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May 20, 1970

L. Squires, Chairman
Midland Subcommittee

S. H. Bush, Vice Chairman, ACRS

CATEGORY B REPORTS - MIDLAND - DRL LETTER DATED APRIL 24, 1970

Attached is a brief summary of the information presented in the subject correspondence. No ACRS action appears warranted.

This item should be incorporated in your set of project documents to maintain an up-to-date description of the plant, organization, procedures, etc.

Original Signed by
J. C. McKinley

J. C. McKinley
Staff Assistant

Attachments:
1) Summary
2) DRL ltr dtd 4/24/70

cc: ACRS Members

OFFICE ▶	ACRS					
SURNAME ▶	JCM:bjh					
DATE ▶	5/20/70					

Form AEC-318 (Rev. 9-53) AECM 0240

MIDLAND

DRL letter dated April 24, 1970 requests the applicant to supply additional information in order that the AEC may prepare a detailed environmental statement as required by the National Environmental Policy Act of 1969. Statements were requested on the following:

a. the environmental impact of the proposed action,

b. any adverse environmental effects which cannot be avoided should the proposal be implemented,

c. alternatives to the proposed action,

d. the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and

e. any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

No ACRS action appears warranted.

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JCM:bjh
6/9/70

Project: Midland Plant

Status: Construction Permit - third ACRS meeting, letter requested

Background:
November 7, 1968, Volumes I & II of PSAR received
January 10, 1969, Preliminary DRL report received
January 13, 1969, Application formally filed
January 22, 1969, Site visit and Subcommittee meeting
January 23, 1969, DRL site report received
February 4, 1969, Subcommittee meeting
February 6-8, 1969, ACRS meeting on site related issues
March 6, 1970, DRL report received
March 24, 1970, Subcommittee meeting
April 9-11, 1970, ACRS meeting
April 24, 1970, Subcommittee meeting
May 6, 1970, DRL Supplemental Report received
May 7-9, 1970, ACRS meeting
June 5, 1970, DRL Report No. 3 received
June 10, 1970, Subcommittee meeting

The Midland Plant Units 1 and 2 are two loop (4 pumps) Babcock and Wilcox PWRs with design power levels of 2452 MWt. The plant is owned and will be operated by Consumers Power Company with the Bechtel Corporation as the A-E. The reactors are similar to the units provided for the Rancho Seco, Arkansas Nuclear One, and Three Mile Island Plants.

A unique feature of the Midland Plant is the intent to supply approximately 4,050,000 lb/hr of process steam to the adjacent Dow Chemical Company plant.

Since the May ACRS meeting, Dow has agreed to apply for a 10 CFR Part 50 Materials License to receive, possess and use secondary steam as a source of thermal and mechanical energy. No secondary steam will be introduced into any product intentionally. As a consequence Consumers has modified the radioactivity limits on the process steam. If 1% fuel fails the applicant estimates that 2×10^{-3} gpm leakage can be tolerated for the short term. With no failed fuel a leak of 1 gpm can be tolerated. DRL finds the proposal acceptable subject to Technical Specification conditions. DRL plans to consult with the FDA regarding Dow's proposed use of secondary steam.

Consumers has agreed to design the reactor vessel cavity to requirements comparable to Zion and Indian Point-3.

Consumers has agreed to a control room design criterion of 1 ppm chlorine in the air in the event of a major chlorine release at the Dow plant. This is acceptable to DRL.

Dow has agreed to discontinue all salt mining (but not brine extraction) activities within 1/2 mile of the plant and to abandon and plug all salt wells in that area by 1975. DRL has concluded that subsidence need not be considered any further.

The pressurizer level alarm circuitry has been upgraded to protection system standards and is now satisfactory to DRL.

DRL intends to require additional verification of the adequacy of the ECCS proposed for Midland.

The question of failure to scram following anticipated transients will be explored at length by the Subcommittee on June 10, 1970 and reported by the Subcommittee Chairman on June 11, 1970.

Other topics for possible discussion include:

(1) Emergency plans - discussed briefly by the Subcommittee, there appears to be a built in delay of 15-20 minutes between the accident and notification to Dow.

(2) Consequences of an undetected fuel enrichment error and of the propagation of fuel failures - identified for Subcommittee consideration but not discussed.

(3) Turbine missiles - the applicant has orally agreed to protect Class I equipment from turbine missiles.

(4) Vibration tests - the applicant has agreed in writing to perform confirmatory vibration tests of the reactor internals.

(5) Hydrogen generation - the applicant has agreed to proceed to the next required step if it is concluded that purging is not acceptable.

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6/11-6/13/70

EXCERPT FROM 122ND ACRS MEETING

CHAIRMAN'S REPORT

Specific Projects

1. Midland Plant Units 1 and 2 - The Committee completed its review of the application by the Consumers Power Company for a permit to construct the Midland Plant Units 1 and 2, twin 2452 MWt PWRs. Items discussed during the meeting included:

See next page

FOIA-85-602

B/23

a. Steam for use in the Dow Chemical Plant - A basic change has been incorporated into the design of the steam system for use in the Dow plant. Heat exchange devices will be used to isolate the export steam from making contact with Dow products.

Consumers identified the radiation levels which might be expected in the export steam and the means for monitoring these levels. They expect the routine yearly average of radiation levels in the steam to be 0.1 MPC or less. Short-term operations would allow radiation levels up to MPC. If these limits are exceeded, corrective measures will be taken in the nuclear plant (e.g., switch to another steam generator) or export steam would not be delivered to Dow.

Dow stated that they are applying to DML for a license to receive the steam from Consumers. They will not use the export steam in any direct process. Dow will provide appropriate surveillance of the heat exchange devices for detection and control of leaks (e.g., pressure tests, use of tracers).

The DRL Staff was satisfied with the proposals made by the applicant and Dow. The Staff has forwarded a copy of the applicant's and Dow's proposal regarding the use and control measures of the export steam to the FDA for comment.

The Committee noted in its report that it believes that the criteria proposed by the applicant and Dow for control of radioactivity in export steam are necessary and adequate and that detailed procedures for implementation should be developed during construction in a manner satisfactory to the Staff. The Committee also wishes to be kept informed.

b. Exemption Request to Perform Certain Construction Activities - Consumers stated that they have applied for an exemption to perform certain construction before a CP is issued. The DRL Staff had indicated to the Committee that they were willing to grant the exemption to Consumers.

The Committee concluded that this item can be handled by the Staff. (Dr. Morris was informed of this decision.)

c. ECCS Design - A question had been raised by the Staff regarding the adequacy of the FLASH code for calculating blowdown during a LOCA. Consumers stated: "If further analyses or information demonstrate to Consumers and the AEC Staff that changes are necessary to meet our maximum clad temperature limit of 2300°F, we would not regard such changes as a backfit item. It would be Consumers' obligation to make the changes or to assume the burden of proof that a change in our temperature limit could safely be made."

B&W is revising the FLASH 2 code and will document the work being undertaken to support the acceptability of the revised code for analyses of accidents such as a cold-leg break.

The Staff will require confirmation that the revised FLASH 2 code is adequately conservative before accepting the B&W proposal that the ECCS, as presently designed, is capable of keeping core temperatures below 2300°F for blowdown accidents.

The Committee noted in its report that the applicant has stated that he will provide additional evidence obtained by improved multi-node analytical techniques to assure that the ECCS is capable of limiting core temperatures to presently established limits. He will also make appropriate plant changes if the further analysis demonstrates that such changes are required.

d. Failure to Scram on Anticipated Transients - B&W stated that they will have a report on their analyses of failure to scram on anticipated transients in early 1971 (January/February).

They will provide flexibility in the design of the plant to accommodate a larger pressure relieving capacity and a rapid boron injection system if either or both of these means are found to be useful to mitigate the consequences of failure to scram on anticipated transients.

The Committee recommended in its report that the applicant accelerate his study of means of preventing common failure modes from negating scram action and of design features to make tolerable the consequences of failure to scram during anticipated transients. The Committee also noted that the applicant stated that the engineering design would maintain flexibility with regard to relief capacity of the primary system and of a diverse means of reducing reactivity. This matter should be resolved during construction in a manner satisfactory to the Regulatory Staff.

e. Emergency Evacuation Plan - Consumers stated that they will have a direct-line phone from the nuclear plant to the Dow plant. The phone would be used by the shift supervisor for informing Dow of any major emergency in the nuclear plant which would require evacuation of the Dow plant employees.

The Committee noted in its report that the applicant has established criteria for and has begun the formulation of a comprehensive emergency evacuation plan.

f. Borated Water Sprays - Consumers reported that a preliminary report will be issued by the end of July, 1970, on the program to evaluate the effectiveness of borated water as a spray for removing iodine from the containment atmosphere. The sponsors of this program hope to discuss the results with the AEC this summer. The experiments have been performed (one large scale and 10 small scale) and preliminary results indicate that iodine did not escape from the borated water during a test where the water was recirculated for six days. The partition factor is not known yet.

g. As-Designed vs. As-Built Protection and Emergency Power Systems - The applicant agreed that he will inform the Staff of any changes in the as-built systems vs. the proposed design so the Staff could compare the changes with the initially agreed upon criteria.

The Committee recommended in its report that the criteria and procedures developed by the applicant (re: installation of protection and emergency power systems; physical and electrical independence of the redundant portions of these systems) be reviewed and approved by the Staff prior to actual installation.

h. Subsidence - The Staff reported that they are satisfied with the agreement made by Consumers and Dow to prohibit future salt mining operations within one-half mile from the center of the reactor plant. No new wells will be drilled within this distance and all existing wells will be abandoned and plugged.

The Committee noted in its report that these arrangements are satisfactory.

i. Chlorine Accident - The Staff reported that they will require the applicant to design the control room air filtration system so that the chlorine concentration within the control room would be kept below 1 ppm during an extended chlorine emergency in order that the operators could work without respiratory equipment during the emergency.

The Committee agreed with the Staff and indicated in its report that this manner should be resolved during construction in a manner satisfactory to the Staff.

j. Reactor Vessel Cavity - The Staff stated that they were satisfied with the design criteria established by the applicant regarding the reactor vessel cavity e.g., the cavity will be capable of withstanding a 600 psi pressure transient in the event of a vessel split.

The Committee noted in its report that the applicant stated that the cavity will be designed to withstand the mechanical forces and pressure transients comparable to those considered in the design of the Zion and Indian Point-3 plants.

k. High Containment Pressure Signal (Reactor Trip) - The Staff was satisfied with the applicant's proposal to provide low reactor pressure signal instrumentation which meets IEEE-279 criteria for use in tripping the reactor (and was not requiring a high containment pressure signal to initiate a reactor trip).

The Committee noted in its report that provision should be made to trip the reactor by the high containment pressure signal as well as the low reactor pressure signal.

l. General Items - The Committee commented on the following items in its report:

(1) Appropriate studies should be made to show that fuel melting will not lead to unacceptable conditions.

(2) Consideration should be given to the utilization of instrumentation for prompt detection of gross failure of a fuel element.

(3) Utilization should be made of a hydrogen control method by means other than purging.