ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

UNITED STATES ATOMIC ENERGY COMMISSION

WASHINGTON, D.C. 20545

July 21, 1972

Honorable James R. Schlesinger
Chairman
U. S. Atomic Energy Commission
Washington, D. C. 20545

Subject: REPORT ON GENERAL ELECTRIC COMPANY - MIDWEST FUEL RECOVERY PLANT

Dear Dr. Schlesinger:

During its 147th meeting, on July 13-15, 1972, the Advisory Committee on Reactor Safeguards completed its review of the application by the General Electric Company for authorization to operate the Midwest Fuel Recovery Plant. The project was considered previously during Subcommittee meetings on March 22, 1972, at the site and on June 30, 1972, in Washington, D. C. During its review, the Committee had the benefit of discussions with representatives of the General Electric Company and of the AEC Regulatory Staff and its consultants, and of the documents listed below. The Committee previously discussed this project in a construction permit report dated September 9, 1967.

The Midwest Fuel Recovery Plant is located in a rural area of Grundy County, Illinois, about eight miles east of Morris, Illinois. The site is south of the Illinois River and adjacent to the Dresden Nuclear Power Station. The applicant has designed and constructed the plant to seismic and tornado criteria which are consistent with those for the Dresden site and which the Committee finds acceptable.

The plant has been designed and constructed to be able to process 300 metric tons per year of irradiated uranium in the form of UO_2, clad in stainless steel or zirconium alloy. The original U-235 enrichment of the fuel to be processed will not exceed five percent and the average burnup will not exceed 44,000 megawatt days per metric ton. The fuel will be stored for a period of time sufficiently long to ensure that the I^{131} content will be less than one curie per metric ton. For fuels of maximum burnup this period will be at least 160 days, implying a reduction of the I^{131} content by a factor of about one million.

In the recovery process, the fuel pins are sheared into short lengths and fed to a leacher tank in which the fuel is dissolved by a nitric acid solution. The cladding hulls are moved to a storage vault and the acid solution is further processed. Plutonium and neptunium are recovered in the form of nitrate by solvent extraction and ion exchange. The uranium process stream is calcined to UO_3, which is then fluorinated to UF_6 followed by purification by distillation.

High activity wastes will be concentrated, calcined and packaged in high integrity containers which will be stored in a water-filled basin. Low activity wastes will be stored in solid form in a monitored, underground vault. Gaseous wastes will be treated by passing through a scrubber, silver zeolite and glass fiber filters and finally a sand filter prior to release. Concentrations of fission products offsite will be substantially below those specified by 10 CFR Part 20. The applicant has stated that no liquid wastes will be released from the plant.

The Technical Specifications for the plant have not been completed and will continue to evolve during startup testing and early operation. Additionally, the Regulatory review of plant physical security measures has not been completed. The Committee recommends that these specifications and this review be completed as appropriate and to the satisfaction of the Regulatory Staff.

The Advisory Committee on Reactor Safeguards believes that, if due regard is given to the items mentioned above, and subject to satisfactory completion of construction and pre-operational testing, there is reasonable assurance that the Midwest Fuel Recovery Plant can be operated without undue risk to the health and safety of the public.

Sincerely yours,

C. P. Siess

C. P. Siess
Chairman

References:
1. General Electric Company letter dated December 31, 1970, forwarding the Final Safety Analysis Report (One Volume) for the Midwest Fuel Recovery Plant

2. Amendments 10 through 26 to the License Application