ML250

July 19, 1982

MEMORANDUM FOR: Dr. David Okrent, Chairman, ACRS Subcommittee on Midland Plant Units 1 & 2

FROM: David Fischer, Staff Engineer

SUBJECT: SUPPLEMENT NO. 1 TO THE MIDLAND PLANT SAFETY EVALUATION REPORT

Attached is Supplement No. 1 to the NRC Staff's Safety Evaluation Report (SER) related to the operation of Midland Plant, Units 1 and 2. It addresses the Committee's recommendations as contained in its interim report on the Midland Plant, dated June 8, 1982. It also provides more recent information regarding resolution of some of the open items and confirmatory issues identified in the SER. The only new open item is one prompted by the ACRS interim report; it deals with natural circulation during small break loss of coolant accidents.

In reviewing the ACRS interim report on Midland the staff identified 12 topics which need to be addressed/tracked. Each is identified below with a summary of what the Supplemental Safety Evaluation Report (SSER) says.

1. Design Adequacy and Construction Quality: NRC Region III is preparing a report which will address Midland Construction problems, their disposition, and the overall effectiveness of the Consumers Power Company's (CPCo) efforts to ensure appropriate plant quality. The report will cover construction up to June 30, 1982 and will be issued by October, 1982. Another report will cover July 1, 1982 through construction completion. The NRC staff is still considering the need for the applicant to acquire an independent evaluation of the adequacy of Midland's design and construction. (In a letter to CPCo dated July 9, 1982 the staff requested CPCo to "start to perform an evaluation leading to such a report on a schedule compatible with your licensing needs.")

2. Decay Heat Removal Following More Severe Earthquakes: This section addresses the Committee's recommendation that plants be designed for earthquakes more severe but less probable than the SSE. The Staff responded that "because of the margin inherent in the design of individual components and the fact that redundant components of a safety system typically are not exposed to the same loads because of different locations, it is likely that systems functions would not be lost in case of earthquakes more severe than the SSE." We should hear more from the staff on the basis for this position. The staff admits that their argument lacks a quantative basis. Perhaps we could persuade the staff (and applicant) to deal with this issue in a technically rigorous fashion rather than have them apply their gut feeling that the margins inherent in designing a plant to the SSE are good enough.

ACRS DFISCHER/w 7-19-82 FILE: MIDLAND SSER

3. Reactor Vessel Head Vent: Issue still open

4. Reactor Vessel Level Indication: The NRC Staff is still requiring (as a licensing condition) the applicant to provide the itemized documentation required by Item II.F.2 of NUREG-0737. Their submittal should address additional differential pressure instrumentation between the vessel head and the lower level of the hot leg. The SSER states the staff's preliminary position that "further submittals by the applicant also should include a reactor coolant pump current monitor, or equivalent, to trend void content of reactor coolant during forced circulation. An acceptable equivalent would be a differential pressure transmitter sensing pressure change from a tap at the bottom of the vessel, and design to trend voiding with the pumps running." I am not quite sure what the staff has in mind as far as the aforementioned "acceptable alternative" goes. I am curious about their differential pressure transmitter sensing pressure change from a tap and also about the ability of a differential pressure instrument to trend voiding with pumps running. I doubt the ability of either of the mentioned techniques to detect voiding (no less trend voiding). We should pursue the staff's justification for their preliminary position at our next Subcommittee meeting.

5. Operating Shift Experience: The SSER indicates that the applicant intends to meet the staff (and ACRS) position that each operating shift at Midland be augmented with at least one person having experience on a large Commercial PWR for at least the first year of commercial operation at Midland (i.e., until the permanent Midland operators have acquired at least one year of commercial operating experience). The applicant is exploring the availability of experienced personnel through several agencies.

6. Augmented NRC Audit of Operations: NRC Region III will implement an augmented audit of operations at Midland during the early years of operation as recommended in the Committee's interim report.

7. Probabilistic Risk Assessment: The applicant has advised the NRC staff that its PRA will be submitted for review in early 1982 (changed from fall of 1982).

8. Natural Circulation During a Small-Break LOCA: The staff is continuing its evaluation of small-break LOCA models including those for Midland under Items I.C.1 and II.K.3.30 of NUREG-0737. The staff is working with the B&W owners and NRC's Office of Research to obtain confirmatory experimental data in this area. This topic will be considered an open issue for Midland "until an experimental program to obtain the necessary data is funded and established to further confirm the staff's understanding of portions of the B&W system dynamics, and to provide additional verification of existing analytical methods." This staff response is puzzling. The item will remain open until a program is funded and established, not until results are obtained. At our next Subcommittee meeting it might be a good idea to find out why the staff is taking this approach.

9. Systems Interaction: The Committee indicated its desire to be informed of the results of Midland's systems interaction study. By a letter dated June 25, 1982, the staff requested that the applicant provide a summary report of their plans in this regard and provide the results of their program for staff review. The staff will report the results of its review to the Committee.

10. Population Density Consideration: The Committee stated its belief that in view of the population density near Midland, additional prudence is appropriate for the Midland Plant in the resolution of the issue of anticipated transients without scram and other Unresolved Safety Issues. The staff will specifically consider this ACRS recommendation when grouping the plants for implementation of the technical resolution of Unresolved Safety Issues.

11. Emergency Procedures: The staff endorses the Committee's suggestion that there be active participation by Midland Plant personnel in emergency procedures developed on the basis of an assumed accident at the DOW Chemical Plant. The staff has asked the applicant to provide a brief description of the interfaces between the emergency plan for the Midland Plant and that for the DOW Plant, emphasizing the actions that Midland Plant personnel would take in the event of an accident at DOW.

12. Turbine Missile: This open item remains unresolved and will be discussed in a later supplement pending staff receipt and review of the General Electric analysis which explains the GE missile generation probabilities.

Additional topics addressed in the SSER include:

1. Tornado Missiles: While this open item remains unresolved, missile protection need not be provided before the first refueling outage, but shall be provided no later than January 1, 1985. In addition, the staff is requiring the applicant to install concrete tornado-missile shielding above diesel fuel oil pipes (buried under 2 feet of soil) between the diesel fuel oil tanks and diesel generator building.

2. Emergency Preparedness: This area is addressed in detail in the SSER but will remain an open item. Based on its review, the staff concluded that the Midland site Emergency Plan, on satisfactory completion of the items listed below, will be acceptable. The items are summarized as follows:
   (a) The applicant must provide a brief description of the interfaces between the emergency plan for the Midland Plant and for the DOW plant emphasizing the actions that Midland personnel will take after being notified of an accident at DOW.

(b) The staff has under review the applicant's
(1) meteorological and dose assessment proposals
(2) concept of operations and method for meeting the staffing guidelines of NUREG-0654 for the EOFs
(3) description of the prompt notification system
The applicant must resolve satisfactorily any deficiencies that result from this review.

The confirmatory issues identified below have been closed out. There is some discussion of each in the SSER.

1. Supplemental ECCS Calculations (4.2.3.3)
2. Adequacy of BWSTs to Provide Boric Acid to RCS (5.4.4.2)
3. MFW Overfill Protection (5.5.6)
4. Applicability of Power Train Code (15.1.2)
5. Steam Generator Water Inventory as a Function of Power Level (15.2.3)
6. Loss of Flow Transients (15.3.1)

I suggest that we address each of the 12 staff-identified follow-up topics from the Committee's interim report at our next Midland Plant Subcommittee meeting. We probably should concentrate on Midland's design adequacy and construction quality, on natural circulation during a SBLOCA, and on decay heat removal following earthquakes more severe than the SSE. The other nine topics might adequately be addressed by shorter status reports or by questions only.

The NRC staff has indicated to me that they see no need for an ACRS Subcommittee meeting on Midland until the spring of 1983 (anything before March would impose a severe hardship on them). However, we may want to schedule one sooner after we have seen the I&E report on Midland construction problems, etc. (October, 1982), the Applicant's PRA (early 1983), or the systems interaction study summary. By spring we may even be able to get a good status on the Applicant's plans to conduct an independent design audit.

I look forward to talking to you about tentative plans for our next Subcommittee meeting. We might want to start lining up our consultants soon. Perhaps you could give some thought as to whom you would like to help us. I will keep you posted on events related to Midland.

Attachment: As Stated

cc: ACRS Members
E. Epler
W. Lipinski
J. Osterberg
R. Fraley
M. Libarkin
J. Mckinley
G. Quittschreiber

MIDLAND PLANT UNITS 1 & 2
OPERATING LICENSE REVIEW
JUNE 2, 1982
PROJECT STATUS REPORT

PURPOSE:

The purpose of this meeting is to review the application of Consumers Power Company for a license to operate the Midland Plant Units 1 & 2.

BACKGROUND:

Pertinent facts concerning the Midland Project are included in my May 17, 1982 project status report for the ACRS Subcommittee Meeting on Midland Plant Units 1 & 2 - May 20-21, 1982. That project status report contained:

- a description of the plant site
- a description of the plant
- comments on plant elevation and design water levels
- a status of the ACRS review
- a list of open items and licensee conditions

Attachments to the May 17th status report included:

- a map of the Midland
- a diagram at Midland's reactor coolant system
- a table comparing Midland features with those of Rancho Seco, Oconee, and Turkey Point
- past ACRS letters
- Staff response to comments made in past ACRS letters
- Dr. Siess' report of the Ad Hoc Subcommittee on foundation problems and remedial actions at Midland Plant Units 1 & 2
- Consultant reports
  - Dr. R. Foster, Comments on Midland's DES and Emergency Plan
  - Mr. P. Davis, Evaluation of Aux. Feedwater Reliability at Midland
  - Dr. P. Pomeroy, Comments on Midland Seismic Site Specific Response Spectra
  - Mr. J. Hickman, Comments on Midland's Aux. Feedwater Design
- Statement of Ms. Mary Sinclair

Copies of the status report for the May 20-21 Subcommittee Meeting are available upon request.

OPEN ITEMS:

The status of open items and licensing conditions has not changed since my last status report. As presented by the NRC Staff during the May 20-21 Subcommittee Meeting, these items are listed on Attachment 1 to this report.

MIDLAND PLANT SUBCOMMITTEE MEETINGS TO REVIEW CONSUMERS OL APPLICATION

On April 29, 1982 an ACRS Ad Hoc Subcommittee met to discuss the remedial actions for soils-related structural settlement problems at the Midland site. Of particular note in this report is the Ad Hoc Subcommittee's recommendation (accepted by the full ACRS during the May Full Committee meeting) that the Midland Plant Subcommittee review:

1. The adequacy of the seismic input criteria and

2. The seismic Site Specific Response Spectra and its relation to the proposed permanent site dewatering as a means of reducing the probability of liquefaction due to an earthquake.

During the May 20-21 Midland Plant Subcommittee Meeting the following topics were discussed:

- The status of the NRC Staff's OL review
- The quality of design and construction
- Human factors review of the control room
- Alternative shutdown panel
- Instrumentation to detect inadequate core cooling
- AC/DC system reliability
- Process steam
- Seismic issues (including seismic input criteria, seismic site specific response spectra, and liquefaction)
- Probabilistic risk assessment
- Auxiliary feedwater system reliability
- Utility organization, management, and training
- Emergency operating procedures
- System high point vents
- Emergency planning
- Radiation protection program
- Environmental issues at Midland
- Potential for ground water contamination

Several items which were scheduled to be discussed during the May 20-21 meeting were deferred until the June 2nd Subcommittee Meeting. These topics include:

- Items from previous ACRS letters
- Methods to reduce common cause failure
- Integrated control system
- Seismic and environmental qualification of equipment important to plant safety
- DHR system operation
- Bolting and other high strength material
- Fire protection
- Habitability

Industrial Security will be discussed at the June 2nd Subcommittee Meeting since we have the facilities in Washington to hear this propriatary presentation.

The tentative schedule for the June 2nd Subcommittee Meeting was issued on May 25, 1982.

ADDITIONAL INFORMATION FOR THE JUNE 2 SUBCOMMITTEE MEETING

The NRC Staff's Midland Plant Project Manager, Mr. Darl Hood, has compiled a list of ACRS concerns from past ACRS letters. This list, Attachment 2, is complete and should obviate your review of chapter 19 in the OL SER. Mr. Hood references the section(s) of the OL SER which addresses each ACRS concern. For each concern, he summarizes:

- the ACRS concern
- the CP SER response to the ACRS concern
- the OL SER section that relates to the ACRS concern

Familiarity with Attachment 2 should allow us to move more quickly through the "ITEMS FROM PREVIOUS ACRS LETTERS" section of the June 2nd Subcommittee Meeting.

ADDITIONAL INFORMATION FOR THE JUNE 4 FULL COMMITTEE MEETING

Attached to this project status report is a memorandum from Mr. Hood to me dated April 7, 1982 (Attachment 3) that discusses the Midland breakdown in quality assurance with respect to soils activities. The testimony filed June 6 1981 referred to in this memorandum is voluminous. Rather than transmit it to you, I would like to tell you what is in it. If you would like to see all or part of this testimony, please let me know. The June 6th, 1981 NRC Staff testimony contains:

1. Testimony of Eugene J. Gallagher with respect Quality Assurance Program Implementation Prior to December 6, 1979;

   Attached to Mr. Gallagher's testimony are those documents listed on Attachment 4. The conclusion of his testimony states "The quality assurance deficiencies related to soil construction activities under and around safety relates structures and systems arising from improper implementation of the quality assurance program provide adequate bases to modify the construction permits by suspending those soil construction activities."

2. NRC Staff testimony of James G. Keppler with respect to the quality assurance implementation prior to December 6, 1979;

   Significant attachments to this testimony include:

   - Midland Summary Report - an overall assessment of the Midland construction project to Feb. 15, 1979
   - Midland Construction Status Report as of Oct. 1, 1979
   - March 15, 1979; Summary of Feb. 23, 1979 and March 5, 1979 meeting
   - March 12, 1979; Midland Diesel Generator Building and Plant Area Fill

3. NRC Staff testimony with respect to quality assurance;

4. Testimony of Joseph D. Kane with respect to the quality assurance program implementation prior to December 6, 1979;

5. Testimony of Darl S. Hood with respect to the quality assurance program implementation prior to December 6, 1979;

6. NRC Staff testimony with respect to implementation of quality assurance for soils work and remedial measures after December 6, 1979;

   The testimony includes as an attachment major summary findings in the areas of management effectiveness, piping and supports, QA/QC program assessment, civil (soils) activities, and electrical work.

7. NRC Staff testimony of Darl S. Hood, Jeffrey K. Kimball and Eugene Gallagher on Stamiris contention 1;

8. NRC Staff testimony of Darl Hood, Joseph Kane, Frank Rinaldi and Eugene Gallagher on Stamiris contention 2; and

9. NRC Staff testimony with respect to intervenor Stamiris contention number 3.

I have extracted Ms. Stamiris' three contentions from the applicable testimony and have included them as Attachment 5.

As a result of the above listed testimony the conclusions of Attachment 6 were reached. Mr. Hood adequately summarized these conclusions in his April 7th memo to me when he said "The applicant subsequently agreed, by joint stipulation with the Staff, not to contest the Staff's findings that a QA breakdown in the soils area existed as of December 6, 1979. The stipulation went on to note that changes had been made to the organization and procedures, and that the Staff now finds these areas to be acceptable."

I also have a copy of the ASLB's Findings of Fact and Conclusions of Law (dated December 30, 1981 and supplement thereto dated March 26, 1982). The supplement addresses the same subjects addressed in the original findings - quality assurance and management attitude. Specific subjects addressed in the supplement include (1) SALP (2) The MPQAD reorganization (3) Quality control inspector qualifications and (4) Audit Report F-77-32. The conclusions reached in the December 30, 1981 findings were not changed. (Attachment 7).

The two Systematic Assessment of Licensee Performance (SALP) reviews which have been completed on Midland are attached (Attachment 8 and 9). Consumers has responded to the latter of these two reviews in a submittals dated May 17th 1982 (Attachment 10). Attachment 11 is a Midland Project Quality Assurance Program update Executive Summary. If you are interested in reviewing Midland's Quality Assurance Program in detail, a two volume description of it is available.

As a result of the most recent SALP report, Mr. Keppler (Region III Administrator) is reevaluating the testimony he made to the ASLB. This reevaluation will be completed in mid June. Selected I&E inspection reports are included as Attachment 12.

MIDLAND PLANT UNITS 1 & 2
OPERATING LICENSE REVIEW
MAY 20-21, 1982
PROJECT STATUS REPORT

PURPOSE:

The purpose of this meeting is to review the application of Consumers Power Company for a license to operate the Midland Plant Units 1 & 2.

BACKGROUND:

Pertinent facts concerning the Midland Project include:

Location:

The Midland site is located partially within the city of Midland, Midland County, Michigan. The city of Midland is approximately 105 miles NNW of Detroit and about halfway up Michigan's lower peninsula on the Lake Huron (east) side. The facility is located along the south shore of the Tittabawassee River and south of the city of Midland. The site is adjacent to the Dow Chemical Company's (Dow) main industrial complex in Midland (located on the north side of the Tittabawassee River and due north of the plant). Within 10 miles of the plant, the 1970 estimated population was 72,706, within 5 miles, there were 48,501 residents. Circulating water for the two units is obtained from a cooling pond. The cooling pond receives make-up water from the Tittabawassee River. A map of the Midland plant site is included as Attachment 1.

Plant:

Each of the two units at the Midland plant employs a Babcock and Wilcox-designed nuclear steam supply system (NSSS) consisting of a pressurized water reactor (PWR) rated at 2468 megawatts thermal (MWt), a pressurizer, two steam generators, four reactor coolant pumps, and the associated piping required to connect these components. Attachment 2 shows the NSSS arrangement. This rated power level includes 2452 MWt generated in the core plus 16 MWt added to the NSSS by the four reactor coolant pumps. The maximum core design output (excluding pump heat) is 2552 MWt. This power level is referred to as the stretch level and is the value used in the radiological accident analyses. The Midland plant is unique in that the heat generated will be used not only to produce electrical energy but also to produce steam for the Dow Chemical Company plant. The facility's turbine generators will produce 504 megawatts electrical (MWe) from Unit 1 and 852 MWe from Unit 2. The remaining heat from Unit 1 will normally be used to produce 460 kg/s (approximately 3.6 x 10^6 lb/hr) at 1200 kPa gauge (175 psig) and 50 kg/s (approximately 0.4 x 10^6 lb/hr) at 4100 kPa gauge (600 psig) of process steam for use at the Dow plant. The process steam system is a tertiary system utilizing heat extracted from the secondary steam system of the Midland plant.

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The containment for the nuclear steam supply system (NSSS) is a post-tensioned, reinforced concrete structure with a steel liner to provide leak tightness. The containment which was designed and constructed by Bechtel Power Corporation has a design pressure of 70 psig.

The reactor cores will be loaded with 177 fuel assemblies (15x15). The core will have an average thermal output of 5.47 kw/ft (based on cold BOL data). The SSE is 0.12 g horizontal, 0.8 g vertical. The OBE is 0.06 g horizontal, 0.05 g vertical. A comparison of Midland features with those of similar plant designs is included as Attachment 3.

ADDITIONAL CONSIDERATIONS:

Midland Units 1 & 2 have a nominal finish grade elevation of +634 ft. The design high water level due to probable maximum flood, including wave run up effects is +635.5 ft. The design water level of the Tittabawassee River, cooling pond, and ultimate heat sink are +588 ft, +618 ft, and +604 ft, respectively.

ACRS REVIEW:

The ACRS reviewed Midland for a CP license in June 1970. A copy of the CP letter and supplement thereto is included as Attachments 4 & 5, respectively. In response to requests for additional information from the Atomic Safety and Licensing Board (ASLB) the ACRS wrote an additional Supplemental Report on Midland Plant Units 1 & 2, dated Nov. 18, 1976 and provided comments to the Commission Chairman in a letter dated March 16, 1977. These two letters are Attachments 6 and 7 to this status report. Supplement No. 2 to the NRC Staff's CP SER of the Midland Plant addresses the ACRS concerns identified in the second supplemental ACRS letter report dated Nov. 18, 1976. This Staff SER supplement (less the ACRS letter) is included as Attachment 8.

On April 29, 1982 an ACRS Ad Hoc Subcommittee met to discuss the remedial actions for soils-related structural settlement problems at the Midland site. The report of that Ad Hoc Subcommittee meeting is included as Attachment 9. Of particular note in this report is the Ad Hoc Subcommittee's recommendation (accepted by the full ACRS during the May Full Committee meeting) that the Midland Plant Subcommittee revew:

1. The adequacy of the seismic input criteria and

2. The seismic Site Specific Response Spectra and its relation to the proposed permanent site dewatering as a means of reducing the probability of liquefaction due to an earthquake.

The full ACRS is tentatively scheduled to review the OL application during its June 1982 meeting.

OPEN ITEMS:

There are currently 16 open items. About half of these items are unresolved due to pending NRC Staff action/evaluation and half due to the need for additional information/evaluation from Consumers Power Company. Disagreements between the NRC Staff and the Applicant still exist on several soils settlement issues and on the need for a reactor vessel head vent. A list of the current open items is included in Attachment 10. Attachment 10 also lists the license conditions to be imposed on the applicant. For a description of each of these open items and license conditions, please see the indicated section of the NRC Staff's Safety Evaluation Report.

MEETING TENTATIVE SCHEDULE:

The meeting tentative schedule was issued May 12, 1982. It incorporated topics identified in the NRC Staff's SER, past ACRS letters (Attachments 4,5,6, and 7), the ACRS Staff's list of suggested discussion items for OL Subcommittee meetings, and items identified in consultant reports concerning Midland. The consultant reports are included as Attachment 11. Comments received from ACRS members and staff were factored into the tentative schedule as were the comments received from members of the public.

SUBCOMMITTEE ACTIONS REQUIRED:

The Subcommittee should decide if the full ACRS should review the application of Consumers Power Company for a license to operate Midland Plant Units 1 & 2 at the June ACRS full Committee meeting. If the Subcommitee decides that the full Committee should review Consumers application in June, then the topics to be discussed during the Midland portion of the June full committee meeting should be identified at the close of the Subcommittee meeting.

PUBLIC PARTICIPATION:

A member of the public (Mary Sinclair/Dr. Charles Anderson has requested an opportunity to make an oral statement regarding the soils/foundation question. Time has been made available on the schedule for this statement. In addition, Mrs. Sinclair has provided a letter, Attachment 12, for ACRS consideration.