 1984 during hot rod drop testing, rod in position H-6 failed to drop during no-flow conditions. The rod had previously been dropped successfully during full reactor coolant flow conditions. At the time that the rod failed to drop, coolant temperature had drifted to 520 degrees F. One pump was started to heat back up and the rod was successfully dropped at 527 degrees F. After heatup, the rod was successfully dropped three more times under no-flow conditions. The problem was believed to be a hang-up of the rod stepping mechanism. The reactor was taken critical at 7:40 a.m. on April 8, 1984 after core physics testing and the unit was placed online on April 9, 1984. The unit had been shut down since October 1983 for refueling and steam generator replacement.

Major work performed during this outage included steam generator replacement, rod control cluster assembly (RCCA) guide tube split pin inspection, ISI reactor vessel inspection, TMI modifications, IEB 79-C1B modifications, ILRT, main steam reheat (MSR) tube bundle replacement, feedwater heater replacement, extraction steam piping replacement, 100% fuel visual inspection and sipping, replacement of 21 and 33 RCCA's, component cooling water heat exchanger modification, RHR heat exchange inspection, and installation of loose parts monitor.



Consumers Power Company



General Offices: 212 West Michigan Avenue
Jackson, Michigan 49201 (517) 788-0333

JACKSON, Michigan, April 10, 1984--The following was issued today by Consumers Power Company.

After careful review, the Board of Directors concurs with management that Unit 2 of the Midland nuclear project can be completed, licensed and placed in commercial service by December 1986, and is in the long-range best interests of the State of Michigan and the Company's shareholders. At completion it will carry a cost of 3.95 billion dollars including allowance for funds used during construction.

The Board recognizes that financing for completion of Unit 2 cannot be obtained unless the completion plan is concurred in by the Michigan Public Service Commission and elected State officials. To that end, management is authorized to continue discussions with representatives of the Michigan Public Service Commission and the office of the Attorney General and others as appropriate to examine all options regarding the future of the Midland project. In the event no plan can be agreed to, the Board is prepared to support those actions required to protect shareholder equity.

In view of the uncertainty of the situation, at present, the Board has voted to reduce the common stock dividend to 35¢/share payable May 20, 1984. All preferred and preference dividends will be paid in full as required by the particular issue.



1984 APR 12 10 10 AM
MIDLAND MI 48840

MIDLAND, MI, April 12, 1984 -- Reports of yesterday's press conference on the Midland Nuclear Plant have indicated some confusion regarding rework assumptions in the new project schedule. One of the reasons the Company feels confident in its new schedule projections is our ability to estimate what additional construction work may result from our total reinspection program for the plant. Based on our 1983 inspection work and detailed planning we have established a conservative allowance in direct craft construction hours to address those inspection findings that require any type of modification of the existing hardware. Our experience to date has been good in that no major hardware deficiencies have been identified. However, some amount of minor finishing or touch-up of previous construction may be necessary to bring the "as-built" conditions of each piece of this plant into full conformance with the design drawings. This is a standard finishing technique for any facility but is one that is hard to estimate until the actual inspections are done. While the overall allowance for this activity is a significant fraction (40%) of the to-go direct craft construction hours it is only a relatively small fraction of the to-go cost estimate and is an even smaller fraction (less than 2%) of the total cost of the facility.

CLIPPING SHEET

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 CLIPPED BY KL Pockrandt
 DATE OF ISSUE 4/12/84 CITY Midland



Consumers
Power
Company

N-plant audit unacceptable to regulators

By DAVE SHANE
Daily News staff writer

A plan to appraise management at the Midland nuclear project submitted by Consumers Power Co. is not acceptable to the Nuclear Regulatory Commission, the NRC said today.

Ted Ankrum, chief of the NRC's Quality Assurance division, said his office has written NRC Region III officials to request "considerable" revision of the plan. Consumers Power was requested by the NRC in January to submit a plan to appraise its management at the Midland construction project.

Ankrum said Consumers' plan to have Cresap, McCormick and Paget of New York conduct the appraisal was "absolutely void of any type of retrospect.

"We have difficulty understanding how you can figure out what's wrong when you can't figure out how you got to where you are," Ankrum said.

Ankrum said he understands that Region III officials are using the recommendations of his office in sending a letter to Consumers, probably within a week.

Region III spokesman Chuck Norelius said today he was unsure if the letter to Consumers had been sent yet. Consumers spokesman Paul Knopick said today he was not sure if one had been received by his firm.

Knopick also declined comment on Ankrum's statements pending receipt and evaluation of the letter from Region III.

Ankrum said the appraisal plan "didn't look back on the history" of mistakes made at the plant.

"Generally, there were quite a few changes that need to be made," he said.

"Let me assure you we are not treating this management review as a cursory exercise. We expect it to be a very useful product."

Among the requests made by Ankrum are details on the involvement of the TERA Corp. in the management appraisal. TERA, which has been involved in other work at the plant site, has been asked by CM&P to provide technical assistance in its work.

"We couldn't reject TERA outright ... but by no means have we given TERA a blank endorsement," Ankrum said, adding that before the NRC approves the audit plan, "we wanted to know what role Cresap foresaw for TERA."

"We don't want to exclude people who are the best qualified," he said. "But on the other hand, you don't want to put the fox in among the hens."

Members of the Government Accountability Project have protested plans to include TERA in the audit because of its work at the site.

Another request in the letter to Region III officials, which Ankrum said he believes is being detailed in the letter to Consumers, is an example of a "good job" of management appraisal. He said Torrey Pines Technology's appraisal of the Zimmer nuclear plant in 1983 was such an example.

Although Consumers has not disclosed its estimates for the cost of the audit, Ankrum said the Torrey Pines audit cost "around a million" dollars.

Ankrum also said he wanted to see more specific resumes on the personnel involved in appraising Consumers' management.

The management appraisal was ordered by the NRC in response to continued construction mistakes at the Midland project.

BETWEEN THE LINES

As the work continues at the construction site, more visitors are expected to be touring the site. Groups from various engineering societies in the Saginaw Valley area, industrial development representatives, government officials, and other power companies' employees have either toured or are planning on visits in the next few months.

In addition, Consumers Power's Speakers Bureau is providing a news community. I learned about the plant. Many of its members have also provided some of being used in co-added another via the nuclear plant is payroll for the com

GA-0119

April 12, 1984

Dear Fellow Midland Workers:

Events in the last two weeks concerning the future of our work here at Midland have moved quickly and culminated in Tuesday's Consumers Power Company Board of Directors meeting, the annual meeting of our shareholders and a news conference yesterday. I would like to make a few comments on these events.

First, the Board of Directors reaffirmed Consumers Power Company's commitment to complete Midland Unit II. In addition, after a thorough review, the Board concurred in our completion schedule that calls for commercial operation in December, 1986, with fuel load occurring the previous July 1.

The shareholders at their meeting overwhelmingly supported Midland completion and by an 11-1 margin rejected a motion that would have halted construction for a year.

Secondly, the Company announced that the estimated cost to complete Unit II is \$3.95 billion. The status of Unit I continues to be deferred according to the project decoupling recommendations adopted last fall. Our customers' electric demands and Consumers Power's financial resources will ultimately determine the future plans for Unit I. It is the Company's intent to maintain the option of completing Unit I when appropriate.

Third, the Board of Directors reduced the quarterly common stock dividend to 35 cents a share.

The Board is very much aware that assembling the financial resources necessary to complete construction of the project will require concurrence in our completion plan by the Michigan Public Service Commission (MPSC) and the elected officials of the state. Discussions between the management of Consumers Power Company and representatives of the MPSC and the Michigan Attorney General's Office were specifically authorized to continue. As a result there will be continuing media attention and speculation until the questions external to the project are resolved.

What does all this mean to Midland project personnel?

Clearly, the management and the Board have expressed confidence in our efforts to complete Midland Unit II. Their conclusions are an endorsement of the completion schedule that drew upon the advice and input of so many at every level of this project.

(OVER)

It is also a significant responsibility that we all now assume. The current schedule conclusion and resulting cost was reached only after consulting with all segments of the project and ensuring each organization's plans had been fully integrated into the overall completion plan. We believe the plan is realistic and clearly charts our path to completion. The details of the plan, including the conservatism in the fuel load date, will soon be reflected in our detailed working schedules.

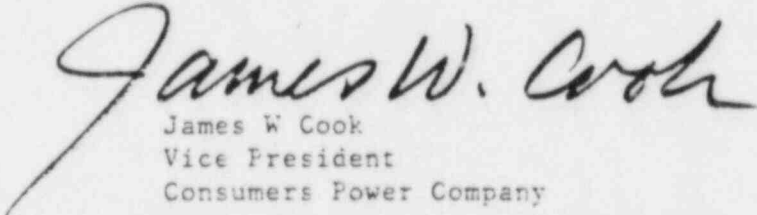
What are some of the reasons we can have confidence in our plan?

1. We have a construction completion program (CCP) approved by the Nuclear Regulatory Commission and we are working well in increasing the confidence of the NRC team in our ability to perform.
2. The design is essentially complete, our procedures are in place and the training of employees is well along.
3. But most importantly, we have a competent, enthusiastic and committed team in place working at this jobsite.

In short, the conditions are right for the successful completion of the project.

However, the determination of Consumers Power Company to continue Midland construction bolstered by the willingness of our stockholders to sacrifice is not enough.

Our continuing performance and commitment to meeting all safety and quality requirements as well as accomplishing the work in accordance with the new schedule and cost forecast is the cornerstone of the corporate strategy. We asked for the chance to finish this major energy facility. We are being given that chance. We can do it.


James W. Cook
Vice President
Consumers Power Company

AB

DAILY REPORT RIII

DATE 04/17/84

FACILITY/LICENSEE	NOTIFICATION	ITEM OR EVENT	REGIONAL ACTION
OFFICE OF THE REGIONAL ADMINISTRATOR			
MIDLAND		MR. A. B. DAVIS IS IN HQ TO ATTEND A MEETING WITH MANAGEMENT REPRESENTAIVES OF CONSUMERS POWER COMPANY AND OTHER NRC STAFF MEMBERS TO DISCUSS MATTERS RELATING TO MIDLAND.	INFORMATION.
CLINTON		MESSRS. S. LEWIS, C. WEIL, AND R. KNOP WILL BE MEETING WITH MS. BENASSI REGARDING THE FIRING OF EMPLOYEES AT CLINTON. THE MEETING WITH BE HELD AT MS. BENASSI'S OFFICE IN PEORIA, IL.	INFORMATION.
D. C. COOK		MESSRS. JAMES G. KEPPLER, R. STRASMA, J. GROBE AND J. KALKMAN WERE SERVED SUBPOENAS TO TESTIFY BEFORE GRAND JURY, GRAND RAPIDS, MICHIGAN CONCERNING D. C. COOK, APPENDIX R.	INFORMATION.

A

Present day utility audit programs do not adequately verify the validity of certification programs; here's why:

1. Audits are neither comprehensive nor scheduled on the basis of the status and importance of the activities. Audits are usually performed on an annual basis, including followup on previous audit findings.
2. Regularly scheduled audits are not supplemented by other audits when, after award of a contract sufficient time has elapsed for implementing the QA program and it is appropriate to determine that the organization is adequately performing the functions as defined in the QA program description, codes, standards, etc.
3. Audit teams do not include personnel who are chosen because of special abilities, specialized technical training, or pertinent experience. Members are usually junior employees or are otherwise inept.
4. Audit teams are not prepared prior to initiation of the audit. Pertinent policies, procedures, standards, instructions, codes, or regulatory requirements are not reviewed by the auditors.
5. Checklists or procedures are not used to ensure depth and continuity of audits.
6. Selected elements of the QA program, e.g., Certificates of Conformance, are not audited to the depth necessary to determine whether or not that part of the program is being implemented effectively.

QA programs are formulated to comply with Appendix B and ASME Boiler and Pressure Vessel Code, Section III. By design, electrical equipment is often overlooked or neglected.

8. Review of QA Documentation

The inspector reviewed the documentation on a Velan valve identified as 2CC 9467C with manufacturer's serial number 77G688. The valve is installed in the Component Cooling System in the auxiliary building.

- a. CECO's Material and Equipment Receiving and Inspection Report (MRR) No. 10431 dated January 11, 1978, indicates the five 150 lb butt weld carbon steel gate valves were received onsite, with no visible shipping damage, and accepted on January 16, 1978.
- b. Westinghouse Electric Corporation (Westinghouse), supplied a Quality Release form (QR) No. 36909 dated December 6, 1977, which indicates that the valves were supplied by Velan and meet Westinghouse Specification G-678853, Revision 1 and Drawing No. 83901-R, Revision A. The QR stated that the following attributes had been reviewed and accepted.
 - (1) Material Certifications ✓
 - (2) Heat Treat Records
 - (3) Penetrant and Magnetic Particle Tests Reports
 - (4) Ultrasonic Test Reports
 - (5) Design Analysis
 - (6) Westinghouse 688 Form
 - (7) Pressure Test Records
 - (8) Seat Tightness Test Records
 - (9) Welding Personnel Qualification Certifications
 - (10) NDE Personnel Qualification Certifications
 - (11) Code Form NPV-1
 - (12) Visual Inspection
 - (13) Dimensional Inspections
 - (14) Cleanliness
 - (15) Painting
 - (16) Packing
- c. Three Deviation Notices were identified and documented as approved.

QUALIFICATION OF CLASS 1E

SYSTEM & INTERFACING COMPONENTS

40 minutes

B

SCOPE

DEFINITIONS

DESIGN CONSIDERATIONS

SAFETY RELATED SYSTEMS

SAFETY RELATED COMPONENTS

PROCEDURE FOR QUALIFICATION

TESTS

CLASS 1E - The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling, and containment and reactor heat removal, or are otherwise essential in preventing significant release of radioactive material to the environment.

GDC 4 - Structures, systems and components important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents.

OTHER BASIS: 10CFR 50.55a(h) [IEEE 279] paragraphs 3(8) and 4.4; 10CFR 50, Appendix A, GDC 2 and 3; Appendix B, Criteria III, VII and XI.

INFORMATION: SAR sections 3.1, 3.2, 3.10, 3.11 and 9.5.1.2; IEEE 323-1974.

ACCIDENTS

Fire

Flood

Earthquake

LOCA

HELB

ENVIRONMENTS (Normal & Accident)

Temperature

Pressure

Relative Humidity

Atmosphere

Chemicals

Radiation

Aging

Degraded grid voltage

DURATION

Continuous

Short term

Intermittent

PLANT AREA LOCATION

Inside Containment

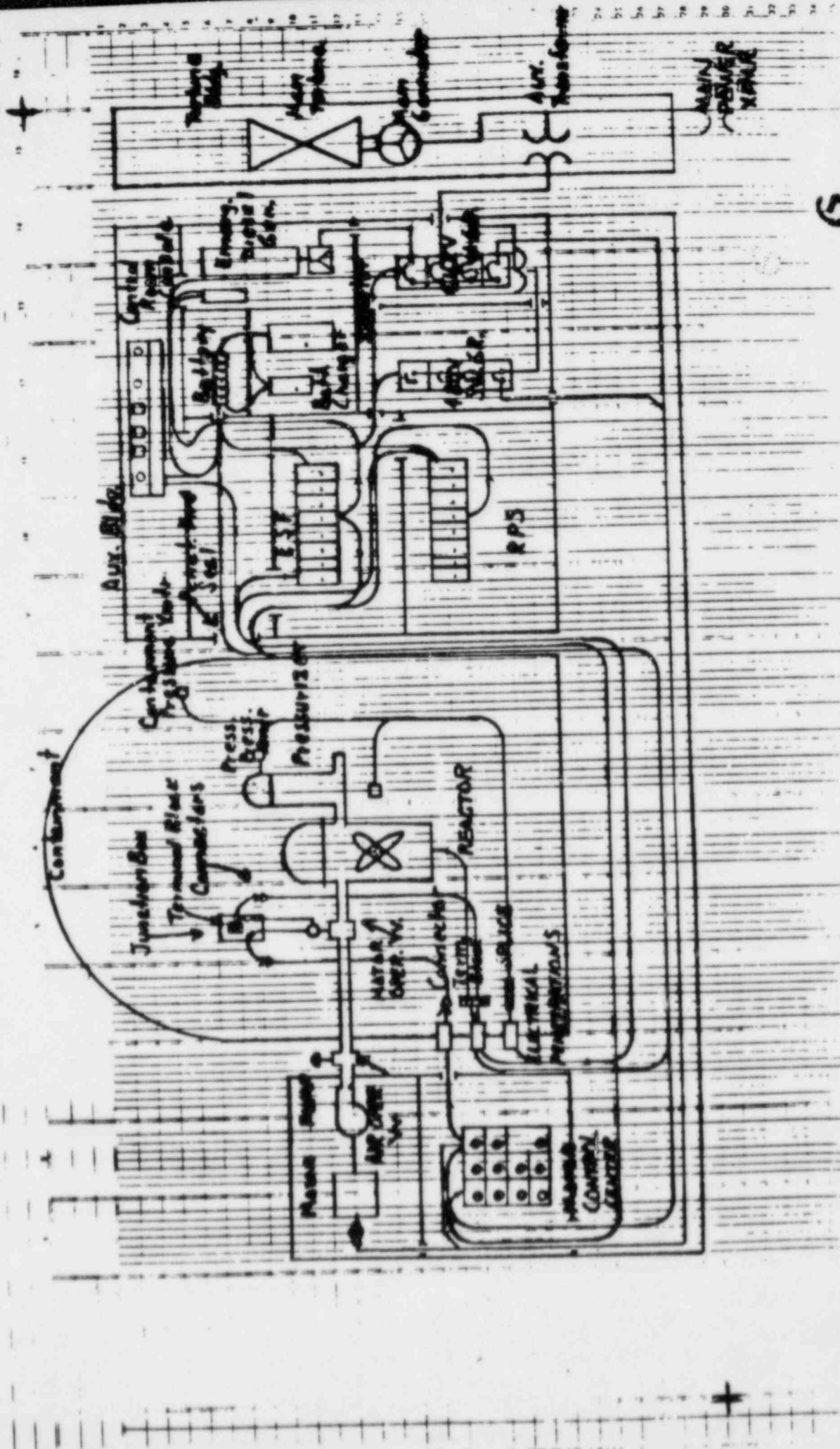
Auxiliary Building

Control Area

Turbine Building

Outdoors

E



5

SYSTEMS:

Electric Power

medium voltage ($> 600\text{v}$)

low voltage ($< 600\text{v}$)

AC-DC

Reactor Protection

Engineered Safety Features

high pressure injection

low pressure injection

core flooding

reactor building clean-up

isolation

spray

component cooling

COMPONENTS

Instruments

sensors, transmitters

Motors for

Pumps, valves, HVAC

Cables

Power, control, instrumentation

Terminations

Penetrations, connectors, terminal blocks, splices

Ancillary

Switches, junction boxes, tapes, solenoids, epoxies,
lubricants, relays, electronic modules, coatings, gaskets,
seals, grommets, o-rings

Power

Diesel generator, AC-DC switchgear, transformers,
batteries, chargers, inverters

Other

switchboards, control panels, instrument racks,
supports - raceway, instrument sensing lines,
raceway, fire stops, radiation shields, flood control
barriers

Show slides

& Examples

G&H superimposed

∞/

Qualification of Nuclear Power
Plant Safety Related Systems &
Interfacing Components No. XXXX

SECTION I

The purpose of this procedure is to assure nuclear power plant system components are built with facing components important to safety are designed built, and tested to be compatible with and accommodate the effects of the environmental conditions associated with normal operation and postulated accidents including loss of coolant.
REFER TO SECTION III - PARA. NO. 1.

et

SECTION II

Qualification of Nuclear Power Plant
Safety Related System and Interlocking
Components No. XXXX

PROCEDURE: REFER TO SECTION III

1. Identify the safety related systems located both inside and outside containment required to perform a safety function under environmental conditions resulting from each design base event (DBE) (FIRE, FLOOD, EARTHQUAKE, LOCA, MELB, ETC.)
REFER TO SECTION III - PARAGRAPH 2 & 5
2. Determine which safety related systems are purchased by the licensee, U.S.S., or other.
REFER TO SECTION III - PARAGRAPH 3
3. Verify each purchaser has a qualified QA program and/or verifies subcontractor programs.
REFER TO SECTION III - PARAGRAPH 4
4. Select two systems installed inside containment (dry well) and one system from each of the other areas identified in 1. above. NOTE: your selection should include one system from each organization determined in 2. above. Increase your sample accordingly.
REFER TO SECTION III - PARAGRAPH 5.
5. Determine the specific environmental requirements for each system identified in 4. above.
REFER TO SECTION III - PARAGRAPH 5.b.

* See IEEE 603-Criteria for safety systems for nuclear power generating stations

6. Determine the major and interfacing components with work systems.
REFER TO SECTION III - PARAGRAPH 5C.

7. Determine the method utilized to verify that the supplied safety related system and components ^{components} interfacing components meet purchase requirements, i.e. specified environmental requirements.

- a. Certificate of Compliance
- b. Certificate of Conformance
- c. Certified Test Report
- d. Topical Report
- e. Other

REFER TO SECTION III - PARAGRAPH 6.

8. Verify that the major and interfacing system components actually installed are of the type model etc. of those tested or otherwise qualified, ^{by observation}

NOTE: Refer to Section III - "Master Form"

SECTION III

1. INTENT:

It is a fundamental premise of NRC's inspection program to rely principally on the implementation of industry QA/QC programs. It is therefore the intent of this procedure to "test" industrial qualification programs. A qualification program will be "tested" by choosing several components and playing them against a particular program. Thus, the programs and specific components can be "qualified".

SCOPE:

This procedure sets forth the attributes to be verified by IE inspection personnel of the design, manufacture, test and/or analysis methods, principles, procedures, etc., used to qualify equipment, for use in nuclear powered electric generating stations, that activate, control or indicate the status of systems which trip the reactor and/or, have engineering safety functions such as containment isolation, core spray, containment spray etc. Use of this procedure includes verification at vendor locations and/or nuclear plant sites.

BASIS:

This procedure is based on the requirements set forth as follows: 10CFR 50.55a (k) (which is IEEE 279) paras. 3(B) and 4.4; 10CFR 50, App. A - GDC 2, 3, and 4; 10CFR 59 App. B, Criteria III, VIII, and XI; Reg. Guide 1.70 sections 3.1, 3.2, 3.10, 3.11 and 9.5.1.2; IEEE 323-1974; ANSI N45.2 sections 4, 8, and 12.

1. Vendor - For use here, Nuclear Steam System Supplies (NSSS); Architect Engineer (AE); manufacturer
* See IEEE 605 - Criteria for Safety Systems for Nuclear Power Generating Stations.
See IEEE 497 - Best accident monitoring instruments for nuclear power generating stations.

DISCUSSION:

Manufacturers and users of safety related systems and interfacing components must have powered electronic generating stations or require to provide assurance that the components to meet or exceed performance requirements throughout the component's life. This includes design, qualification, production, installation, maintenance, and periodic testing. Once confidence is gained through qualification methods that a component will perform, assurance must be provided subsequent equipment of the ^{same} type methods which are justified.

Information from licensee's equipment tests and evaluations have indicated potential problems in qualification of installed equipment. Poor installation practices, inadequate consideration of off the shelf components, and omission of certain environmental parameters in the design are examples of such problems. ~~Installation~~ inadequate documentation of qualification, and general lack of knowledge of the quality of installed equipment are examples of problems encountered.

Other contributors include:

- a. Vendors face the task of implementing a number of industry standards and ability to meet NSSS specifications, all which are subject to varying interpretations and translate through a qualification program for product lines which may have been in production for several years.
- b. Specification requirements and standards include traceability of all materials, components, and sub-assemblies in the entire environment: and that must extend to the sub-assembly.

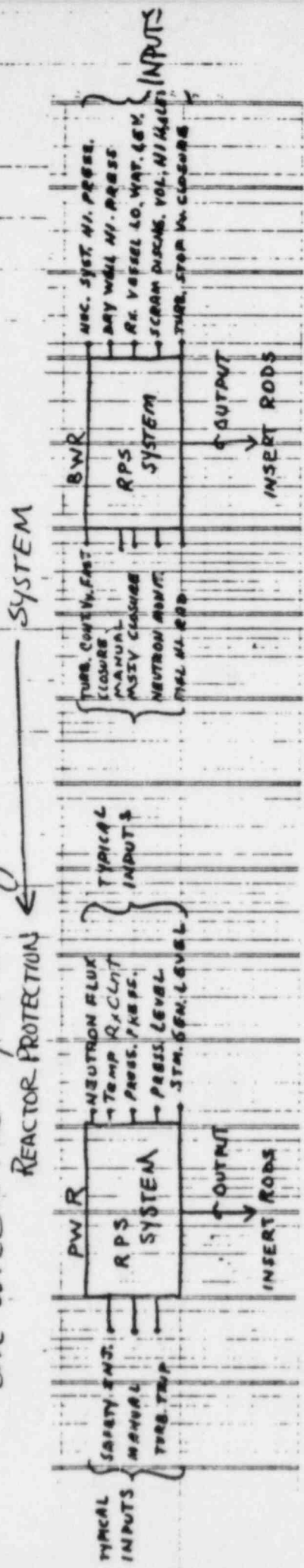
and to any other organization that designs or fabricates any parts, subassembly or tooling affecting the equipment.

Hard ware problems are common. Components manufactured by a vendor are mounted on racks or panels supplied by him; components manufactured by others are mounted on racks or panels supplied by the vendor; components manufactured by the vendor are mounted on racks or panels supplied by others, etc. As a result consultants encourage utilization, NSSS, AFS to greatly reduce problems in specification preparation by avoiding unnecessary upgrading or special interpretations or requirements of cables standards, i.e. do not write design specifications but functional specifications.

SYSTEMS:

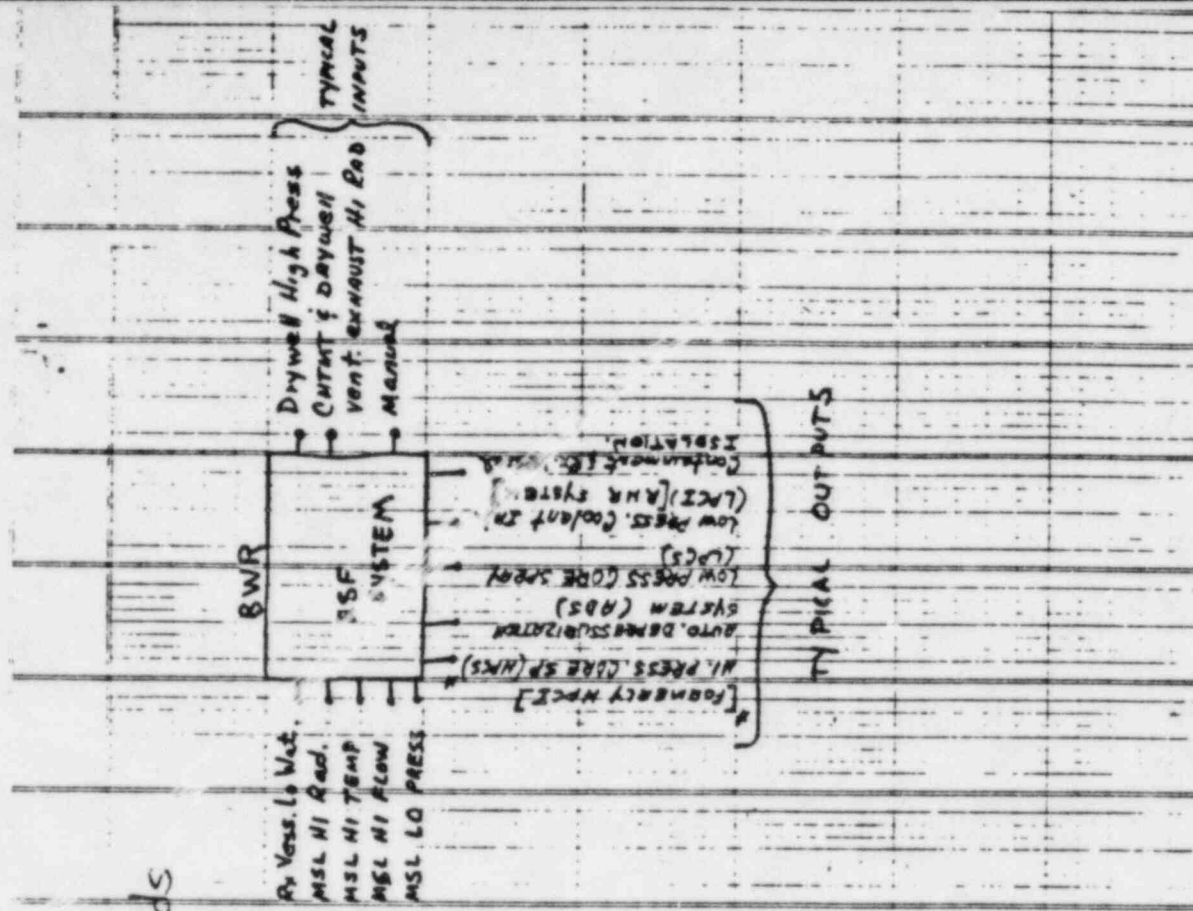
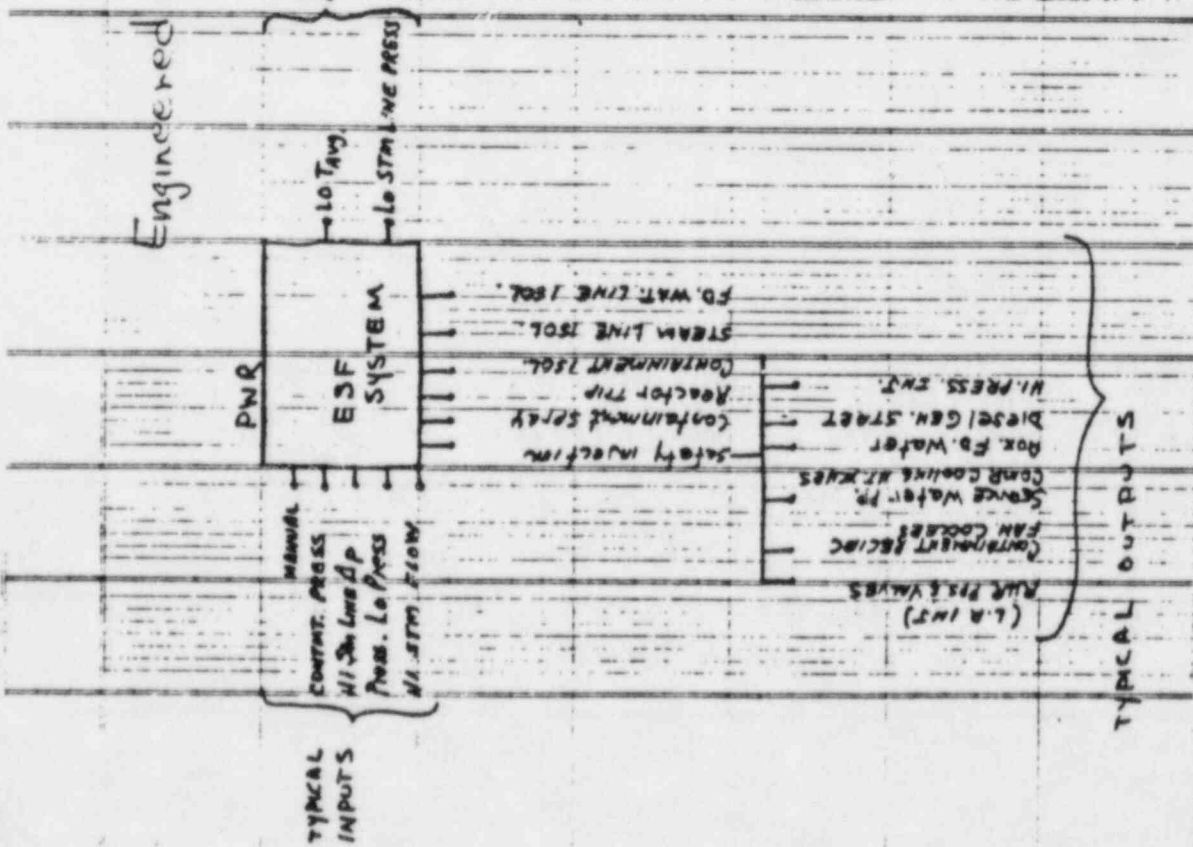
! SYSTEMS:

a. Reactor Protection - "trips" the reactor in the event of an unsafe operating condition.



b. Engineered safeguards - installed to provide a barrier against release of radioactivity from loss of coolant accident (LOCA) or steam line breaks; (Containment, penetrations, Containment Isolation valves); to minimize the potential for leakage through these barriers (ventilation and spray system); reactor core cooling if reactor pressure boundary is breached (Emergency core cooling system (ECCS)); Negative reactivity insertion (poison" such as boron or Sodium pentaborate); reliable power supply (diesel generator - batteries).

Engineered Safeguards



C. TYPICAL PWR SYSTEMS REQUIRED FOR EMERGENCY CORE OR CONTAINMENT COOLING

Residual Heat Removal (RHR) [Delayed Mode]
Low Pressure Injection
Accumulators (Core Flooding Tanks)
High Pressure Injection (HPI) [Delayed Mode]
Charging Pumps
Safety Injection
Containment Spray System
Containment Fan Cooler System
Aux. Feedwater
Service Water (Purified)
Diesel Generator - Batteries

* Commonly included as part of the Emergency Core Cooling System (ECCS)

D. Refer also to AC & DC single line drawings for identification of specific plant systems.

TYPICAL BWR SYSTEMS REQUIRED FOR EMERGENCY CORE OR CONTAINMENT COOLING

Residual Heat Removal (RHR) - Containment flooding mode;
Low Pressure Coolant Injection (LPCI) * MCR
Standby Liquid Control System
High Press Core Spray (HPCS)
Low Press Core Spray (LPCS)
Automatic Depressurization System (ADS) * [Blowdown Sys]
Emergency Equipment Cooling System [Closed Loop Cooling Syst]
Portions of the Service Water System
Diesel Generator - Batteries

* Commonly included as part of the Emergency Core Cooling System (ECCS) Class 15
Refer to specific plant system drawings.

3. PURCHASERS - ~~PROGRAM~~

Safety related system and infrastructure components may be purchased as follows:

- License - Balance of Plant (BOP), i.e. reactor, e.g. turbine-generator etc.
- Nuclear Steam Supply System (NSSS) vendor [GE, W, B, W, CE] - NSSS
- Architect Engineer (AE) - Balance of Plant, i.e. class EE but not part of the NSSS, e.g. Diesel generator

Purchasing includes the design, manufacture, and test of a safety related system and/or infrastructure component. A particular component may be ~~cost~~ however:

- designed by self, manufactured, tested by others;
- designed and manufactured by self, tested by others;
- designed, tested and manufactured by self;
- tested only (shelf item);
- designed and tested by self, manufactured by others;
- purchased as a 'just in time' part, e.g. cable

* Self - NSSS, AE, or manufacturer

4 QA PROGRAM

Criterion VII of Appendix B requires in part that measures shall include provisions for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor (Vendor), inspection at the contractor or subcontractor (Vendor) source. (Refer to ANSI N45.2.13)

Listed below is an example of a check list which meets minimum requirements:

1. Is the program controlled by written procedures, eg. training, design, procurement?
2. Do the program provide indoctrination and training of personnel performing functions of design, manufacture, test and/or procurement? (Refer to Reg. Guide 1.58; ANSIN45.2)
3. Do specifications include necessary environmental parameters and quality requirements such as those identified in the SAR?
4. Are deviations controlled?
5. Are materials, parts, equipment and processes reviewed for suitability (see no. 2 above)?
6. Are design interfaces controlled, i.e. between disciplines, in house organizations, and/or between outside organizations?
7. Have procedures been established to control such interfaces?
8. Are design changes, including field changes, subject to the same review as the original design?
9. Do purchase documents provide adequate reference to specifications which include definition, i.e. qualitative and quantitative requirements such as environmental parameters?

by qualified personnel

11

10. Do procedures, for example testing and inspection, include definitive acceptance criteria?
11. Are purchased materials, equipment, services etc., i.e. direct purchases or through subcontractors verified to conform to procurement requirements?
12. Has an inspection program for the manufacture of each component been established which includes definitive acceptance criteria?
13. Has a test program been established to demonstrate that the safety related system and interfacing components will perform in service under the most adverse conditions? (Refer to method below)
14. Are tools, instruments, gages and other measuring & testing devices calibrated, controlled, or adjusted to maintain accuracy? (Refer to IEEE 498)
15. Is there an established method of identifying failures, deviations, defective material, etc., and then taking corrective action?
16. Are records kept such as test results, inspection results, deficiency records?

5. DATA FORM

(Not required for design guidance only)

- a) A chosen system may include any, all, or other of the components identified in the DATA FORM component type LIST. It is intended to verify all of the components used in the system selected for each area of the nuclear plant site (Reference V). NOTE: A system which is routed through more than one plant area may satisfy the "area" requirement of Section II Para. 4. Emphasis must be on verification of each purchaser's inclusion and verification of environmental requirements for auxiliary components.
- b) Refer to individual component or system specifications and to the information provided and referenced under columns VI through VIII.
- c) Refer to Component Type List.

- * DATA FORM includes all of the subsequent information up to and including XVI.
- NOTE: Drawings, materials part lists, etc. should be reviewed to determine which specific major and auxiliary components are included in the system.

DATA FORM

Facility:
Rx Type:

System:
Specification(s):

COMPONENT TYPE LIST	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI ICEE, REG. 6
	TYPE OF COMPONENT (MODEL)	DESIGNED BY	MANUFACT. BY	TESTED BY (LAB. TOPICAL)	PLANT LOCATION BY AREA	TEMP. 32°	PRESS 32°	REL. HUMID. 32°	ATMOS 32°	CHEMICAL 32°	RADIATION 37° 32°	AGE 32°	DURATION 32°	SEISMIC 51°	FIBER 33°	
Instrumentation transmitters sensors																1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
Motors Pumps valves HVAC																
Cables Power Control instrumentation																
Terminations Penetrations Connectors terminal blocks splices																
Ancillary switches-Limit Control-Transfer Junction boxes																
tapes Solenoids epoxies lubricants relays																
electronics modules coatings-paint, galvanized gaskets seals																
grommets fuseholders bushings rings																
Other Switchgear (below)																

DATA FORM

Facility:
Rx Type:

System:
Specification(s)

NOTE

Component Type List (Cont'd)	Type of Component (Model)	Designed By	Approved By	Minimum BY	Tested by (Lab. - Topical)	Plant Location Area	VI TEMP.	VII PRESS.	VIII REL. HUMID.	IX ATMOS.	X CHEMICAL	XI RADIATION	XII AGE	XIII DURATION	XIV SEISMIC	XV FIRE	XVI IEEE REG. GUIDE	
transformers							32°	32°	32°	32°	32°	32°	32°	32°	31°	33°		
racks - battery																		
local instruments																		
panels																		
raceway																		
supports - raceway																		
instrumented sensing lines																		
fire stops																		
digital generator																		
switchgear - MCC's, SKV, 980V, Rk, trip, DC/AC																		
batteries																		
chargers																		
inverters																		
* may be located inside containment (drywall)																		
includes materials which serve to restore structural integrity of floors or walls which have been penetrated by pipe, duct, raceway, etc. fire, flood, radiation shielding, pressure etc.																		

NOTE: IEEE 279⁽¹⁾, 308⁽²⁾ (R.6.1.32), 323⁽³⁾ (R.6.1.89), 344⁽⁴⁾ (R.6.1.291.100), 579⁽⁵⁾ (R.6.1.53), 584⁽⁶⁾ (E.6.1.75), 690⁽⁷⁾ and 616.146⁽⁸⁾ are generic for all electrical safety related system and interfacing components. Refer to SAR sections 1.3, 3.1, 7.1 and 8.1 for conformance to general design criteria, test guides, standards and other documents utilized in the design of instrument, electrical safety related system and interfacing components.

The numbers in column XVI and VI - ~~VI~~ XV are interpreted in attachment XVI.

Plant location
by area:

Areas within the nuclear plant site have "normal" and "accident" environmental characteristics. The type of reactor, containment, nuclear steam supply system, architect engineer, and specific plant location play a role in establishing these characteristics. Below are general examples of those areas most likely to play the greatest role.

PWR

Inside Containment
(Reactor Building)
Auxiliary Building
Turbine Building
Control Areas
Outdoors

BWR

Inside Containment
Inside drywell
Outside drywell
Reactor Building
Turbine Building
Control Areas
Outdoors
Auxiliary Building

Normal and accident environments are defined in section 3.11 of the SAR. Plant areas outside the reactor building such as the control room, relay rooms, switchgear rooms etc. may be affected only by loss of HVAC, fire, or seismic events. Flooding may be localized.

Equipment located inside containment is subjected to the most extreme environmental conditions for postulated accidents. For equipment located outside containment, the high energy the break (NEEP) turbine building, etc. at these environmental conditions.

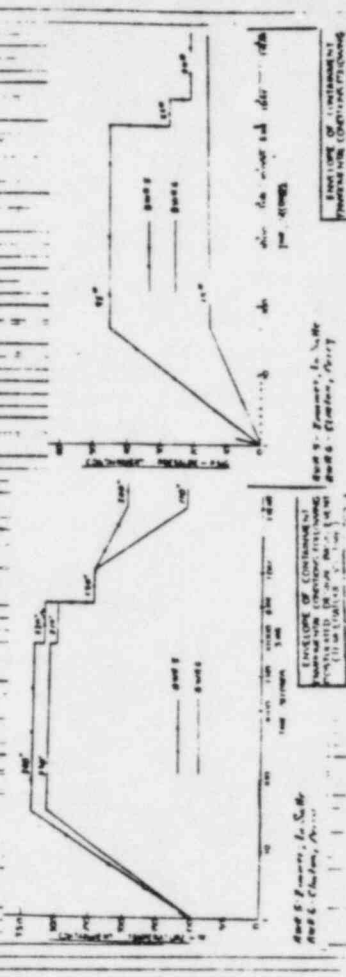
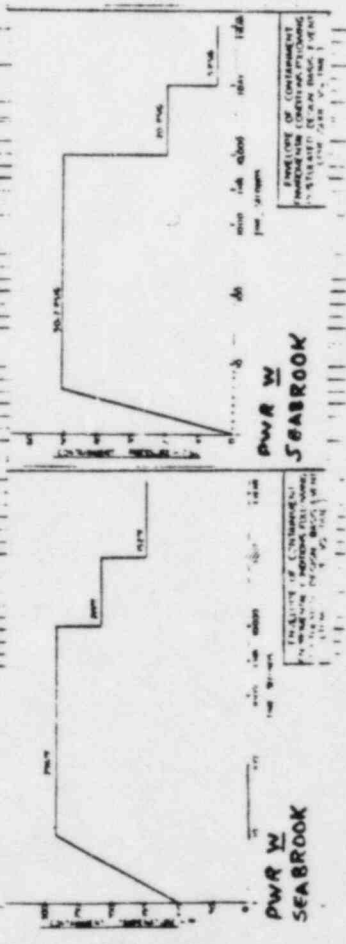
TEMPERATURE
PRESSURE

VI
VII

the postulated accident which generally could produce the most severe environmental conditions is the loss of coolant accident (LOCA). The LOCA usually results in the highest pressure condition whereas a main steam line break (MSLB) can produce higher temperatures.

Worst case environmental parameters as defined in IEEE 323 1574 - Tables A₁, A₂, & Fig. A₁, may not be relative to the plant or manufacturer being inspected, however, many components have been type-tested generally for a group of facilities. The worst case parameters usually provide margin for most plants. Specifications and the SAR must be reviewed to determine relevant parameters.

* Examples of accident and post accident temperature - pressure conditions which may be encountered at any time during the design life of the plant are given below.



VIII REL. HUMIDITY

IX-X ATMOSPHERE CHEMICALS

For both PWR & BWR, 100% RH is assumed.

During an accident cond. from the atmosphere within a PWR containment may consist of sulfuric acid steam, air, and hydrogen. In addition, the equipment could simultaneously be exposed to an aqueous spray of:

Boron 1900 - 2200 ppm

pH (min-max) of

Boric Acid-Sodium
Hydroxide Solution

9.0 - 10.5

Sodium Hydroxide
Hydrazine

1.75% by weight

* Hydrogen accumulations occur from the corrosion of aluminum and zinc.

NOTE: Chemicals, heat, radiation may cause coatings such as paint or galvanizing, to flake, peel or otherwise be removed from the surface being protected. This slough can cause emergency cooling water pump suction screens and/or discharge spray nozzles to be plugged.

Examples of the integrated beta-gamma dose following a LOCA are shown below:

PWR - 1.5×10^8 rads BWR - 2.6×10^7 rads

the LOCA is the DBE of primary concern from a radiation standpoint. Assuming no removal of radioactivity by sprays or filters, the integrated 60 day LOCA dose to electrical equipment

due to gamma radiation ranges from 10^6 - 10^8 rads. Equipment required to function only during the first hour following a LOCA (refer to XIII DURATION) will not likely be exposed to doses in excess of 10^6 rads and will not have its safety function impaired. Only equipment needed for long term accident mitigation such as maintenance of containment integrity and residual heat removal will have to be qualified for radiation doses of 10^7 - 10^8 rads.

Normal and accident integrated radiation doses have cumulative effects. Most elastomers (rubber-like materials) begin to exhibit damage when exposed to doses on the order of 10^7 rads or higher. Minor damage is initiated for certain materials at somewhat lower doses but not to the extent of functional impairment. For most thermoplastic resins, e.g. polymers, cellulose, vinyls, etc., mild damage becomes evident starting at about 10^6 rads. Metals offer no problem to gamma irradiation. Organics pose a serious problem and the fluorinated hydrocarbons are either to be avoided completely or used under carefully controlled conditions. (See accompanying table) [Refer to IEEE 278 - "Guide for classifying electrical insulating materials exposed to neutron, gamma radiation"]

Functional Damage Thresholds of Organic Materials Due to Radiation

Material	Integrated Dose: Rad
EE Beams	5.0 x 10 ⁶
AcF	6.0 x 10 ⁶
PVC	9.0 x 10 ⁶
Brxl Rubber	1.0 x 10 ⁷
Nylon	1.5 x 10 ⁷
Polypropylene	5.0 x 10 ⁷
EEP Beams	9.0 x 10 ⁷
Silicone Rubber	9.5 x 10 ⁷
Hypalon	1.0 x 10 ⁸
Viton	1.0 x 10 ⁸
Nitrile	4.0 x 10 ⁸
Neoprene	4.0 x 10 ⁸
Polyethylene	4.0 x 10 ⁸
SBR Rubber	4.0 x 10 ⁸
Natural Rubber	4.0 x 10 ⁸
Ethylene Propylene Rubber	1.5 x 10 ⁹
Epony	2.0 x 10 ⁹
Polyester	2.0 x 10 ⁹
Phenolic	2.0 x 10 ⁹
Pyrom	2.0 x 10 ⁹
Sorban	4.0 x 10 ⁹
Kovar	5.0 x 10 ⁹
Filled Silicone Resins	8.0 x 10 ⁹
Polypyrrene	1.5 x 10 ¹⁰

NOTE: Above these total integrated doses, permanent damage can be expected to occur. The damage may take the form of hardening, swelling, softening, or degradation. The appropriate standard should be applied.

XII AGE

Aging simulation is designed to put a test specimen in the end-of-life or 40 year plant service condition, whichever is earlier. Aging simulation includes thermal, radiation and generation. Insulation life is halved, on the average, for each 18°F temperature increase. Very little research has been performed in the area of aging, e.g. there is no type test in current use to prove the adequacy of cable used in nuclear power plants to perform normally in wet environments for an extended period.

XIII DURATION:

Duration is probably the most significant entry for determining the qualification requirements of a system component. Duration may be continuous, short-term, intermittent or not applicable.

- Operates during or following bba or safe shutdown and must continuously perform a function to allow a safety system to operate. Isolation valves must maintain pressure boundary continuously. *Do not perform function during bba.*
- Performs a function for a time less than the duration of the bba or for going to safe shutdown and is then isolated from the safety-related system. Is not used again during bba or for going to safe shutdown.
- Performs a function on a cyclic basis during the bba or safe shutdown, or performs a function for a short term and is isolated from the safety system, but may be operated as required during the bba or for going to safe shutdown.
- Item does not function during bba or for safe shutdown. An MA safety item must, however, maintain its structural and mechanical integrity during an accident.

Below are examples. Refer to SAE Table 3.11.1.

TABLE 3.11-1 (PWR)

POST-ACCIDENT EQUIPMENT (INSIDE CONTAINMENT)

OPERATIONAL REQUIREMENTS

Equipment Name	Operating Mode	Required Duration of Operation	Design Duration of Operation
CATEGORY 1 - INSTRUMENTATION			
Pressurizer pressure channels	Continuous	1/2 hr (for safety injection initiation)	2 hrs
Pressurizer level channels	Continuous	1/2 hr (for safety injection initiation)	2 hrs
High-head flow channels	Continuous	5 min.	2 hrs
Accumulator pressure channels	During injection phase	5 min.	2 hrs
Containment sump level channels	Continuous	3 hrs	Available to 1 year
Containment pressure	Continuous	3 months	Available to 1 year
CATEGORY 2 - VALVES			
Emergency Core Cooling System motor operated valves, high head injection line	Continuous	5 min.	1/2 hr after accident
Containment isolation valves	Operate on signal	5 min.	1/2 hr minimum
Containment air recirculation fan valves	Open on signal	5 min.	1/2 hr minimum
Hydrogen Recombiner System	Operate on demand	3 months	Available for 1 year
Engineered Safety Features equipment power, control and instrument cable	Continuous	3 months	Available for 1 year
Containment Air Recirculation Fans	Continuous	2 months	Available for 1 year

BWR (INSIDE DRYWELL)

Component	Duration	Notes
(1) Ex shutdown cooling suction Vv, including operator cable	3hr 300t 3hr 300t	1 day
(2) Relief Vvs. - operator cable		
(3) Vessel level indicator		
(4) HPCS 150L Vv - op f cable		
(5) RJC sth 150L Vv op f cable		
(6) Ex H ₂ O sample line Vv - op f cable		
(7) 2" and under Vvs. - op f cables		
(8) IRM f PWR cables		
(9) Ex Vsl, head spray 150L Vv - op f cable		
(10) Ex H ₂ O clean up suction Vv. f op f cable		
(11) MSIV - op f cable		
(12) MSIV drain 150L Vv - op f cable		
(13) RPS		
(14) Neat Monit. System		
(15) Penetrations		

XIV SEISMIC

SEISMIC CLASS I- Structures, components, and instrumentation vital to the safe shutdown of the reactor and whose failure might cause the severity of a LOCA or otherwise result in an uncontrolled release of excessive amounts of radioactivity.

OPERATING BASIS EARTHQUAKE (OBE) The earthquake which could reasonably be expected to affect the plant site during the operating life of the plant. Seismic Class I equipment will remain functional.

SAFE SHUTDOWN EARTHQUAKE (SSE) The earthquake which is based upon an evaluation of the maximum earthquake potential considering the regional and local geology, seismology and specific characteristics of local subsurface material. It produces the maximum vibratory ground motion.

All plant locations are different; each floor level within a plant is different. Tests are performed at accelerations (g's) over a given frequencies. (0-33hz up to 10g) [see Fig. 1]

Earthquakes are characteristically low frequency, large displacement earth movements with both horizontal and vertical components. The actual earth motion is often amplified at certain frequencies due to the response of the reactor building and to the interaction of the building and the soil on which it is built. This amplification phenomenon can result in horizontal accelerations of several times the force of gravity.

If the expected failure mode of safety related equipment is primarily structural, then mathematical analysis is an appropriate method of assuring its survivability. However, if the expected failure mode is primarily functional, then a test is required. Under certain conditions, such as when the equipment is too large to be tested, a combination of analysis and testing may be appropriate.

Continuous Sine Test
A continuous sinusoidal motion at a single frequency with a peak acceleration equal to at least the maximum qualification acceleration is applied to the test article. The peak input acceleration and the time of excitation is adjusted so that the analysis of the test response spectrum (TRS) equals or envelopes the required response spectrum (RRS).

Sine Beat Test
A continuous sinusoid of one frequency is amplitude modulated by a 1/3 octave sinusoid of a lower frequency is applied to the test article. The number of oscillations and peak amplitude of the beat for each test frequency is chosen so most nearly produce test response spectrum (TRS) which equals or exceeds the required response spectrum (RRS).

Decaying Sine Test

A single frequency decaying sinusoid with a maximum amplitude equal to or greater than the peak test acceleration is applied to the test article. The peak input acceleration and the decay rate is adjusted so that the test response spectrum (TRS) envelopes the required response spectrum (RRS).

Time History Test

A pre-recorded time history which has been synthesized to simulate the probable input is applied to the test article. If a time history is required to meet a specific RRS, then the time history is analyzed to insure that the TRS envelopes the RRS.

Random Motion Test

The test article is subjected to a random motion consisting typically of frequencies in the range of 0.5 to 33 Hz. The amplitude is controlled in 1/3 octave frequency bandwidths and is iteratively adjusted so that the analysis of the input motion envelopes the required response spectrum (RRS).

Random With Sine Beat Test

To meet an RRS with a moderately high peak, a sine beat is superimposed on a random excitation. This permits the enveloping of the RRS without substantial oversteering at frequencies other than at the peak frequency.

Complex Motion Test

The test article is subjected to a complex motion generated by summing a group of decaying sinusoids with a decay rate of approximately 5%. The frequencies are initiated so that their peaks occur at approximately the same

time. They are spaced 1/3 octave apart and have individual amplitude controls. The signal is iteratively adjusted until the analysis of the input signal envelopes the required response spectrum. The test is applied several times with a pause between excitations to avoid superposition of the response motions.

Low Level Sine Sweep Test

While not sufficient for a qualification test, a low level sine sweep is often useful as a design tool or for obtaining data to support or verify a mathematical analysis. The test item is excited to a very low level, typically 0.2 g, and continuous acceleration levels are recorded at points of interest. Resonance frequencies, transfer functions, and damping factors can be obtained from this test.

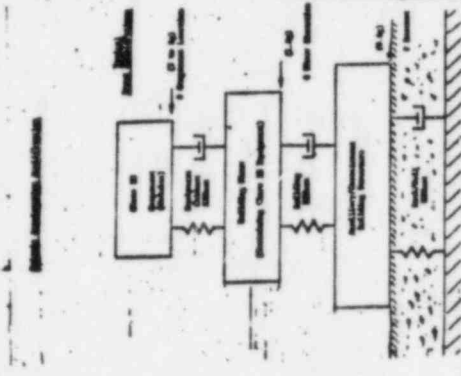
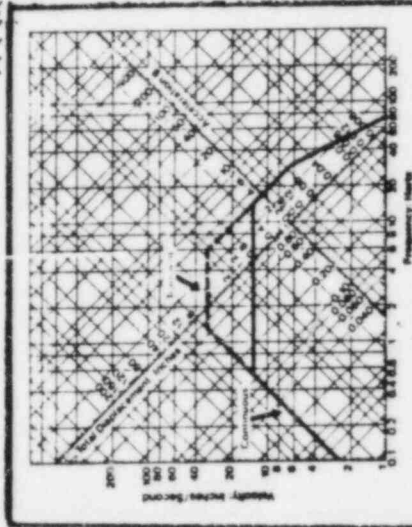
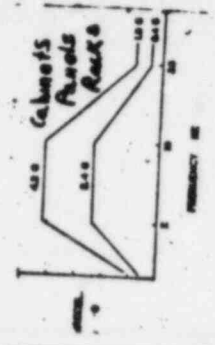
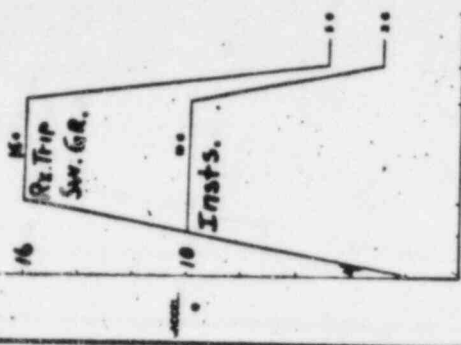


FIG. 1



Max. Displacement: 8 in. double amplitude
Max. Velocity: 25 inches per second
Max. Acceleration: 3 g's
Max. Frequency: 70 Hertz

How to read the



TYPICAL Values

XV FIRE

The concept of defense-in-depth against fire and its consequences includes the use of noncombustible materials in the selection of insulations, lubricants, electrical circuits, equipment and other components.

* Noncombustible materials are those which in the form to be used and under the conditions anticipated will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. Material that has passed the American Society of Testing Materials (ASTM) E 136-1973 "Standard Method of Test for Non-Combustibility of Elementary Materials" are considered noncombustible.

All safety related equipment and components shall be Underwriters Laboratories (UL) or Factory Mutual (FM) listed.

Electric cable constructions should, as a minimum, pass the flame test in the current IEEE Std 383, "IEEE Standard of Type Test of Class 1E Electrical Cables, Field Splices and Connections for Nuclear Power Generating Stations." (This does not imply that cables passing this test will not require fire protection.)

IEEE Standards, Reg. Guide Identification and SAR Information

XVI

IEEE 279	Criteria for protection systems for nuclear power generating stations (see IEEE 50.559 (4))
IEEE 308	Class 2 power systems for nuclear power generating stations (1)
IEEE 317	Electric penetration assemblies in containment buildings for nuclear power generating stations (1)
IEEE 323	Qualifying Class 2 equipment for nuclear power generating stations (1)
IEEE 334	Type tests for continuous duty Class 2 motors installed inside the containment of nuclear power generating stations (1)
IEEE 344	Seismic qualifications of Class 2 equipment for nuclear power generating stations (1)
IEEE 379	Application of the single failure criterion to nuclear power generating stations (1)
IEEE 382	Type tests of Class 2 electric valve operators for nuclear power generating stations (1)
IEEE 383	Type tests of Class 2 electric cables, hard splices and connections for nuclear power generating stations (1)
IEEE 384	Criteria for separation of Class 2 equipment and circuits (1)
IEEE 387	Design criteria for standby power supplies for nuclear power generating stations (1)
IEEE 420	Class 2 control switchboards for nuclear power generating stations (1)
IEEE 650	Design and installation of cable systems in nuclear power generating stations (1)
IEEE 434	Installation and design of large lead storage batteries (1)
IEEE P 628	Criteria for the application, installation and qualification of Class 2 recovery systems for nuclear power generating stations (1)
IEEE 634	Qualification of cable penetration from fire tops (1)
Reg. Guide 132	(1)
163	(1)
187	(1)
190	(1)
199	(1)
100	(1)
153	(1)
173	(1)
175	(1)
128	(1)
131	(1)
19	(1)
11	(1)
105	(1)
SAR 3.10	Instrument lines penetrating primary reactor containment
3.11	Instrument set points
9.5.1.2	Seismic qualification of Seismic Category I instrumentation and electric systems
1.54	Environmental design of mechanical electrical equipment
1.7	Fire-resistant protection systems description
1.120	QA requirements for protective coatings applied to water cooled nuclear power plants
178	Control of combustible gas concentrations in containment following a LOCA
10 CFR 100	Fire Protection Guidelines for nuclear power generating stations
10 CFR 100	Guide for classifying electrical insulation materials used to neutralize gamma radiation

APP A. Seismic & Geologic Siting Criteria for Nuclear Power Plants (6)

6. QUALIFICATION METHOD

i Certificates of Compliance

a) Accompanying information, e.g. test reports, are reviewed by persons who have been indoctrinated and trained in performing a technical review. (See Vendor Qualification Method App. A) Procedures are available indicating reviewers' responsibility, method etc.

b) The review is comprehensive enough to assure requirements delineated in procurement documents (specifications), e.g. IEEE or other standards, ^{and} Guides, have been met. (See Vendor Qualification Method App. A)

c) Stated exceptions to procurement requirements have been reviewed technically and are accepted, rejected etc.

d) Results of the review are recorded and include the identity of the reviewer, what was reviewed, whether it is acceptable or not, and action taken relative to any deficiencies noted.

e) Methods established to verify and record that when bits of technical information are received reviewed and in total before ^{being} releasing for installation and use. An example method would be a check list made up of all which includes all specification requirements and the status of receipt, review, approval, rejection etc.

ii Certificate of Conformance (ANSI N45.2.13)

a) Examples include Westinghouse Quality Release (QR); General Electric Product Quality Cert. (PQC)

b) The Cert. of Conformance should

- be sufficient to specifically identify the purchased material or equipment, such as by the purchase order number.
- identify the specific procurement requirements met by the purchased material or equipment, such as codes, standards, and other specifications. This may be accomplished by including a list of the specific requirements or by providing, onsite, a copy of the purchase order and the procurement specifications or drawings, together with a suitable conformance statement. The procurement requirements identified should include any approved changes, waivers, or deviations applicable to the subject material or equipment.
- identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformances.
- be attested to by a person who is responsible for this QA function and whose function and position are described in the purchaser's or supplier's QA program.
- have the certification system, including the procedures to be followed in filling out a certificate and the administrative procedures for review and approval of the certificates, described in the purchaser's or supplier's QA program.
- have means provided to verify the validity of certificates and to determine the effectiveness of the certification system when desired, such as during the performance of audits.

• the audits or other means of verification such as vendor inspection, should be truly comprehensive enough to verify the Vendor's qualification method (See Vendor Qualification Method APP A)

c.) Audits are performed in accordance with written procedures and checklists by qualified persons including technical specialists experienced or trained in the activities being audited. The scope, complexity and special nature of the audit should be considered in the selection of audit personnel.

2) Audits are performed: early enough to assure effectiveness of QA during design, procurement or testing activities; after time has elapsed in order to verify implementation of ^{the} QA/QC program into products ~~made~~ for use at the intended site.

3) Deficiencies identified are followed up in a defined time frame (timely).

iii Certified Test Reports are handled like Certificates of Compliance above.

iv Topical Reports

• Prototype test reports may be documented in topical reports such as NEDO - General Electric; WCAP - Westinghouse; BAW - Babcock & Wilcox etc. SAR table I.C-1 should identify specific titles and subjects of the topical. You must determine the status of NRE's review and acceptance.

Appendix A - Qualification Method

1. Refer to IEEE 323, V174

2. Qualification methods:

- a) Operating Experience (S.2 and 6.4) *
- b) Type Testing (S.1 and 6.3) *
- c) Ongoing (S.5 and 6.6) *
- d) Analysis (S.3 and 6.5) *
- e) Combination (S.4) *
- f) Other

3. Operating experience data includes:

- a) interface or boundary conditions
- b) qualification features demonstrated
- c) comparison of experience and specification *
- d) summary and source of experience
- e) qualification basis

4. Type Testing includes:

- a) test plan (6.3.1.1) *
- b) monitoring (6.3.1.2) *
- c) connections (6.3.1.3) *
- d) monitoring (6.3.1.4) *
- e) margin (6.3.1.5) *
- f) test sequence (6.3.2; 7.0) *

- g) aging (6.3.3) *
- h) vibration (6.3.4) *
- i) seismic (IEEE 344)
- j) fire (IEEE 373)
- k) flood (Reg Guide)
- l) ~~---~~

5. Analysis includes: (Ref. IEEE 577)

- a) interaction and boundary conditions
- b) specific functions analyzed
- c) assumptions and models
- d) analytical and computer programs

6. In all test performance specifications shall include or consider as appropriate:
a) inclusion of both major and minor (auxiliary) components (Refer to Section III, para 5)
b) inclusion of critical parameters

- i) volts, frequency, load, electrical mechanical interference (EMI), other
- ii) operating cycles (number)
- iii) design life (expected length of service in years)
- iv) qualified life (length of demonstrated life)
- v) accuracy
- vi) duration

c) inclusion of normal & accident environmental conditions (Refer to Section III, para 5 - Vibration, etc.)
d) environmental specifications meet SAR or ^{and} "worst case"

@ 7. Test Procedures include:

- a) prescriptive tests and inspections
- b) functional tests
- c) burn in

- d) environmental
- e) power supply cycling
- f) quantitative - qualitative accept. crit.

- g) test equipment calibration
- h) disassembly & inspection

8. Documentation

No matter what qualification method is used, documentation must be in the readable form and include:

- a) test envelope and description
- b) date
- c) summary
- d) conclusion

④ CONCLUSIONS

a) QA Programs

Licenses

NSSS

AE

Other

b) Specifications

and SAR component

c) Specified system

components meet

specifications and

purchase require-

ments

d) Observations

verify installed

components

complement those

qualified

Use with Master Form ③

Facility _____

Page 1 of 2

Purchaser _____

QA PROGRAM

Criterion VII of Appendix B requires in part that measures shall include provisions for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor (Vendor), inspection at the contractor or subcontractor (Vendor) source. (Refer to ANSI N45.2.13)

Listed below is an example of a check list which meets minimum requirements:

1. Is the program controlled by written procedures, eg. training, design, procurement _____ ?
2. Do the program provide indoctrination and training of personnel performing functions of design, manufacture, test and/or procurement _____ ? (Refer to Reg. Guide 1.581 ANSIN452.2)
3. Do specifications include necessary environmental parameters and quality requirements such as those identified in the SAR _____ ?
4. Are deviations controlled _____ ?
5. Are materials, parts, equipment and processes reviewed for suitability (see No. 2 above) _____ ?
by qualified personnel
6. Are design interfaces controlled _____ ?
between disciplines, in house organizations, and/or between outside organizations
7. Have procedures been established to control such interfaces _____ ?
8. Are design changes, including field changes, subject to the same review as the original design _____ ?
9. Do purchase documents provide adequate reference to specifications which include definitions, i.e. qualitative and quantitative requirements such as environmental parameters _____ ?

3

10. Do procedures, for example testing and inspection, include definitive acceptance criteria?
11. Are purchased materials, equipment, services etc., i.e. direct purchases or through subcontractors, verified to conform to procurement requirements?
12. How an inspection program for the manufacture of ~~such~~ components been established which includes definitive acceptance criteria?
13. How a test program been established to demonstrate that the safety related systems and interfacing components will perform in service under the most adverse conditions? (Refer to method below)
14. Are tools, instruments, gages and other measuring & testing devices controlled, calibrated, or adjusted to maintain accuracy? (Refer to IEEE 498)
15. Is there an established method of identifying failures, deviations, defective material, etc., and then taking corrective action?
16. Are records kept such as test results, inspection results, deficiency records?

1. Use with Master Form 6

Facility: _____
 System: _____
 Specifications: _____

REV

COMPONENT TYPE LIST	I TYPE OF COMPONENT (MODEL)	II DESIGNED BY	III MANUFACT. BY	IV TESTED BY (LAB. TYPICAL)	V PLANT LOCATION BY AREA	VI TEMP.	VII PRESS.	VIII REL. HUMID.	IX ATMOS.	X CAMBER	XI RADIATION	XII AGE	XIII VIBRATION	XIV SEISMIC	XV FIRE	XVI SEE NOTE		
																IRREG.	REG. CURVE	
Instrumentation																	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100	
transmitters																		
sensors																		
Motors																		
Pumps																		
Valves																		
HYAC																		
Cables																		
Power																		
Control																		
instrumentation																		
Terminations																		
Connectors																		
Terminal blocks																		
Splices																		
Accessory																		
switches - limit																		
Control - transfer																		
junction boxes																		
tapes																		
solenoids																		
oparors																		
lubricants																		
relays																		
electronic modules																		
spatings - paint																		
galvanised																		
gaskets																		
seals																		
brackets																		
tyseholders																		
bushings																		
Other																		
Switchgear (later)																		

Specification may be a generic system spec. or each/several individual components may have individual specs. Record accordingly.

USE - (V) Type of component for each "system component"

System Specification(s) #

Facility: _____
 R# Type: _____

Component Type List (Cont'd)	Type or Component (Model)	Designed By	Approved By	Tested By (LAB - TORICAL)	PLANT LOCATED BY AREA	TEMP.	PRESS.	REL. HUMID.	ATMOS.	CHEMICAL	RADIATION	AGE	SEISMIC	FIRE	SEE REF. GUIDE
		III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
transformers															
rack-battery															
local instrument															
panels															
raceway															
supports - raceway															
instrument sound lines															
fire stops															
digital generator															
switchgear-MCC's															
5KV, 500V, Rk.															
trip, DC/AC															
batteries															
chargers															
inverters															
may be located inside															
confinement (drywall)															
includes materials															
which serve to restore															
structural integrity of															
floors or walls which															
have been annotated															
by pipe, duct, raceway,															
e.g. fire, flood, radiation															
shielding, pressure etc.															

NOTE: IEEE 279, 308 (R.G. 32), 323 (R.G. 189), 344 (R.G. 153), 384 (R.G. 175), 690 and 616 are generic for electrical safety related system and interfacing components. Refer to SAR sections 1.3, 3.1, 7.1 and 8.1 for compliance to general design criteria, test guides, standards and other documents utilized in the design of instrument, safety related system and interfacing components.

The numbers in column XVI and VII are interpreted in attachment XVI.

Facility _____
 Purchasing Organization _____
 System and/or Component _____

- A. Circle appropriate method
 B. Perform steps and record accordingly

QUALIFICATION METHOD

- i Certificates of Compliance
- Accompanying information, e.g. test reports, are reviewed by persons who have been indoctrinated and trained in performing a technical review. (See Vendor Qualification Method (App. A)). Procedures are available indicating reviewer's responsibility, methods etc.
 - The review is comprehensive enough to assure requirements delineated in procurement documents (specifications), e.g. IEEE or other standards, ^{and} Guides, have been met. (See Vendor Qualification Method (App. A))
- c) Stated exceptions to procurement requirements have been reviewed technically and are accepted, rejected etc.
- d) Results of the review are recorded and include the identity of the reviewer, what was reviewed, whether it is acceptable or not, and action taken relative to any deficiencies noted.
- e) Methods established to verify and record that what ^{being} released for installation and use. An example method would be reviewed and in total before releasing for installation and use. An example method would be a check list made up of all which includes all specification requirements and the status of receipt, review, approval, rejection, etc.
- ii Certificates of Conformance (ANSI N45.2.13)
- Examples include, Westinghouse Quality Release (QR), General Electric Product Quality Cert (PQC)
 - The Cert. of Conformance should:

⑦

- be sufficient to specifically identify the purchased material or equipment, such as by the purchase order number. _____
- identify the specific procurement requirements met by the purchased material or equipment, such as codes, standards, and other specifications. This may be accomplished by including a list of the specific requirements or by providing, onsite, a copy of the purchase order and the procurement specifications or drawings, together with a suitable conformance statement. The procurement requirements identified should include any approved changes, waivers, or deviations applicable to the subject material or equipment. _____
- identify any procurement requirements that have not been met, together with an explanation and the means for resolving the nonconformances. _____
- be attested to by a person who is responsible for this QA function and whose function and position are described in the purchaser's or supplier's QA program. _____
- have the certification system, including the procedures to be followed in filling out a certificate and the administrative procedures for review and approval of the certificates, described in the purchaser's or supplier's QA program. _____
- have means provided to verify the validity of certificates and to determine the effectiveness of the certification system when desired, such as during the performance of audits. _____

• the audits or other means of verification such as vendor inspection, should be truly comprehensive enough to verify the Vendor's qualification method (See Vendor Qualification Method (iff A)) _____

C. 1) Audits are performed in accordance with written procedures and checklists by qualified personnel including technical specialists experienced or trained in the activities being audited. The scope, complexity and special nature of the audit should be considered in the selection of audit personnel. _____

2) Audits are performed early enough to assure effectiveness of QA during design, procurement and testing activities; after time has elapsed in order to verify implementation of ^{the} QA/QC program into products ~~are~~ for use at the intended site. _____

3) Deficiencies identified are followed up in a defined time frame (timely). _____

iii Certified Test Reports are handled like Certificates of Compliance above.

Facility Organization _____ System Component _____

Appendix A - Qualification Method

- * Ref: IEEE 323, 1974
- 1. Qualification methods:
 - a) Operating Experience (S.2 and 6.4) *
 - b) Type Testing (S.1 and 6.3) *
 - c) Onload (S.5 and 6.6) *
 - d) Analysis (S.3 and 6.5) *
 - e) Combination (S.4) *
 - f) Other _____
- 2. Operating experience data includes:
 - a) Interface or boundary conditions _____
 - b) qualification features administration _____
 - c) Comparison of experience and specifications _____
 - d) Summary and sources of experience _____
 - e) Qualification basis _____
- 3. Type Testing includes:
 - a) test plan (6.3.1.1) *
 - b) mounting (6.3.1.2) *
 - c) connections (6.3.1.3) *
 - d) monitoring (6.3.1.4) *
 - e) margin (6.3.1.5) *
 - f) test sequence (6.3.2; 7.6) *

- A. Circle appropriate qual. method
- B. Perform appropriate steps of circled qual. method (3, 4 or 5)
- C. Complete steps 6, 7 and 8.

- g) aging (6.3.3) *
- h) fluctuation (6.3.4) *
- i) seismic (IEEE 344)
- j) fire (IEEE 303)
- k) flood (IEEE 304)

Facility Organization _____ System Component _____

Appendix A - Qualification Method

- * Refer to IEEE 323, 1974
- Qualification methods:
 - a) Operating Experience (S.2 and 6.4) *
 - b) Type Testing (S.1 and 6.3) *
 - c) Ongoing (S.5 and 6.6) *
 - d) Analysis (S.3 and 6.5) *
 - e) Combination (S.4) *
 - f) Other _____

3. Operating experience data includes:

- a) Interface or boundary conditions _____
- b) qualification features demonstrated _____
- c) Comparison of experience and specifications # _____
- d) Summary and source of experience _____
- e) Qualification basis _____

4. Type Testing includes:

- a) test plan (6.3.1.1) * _____ d) monitoring (6.3.1.4) *
- b) mounting (6.3.1.2) * _____ e) margin (6.3.1.5) *
- c) connections (6.3.1.3) * _____ f) test sequence (6.3.2; 7.0) * _____

- A. Circle appropriate qual. method
- B. Perform appropriate steps of circled qual. method (3, 4 or 5)
- C. Complete steps 6, 7 and 8.

- g) aging (6.3.3) * _____ d) fire (IEEE 303)
- h) fluctuation (6.3.4) * _____ k) flood (IEEE 304)
- e) seismic (IEEE 344)

5. Analysis includes: (Refer to IEEE 577)

- a) interfacing and boundary conditions _____
- b) specific features analyzed _____
- c) assumptions and models _____
- d) analytical and computer programs _____

6. In all cases performance specifications shall include or consider as appropriate:

- a) inclusion of both major and minor (auxiliary) components. (Refer to Section III, para 5) _____
- b) inclusion of electrical parameters _____
 - i) volts, frequency, load, electrical mechanical interference (EMI), other _____
 - ii) operating cycles (number) _____
 - iii) design life (expected length of service in years) _____
 - iv) qualified life (length of demonstrated life) _____
 - v) accuracy _____
 - vi) duration _____
- c) inclusion of normal & accident environmental conditions (Refer to Section III, para 5-VI through XV) _____
- d) environmental specifications meet SAR or ^{are} "worst case" _____

@ 7. Test Procedures include

- a) preoperational tests and inspections _____
- b) functional tests _____
- c) burn in _____
- a) environmental _____
- c) power supply cycling _____
- (1) quantitative-qualitative accept. crit. _____
- g) test equipment calibration _____
- h) disassembly & inspection _____

8) Documentation

No matter what type of program method is used, documentation must be in the readable form and includes:

- a) test envelope and description
- b) data
- c) summary
- d) conclusion

APPENDIX 3B

COMPLIANCE OF MIDLAND PLANT UNITS 1 AND 2

WITH THE NRC REGULATIONS OF

10 CFR PARTS 20, 50, AND 100

<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
20.1(a) (8/20/79)	This regulation states the general purpose for which the Part 20 regulations are established and does not impose any independent obligations on Consumers Power Company.
20.1(b) (8/20/79)	This regulation describes the overall purpose of the Part 20 regulations. It does not impose any independent obligations on Consumers Power Company.
20.1(c) (8/20/79)	Conformance to the as low as is reasonably achievable (ALARA) principle stated in this regulation is ensured by the implementation of Consumers Power Company policies and appropriate technical specifications and procedures. Chapters 11 and 12 describe the specific equipment and design features used in this effort.
20.2 (12/1/81)	This regulation establishes the applicability of the Part 20 regulations and does not impose any independent obligations on Consumers Power Company.
20.3 (12/1/81)	This regulation defines words and phrases used in Part 20 and does not impose any independent obligations on Consumers Power Company.
20.4 (1/1/61)	This regulation defines the Units of Radiation Dose and does not impose any independent obligations on Consumers Power Company.
20.5 (1/29/76)	This regulation defines the Units of Radioactivity and does not impose any independent obligations on Consumers Power Company.
20.6 (2/28/57)	This regulation governs the interpretation of regulations by the NRC and does not

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	impose any independent obligations on Consumers Power Company.
20.7 (3/3/75)	This regulation gives the address of the NRC and does not impose any independent obligations on Consumers Power Company.
20.101 (8/20/79)	The radiation dose limits specified in this regulation are complied with through the implementation of and adherence to Midland administrative policies and controls and appropriate procedures developed for this purpose.
20.102 (8/20/79)	When required by this regulation, the accumulated dose for any individual is determined by the use of Form NRC-4 or equivalent. Appropriate Midland procedures and administrative policies control this process.
20.103(a) (7/7/78)	Compliance with this regulation is ensured through the implementation of appropriate Midland procedures relating to air sampling for radioactive materials and bioassay of individuals for internal contamination. Midland administrative policies and controls provide adequate safety margins to protect individuals against intake of radioactive materials. The systems and equipment described in Chapters 11 and 12 provide the capability to minimize these hazards.
20.103(b) (7/7/78)	Appropriate process and engineering controls and equipment, as described in Chapters 11 and 12, are installed and operated to maintain levels of airborne radioactivity as low as is reasonably achievable. When necessary, as determined by Midland procedures, additional precautionary measures are used to limit the potential for intake of radioactive materials.
20.103(c) (7/7/78)	The Midland respiratory protection program will comply with this regulation and follow the guidance of Regulatory Guide 8.15. Further information is provided in Section 12.5.

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Regulation (10 CFR) (Effective Date)	Compliance
20.103(d) (7/7/78)	This regulation describes further restrictions which the Commission may impose on licensees. It does not impose any independent obligations on Consumers Power Company.
20.103(e) (7/7/78)	Consumers Power Company will notify the appropriate NRC Regional office at least 30 days before the first use of respiratory protective equipment for radiological purposes.
20.103(f) (7/7/78)	This regulation does not apply to the Midland plant because no respiratory protection program was in effect before December 2, 1976.
20.104 (12/29/76)	Conformance with this regulation is ensured by appropriate Consumers Power Company policies regarding employment of individuals under 18 and the Midland Plant Procedure restricting these individuals' access to restricted areas.
20.105(a) (6/23/81)	Proposed limits for permissible levels of radiation in unrestricted areas will be included in Midland technical specifications.
20.105(b) (6/23/81)	Chapters 11 and 12 provide information on radiation levels. Plant procedures will ensure that radiation levels in unrestricted areas are within prescribed limits.
20.105(c) (6/23/81)	Implementation of 40 CFR 190 requirements will be included in Midland technical specifications.
20.106(a) (6/23/81)	Conformance with the limits specified in this regulation is ensured through the implementation of Midland procedures and applicable technical specifications which provide adequate sampling and analyses, or monitoring of radioactive materials in effluents before and during their release. The level of radioactivity in station effluents is minimized to the extent practicable by equipment designed for this purpose, as described in Chapter 11.

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
20.106(b) 20.106(c) (6/23/81)	Consumers Power Company has not and does not intend to include in any license or amendment applications proposed limits higher than those specified in Paragraph 20.106(a), as provided for in these regulations.
20.106(d) (6/23/81)	Appropriate allowances for dilution and dispersion of radioactive effluents are made in conformance with this regulation, and are described in detail in Chapter 11 and in appropriate reports required by the technical specifications.
20.106(e) (6/23/81)	Midland technical specifications will include all limitations on release of radioactive materials.
20.106(f) (6/23/81)	This regulation states that the provisions of Section 20.106 do not apply to disposal of radioactive material into sanitary sewerage systems. It does not impose any independent obligations on Consumers Power Company.
20.106(g) (6/23/81)	Implementation of 40 CFR 190 requirements will be included in Midland technical specifications
20.107 (1/1/61)	This regulation clarifies that the Part 20 regulations are not intended to apply to the intentional exposure of patients to radiation for the purpose of medical diagnosis or therapy. It does not impose any independent obligations on Consumers Power Company.
20.108 (1/1/61)	Necessary bioassay equipment and procedures will be used at Midland to determine exposure of individuals to concentrations of radioactive materials. Appropriate procedures and administrative policies implement this requirement.
20.201 (2/28/57)	The surveys required by this regulation will be performed at adequate frequencies and will contain enough detail to be consistent with the radiation hazard being evaluated. Applicable Midland procedures will require these surveys and provide for their

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Regulation (10 CFR) (Effective Date)	Compliance
20.202(a) (1/1/61)	documentation in such a manner as to ensure compliance with Part 20 regulations. Applicable Midland procedures set forth policies and practices which ensure that all individuals are supplied with, and required to use, appropriate personnel monitoring equipment.
20.202(b) (1/1/61)	This regulation provides some definitions of phrases used in this Part. It does not impose any independent obligations on Consumers Power Company.
20.203(a) (6/23/78)	The conventional radiation caution colors and "three-bladed design" radiation symbol prescribed by this regulation are used and will continue to be used by Consumers Power Company.
20.203(b) (6/23/78)	The posting requirement for radiation areas prescribed by this regulation is used and will continue to be used by Consumers Power Company.
20.203(c) (6/23/78)	The requirements of this regulation for high radiation areas will be conformed to by the implementation of Midland technical specifications and appropriate procedures. The controls and other protective measures set forth in the regulation are maintained under the surveillance of plant personnel. Midland Technical Specification 16.6.12 based on NUREG 0103, provides alternate access control methods to be applied "in lieu of the 'control device' or 'alarm signal' required by Paragraph 20.203(c)(2)," which will prevent unauthorized entry into a high radiation area.
20.203(d) (6/23/78)	Each airborne radioactivity area, as defined in this regulation, is required to be posted by provisions of appropriate Midland procedures. These procedures also provide for the surveillance requirements necessary to determine airborne radioactivity levels.
20.203(e) (6/23/78)	The area and room posting requirements set forth in this regulation pertaining to

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	radioactive materials are complied with through the implementation of appropriate Midland procedures.
20.203(f) (6/23/78)	The container labeling requirements set forth in this regulation are complied with through the implementation of appropriate Midland procedures.
20.204 (4/24/70)	The posting requirement exceptions described in this regulation will be used where appropriate and necessary at Midland. Adequate controls are provided within the Midland procedures to ensure safe and proper application of these exceptions.
20.205 (4/19/76)	All requirements of this regulation pertaining to procedures for picking up, receiving, and opening packages of radioactive materials are implemented by appropriate Midland procedures. These procedures also provide for the necessary documentation to ensure an auditable record of compliance.
20.206 (9/17/73)	The requirements of Section 19.12 referred to by this regulation are satisfied by the radiation protection training program. Appropriate Midland procedures set forth requirements for all radiation workers to receive this instruction on a periodic basis.
20.207 (6/25/75)	The storage and control requirements for licensed materials in unrestricted areas are conformed to and documented through the implementation of Midland procedures.
20.301 (12/1/81)	The general requirements for waste disposal set forth in this regulation are complied with through Midland procedures and the technical specifications. Chapter 11 describes the solid waste disposal system installed at Midland.
20.302 (1/3/72)	No such application for proposed disposal procedures, as described in this regulation, has been made or is presently contemplated for the Midland plant.

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
20.303 (3/11/81)	No plans for waste disposal by release into sanitary sewerage systems, as provided for in this regulation, are presently contemplated for the Midland plant.
20.305 (3/11/81)	Specific authorization, as described in this regulation, is not currently being sought for the Midland plant for treatment or disposal of wastes by incineration. Consumers Power Company will comply with this regulation if these plans change.
20.306 (3/11/81)	Consumers Power Company has no current plans to dispose of licensed material from the Midland plant by any means other than described in the response to Section 20.301.
20.401 (1/28/81)	All requirements of this regulation will be complied with through the implementation of appropriate Midland technical specifications and procedures pertaining to records of surveys, radiation monitoring and waste disposal. The retention periods specified for such records are also provided for in these technical specifications and procedures.
20.402 (9/1/77)	Appropriate procedures will establish an inventory and control program to ensure accountability for all licensed radioactive materials. Reports of theft or loss of licensed material are required by reference to the regulations of 10 CFR in Midland technical specifications.
20.403 (2/29/80)	Notifications of incidents, as described in this regulation, will be ensured by the requirements of Midland technical specifications and appropriate plant procedures, which also provide for the necessary assessments to determine the occurrence of such incidents.
20.405 (6/23/81)	Reports of overexposures to radiation and the occurrence of excessive levels and concentrations, as required by this regulation, will be provided for by reference in Midland technical specifications and in appropriate procedures.

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
20.407 (12/13/78)	The personnel monitoring report required by this regulation is provided for by appropriate Midland procedures.
20.408 (12/1/81)	The report of radiation exposure required by this regulation upon termination of an individual's employment or work assignment is generated through the provisions of appropriate Midland procedures.
20.409 (9/17/73)	The notification and reporting requirements of this regulation, and those referred to by it, are satisfied by the provisions of appropriate Midland procedures.
20.501 (2/28/57)	This regulation provides for the granting of exemptions from Part 20 regulations, provided such exemptions are authorized by law and will not result in undue hazard to life or property. It does not impose any independent obligations on Consumers Power Company.
20.502 (2/28/57)	This regulation describes the means by which the Commission may impose requirements upon any licensee in addition to the regulations of Part 20. It does not impose any independent obligations on Consumers Power Company.
20.601 (3/3/75)	This regulation describes the remedies which the Commission may obtain to enforce its regulations, and sets forth those penalties or punishments which may be imposed for violations of its rules. It does not impose any independent obligations on Consumers Power Company.
50.1 (3/3/75)	This regulation states the purpose of the Part 50 regulations and does not impose any independent obligations on Consumers Power Company.
50.2 (3/24/80)	This regulation defines various terms and does not impose any independent obligations on Consumers Power Company.
50.3 (2/18/56)	This regulation governs the interpretation of the regulations by the NRC and does not

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	impose any independent obligations on Consumers Power Company.
50.4 (3/3/75)	This regulation gives the address of the NRC and does not impose any independent obligations on Consumers Power Company.
50.10 (5/3/78)	This regulation specifies the types of activities that may not be undertaken without a license from the NRC. Consumers Power Company does not propose to conduct any such activities at Midland without an NRC license.
50.11 (3/3/75)	This regulation defines exceptions and exemptions from licensing requirements. It does not impose any independent obligations on Consumers Power Company.
50.12 (3/3/75)	This regulation provides for the granting of exemptions from Part 50 regulations, provided such exemptions are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest. It does not impose any independent obligations on Consumers Power Company.
50.13 (10/26/67)	This regulation states that a license applicant need not design against acts of war. It does not impose any independent obligations on Consumers Power Company.
50.20 (2/18/56)	These regulations describe the types of licenses the NRC issues. They do not address the substantive requirements that an applicant must satisfy to qualify for such licenses and do not impose any independent obligations on Consumers Power Company.
50.21 (5/3/78)	
50.22 (5/3/78)	
50.23 (2/18/56)	
50.30 (5/1/78)	This regulation sets down procedural requirements for the filing of license applications, such as the number of copies of the application that must be provided to the NRC. Consumers Power Company has complied with the procedural requirements when filing its Midland license application and the amendments thereto. In particular, Paragraph 50.30(f) requires that a license

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Regulation (10 CFR) (Effective Date)	Compliance
50.31 (2/18/56) 50.32 (2/18/56)	<p>application be accompanied by any environmental report required under Part 51, and Consumers Power Company has submitted an environmental report covering Midland.</p> <p>These regulations permit more efficient organization of the license application and do not impose any independent obligations on Consumers Power Company.</p>
50.33 (11/3/80)	<p>This regulation requires the license application to contain certain general information. This information has been provided in the General Information volume of the Midland operating license application.</p>
50.33a (10/22/79)	<p>This regulation requires applicants for construction permits to submit information required for antitrust review. The antitrust review required by the Atomic Energy Act of 1954, as amended, was performed at the construction permit stage. Further information on the antitrust review is found in the response to Open Item ATF-1 in the Addendum to the Responses to NRC Questions volumes.</p>
50.34(a) (2/4/81)	<p>This regulation governs the contents of the Preliminary Safety Analysis Report (PSAR) and is relevant to the construction permit stage rather than the operating license stage. The applicable information was supplied at the construction permit stage.</p>
50.34(b) (2/4/81)	<p>A final safety analysis report (FSAR) has been prepared and submitted, which addresses in the chapters indicated the information required:</p> <ol style="list-style-type: none"><li data-bbox="640 1612 1409 1640">1. Site evaluation factors - Chapter 2<li data-bbox="640 1673 1450 1770">2. Structures, systems, and components - Chapters 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 15<li data-bbox="640 1802 1409 1867">3. Radioactive effluents and radiation protection - Chapters 11 and 12

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Regulation (10 CFR)
(Effective Date)

Compliance

4. Design and performance evaluation - emergency core cooling system (ECCS) performance is discussed and shown to meet the requirements of Section 50.46, in Chapters 6 and 15.
5. Results of research programs - Chapter 1
6.
 - i) Organizational structure - Chapter 13
 - ii) Managerial and administrative controls - Chapters 13 and 17. Chapter 17 discusses compliance with the quality assurance requirements of Appendix B.
 - iii) Plans for preoperational testing and initial operations - Chapter 14
 - iv) Plans for conduct of normal operations - Chapters 13 and 17. Surveillance and periodic testing is specified in the technical specifications.
 - v) Plans for coping with emergencies - Site Emergency Plan (Chapter 13)
 - vi) Technical specifications - prepared in conjunction with the staff (Chapter 16)
 - vii) Not applicable, because the operating license application was filed before February 5, 1979
7. Technical qualifications - Chapter 13
8. Operator requalification program - Chapter 13

50.34(c) (2/4/81)

A physical security plan has been prepared and submitted to the NRC, and will be implemented for the Midland plant.

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<u>Regulation (10 CFR) (Effective Date)</u>	<u>Compliance</u>
50.34(d) (2/4/81)	A safeguards contingency plan has been prepared and submitted to the NRC, and will be implemented for the Midland plant.
50.34a (1/19/76)	As required by this regulation, a description of the equipment and procedures for the control of gaseous and liquid effluents and for the maintenance and use of equipment installed in radioactive waste systems, and an estimate of expected releases of radio-nuclides is provided in Sections 11.2 and 11.3.
50.35 (4/30/70)	This regulation is relevant to the construction permit stage rather than the operating license stage. Applicable requirements were complied with at the construction permit stage.
50.36 (8/5/74)	Midland technical specifications are being prepared and will be implemented, including items in each of the following specified categories: (1) safety limits and limiting safety settings, (2) limiting conditions for operation, (3) surveillance requirements, (4) design features, and (5) administrative controls.
50.36a (4/19/76)	Midland technical specifications include specifications that require compliance with Section 50.34a (releases as low as is reasonably achievable) and that ensure that concentrations of radioactive effluents released to unrestricted areas are within the limits specified in Section 20.106. The reporting requirements of Paragraph 50.36a(a)(2) are also included in these specifications.
50.37 (2/18/56)	This regulation requires the applicant to agree to limit access to Restricted Data. This requirement was satisfied at the time of application for the Midland Construction Permit as discussed therein.
50.38 (5/3/78)	This regulation prohibits the NRC from issuing a license to foreign-controlled entities. Consumers Power Company's statement that it is not owned, controlled, or dominated by an alien, foreign

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Regulation (10 CFR) (Effective Date)	Compliance
50.39 (2/18/56)	corporation, or foreign government is in the operating license application for the Midland Plant Units 1 and 2 in the General Information volume.
50.40 (8/19/74)	This regulation provides that applications and related documents may be made available for public inspection. This does not impose any direct obligations on Consumers Power Company.
50.40 (8/19/74)	This regulation provides considerations to guide the Commission in granting licenses and does not impose any independent obligations on Consumers Power Company.
50.41 (12/29/70)	This regulation applies to Class 104 licensees, such as those for devices used in medical therapy. Consumers Power Company has not applied for a Class 104 license for the Midland plant, therefore Section 50.41 is not applicable.
50.42 (3/3/75)	Section 50.42 provides additional considerations to guide the Commission in issuing Class 103 licenses and does not impose any independent obligations on Consumers Power Company.
50.43 (12/29/70)	This regulation imposes certain duties on the NRC and addresses the applicability of the Federal Power Act and the right of government agencies to obtain NRC licenses. It does not impose any direct obligations on Consumers Power Company.
50.44 (1/4/82)	The Midland plant combustible gas control system is described in Subsection 6.2.5. The system is designed to maintain the hydrogen concentration in containment at a safe level following a LOCA, without purging the containment atmosphere as a primary means for controlling combustible gases, as specified in Paragraph 50.44(e). The system consists of a hydrogen monitoring subsystem, a hydrogen recombiner subsystem, and a hydrogen purge subsystem (the hydrogen purge subsystem is used only as a backup system to the hydrogen recombiner subsystem). Compliance with Paragraph 50.44(c)(3)(iii)

MIDLAND 1&2-FSAR
APPENDIX 3B

Regulation (10 CFR) (Effective Date)	Compliance
50.45 (2/18/56)	on system vents is achieved by installation of reactor coolant system hot leg vents and a pressurizer vent. However, no vent is installed on the reactor vessel head because the accumulation of noncondensable gases in the head region would not cause loss-of-core cooling or loss of function of the reactor coolant system. The requirements of Section 50.44 are satisfied.
50.46 (3/3/75)	This regulation provides standards for construction permits rather than operating licenses and therefore does not impose any independent obligations on Consumers Power Company
50.47 (11/3/80)	Section 6.3 and Subsection 15.5.1 describe the ECCS and the methods used to analyze ECCS performance following a postulated LOCA.
50.48 (2/17/81)	This regulation sets forth the standards for emergency plans. Compliance with this regulation is being achieved by the submission of the Midland Site Emergency Plan, the emergency plans for the three counties lying within the 10-mile Emergency Planning Zone, and the State of Michigan Emergency Plan.
50.50 (2/18/56)	This regulation sets forth the standards for fire protection plans and features. The Midland Fire Prevention and Protection Program complies with the requirements of this regulation as discussed in Subsection 9.5.1 and Appendix 9A. Refer also to the discussion for Appendix R to Part 50 contained herein.
50.50 (2/18/56)	This regulation provides that the NRC will issue a license upon determining that the application meets the standards and requirements of the Atomic Energy Act and the regulations and that the necessary notifications to other agencies or bodies have been duly made. It does not impose any direct obligations on Consumers Power Company.

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APPENDIX 3B

<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
50.51 (2/18/56)	This regulation specifies the maximum duration of licenses and does not impose any independent obligations on Consumers Power Company.
50.52 (2/18/56)	This regulation provides for the combining in a single license of a number of activities. It does not impose any independent obligation on Consumers Power Company.
50.53 (5/3/78)	This regulation provides that licenses are not to be issued for activities that are not under or within the jurisdiction of the United States. The operation of the Midland plant will be within the United States and subject to the jurisdiction of the United States.
50.54 (5/29/81)	This regulation specifies conditions that are incorporated in every license issued and does not impose any independent obligations on Consumers Power Company.
50.55 (8/29/77)	This regulation addresses conditions of construction permits. Applicable portions were complied with at the construction permit stage.
50.55a(a) (5/4/81)	Structures, systems, and components for the Midland plant are designed, fabricated, constructed, tested, and inspected to quality standards commensurate with their importance.
50.55a(b) (5/4/81)	This regulation provides the date of the current approved Edition and Addenda of Section III and XI of the ASME Boiler and Pressure Vessel (B&PV) Code.
50.55a(c) (5/4/81)	Design and fabrication of the reactor vessel was carried out in accordance with ASME B&PV Code Section III. Further information demonstrating compliance with this regulation is provided in Section 5.2.
50.55a(d) (5/4/81)	Reactor coolant system piping meets the requirements of ANSI B31.7. Further information demonstrating compliance with this regulation is provided in Section 5.2.

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
50.55a(e) (5/4/81)	Reactor coolant pumps meet the requirements of ASME B&PV Code Section III. Further information demonstrating compliance with this regulation is provided in Section 5.2.
50.55a(f) (5/4/81)	The valves in the reactor coolant system pressure boundary were designed and fabricated in accordance with the requirements of ASME B&PV Code Section III. Further information demonstrating compliance with this regulation is provided in Section 5.2.
50.55a(g) (5/4/81)	Inservice inspection (ISI) requirements are delineated in this part and are specified in Midland technical specifications, Subsection 16.4.0.5. As permitted by this part and the technical specifications, certain exemptions have been requested and granted for the ISI of various systems and the inservice testing of various pumps and valves.
50.55a(h) (5/4/81)	As discussed in Chapter 7, the protection systems meet IEEE Std 279-1971.
50.55a(i) (5/4/81)	Fracture toughness requirements are set forth in Appendixes G and H of Part 50. Technical specifications require the use of reactor vessel material irradiation surveillance specimens and updating of the heatup and cooldown curves given in the technical specifications. Further information is given in Chapter 5 concerning the irradiation surveillance program. Exemptions to the requirements of Appendixes G and H of Part 50 are discussed in the responses to Appendixes G and H.
50.55a(j) (5/4/81)	This regulation applies to power reactors for which a notice of hearing on an application for a provisional construction permit or construction permit had been published on or before December 31, 1970. Such notice was published for the Midland plant before this date. Accordingly, the provisions of Section 50.55a, Paragraphs (c)(1), (d)(1), (e)(1), and (f)(1) apply to Midland, rather than

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<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	Paragraphs (c)(2), (d)(2), (e)(2), and (f)(2), respectively.
50.55e (Proposed)	This regulation will apply to fuel reprocessing plants when it is adopted, and is therefore not applicable to the Midland plant.
50.56 (2/18/56)	This regulation provides that the Commission will, in the absence of good cause shown to the contrary, issue an operating license upon completion of the construction of a facility in compliance with the terms and conditions of the construction permit. This does not impose any independent obligations on Consumers Power Company.
50.57(a) (3/3/75)	This regulation requires the Commission to make certain findings before issuance of an operating license and does not impose any independent obligations on Consumers Power Company.
50.57(b) (3/3/75)	The license, as issued, will contain appropriate conditions to ensure that items of construction or modification are completed on a schedule acceptable to the Commission. Consumers Power Company will comply with these conditions if they are included in the license for the Midland plant.
50.57(c) (3/3/75)	This regulation allows an applicant to make a written motion for a license authorizing low-power testing and further operations short of full power. Consumers Power Company will comply with this regulation if such a request is initiated for the Midland plant.
50.58 (4/22/74)	This regulation provides for the review and report of the ACRS and does not impose any independent obligations on Consumers Power Company.
50.59 (4/18/77)	This regulation provides for the licensing of certain changes, tests, and experiments at a licensed facility. Compliance will be effected by the technical specifications and

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APPENDIX 3B

<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	procedures that provide implementation of this regulation.
50.70 (9/17/79)	The Commission has assigned resident inspectors to the Midland plant. Consumers Power Company has provided office space and permits access to the station to NRC inspectors in accordance with the requirements of this section.
50.71 (7/22/80)	Records are and will be maintained in accordance with the requirements of Paragraphs (a) through (e) of this regulation and the license. Paragraph (e) requires that the FSAR be updated within 24 months of the date of issuance of the operating license, and annually thereafter. Such updates will be submitted to the NRC.
50.72 (2/29/80)	The NRC will be notified of significant events in accordance with the requirements of this regulation.
50.78 (12/24/80)	Consumers Power Company will submit installation information and permit verification to the International Atomic Energy Agency, if requested by the Commission for the Midland plant.
50.80 (3/11/73)	This regulation provides that licenses may not be transferred without NRC consent. No application for transfer of a license is involved in the Midland proceeding.
50.81 (3/9/67)	This regulation permits the creation of mortgages, pledges, and liens on licensed facilities, subject to certain provisions. It also specifies the rights of creditors with respect to licensed facilities. The rights of all creditors of Consumers Power Company having interests in the Midland plant are subject to the terms of this section.
50.82 (2/21/67)	This regulation provides for the termination of licenses. It does not apply to Midland because Consumers Power Company has not requested the termination of a license.
50.90 (2/18/56)	This regulation governs applications for amendments to licenses. Future requests for

MIDLAND 1&2-FSAR
APPENDIX 3B

<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	license amendments will be made in accordance with these requirements.
50.91 (4/22/74)	This regulation provides guidance to the NRC in issuing license amendments and does not impose any independent obligations on Consumers Power Company.
50.100 (2/18/56) 50.101 (3/3/75) 50.102 (3/3/75) 50.103 (3/3/75)	These regulations govern the revocation, suspension, and modification of licenses by the Commission under unusual circumstances and do not impose any independent obligations on Consumers Power Company.
50.109 (4/30/70)	This regulation specifies the conditions under which the NRC may require the backfitting of a facility. This regulation does not impose any independent obligations on Consumers Power Company unless the NRC proposes a backfitting requirement in compliance with the terms hereof.
50.110 (3/3/75)	This regulation governs enforcement in court of the Atomic Energy Act, the Energy Reorganization Act of 1974, and the NRC regulations and orders. No enforcement action under this section is pending in the Midland proceeding.
Appendix A (11/27/78)	Conformance with the general design criteria for the Midland plant is discussed in detail in Section 3.1. Additional detail is provided throughout the FSAR in the system design descriptions.
Appendix B (2/19/75)	Chapter 17 describes in detail the provisions of the quality assurance program which has been implemented to meet all applicable requirements of Appendix B.
Appendix C (9/2/68)	This Appendix provides a guide for establishing the Applicant's financial qualification. Consumers Power Company's financial qualifications were fully litigated before the Atomic Safety and Licensing Board, and the Board expressly found that Consumers Power Company had satisfied the burden of proving that it has reasonable assurance of having the funds it needs to design and construct the facility

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Regulation (10 CFR) (Effective Date)	Compliance
	in compliance with the Commission's regulations.
Appendix D (8/19/74)	This appendix has been superseded by Part 51. The requirements of Part 51 have been satisfied.
Appendix E (5/29/81)	This appendix specifies requirements for emergency plans. An emergency plan has been prepared for Midland, and submitted to the NRC for review.
Appendix F (3/5/80)	This appendix applies to fuel reprocessing plants and related waste management facilities, not to power reactors, and is therefore not applicable to this proceeding.
Appendix G (11/20/79)	Fracture toughness requirements of this appendix and program requirements given in Appendix H form the basis for technical specification surveillance requirements dealing with the use of surveillance specimens. Additional information to demonstrate compliance can be found in Subsection 5.3.1, concerning the irradiation surveillance program. A request for exemptions to certain requirements are identified and described in the response to NRC Question 121.17.
Appendix H (11/20/79)	Reactor vessel material surveillance program requirements are delineated in this part. Further information is provided in Subsection 5.3.1.6. A request for exemptions to certain requirements are identified and described in the response to NRC Question 121.17.
Appendix I (4/19/76)	This appendix provides numerical guides for design objectives and limiting conditions for operation to meet the criteria "as low as is reasonably achievable" for radioactive material in light-water-cooled nuclear power reactor effluents. Consumers Power Company filed with the Commission the necessary information to permit an evaluation of Midland with respect to the requirements of Appendix I.

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<u>Regulation (10 CFR) (Effective Date)</u>	<u>Compliance</u>
Appendix J (10/22/80)	Reactor containment leakage testing requirements for water-cooled power reactors are described in this appendix. Information concerning compliance can be found in Chapters 3, 6, and 16.
Appendix K (2/4/74)	This appendix specifies features of acceptable ECCS evaluation models. As noted above for Section 50.46, the analysis for Midland has been conducted using a model which has been accepted by the Commission staff as meeting the requirements of this appendix.
Appendix L (10/22/79)	This appendix covers information requested by the Attorney General for antitrust review of license applications. Refer to the compliance statement for Section 50.33a.
Appendix M (8/19/74)	This appendix covers standardization of manufactured plants and is not applicable to Midland.
Appendix N (2/18/75)	This appendix covers standardization of duplicate plants and is not applicable to Midland.
Appendix O (2/18/75)	This appendix covers standardization of design and is not applicable to Midland.
Appendix P (Proposed)	This proposed appendix applies to fuel reprocessing plants and is not applicable to Midland.
Appendix Q (6/6/77)	This appendix governs preapplication early review of site suitability issues and is not applicable to Midland.
Appendix Q (Proposed)	This proposed appendix will apply to fuel reprocessing plants and is not applicable to Midland.
Appendix R	This appendix provides fire protection program requirements for nuclear power facilities operating prior to January 1, 1979. Midland was not operating prior to this date, so this appendix is not applicable. However, a comparison has been provided to the NRC by separate correspondence. The Midland Fire Protection

MIDLAND 1&2-FSAR
APPENDIX 3B

<u>Regulation (10 CFR)</u> <u>(Effective Date)</u>	<u>Compliance</u>
	Evaluation Report is provided in Appendix 9A.
100.1 (5/12/62)	This regulation is explanatory and does not impose independent obligations on Consumers Power Company.
100.2 (3/3/75)	This regulation is explanatory. The Midland plant is not novel in design and is not unproven as a prototype or pilot plant. Therefore, no independent obligations are imposed on Consumers Power Company.
100.3 (5/12/62)	This regulation is explanatory and does not impose independent obligations on Consumers Power Company.
100.10 (12/13/73)	The factors listed related to both the unit design and the site have been provided in the application. Site specifics, including seismology, meteorology, geology, and hydrology, are presented in Chapter 2. The exclusion area, low population zone, and population center distance are provided and described. The FSAR also describes the characteristics of reactor design and operation.
100.11 (6/24/75)	An exclusion area has been established, as described in Subsection 2.1.2. The low population zone required by Paragraph 100.11(a)(2) has been established, as described in Subsection 2.1.3.4, as the area within a radial distance of one (1) mile from the centerline connecting the Unit 1 and 2 containments. Compliance with Paragraph 100.3(c) is addressed in Subsection 2.1.3.5. The FSAR accident analyses, particularly those in Chapters 6 and 15, demonstrate that offsite doses resulting from postulated accidents would not exceed the criteria in this section of the regulation.
Appendix A (1/10/77)	Appendix A to Part 100 provides seismic and geologic siting criteria for nuclear power plants. Compliance of the Midland site with these criteria has been litigated in a show cause proceeding involving foundation soils.

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Regulation (10 CFR)
(Effective Date)

Compliance

An order on this issue has not yet been rendered by the hearing board.

5711 Sunnyside Drive
Midland, MI 48640
April 18, 1963

PRINCIPAL STAFF		
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Mr. James Keppler, Regional Administrator
Nuclear Regulatory Commission, Region III
Office of Inspection and Enforcement
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

Over the past couple of months, a man, who used to work on the Midland nuclear plant, has called me several times to give me information that he believes is very important to relay, not only to you, but to our Attorney-General Frank Kelley.

He will not provide an affidavit to the Government Accountability Project on these matters because he does not believe his anonymity can be adequately protected. He is now working for a Midland subcontractor, as I understand it.

His concern is about the many unqualified people there are at the plant site in jobs of critical importance to safety.

Since I notice in the testimony of Ron Cook, the resident inspector, his frequent mention of poor installation and even his requests to see the qualifications of workers because of poor workmanship, I believe there may be merit in these facts that I have been given over the phone or sent in the mail.

He gave me names of people he worked with who were not qualified for their assignments. They all worked for Bechtel or Bechtel subcontractors. These include: Leo Davis - no Michigan engineering registration and no field experience who worked on systems requiring engineering. He is not sure he has a degree of any kind. Dick Soderholm - no Michigan engineering registration, little field experience, worked in procurement. Clark Ash - has a degree (not sure in what), no Michigan engineering registration, little field experience, worked in procurement. Ed Entrokin - has no degree, is not registered as engineer in Michigan, field experience amounts to 2 or 3 years with Bechtel. The sub-contract department under Ed Entrokin had design authority - the balance of sub-contracts did not have design authority.

According to my informant, engineering design authority was delegated to Zack by Bechtel. Zack also did not have qualified people for design work they were doing. People without adequate training were designing duct work, or pipe hangers and brackets.

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Page Two
Mr. James Keppler
April 18, 1983

Soils work was subcontracted by Bechtel.

Also, he stated that someone by the name of Cannon was the subcontractor for soil compaction and he was also given subcontract for part of the underpinning of sinking buildings.

He claims that all work on any construction project beyond a certain limited size must be done as a Michigan registered engineer or architect.

He gave me the following citation from Michigan Compiled Laws 338.551-- Architects, Engineers, Surveyors, Article 20, Act 299, Public Acts of 1960 p. 902-7, defines the role of licensed engineers and architects--does not give any exception to Federal activity. Any building structure must be designed, planned and materials and supplies inspected under direct supervision of a licensed engineer.

He told me that a very good welder quit the project recently because the scheduling was so erratic. One day he would have an apprentice assistant, the next day a journeyman. He was forced to repair continually what was done. He said the Bechtel management here was the poorest he had seen anywhere and he couldn't take it anymore.

The informant also sent me a sketch of management responsibility, rate and pay schedule of contractors for Bechtel and a copy of Article 20, Act 299, PA of 1960 on Architects, Engineers and Surveyors. These materials are enclosed.

I hope your office will investigate these matters to protect the public health and safety of the people of this area.

Yours sincerely,

Mary Sinclair
Mary Sinclair

cc: Attorney-General Frank Kelley
Senator Carl Levin
Senator Don Riegle
Congressman Don Albosta

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ROUTING AND TRANSMITTAL SLIP

Date 2/17

TO: (Name, office symbol, room number, building, Agency/Post)	Initials	Date
1. Jay Harrison		
2. Ross Landsman		
3. Ron Gardner		
4. Ron Cook		

Action	File	Note and Return
Approval	For Clearance	Per Conversation
As Requested	For Correction	Prepare Reply
Circulate	For Your Information	See Me
Comment	Investigate	Signature
Coordination	Justify	

REMARKS

Attached is GAP's latest missive to the Commission. I will advise you as to how the Commission treats it (e.g., considers it as part of their review of the Director's Decisions, rejects it, or refers it to the Director as a new 2.206.)

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.
Steve Lewis	Phone No.

5041-102

OPTIONAL FORM 41 (Rev. 7-76)
 Prescribed by GSA
 FPMR (41 CFR) 101-11.206

GOVERNMENT ACCOUNTABILITY PROJECT

Institute for Policy Studies

1921 Gue Street, N.W., Washington, D.C. 20009

1 *[Signature]* 18

(202) 234-9082

February 10, 1984

TO: *Steve Lewis*
Reg. III

FROM: *J. Liberman*
OELD

Honorable Chairman Nunzio Palladino
Honorable Victor Gilinsky
Honorable James Asseltine
Honorable Thomas Roberts
Honorable Frederick Bernthal
United States Regulatory Commission
Washington, D.C. 20555

Re: In the Matter of Consumers Power Company
Midland Nuclear Power Plant, Units 1 and 2
Docket Nos. 50-329/330 (10 C.F.R. 2.206)

Dear Commissioners:

On June 13, 1983, the Government Accountability Project (GAP) filed a Petition pursuant to 10 CFR 2.206 (Petition) on behalf of the Lone Tree Council and others (Petitioners), requesting specific items of relief regarding the Midland Nuclear Power Plant (Midland). The Petition has been granted in part and denied in part in Director's Decision DD 83-16 and DD 84-02. On January 27, 1984 pursuant to 10 CFR 2.772, the Commission extended the time within which the Commission may act to review the Director's Decision until February 10, 1984.

On the basis of the information provided in the Petition, and with the consideration of the additional facts and argument provided in this letter we request that the Commission take review of the Director's Decision.

Specifically, we renew our request for the Commission to:

(1) Require that all ongoing activity, including the "soils work" ^{1/} be included under the Order of Modification of Consumer's Power Company's (CPCo) construction permit for the Midland Plant. (Petition, page 13 - 15.)

(2) Remove CPCo from managerial responsibility of the QA/QC function at the Midland plant, replacing them with an independent third-party with the responsibility to report simultaneously to both the NRC and CPCo. (Petition, page 20 - 22).

(3) Increase NRC staffing for the Midland Office of Special Cases (OSC). (Petition, page 22 - 23.)

^{1/}"Soils work" in this letter refers to all activity, including underpinning of safety related buildings on the site, undertaken by CPCo following the December 1979 Stop Work Order issued by the Nuclear Regulatory Commission (NRC).

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BASIS

The Government Accountability Project (GAP) filed a detailed request pursuant to 10 CFR 2.206 on June 13, 1983. The Inspection and Enforcement Manual, Chapter 0800, §0860-04 requires that, in order for a request to be granted, it must specify the action sought by the Petitioners and "set out the facts that constitute the basis for the request." ^{2/}

GAP assumes that the Director did not see the need for an expansion by Petitioner of the factual basis for its requests, since no request for further information was received. Moreover, since the request has been substantially granted (except for the items enumerated in this letter for which we renew our request), we assume that the supporting documentation and/or explanations provided the Director with an accurate portrayal of the basis upon which submitted our request.

However, much has happened at the Midland Project since the Petition was filed.

In determining whether or not the Commission should take review of the two Director's decisions issued in response to the Petition we believe that it is necessary to update the factual basis upon which our original petition was based. (This submittal is not an appeal or request for review of items granted in DD 83-16 and 84-02, Petitioner recognizes that there is no procedure for appeal of Commission decisions under 10 CFR 2.206. Instances where the Director's decision differs from our request which are not mentioned in this submittal can be construed as acceptable to Petitioners, unless stated otherwise in previous correspondence; i.e., our continuing skepticism toward Stone and Webster's competence and independence in their role as third-party overviewer.)

UPDATE SUMMARY

Since June, 1983, CPCo's Midland project has suffered from a series of financial, construction, legal, and regulatory setbacks. Petitioners believe that the cumulative effect of these setbacks, described below, provides additional basis for our original requests for (1) Institutionalizing all reinspection programs under the Construction Completion Program (CCP), (2) Removal of CPCo from primary responsibility for the QA/QC function at the plant, and (3) the assignment of more NRC personnel to the Midland OSC.

1. DOW PULLOUT

In July 1983 the Dow Chemical Corporation (Dow) cancelled its steam contract with CPCo, and brought legal action against CPCo in Midland County District Court. The Dow suit alleges that CPCo

made fraudulent misrepresentations and nondisclosures;
made material breaches of its contractual and fiduciary

^{2/} Nuclear Regulatory Commission Inspection and Enforcement Manual, Chapter 0800, Section 0860-04, "Guidance for Accepting or Denying Requests for Enforcement Action," November 15, 1978.

February 10, 1984

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obligations to Dow; and demonstrated its inability to complete the Midland Nuclear Facility within any reasonable time or cost.

Allegations contained in the Dow complaint point to a "dual cost and schedule" kept by CPCo since 1978. The Dow allegations are the subject of a Atomic Safety and Licensing Board (ASLB) contention which is expected to be litigated in late spring 1984.

2. STOCKHOLDER SUITS

Four stockholders suits have been filed to date by shareholders of CPCo stock. These suits have been filed against CPCo pursuant to provisions of the Securities Exchange Act. Essentially they allege that CPCo made certain material omissions in prospectus, made false statements to its stockholders, and willfully concealed information about the cost and completion schedule for the Midland plant. They accuse CPCo of deceiving potential investors about the stability of its construction project and inducing them to purchase stock that they would not have bought had CPCo disclosed known to them, or that should have been known to them, at the time.

Of particular interest to the Commission should be the Weiland suit, included as Attachment 1, which relies in great part on information provided from CPCo to the NRC at its April Caseload Forecast Panel (CLFP) meeting. ^{3/}

3. CASELOAD FORECAST PANEL CONTROVERSY

The NRC CLFP for Midland announced on December 20, 1983 that CPCo's schedule estimate (based on CPCo's April 1983 CLFP presentation) was "off" by at least 16 months. The December 20, 1983 letter from Thomas M. Novak, Assistant Director for Licensing of the Division of Licensing to Mr. J.W. Cook of CPCo designates that the NRC intends to use September 1986 as the "planning date for completing the Licensing review process for Unit 2." ^{4/}

Internal disputes between the members of the CLFP and NRR management succeeded in keeping the NRC's knowledge about the expected delay from public disclosure for over seven months. Included as Attachment 2 to this letter is an affidavit from the undersigned, with exhibits, which detail the impropriety of the staff actions in withholding significant information regarding the incredulity of CPCo's completion schedule estimates given in April, 1983.

^{2/} The text of the suit confuses the CLFP and the CCP, particularly with respect to meetings. However, it should be obvious to a knowledgeable reader whether plaintiff Weiland is referring to CCP activities or CLFP information.

^{3/} Richard A. Weiland versus Consumers Power Company, et al. (ED Michigan)

^{4/} U.S. NRC letter, Thomas M. Novak to J.W. Cook, CPCo, December 20, 1983.

Certain agency staff members "stonewalled" the release of the CLFP review, completed in mid-May 1983. (see Attachment 2, Exhibit 4) and prevented its disclosure to the Atomic Safety and Licensing Board (ASLB), and the public. CPCo management officials, however, did have knowledge of the CLFP's May estimates and successfully managed to get NRC release of the information quashed.

Had the CLFP information been disclosed at either the ASLB hearing or at the planned (but cancelled) public meeting CPCo would not have been able to portray false and misleading information to potential investors.

4. DIESEL GENERATOR BUILDING RE-REVIEW

A re-review of the acceptability of the Diesel Generator Building by a combined team of professional soils and geo-technical engineers from the Brookhaven National Laboratory, the NRC, and an outside consultant was conducted. It concluded, essentially, that the DGB could not meet federal regulatory standards for the Midland project, but that it would probably be acceptable.

The impasse continues over the DGB with a seemingly unresolvable controversy between numerous professionals. Of critical importance for the Commissioners consideration at this time in the non-negotiable position of the U.S. Corps of Engineers, who have refused to certify the building as safe.

The DGB review which was issued October 21, 1983 by the NRC, a December 2, 1983 Memorandum from J. Kane of the Division of Nuclear Reactor Regulation, and several drafts and supporting memorandum of the report issued to the undersigned under Freedom of Information Act (FOIA) request No. 83-_____ give insight into the preposterousness of the "mysterious" sixth conclusion of the DGB Re-review in the final report.

That conclusion, which was added after several levels of internal dispute, states:

While significant cracking has occurred in the DGB, it is our opinion that the structure will continue to fulfill its functional requirement. This conclusion is based on the fact that stresses induced in the structure by all other extreme loadings are small.

However, the original Brookhaven report contained a conclusion six that was totally opposite the final, publicly issued, version. That "bottom line" stated

It is recommended that a repair program be developed and implemented.

It is our understanding that, in fact, several repair recommendations were in the development stage by the team that did the reanalysis. Those recommendations were, however, never disclosed or even discussed.

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The ASLE OM hearings must also conclude that there is a reasonable assurance that the public health and safety of the Midland/Saginaw/Bay City area would be protected under any conditions. That may not be possible, regardless of how many staff "edits" are made of the truth about the DGB.

5. FAILURE OF CPCO TO MAP AUXILIARY BUILDING CRACKS

The NRC discovered in January 1984 that CPCo has not mapped all of the cracks in the Auxiliary Building (Aux Building), and that neither CPCo nor the NRC know the extent or the seriousness of the cracks in the building.

On February 8, 1984 CPCo provided the NRC OSC team with a package of documentation in an attempt to explain away the problems. At the monthly public meeting between Stone and Webster, the NRC, and CPCo Mr. J. Mooney gave a detailed presentation of the new crack monitoring program. They also presented a weak explanation of why the entire building had not been monitored for cracks for the past five years.

Their explanation, that certain "hairline cracks" weren't required to be mapped or included in the crack mapping, and that crack mapping was never intended to cover certain "inaccessible" parts of the Aux Building, defys reason.

A preliminary review of NRC/NRR time and effort that has gone into an evaluation of the Aux Building indicates that slightly over half of all recent efforts have gone into technical work on the Aux Building. The money spent by the agency is now largely wasted. Re-evaluations, more engineering analysis, more staff inspections will be required. All of that could have been avoided had CPCo demonstrated any regulatory responsibility.

The ASLE OM hearings will probably now also have to be reopened into the Aux Building. (That motion is pending before the Board at this time.)

Other problems with the Aux Building as the underpinning effort continues plague CPCo. For example, the summary of an audit held on January 4 - 6, 1984 (Report No. 50-329/84-01(OSC); 50-330/84-01(OSC) concluded that upward building movement limits established by the contractor and proposed by CPCo in response to unanticipated upward building movement were unacceptable.

6. ENFORCEMENT ACTION, RE: VIOLATION OF BOARD ORDER/NRC STAFF

An Office of Investigations (OI) investigation into a July 1982 incident where CPCo deliberately drilled into a deep-Q duct bank, and removed soils in order to lay certain cables, concluded that CPCo had excavated the soil without the required prior NRC authorization.

As a result of those findings the Region recommended a civil penalty of \$100,000.00 be levied on CPCo. That Enforcement Action was almost issued as

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Enforcement Notice 83-69. However, after an unannounced meeting between the Director and CPCo Counsel M. Miller, and subsequent discussions between the Regional Director and the Director --but not with the R111 staff--the Civil Penalty was withdrawn.

Instead DD 84-02 was issued which incorporated an Order for CPCo to submit to an independent management audit. GAP vehemently protested the withdrawal of EN 83-69, and the misrepresentation that the management audit (which was first proposed in the Petition and which CPCo agreed to in October 1983) was an adequate response to the OI findings.

Our foremost complaint about the handling of the Violation of the Board Order is that the OSC team and regional management made a firm recommendation for a civil penalty. (Presumably this was based on their cumulative experience with CPCo's blatant disregard for regulatory requirements that are inconvenient to CPCo.) Then, exhibiting CPCo's infamous ability to seek out and find someone in the NRC who will agree with CPCo's best interests, a meeting was arranged between the lawyer (not management) who was responsible for litigating the very same issue in front of the ASLB and the Director. No opportunity was provided for factual rebuttal by the OSC team, even though members of the team were present to observe the actual violation of the order.

RENEWED REQUESTS

Petitioners requested six specific actions in the original June Petition. These were requested "to protect the future public health and safety of central Michigan residents..." For the same reason, and additionally based on information summarized above, we renew our request for three of the original six items.

1. Require that all ongoing activity, including the "soils work," be included under the Order of Modification of CPCo's construction permit for the Midland Plant. (Petition, page 13 - 15)

The Director's Decision, issued October 6, 1983, responded to that request as follows

It should be noted that the CCP does not include the remedial soils program, nuclear steam supply system installation, HVAC installation, and the reinspection of pipe hangers and electrical cable. The remedial soils activities are being closely inspected under the conditions of the construction permits which implement the Atomic Safety and Licensing Board's April 30, 1982 order and work authorization procedure. Therefore, the staff does not consider it necessary to require the remedial soils activities to be included in the CCP. Controls over the soils work have been implemented under a separate program.

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Similarly, reinspection of the pipe hangers and electrical cable were not included in Phase I of the CCP because that reinspection is being done under a separate commitment to the NRC... Nuclear Steam Supply System installation and HVAC installation were not drawn into question by the diesel generator building inspection. - (DD 83-16, at 7.)

Since the decision was issued in October CPCo activities regarding the soils program, the HVAC installation, and pipe hanger and electrical cable reinspection programs have demonstrated that the staff's position was premature. In fact, the Decision should have clarified which part of the staff was being represented in that statement.

Each of the above listed systems and the soils work have undergone major reviews, and Petitioner acknowledges that construction completion will occur under the Construction Implementation Overview (CIO), however, given recent disclosures and identified problems (such as the identification of cracks in the Aux building), it is no longer acceptable to "take CPCo's word for it," in regard to critical systems.

The HVAC reinspection program, and the NRC HVAC inspection, have been on-going for almost two years. Yet, new witnesses that GAP has interviewed who worked as field engineers on the system disclose that problems were being actively "covered up" by CPCo instead of being repaired. These witnesses would have talked to NRC inspectors, had they been independently interviewed, however -- no one contacted them. GAP investigators are in the process of reviewing their concerns and will submit affidavits upon the completion of the same. The message is clear, however, that CPCo continues to view the NRC as capable of identifying only a limited amount of the problems, and unless forced to by inclusion under DD 83-16 will not comply with the voluntary disclosure of hardware problems.

Both the pipe hanger and the electrical inspections conducted by CPCo also failed to disclose information given to the NRC by other sources, including several GAP witnesses.

GAP urges the Commission to re-review this request and include the information from the OSC team regarding problems in the exempted systems.

2. Remove CPCo from managerial responsibility of the QA/QC function at the Midland Plant, replacing them with an independent third-party with the responsibility to report simultaneously to both the NRC and CPCo. (Petition, page 20 - 22)

The Director's Decision responded to that request as follows:

While it might be permissible under Appendix B to 10 CFR Part 50 for CPCo to retain an independent organization to execute the QA/QC program, the licensee remains ultimately responsible for the establishment and execution of the program. As stated above, the

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staff considers the strengthening of MPQAD to be a positive step in improving CPCo's capability to assure the quality of construction of the Midland facility. In view of the relatively short existence of the MPQAD, there does not currently exist any justification for requiring CPCo to retain an outside organization to execute the QA/QC program. (Emphasis added)

That response was based upon the information contained in the June 1983 Petition. At that time, besides the historical references, there were three on going Office of Investigations investigations into deliberate misconduct by CPCo. Two of the three have now been completed, both which point the finger squarely at CPCo management for misleading the NRC regarding important safety related activities.

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First, the Boos investigation, concluded that at least one CPCo official knew that the representation made at a Bethesda meeting between RFR/R111 and CPCo was not true. No enforcement action was taken as a result of that incident. Mr. Keppler, R111 Director, commented at a public meeting that this incident was the last time he would give CPCo the benefit of the doubt.

The second incident, drilling through the deep-Q duct bank in violation of the board order about work authorization permits was the next incident. As discussed previously in this letter, Mr. Keppler did recommend strong enforcement action after the OI investigation concluded that CPCo had violated the board order. Unfortunately, the Director decided to "give them one more chance," and dismissed the civil penalty recommendation.

quote from where?

The third investigation, still on-going, into CPCo's withholding of information about an internal quality assurance breakdown of the Zack Company is expected to be issued in the near future. Regardless of the technical findings it is unlikely that CPCo will be able to weasel out of the simple facts surrounding their failure to notify the NRC. They did not

Does OI have any action on this?

Finally, as also discussed previously in this letter, CPCo management has now conceded that no one, not even CPCo, knows the number or extent of the thousands of cracks in the Aux Building. This despite the fact that they have permitted the NRC to spend hundreds of thousands of taxpayer dollars on evaluations of the safety of the building.

Contained in the Dow and stockholder suits are numerous examples of CPCo deceit of shareholders, business partners, investment companies and the public at large. Discovery in these cases is revealing, on a daily basis, the extent to which CPCo has been willing to go to protect its survival as a company.

At Zimmer the NRC withheld approval of a reinspection program that contained a plan for the H.J. Kaiser company to continue as prime contractor because they were under investigation! Here the Company has been under investigation, and multiple investigations for the past two years. Some of those investigations have concluded that CPCo was guilty of what it was accused of. Surely the staff

cannot continue to pretend that there is not now justification for requiring CPCo to retain an outside organization to execute the QA/QC program.

At a minimum that responsibility should be transferred to a third-party until the completion of the management audit.

This request, the removal of CPCo management officials from the QA/QC function for the Quality Verification Program (QVP) is of immediate concern. The QVP is just beginning. At the February 9, 1984 public meeting Stone and Webster officials reported that the first QVP report was issued on February 3, 1984. Of the thirteen work packages reviewed by S&W three non-conformances were written and another eight findings were discovered. GAP, nor the NRC, have yet received that report. However, as S&W begin to step up their QVP operations this month it is critical that they (or another party) have an institutionalized responsibility for reportability under 10 CFR to the NRC.

If it were possible to indict one person or group of persons for the problems which CPCo has had over the past 15 years the solution would be a simple one. However, that is not the case. GAP's experience with the management audit of Cincinnati Gas and Electric (CG&E) officials gives some insight into the types of problems that can be discovered for the faults that CPCo has suffered from. Yet, the identification of the root of the problem of a poor managerial attitude and inadequate regulatory relationships cannot guarantee the single issue which the Commission is responsible for certifying that the Midland Nuclear Power Plant is safe.

Any error in deciding this request should be made on the side of prudence towards public health and safety -- not concern for the corporate financial viability of CPCo.

3. The increase in NRC staffing for the Midland Office of Special Cases (Petition at 22 - 23.)

The Director's decision responded

The fifth issue relates to a matter of internal Commission organization and staffing, namely the allocation of staff to inspection of facilities. The staff is expecting to augment inspect inspection personnel available to work on Midland. However, the creation of positions within the Office of Special Cases is a matter that will be determined by the Commission budget process. For these reasons, the staff is not considering this aspect of the request in this decision.

We renew our request for increased assignment of personnel to the OSC team. We understand that there has been the assignment of one additional inspector within the past week to the OSC team. We are relieved that the Commission recognizes the need for increased staffing and has appropriated funds for an additional inspector. However, there simply is much more work than even six inspectors can handle.

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With recent events in Region III (i.e., the cancellation of Marble Hill and Zimmer) we assume that resources are currently available for designation to Midland. GAP staff did a review of the inspection-hours expended on the Marble Hill and Zimmer projects during the calendar year of 1983. According to the Regional inspection reports there were 2,989 inspection hours for Zimmer and 1,895 inspector hours for Marble Hill. A review of the assigned personnel indicated a full-time Project Manager for both plants in the Office of Nuclear Reactor Regulation and other technical resources not identified by Project in NRR. According to NRC files Zimmer had two resident inspectors and one senior resident inspector, and Marble Hill had one senior resident inspector.

By comparison, Midland has one senior resident inspector and one resident inspector, and also one Project Manager (NRR). At Midland during 1983 there were 2,501 inspection hours (that does not include the 734 inspector hours spent on the DGB inspection in late 1982). Those inspections were conducted when the majority of safety-related construction was halted (from December 1982 through the end of 1983).

If, as the NRC Regional Director and the Director of IE maintain, the public confidence in the CCP should be based on the oversight of the NRC inspectors, then there must be more inspectors. The S&W representative indicated at the February 9 public meeting that based on workload S&W would increase its personnel as the QVP operation increased. It is simply impossible for five or six inspectors, with limited technical resources, to keep up a regular regulatory program, deal with allegations and information provided by workers and others, overview a floating inspection program, continue oversight of the underpinning efforts, and monitor the most complicated construction program on going in the nuclear industry.

DAP has a great deal of confidence in the OSC team assigned to Midland. Yet we recognize the limitations of a 24-hour day, and a seven day week. We urge the Director to do the same.

CONCLUSION

This submittal summarizes our renewed request for three items not responded to in DD 83-16 and DD 84-02. If the Commission does not take review of these items under the provisions outlined in this letter GAP requests that it be considered as a separate request filed pursuant to 10 CFR 2.206.

Our concern for the continuing deterioration of the Midland construction project heightens every day. We recognize, as should the Commission, that this project is out of control. With the recent events in the nuclear industry that have occurred at plants with late-discovered quality assurance breakdowns it is inexcusable that troubled projects, such as Midland, not receive the extra measures of assurance that the agency is capable of providing.

We look forward to your response.

Sincerely,

Billie Pinner Gardner
Billie Pinner Gardner
Citizens Clinic Director