

CT-1450

Richard F. Foster, Ph.D.

CONSULTANT . . . . Environmental Effects of Energy Systems

April 29, 1982

Dr. Dade Moeller (c/o D. C. Fischer)  
Advisory Committee on Reactor Safeguards  
U S Nuclear Regulatory Commission  
Washington, D. C. 20555



SUBJECT: Comments on Midland DES and Emergency Plans.

Dear Dade:

In response to a telephone request from David Fischer, I have reviewed the recently issued Draft Environmental Statement related to the operation on Midland Plant, Unit 1 and 2 (NUREG - 0537). I gave particular attention to liquid environmental pathways.

Since the subject DES is for the operational stage, it does not contain a lot of information that was probably in the FES for the construction permit. Unfortunately, I do not have a copy of the CP statement at hand, so do not know whether or not the earlier statement answers some of my concerns. As a matter of good practice, it would be better if the operating stage ES focused more on the relevant site specific issues and less on generic and "boiler-plate" tutorial material. In my view, NUREG-0537 does not adequately describe or discuss 1) potential radioactive contamination of the cooling pond under either normal or unplanned conditions, nor 2) potential ground water contamination and its consequences as a result of seepage from the cooling pond or from a core-melt accident.

Strangely, the DES does not say whether or not any radioactive liquid waste is intentionally routed to the cooling pond or could enter the pond as a result of equipment failure. It does state, in relation to non-radioactive waste that --"(the) cooling pond will be the intermediate sink for many plant chemical wastes prior to their discharge to the Tittabawassee River". This suggests that there may well be routes that could result in wayward radioactive material entering the pond.

Close reading of Appendix B ( proposed discharge authorization from the State of Michigan) indicates that the rad waste will not enter the pond, but will be directed into the pond blow-down drain(?) and to Outfall 001 (Pg. B-23). Note that the pond blowdown will not be released to the Tittabawassee River all of the time because of State restrictions on heat and chemicals. When there is no, or little, blowdown, the rad waste can still be discharged provided that river water is pumped into the outfall system.

DESIGNATED ORIGINAL

8205280 222

Certified By

BFR

There are obviously pros and cons about routing the liquid rad waste to, or around, the cooling pond. e.g. radioactive materials in the pond would result in contamination of the condensor cooling system and other parts of the plant, in higher occupational exposures, and in additional exposure pathways for the public (waterfowl and ground water). On the other hand, the cooling pond could serve as a valuable receiving basin for accidental spills. These features ought to be discussed, the present design should be described, and the rationale for selecting the chosen system should be explained.

The concept of pumping large amounts of water into the outfall system in order to pre-dilute the rad waste is, in my opinion, a needless waste of energy and money and is without technical justification. Such concepts should be made subject to ALARA guide lines of spending no more than \$ 1 000 per man rem saved. Unless there is a direct external exposure pathway of significance for humans in the very near vicinity of the outfall (Table C-6 suggests that this might be 0.003 mrem/yr. to the maximally exposed individual) the predilution will not result in a lower annual dose commitment.

The DES does not mention wells as a source of drinking (or other use) water in the vicinity of the plant. This feature is crucial to the potential significance of any contamination of the ground water and should be described. Some discussion of potential ground water contamination is provided in Section 5.9.4.5 Accident Risk and Impact Assessment on Pages 5-58 and 5-59 under (5) Releases to Ground Water. The first paragraph of this section states that, "(s)oluble radionuclides in this (core-melt) debris can be leached and transported with ground water to downgradient domestic wells used for drinking ---". However, it is not clear whether this is a generic statement or is specific to Midland.

On the basis of statements and assumptions made on Pgs. 5-58 and 5-59, the staff concludes -- "(w)ithout further analysis --that the liquid pathway consequences of an assumed core-melt accident at Midland would be less than that calculated in the (Liquid Pathway Generic Study)." In my view, this conclusion could be challenged for the following reasons:

- 1.) Although the reactors are located on a flood plane only a few hundred yards from the river, the staff estimates that the travel time to the river will be about 59 years (pg. 5-59). This is incredibly long, especially in view of the disruption of the soils during excavation for construction and the hydraulic head of the cooling pond.

- 2.) Interdiction of core-melt debris before it seeped into the river would be most difficult because of the close proximity to the river and the existence of the cooling pond and its associated perched water table.

3.) Because of the ground water mound beneath the cooling pond, the ground water flow will likely spread in all directions, not just towards the river. Thus, water from the pond could contaminate wells in a direction away from the river.

4.) The applicant now plans to pump water from wells in order to lower the level of the perched water table, and return it to the cooling pond. This will further complicate the ground water direction and rate of travel. Should the ground water become contaminated, a completely different pumping strategy may be necessary.

The bottom-line conclusion (pg. 5-67) is "--that there are no special or unique circumstances about the Midland Site and environs that would warrant special mitigation features--". This conclusion should be supported by a more convincing discussion of why the cooling pond seepage, perched water table, proximity of the Tittabawassee River, and potential contamination of the ground water does not warrant any special consideration.

In addition to the above comments, I have a few other questions about the DES:

The reason for having to pump the ground water to lower the perched water table should be explained.

Table C.6 (Pg. C-10) shows "liver" as the critical organ from fish consumption. What nuclide is involved in this unusual situation?

Waterfowl are expected to be a nuisance on the cooling pond, but they are not included as an exposure pathway. They should at least be included in the radiological sampling program.

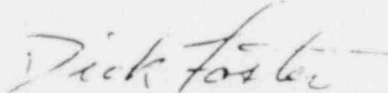
Table 5.4 (Pg. 5-35) "Activity of Radionuclides in a Midland Reactor Core--" does not include  $^3\text{H}$ . Why?

The Section on Releases to Ground Water (Pg. 5-58) states that the ground water pathway associated with severe reactor accidents was identified in Section 5.9.3 "Exposure Pathways". This pathway is not identified in Section 5.9.3. It is mentioned in Section 5.9.4.2 (2), but only in a generic sense.

In addition to review of NUREG 0537, I selectively read portions of the Applicant's Site Emergency Plan for Midland 1 & 2, with particular attention to protection of the public. I have no specific comments on this Emergency Plan. I was, however, pleased to note that dose projections can be made promptly by a pre-programed local computer that receives part of its input on a real time basis from monitoring instruments. Terminals for this computer are to be located in both the Technical Support Center and the Emergency Operations Facility. Quite properly, the computer system is backed up by manual procedures which use assumed source terms, scenarios, meteorology, and overlays for maps.

If I can be of further assistance, please let me know.

Yours very truly,

A handwritten signature in cursive script that reads "Dick Foster".

Richard. F. Foster