UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

ATOMIC SAFETY AND LICENSING APPEAL BOARD:

Sidney G. Kingsley, Chairman
Dr. John H. Buck
Dr. Lawrence R. Quarles

In the Matter of		
CONSUMERS POWER COMPANY	Docket Nos.	50-329 50-330
(Midland Plant, Units 1 and 2)		

MEMORANDUM AND ORDER

This is a proceeding on an application for construction permits for two pressurized water nuclear power reactors, each with an initial power rating of 2452 thermal megawatts, to be located on the shore of the Tittabawassee River adjacent to the city limits of Midland, Michigan. An atomic safety and licensing board presiding over the hearing has referred to us, pursuant to 10 CFR 2.730(f), its order of March 10, 1972 concerning the extent to which all aspects of the fuel cycle "from the mining of uranium to the ultimate storage of high level wastes" are to be considered in this proceeding. The referral raises the question of the scope of the Commission's duties in conducting the environmental study required by Section 102(2)(C)

of the National Environmental Policy Act, 42 U.S.C. 4332(2)(C).

The order of the Atomic Safety and Licensing Board is that the environmental effects of the mining, production and fabrication of nuclear fuel and the handling of spent fuel, including its chemical reprocessing and waste storage, are at issue in this proceeding only with respect to:

(1) transportation of fuel elements from a fuel fabrication plant to the reactor site;

(2) transportation of spent fuel elements from the reactor site to a fuel reprocessing plant;

(3) transportation of packaged radioactive material from the site to low level waste burial grounds; and

(4) radioactive discharges at the site and any other environmental effects directly associated with the handling and use of fuel at the site.

The Board's referral arises primarily from the contentions of several groups of intervenors. The State of Kansas is particularly concerned with the possibility that certain wastes from nuclear power reactors in general might be stored in the State of Kansas, but it has associated itself generally with the objections of the intervenors.[1/]

1/ The possibility of underground storage of nuclear wastes in abandoned salt mines in Kansas has been considered by the Commission, but other alternatives are now being explored. See H. Rept. No. 92-1066, 92d Cong. 2d. Sess. 11-12.

The Board's referral is phrased in terms of the entire fuel cycle, as are the intervenors' contentions. The basic position of the intervenors is substantially similar to that of the intervenors in Matter of Vermont Yankee Nuclear Power Corporation (Docket No. 50-271), which was the subject of our memorandum and order of June 6, 1972, --AEC--.

The Commission's regulatory staff has filed a voluminous final detailed statement on environmental considerations after receipt of comments from the public, the Council on Environmental Quality, and other Government agencies as required by the Commission's regulations, 10 CFR Part 50, Appendix D.[2/]

The Licensing Board has recommended that, under the authority of 10 CFR 2.785(d), we refer its rulings to the Commission as raising novel questions of law and policy. We decline to do so on the grounds on which we rested such a decision in Matter of Vermont Yankee Nuclear Power Corporation, --AEC--(June 6, 1972), and on the additional ground that, as to portions of the fuel cycle concerned with the reprocessing of irradiated nuclear fuel and the disposal of wastes after irradiation of fuel in a reactor, the Commission has permitted that decision to stand. See 10 CFR 2.786.

2/ 36 F.R. 18071, September 9, 1971. See also 36 F.R. 18716, September 21, 1971; 36 F.R. 19153, September 30, 1971; 36 F.R. 21579, November 11, 1971; 36 F.R. 23900, December 16, 1971; 37 F.R. 864, January 20, 1972; 37 F.R. 9619, May 13, 1972; 37 F.R. 9779, May 17, 1972.

On the basis of our decision in Vermont Yankee and for the reasons expressed there, we hold that the order of the Licensing Board is affirmed as to the environmental effects of the handling of spent fuel, including chemical reprocessing and waste storage. And we now extend that interpretation of the National Environmental Policy Act to earlier stages of the fuel cycle.

The issue as to the part of the fuel cycle before the irradiation of fuel in a reactor raises the question which we considered in Vermont Yankee: the definition, for the purposes of the Environmental Policy Act, of the "project" or "action" of the agency under Section 102 of the Act, 42 U.S.C. 4332, and the Commission's regulations, 10 CFR 50, Appendix D. Again the question is identification of the "major Federal action significantly affecting the quality of the human environment" (National Environmental Policy Act, Section 102(2)(C), 42 U.S.C. 4332(2)(C)) which this agency is now undertaking. What this agency is undertaking is consideration of the issuance of permits to construct two individual power reactors.

The fuel to be used in these reactors will be of a common type: an array of fuel rods each of which consists of uranium dioxide sealed in cylindrical zirconium alloy containers. The uranium is mined as ore which is later

pulverized at uranium mills. It is then dissolved by chemical means at processing plants, and the dissolved uranium is recovered and calcined to yield uranium oxide powder. This powder is refined at various plants to yield essentially pure uranium oxide. By successive chemical processes, the oxide is converted to crystalline uranium fluoride. The fluoride is converted to a gas, uranium hexafluoride. The gas is enriched at gaseous diffusion plants; the diffusion process separates it into a product having a concentration of the isotope uranium-235 higher than in normal uranium, and a depleted fraction having a uranium concentration lower than normal.

The enriched uranium is converted by chemical processes to uranium dioxide (or some other solid compound), is prepared in an appropriate physical form, and is then clad in zirconium alloy (or stainless steel) to produce fuel elements. After irradiation in a reactor, the fuel is reprocessed in a reprocessing plant by chemical solution of the fuel elements and the separation of useful uranium and plutonium for recycling for future use. Under current practice these successive processes of mining, milling, refining, enrichment, conversion, fabrication, irradiation, and reprocessing constitute the fuel cycle.[3/]

3/ See Hogerton, Atomic Fuel (U.S. Atomic Energy Commission 1967); Singleton, Sources of Nuclear Fuel (U.S. Atomic Energy Commission 1968).

There are over 200 uranium mines in this country alone, some underground and some of the open pit type, as well as other sources of uranium.[4/] Twenty mills are in operation or scheduled to go into operation during the current calendar year; four plants are engaged in the conversion of feed materials to uranium hexafluoride, and there are competing foreign plants; there are three gaseous diffusion plants operated for the Commission; nine plants are engaged in later stages of processing, and fourteen plants are engaged in fabricating nuclear fuel.[5/]

The facilities engaged in preparing fuel for use in power reactors are either operated or licensed by the Commission. From the time when the raw uranium ore is pulverized at the mill, uranium is source material as defined by the Atomic Energy Act, and its possession or other dealing with it is required to be licensed under the Act.[6/] Enrichment in the gaseous diffusion plants[7/]

4/ Statistical Data of the Uranium Industry, January 1, 1972 (USAEC 1972, Report No. GJO-100).

5/ The Nuclear Industry 1971 (USAEC Report No. WASH-1174-71, p.p. 5, 18, 20, 23, 26-7, 39).

6/ Atomic Energy Act of 1954, Secs. 11(z),(62), 42 USC 2014(z); 2092; 10 CFR 40. An exemption for unrefined and unprocessed ore is based on the Commission's finding that there is no need to license it from the standpoint of either public health and safety or the national security. See 10 CFR 40.4(h), 40.13(a)(b).

7/ The gaseous diffusion plants are owned by the Commission and operated for it by operating contractors. See Hiestand and Florsheim, The Atomic Energy Commission Management Contract Concept, 29 Fed. B.J. 67(1969).

creates special nuclear material as defined by the Act, as to which such activities are also required to be licensed.[8/] Facilities dealing with source material are thus operated under license,[9/] and those involved with special nuclear material are licensed as either production facilities or as utilization facilities.[10/]

When in December of 1970 the Commission published amendments of Appendix D of Part 50 of its regulations, implementing the Environmental Policy Act (35 F.R. 18469, December 4, 1970; see also 35 F.R. 5463, April 2, 1970), it defined the scope of the procedures thus prescribed as extending to power reactors and fuel reprocessing plants (Appendix D, par. 1, 35 F.R. 18473). It also directed that compliance with the Environmental Policy Act be extended to other facilities handling source material and special nuclear material in the various stages of the fuel cycle:

> "Procedures and measures similar to those described in the preceding paragraphs of this appendix will be followed in proceedings other than those involving nuclear power reactors and fuel reprocessing plants when the Commission determines that the proposed action is one significantly affecting the quality of the human environment. The Commission has determined that such proceedings will ordinarily include proceedings for the issuance of the following

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8/ Atomic Energy Act of 1954, Secs. 11 aa., 53, 42 USC 2014 (aa), 2073, 10 CFR 70.

9/ 10 CFR 40.

10/ Atomic Energy Act of 1954, Secs. 11 v., 11 cc., 42 U.S.C. 2014(v), 2014(cc); 10 CFR 50.2(a), 50.2(m), 50.2(b).

> types of materials licenses: (a) Licenses for possession and use of special nuclear material for fuel element fabrication, scrap recovery and conversion of uranium hexafluoride; (b) licenses for possession and use of source material for uranium milling and production of uranium hexafluoride; and (c) licenses authorizing commercial radioactive waste disposal by land burial." (Appendix D, 35 F.R. 18474, now par. A. 14.)

The Commission soon adopted regulations explicitly requiring that an application for a license to process and use source material which will significantly affect the quality of the human environment be accompanied by an environmental report under Appendix D, imposing compliance with Appendix D as a prerequisite for a license, and imposing similar requirements for special nuclear material licenses.[11/] The consequence is that each significant licensed activity at each successive stage of the fuel cycle requires a separate environmental statement complying with the Environmental Policy Act and with Appendix D.[12/]

There is no material difference between this reactor licensing proceeding and any other, and the intervenors do not appear to claim that there is. What they assert is that, notwithstanding the existing elaborate pattern of compliance with the mandate of the Environmental Policy Act at the various stages of the fuel cycle, it is the

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11/ 10 CFR 40.31(f), 40.32(e), 10 CFR 7.21(f), 70.23(a), 36 F.R. 12731, July 7, 1971.

12/ An exemption for unrefined and unprocessed ore is based on the Commission's findings that there is no need to license it from the standpoint of either public health and safety or the national security. See 10 CFR 40.4(h), 40.13(a)(b).

Commission's duty in this (and in every other) individual reactor licensing proceeding to take evidence upon and to consider the environmental consequences of every aspect of the whole fuel cycle.[13/]

The intervenors' suggested extension of the environmental study to uranium mining and tailings illustrates the extent of the remoteness and generality of what they contend must be analyzed in this proceeding, its lack of any specific relation to the project before us, and its departure from what we believe to be required by the Environmental Policy Act. The health aspects of uranium mining and the problem of tailings have been the subject of extensive consideration by Congress and by other public authorities.[14/] We recognize of course that an agency's

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13/ As the so-called Mapleton intervenors put it:

> "In general, Mapleton believes that all adverse environmental effects and social and economic costs associated with the nuclear fuel cycle, to wit, mining, milling, feed material preparation, fuel enrichment, fuel fabrication, reactor operation, transportation, fuel reprocessing, and ultimate high-level radioactive waste storage and disposal should be considered in this proceeding."

Counsel for the intervenor Environmental Defense Fund and for the intervenors Saginaw Valley Nuclear Study Group and others explicitly concur in such an all-embracing view of the study to be undertaken.

14/ See Hearings, Use of Uranium Materials for Construction Purposes, October 28-29, 1971, and Summary Analysis of Hearings, 39-44, 12-13; see also P.L. 92-314, Title II, approved June 16, 1972; H. Rept. No. 92-1066, 92d Cong., 2d Sess.) 7-8, 47-49.

duty to conduct an environmental study is not limited by its statutory authority,[15] but the universality of what the intervenors claim and its remoteness from an environmental study of the specific project before us -- the licensing of these two reactors -- is perfectly plain.

The intervenors even seek to extend the environmental study in this proceeding to such subjects as the production of uranium by means not presently developed, such as the liquid metal fast breeder reactor.[16] The development of this type of reactor is in its early stages, and is a matter of national policy[17] which has no specific relationship to the subject matter of this proceeding. The Commission has already published an environmental study of a demonstration fast breeder project.[18] Undertaking to weigh here its probable environmental consequences by the standards of the Environmental Policy Act and under

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15/ See Natural Resources Defense Council v. Morton, 458 F. 2d 827, 834-5 (D.C. Cir. 1972).

16/ The Saginaw Valley intervenors argue: "Since the proposed plant may rely upon nuclear fuel created by a Breeder, the risks and costs of the development and operation of Breeders must be analyzed against any alleged or asserted benefits, if any, that may be gained by construction and operation of the proposed Plant."

17/ See Message from the President of the United States Transmitting a Program to Insure an Adequate Supply of Clean Energy in the Future, June 4, 1971, 92d Cong., 1st Sess., H. Doc. No. 92-118.

18/ Environmental Statement, Liquid Metal Fast Breeder Reactor Demonstration Plant (April 1972, Report No. WASH-1509).

the procedures of Appendix D would be an exercise in futility which would be duplicitous, premature and far beyond the reasonable scope of the present case. That would be even more true of such a study of other means under development.

We are deeply conscious that, in enacting the Environmental Policy Act, Congress intended that the phrase "to the fullest extent possible" in Section 102 should not be understood as authorizing the avoidance of the duties imposed by that Section, and that Congress intended that an agency comply with the directives in Section 102 unless existing law makes full compliance impossible. (See Conference Report, H. Rept. 91-765, 9-10). But, as we pointed out in the Vermont Yankee case, our duties under the Environmental Policy Act are defined by the proposed "project" or "action" before the agency. We cannot accept that it was the purpose of Congress, in adopting the Environmental Policy Act, to impose such a remote, conjectural and multiplicitous requirement on this proceeding as the intervenors assert, and as an inference to do so in every reactor licensing proceeding.

There is no way of ascertaining in the present proceeding what plants in the various earlier stages of the fuel cycle will be engaged in one stage or another of the

production of fuel for this plant among others. There is no way in which one can now even tentatively identify, over the prospective life of the proposed installation spanning perhaps four decades, the specific mines, mills, refining and conversion plants, and fabrication facilities which will from time to time be involved in furnishing the fuel for these reactors.

In any case, we cannot believe that Congress intended that in the proceedings for the licensing of each individual power reactor there be conducted an environmental study of the present and future operations of an entire industry, including complex and perhaps unidentifiable operations performed by unidentifiable persons at unidentifiable locations under unidentifiable conditions. To embark on such a venture would plunge us into a labyrinth of indeterminacy. What we regarded in Vermont Yankee as impossible would here be enormously compounded.

We held in the Vermont Yankee case that, under the principles enunciated by the Court of Appeals for the District of Columbia in Natural Resources Defense Council v. Morton, 458 F. 2d 827 (1972), the Environmental Policy Act is to be construed in the light of reason, and that the environmental study required by that Act for an individual power reactor does not extend to reprocessing

and the ultimate disposal of wastes. We now conclude that, for the reasons expressed in the Vermont Yankee case and in this memorandum, the order of the Licensing Board dated March 10, 1972 should be affirmed.

It is therefore ORDERED:

(1) Certification to the Commission of the order of the Atomic Safety and Licensing Board dated March 10, 1972 is denied;

(2) The order of the Atomic Safety and Licensing Board dated March 10, 1972 is affirmed.

ATOMIC SAFETY AND LICENSING
APPEAL BOARD

By William Woodard
William Woodard

Dated: July 19, 1972

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UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

In the Matter of)
)
CONSUMERS POWER COMPANY) Docket No. 329,330
(Midland Plant, Units 1 and 2))

CERTIFICATE OF SERVICE

I hereby certify that copies of MEMORANDUM AND ORDER dated July 19, 1972 in the captioned matter have been served on the following by deposit in the United States mail, first class or air mail, this 20th day of July 1972:

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