

ated will have to be extended even if the Consumers Power project is completed on schedule.

Dow has agreed to buy at least 2 million pounds of process steam per hour as well as nearly a fourth of the 1300 megawatts which the facility's two reactors will generate. This is absolutely critical to the Midland project's economic justification. Project costs are now at stratospheric levels; once put at less than \$500 million, they are now estimated at \$1.6 billion and they may actually hit \$2 billion. The dual-purpose design, besides adding to construction costs, reduces the potential for power generation by about 300 megawatts.

The project's history is one of almost constant trouble and frustration. Site preparations began in 1969, but the construction permit was not issued by the Atomic Energy Commission until mid-1973. Nuclear power projects all around the country were encountering opposition from environmental intervenors in licensing proceedings. The Midland project could hardly have failed to arouse strong opposition. The reactors were to be built less than a half-mile from the Dow complex and only about a mile from Midland's Main Street. To serve a dual purpose, the facility *had* to be immediately adjacent to Dow because steam travels poorly.

The new impact review procedures imposed by the National Environmental Policy Act (NEPA) contributed to the construction permit delays, as did a general tightening of AEC reactor safety requirements. Even after construction began in 1973, the work went slowly. The AEC was mandating numerous generic design changes which affected this project as well as others. In one instance, the agency's Atomic Safety and Appeals Board sharply criticized Consumers Power for negligence in quality control, and, as a result, some work was ordered suspended briefly.

In late 1974, Consumers Power, in a financial pinch, began a drastic, albeit temporary, cut in the project work force. Consumers has ascribed its financial problems chiefly to the high cost of capital and the state utility commission's refusal to grant sufficient and timely rate increases. But these problems also were due in part to the company's troubles with its Palisades nuclear plant on Lake Michigan. This plant has had one of the worst reliability records in the nuclear industry.

Then, last July, the U.S. Circuit Court of Appeals for the District of Columbia, ruling in a suit brought by the environmental intervenors under NEPA, ordered the Nuclear Regulatory Commis-

sion (the AEC's successor in regulatory matters) to reconsider several issues, including those related to reactor safety, disposal of nuclear wastes, energy conservation (as an alternative to the generation of nuclear power), and the project's benefit-cost ratio as affected by Dow's present needs for electricity and process steam. On 30 November, NRC's Atomic Safety and Licensing Board (ASLB) began several days of hearings on whether work on the project should be suspended pending a resolution of the issues on the merits.

At these hearings it has come to light that in September the general manager of Dow's Michigan Division, Joseph G. Temple, Jr., sent the company's top corporate officials an urgent memorandum. "In our judgment, the July decision by the Court of Appeals has dramatically and adversely affected the odds that Consumers will complete the plant by their new, target completion-operation date," he wrote.

Lawsuit Threatened

Temple said there were now more "unknowns" about the project than ever before and that "the project will most likely be disadvantageous to Dow and to the Midland plant and to our employees in this community." He recommended that a top-level review of the contract with Consumers Power be undertaken, with an eye both to Dow's contractual rights and obligations and to other possibilities for meeting the company's future needs for power and process steam. Subsequently, A. H. Aymond, Consumers' board chairman, is reported to have warned Dow officials that, if the construction permit were revoked because of a failure on Dow's part to abide by the contract, the utility would sue for damages that could run as much as \$600 million. A Consumers Power memorandum went so far as to suggest that it would be "inconsistent with Dow's contract obligations" for the company to tell the ASLB that it is standing by the contract reluctantly or that it believes its interests could be better served by an alternative source of steam and electricity.

In his prepared testimony, Temple reaffirmed Dow's commitment to the Midland project and said that, in the company's latest economic analysis, the project still offered at least a narrow advantage over a coal-fired facility for production of power and steam. But, as the ASLB soon learned, this testimony was partly prepared by attorneys for Dow and Consumers and did not fully reflect Temple's views. Responding to questions by Myron Cherry, the Chicago

attorney representing the intervenors, Temple said that he still felt the project to be disadvantageous to Dow. If there were no threat of a lawsuit, he indicated, Dow would "go its own way."

Whatever the contradictions in Dow testimony, it is clear that the company does not like its present contract with Consumers and that it is pressing for revisions. In particular, Dow wants it stipulated that unless Consumers can meet a "firm deadline" for commencement of service, the steam contract will be terminated.

The long-troubled Midland project will be in grave difficulty if construction work is suspended even briefly. But a suspension would entail such high costs that the ASLB is perhaps unlikely to order one. Moreover, the project is now so far along that not even the environmental intervenors think there is much chance of its ultimately being abandoned.

Although a collapse of project financing remains a possibility, there are now moves afoot which suggest that this, too, will be averted. Some financially sound electric cooperatives and municipally owned utilities in Michigan apparently retain sufficient faith in nuclear power to want to buy into the project.

What the story of the Midlands project seems best to illustrate is that in all its aspects—technological, economic, and regulatory—the nuclear enterprise is one of agonizing uncertainty. Any electric utility or large industrial consumer of power or process steam that commits itself deeply to this enterprise surely needs, besides strong faith and good luck, clever lawyers to write the contracts so as to make the uncertainty bearable.—LUTHER J. CARTER

APPOINTMENTS

William H. Muller, Jr., chairman, surgery department, University of Virginia School of Medicine, to vice president for health science of the university. . . . **M. Alton Hodges**, acting dean, School of Allied Health Sciences, University of Texas, Houston, to dean of the school. . . . **Mary Duren**, dean, School of Humanities and Social Sciences, University of Zambia, to dean, School of Health and Human Services, California State University, Chico. . . . **George F. Reed**, chairman of otolaryngology and communication sciences, Upstate Medical Center, State University of New York, to dean, College of Medicine at the center.