

5/20-21/82

MEMORANDUM FOR: D. Ukrent, Chairman, ACRS Subcommittee on Midland Plant
Units 1 & 2

FROM: D. Fischer, Staff Engineer

SUBJECT: SUBCOMMITTEE ON MIDLAND PLANT UNITS 1 & 2 - MAY 20 & 21, 1982 -
MIDLAND, MICHIGAN

I have prepared the attached meeting summary for your review. Copies are
being distributed to the other ACRS members and Subcommittee consultants for
their information and comment. Corrections and additions will be included
in the minutes of the meeting.

Attachment:
AS stated

- cc: ACRS Members
ACRS Technical Staff
P. Davis, ACRS Consultant
E. Epler, ACRS Consultant
W. Lipinski, ACRS Consultant
J. Osterberg, ACRS Consultant
F. Parker, ACRS Consultant
P. Poweroy, ACRS Consultant
K. Scavuzzo, ACRS Consultant
H. Trifunac, ACRS Consultant
L. Ludans, ACRS Consultant
K. Foster, ACRS Consultant
E. Case, NRR
E. Goodwin, NRR
R. DeYoung, IE
K. Minogue, KES
D. Eisenhut, NRR
K. Vollmer, NRR
J. Keppler, NRR
K. Purple, NRR
E. Adensan, NRR
D. Hood, NRR

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OFFICE	R. Hermon, NRR					
SURNAME	J. Knight, NRR				DFischer	
DATE						

PROPOSED SUMMARY
OF THE MAY 20 & 21, 1982
MEETING OF THE SUBCOMMITTEE ON MIDLAND PLANT UNITS 1 & 2

PURPOSE:

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

PRINCIPAL ATTENDEES:ACRS

D. Okrent, Chairman
 W. Mathis, ACRS Member
 D. Moeller, ACRS Member
 C. Siess, ACRS Member
 P. Davis, ACRS Consultant (part-time)
 E. Epler, ACRS Consultant
 W. Lipinski, ACRS Consultant
 J. Osterberg, ACRS Consultant
 F. Parker, ACRS Consultant
 P. Pomeroy, ACRS Consultant (part-time)
 R. Scavuzzo, ACRS Consultant
 M. Trifunac, ACRS Consultant (part-time)
 Z. Zudans, ACRS Consultant
 J. McKinley, ACRS Staff
 D. Fischer, ACRS Staff

NRC STAFF

R. Tedesco
 E. Adensam
 D. Hood
 R. Hernan
 J. Knight
 R. Lobel
 L. Reiter
 J. Kimball
 J. Kane
 J. Peschel
 R. Cook
 B. Burgess
 W. Little

CONSUMERS POWER COMPANY

J. Cook
 T. Sullivan
 R. Hamm
 B. Harshe
 J. Alderink
 T. Thiruvengadam
 L. Gibson

F. Buckman
 G. Slade
 W. Hall
 H. Slager
 R. Polich
 J. Zabritski
 W. Beckman

D. Sommers
 K. Drenobl
 D. Budzik
 R. B. DeWitt

PUBLIC

C. Anderson
 M. Sinclair
 B. Stamiris

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS:

1. Mr. R. Hernan (NRR/DL) provided the Subcommittee with a brief history of the Midland operating license (OL) review. He discussed each of the 16 remaining open items. Significant items which remain unresolved include:

- a. the potential effects of using natural gas onsite for auxiliary heating of tertiary steam in evaporators,
- b. ongoing soils remedial actions,
- c. the need for a reactor vessel head vent, and
- d. turbine missiles.

Mr. Hernan also summarized the various license conditions which are being imposed on the Applicant. For several of the open items and license conditions, Dr. Okrent questioned the NRC Staff on how it developed criteria to evaluate/resolve these issues. The Staff, on occasion, has relied on engineering judgment as opposed to probabilistic estimates in determining the adequacy of licensee-proposed fixes to safety-related issues.

2. Mr. W. Little from the NRC's Region III Staff described significant construction quality assurance (QA) and quality control (QC) experiences at the Midland plant. He also made an assessment of CPCo's construction management. While he indicated that the QA record at Midland has been below average as compared to other plants under construction, he expressed general satisfaction with the current QA program and organization. He said that recent special inspections have concluded that the quality-related problems at Midland were generally isolated or limited to a specific area and not indicative of major programmatic weaknesses in the implementation of their Quality Assurance program. Dr. Okrent asked the Staff what conditions would prompt the Staff to ensure that a more detailed review of the plant design and construction quality is conducted (e.g., past poor record related to quality assurance, large population near the site). Dr. Siess questioned the Staff on the purpose of a QA program and asked how the Staff measured the effectiveness of a QA program. In his concluding remarks, Mr. Little said that Region III believes that Midland construction management is staffed with competent people and that a program does exist such that the plant can be completed in accordance with design and regulatory requirements. Dr. Okrent questioned the Staff on the need for detailed audits to assure that plant quality is adequate. Mr. Tedesco (NRR/D/DL) said

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

that the Staff is asking all near-term OL applicants to provide the Staff with an evaluation of why they believe that their plant has been designed and built in accordance with their application. He added that this would involve a thorough look at their whole QA program and the experiences that they have had during construction. The scope of these design re-verifications, and the need for an independent group to perform them, have not yet been deemed a requirement by the Staff. Recognizing that an independent design re-verification may be required, CPCo is currently having their architect-engineer, Bechtel, perform a design re-verification.

3. Dr. Charles Anderson, consultant to Midland citizens/intervenors, discussed cracks in the Midland Plant diesel generator building and service water pump structure. He demonstrated, using cardboard boxes, how these structures might have lost their rigidity. He stated that the buildings do not have their designed structural integrity because of the cracks which exist in their walls. He said that these cracks, which were caused by differential settlement, are numerous, quite long, and random in orientation. CPCo stated that they have evaluated the cracks and have determined that they have no effect on the integrity of the structure.
4. Ms. Barbara Stamiris suggested several documents which the Committee should review related to QA/QC at Midland. She indicated that CPCo was slow to correct deficiencies identified in the QA/QC area. She also said that the generic implications of QA/QC deficiencies was seldom addressed. Finally, Ms. Stamiris noted that the Staff lacked criteria for evaluating an applicant's QA/QC program. She indicated that this made it particularly difficult for an outside observer to determine the basis for a Staff judgment as to the adequacy of a applicant's QA/QC program or activities.
5. Ms. Mary Sinclair summarized the written statement she provided to the Subcommittee. She encouraged the Subcommittee to pursue the topics identified in the ACRS letter to the AEC on Midland's CP application. In addition, she commented on Midland's final environmental impact statement, evacuation plan, and radioactive waste disposal capabilities.
6. Mr. Robert Hamm, CPCo, described the ongoing human factors review of Midland's control room. He described the preliminary control room design review which was performed and outlined that review's findings. Control room enhancements resulting from the preliminary review were discussed. No enhancement was identified to correct the preliminary review deficiency that alarms are not prioritized. CPCo stated that this deficiency is still under review. Mr. Hamm next described the detailed task analysis of control room operator's functions which is ongoing. He related this to other human factors related activities at Midland.

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

7. Mr. Hamm described CPCo's auxiliary shutdown panel. This panel provides those controls and indications necessary to maintain the plant in hot standby. It also provides some of the instrumentation and controls needed to bring the plant to cold shutdown.
8. Mr. Hamm outlined methods CPCo is using to detect inadequate core cooling. These methods include: a subcooling monitoring system, a hot leg level monitoring system, and 24 safety-grade, core-exit thermocouples. The highpoint vents for the Midland design will be off the top of the hot leg (CPCo proposes not to have a head vent). CPCo stated that a void in the reactor coolant system will not result in a loss of natural circulation. The potential for losing the plant's natural circulation capability was addressed. Methods to reduce the concentration of both condensable and non-condensable gases in the reactor coolant system were discussed. Dr. Okrent asked the Staff to discuss the instrumentation required to detect inadequate core cooling at the ACRS full Committee meeting.
9. Mr. J. Alderink, CPCo, outlined the basic system function of the process steam (evaporator) system and gave an overview of its operation. The system interfaces with Dow were highlighted (including communication interfaces). Mr. D. Sommers briefly described the radiation monitoring program associated with the evaporator system.
10. The Subcommittee members and consultants toured the Midland Plant site. Subcommittee members and consultants divided into several groups. One group took a general tour. Another group took an abbreviated general tour and, in addition, saw the chemistry and radiation monitoring facilities. A third group took an abbreviated general tour and, in addition, saw the areas/structures requiring soils remedial actions.
11. Dr. T. Thiruvengadam, CPCo, presented a brief overview of the criteria to which the plant structures and equipment were built. He described the ground acceleration magnitude Midland's OBE and SSE, the design response spectra, damping coefficients, and CPCo's analysis methodology.
12. Mr. R. Holt of Weston Geophysical Corporation discussed Midland's site-specific response spectra. He outlined two approaches to seismic design, one which results in a standard response spectra and another which results in a site-specific spectra. CPCo has developed a site-specific response spectra. Mr. Holt explained the earthquake magnitude appropriate to the Midland site, the various distances, the shear wave velocity profile, and the resulting final Midland-specific spectra. His presentation showed how CPCo's use of the Michigan Basin as a tectonic province affects the seismic site-specific spectra.

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

13. H. G. Klimkiewicz, a seismologist with Weston Geophysical, presented the results of a seismic hazard analysis (i.e., a determination of the probability of occurrence of the spectra) performed for the Midland Plant. He concluded that the predominant source of seismic hazard at the site is the local occurrence of a moderate earthquake.
14. Mr. J. Kimball (NRR/DE/SEB) discussed the seismic portion of the NRC's operating license review for Midland. He highlighted several areas where the Staff and Applicant disagree. These areas of disagreement relate to:
 - the use of the Michigan Basin as a tectonic province,
 - The use of the Parkfield earthquake records to develop the site-specific spectra.

The Staff has found the Applicant's site-specific spectra acceptable in spite of these differences because of conservatism of larger magnitude that have been incorporated into the spectra.

15. Mr. L. Reiter (NRR/DE/GSB) discussed the use of probabilistic estimates to determine seismic hazards. He also discussed some recent work on sensitivity of seismic hazard to variations in input parameters. Finally, Mr. Reiter outlined the direction that the Staff plans on taking relating to the use of probabilistic estimates. The Staff will use probability to obtain relative as opposed to absolute insights into seismic hazard. Mr. Reiter said that reliance upon probabilistic estimates for very long return periods is not the way to alleviate concerns about earthquakes greater than the SSE. He did, however, encourage research to facilitate increasing use of probabilistic estimates.
16. Dr. R. Kennedy, President of Structural Mechanics Associates and consultant to CPCo, discussed the seismic reevaluation of the Midland facilities. He discussed the criteria that are being used in the seismic margin review. He also gave a sample of some of the preliminary results from this review. He explained that the site-specific spectra is being used in the seismic margin review. The review involves both structures and equipment.
17. Dr. Thiruvengadam, CPCo, addressed the potential for soil liquefaction at the Midland site. He briefly described the basis for the permanent site dewatering system. The loose granular backfill supporting the diesel generator building and the auxiliary building railroad bay area will not liquefy during an earthquake with a peak ground acceleration of 0.19g provided the ground water level in the backfill is maintained at or below elevation 610. The dewatering system will maintain the water level under these structures at about elevation 595. Total failure of

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

- all pumping capacity in the system would still permit an ample 60 days to repair or reinstall the system before the water reaches elevation 610 in critical areas. At 0.25g there is a 1.1 margin of safety. The Staff agrees with the Applicant on the results of the liquefaction analysis.
18. In response to a request from Dr. Okrent, the Applicant, NRC Staff, and ACRS consultants each gave their estimates of that earthquake having a return frequency of a thousand years, ten thousand years, and a hundred thousand years. There were considerable differences in these estimates of low probability earthquakes of a certain size.
 19. Mr. J. Cook, Vice President of Projects Engineering and Construction for Consumers Power Company, briefly outlined the company's corporate structure and the engineering and construction operation for which he is responsible. CPCo has considerable nuclear experience but Dr. Okrent questioned its sufficiency to ensure safe plant operation.
 20. Mr. R. DeWitt, Vice President of Nuclear Operations, very briefly reviewed CPCo Corporate organization, Nuclear Operations Department organization, Energy Supply organization, and his nuclear experience/background.
 21. Mr. F. Buckman, CPCo's Executive Director of Nuclear Activities briefly described the organization, staffing, and experience of the Nuclear Operations Department. He similarly described the Nuclear Activities Department. The composition and functions of the Nuclear Safety Board were presented. Mr. Buckman identified the people on the board and gave their experience and qualifications. The Subcommittee discussed how LERs from other plants were evaluated by CPCo.
 22. Mr. G. Slade, CPCo's Assistant Site Manager for the Midland Site Management Office, discussed the organization of the plant staff, human resources planning of the plant staff, and the qualification program for the plant. The composition and qualifications of the plant staff were discussed in detail. The control room operator shift organization was presented to the Subcommittee. It was mentioned that a two-unit simulator would be available for crew training by mid 1983. Typical training programs were identified, including those for reactor operators, simulator training, and training to mitigate core damage. The composition and qualifications of the training staff were discussed.
 23. Dr. T. Sullivan, Manager of Safety and Licensing for the Midland project, discussed Midland's ongoing probabilistic risk assessment (PRA). Midland's licensing staff is working with Pickert, Lowe & Gerrick, the Midland site organization (including STAs and the operating staff) to conduct the PRA. The PRA was initiated in December 1980 and is 75% completed. Final results of the PRA are expected in January 1983. Dr. Sullivan discussed the objectives and unique features of the Midland PRA.

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

24. Mr. L. Gibson, CPCo, discussed Auxiliary Feedwater (AFW) system reliability. After some disagreement on the need for a third AFW pump, CPCo has agreed to install a third pump by the second refueling outage. The basis for the Staff's probabilistic criteria regarding AFW system unavailability was discussed at length.
25. Mr. W. Hall, CPCo, discussed Midland's Emergency Operating Procedures (EOPs). Mr. Hall has been working with INPO in the development of an Emergency Operating Procedures Writer's Guide. He also is chairman of the B&W Owners Group Subcommittee responsible for developing B&W Guidelines for writing EOPs [Abnormal Transient Operating Guidelines (ATOG)]. Mr. Hall discussed ATOG and symptom-oriented procedures. He outlined the methodology used to develop ATOG, the structure of the two-part ATOG product, the methods used to validate ATOG, a plan to implement ATOG, and finally recent and proposed additions to ATOG.
26. Mr. B. Harshe, CPCo, described Midland's AC and DC power systems. He identified several features of each system which make them more reliable than those which exist at other plants and/or which are required by NRC documents.
27. Mr. B. Harshe, CPCo, discussed the possibility of a station blackout at Midland. He indicated that while such an event is not part of the design basis, procedures are being developed to cope with it. He said that greater than two hours (the design life of the battery) would be available before serious consequences occurred. He outlined procedures which would be taken to restore AC power before that two-hour period expired. Mr. Kindinger, CPCo, said that there would conservatively be approximately 6 hours before a core melt occurred.
28. Mr. L. Gibson discussed highpoint vents in Midland's reactor coolant systems. He showed a diagram of and discussed the system configuration. He said that a bubble in the head would be detectable by plant operators and that it would not interfere in the natural circulation flow path. The control rod drive mechanism manual vents are not suited for system venting with the system hot and pressurized. Mr. Gibson indicated that the perceived benefit from installing a suitable vent on a control rod drive mechanism flange (after drilling and tapping) would not outweigh the cost.
29. Mr. G. Slade, CPCo, discussed several unique features of the Midland Plant site which affects the Midland Emergency Plan. He specifically addressed the fact that the plant is located in the state of Michigan, within the city limits of Midland, and adjacent to a major chemical manufacturing facility. A representative of the Michigan State Police discussed the state's role in carrying out Midland's Emergency Plan. The coordination of CPCo, state, local, and Dow personnel was addressed.

MEETING HIGHLIGHTS, AGREEMENTS, AND REQUESTS (CONT'D):

30. Mr. D. Sommers highlighted several controversial or outstanding environmental issues on the Midland project. Issues discussed relating to the National Pollution Discharge Elimination System (NPDES) include:

- control of total dissolved solids in the Tittabawassee River,
- thermal effects of discharges to the Tittabawassee River, and
- the assimilative capacity for ammonia in the river.

Issues discussed relating to the Draft Environmental Statement (DES) include:

- the potential for fogging and icing, and
- the potential for increased death due to disease and starvation of water fowl in the cooling pond.

CPCo indicated that all of these issues should be resolved without difficulty.

31. Mr. D. Sommers, CPCo, discussed the potential for ground water contamination at the Midland site. He gave several reasons why he felt that the potential for ground water contamination at Midland was minimal.
32. Mr. W. Beckman, CPCo, briefly outlined the Midland Plant Radiation Safety Program. He mentioned the corporate guidance that has gone into the development of the Midland Program. His discussion indicated that a strong ALARA program is in place at Midland. The ALARA Program includes:

- An ALARA coordinator who reports to the Radiation Protection Manager,
- Annual ALARA goals,
- A \$5000 cost attached to each occupational man-rem projected to be consumed to install new equipment or modify the plant,
- A radiation exposure tracking system, and
- Pre-and Post-activity ALARA reviews for jobs involving personnel exposure.

Mr. Beckman highlighted Midland's normal dose projection and accident dose assessment methods.

PROPOSED SUMMARY
MIDLAND 1 & 2
MAY 20 & 21, 1982

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FUTURE MEETINGS:

The ACRS Subcommittee on Midland Plant Units 1 & 2 will have a meeting on Wednesday, June 2, 1982, commencing at 4:00 p.m., to discuss those topics on this meeting's tentative schedule that were not discussed.