

July 16, 1990

Docket No. 50-289

Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT
RELATING TO EXTENSION OF THREE MILE ISLAND UNIT 1 OPERATING
LICENSE (TAC NO. 76822)

Enclosed is a copy of an "Environmental Assessment and Finding of No
Significant Impact" for your information. This environmental assessment
relates to your letter dated March 23, 1990, regarding your application for a
license amendment to extend the expiration date of the Three Mile Island Unit 1
operating license from May 18, 2008 to April 19, 2014.

The environmental assessment has been forwarded to the Office of the Federal
Register for publication.

Sincerely,

/s/

Ronald W. Hernan, Senior Project Manager
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc w/enclosure:
See next page

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Mr. Henry D. Hukill
GPU Nuclear Corporation

Three Mile Island Nuclear Station,
Unit No. 1

cc:

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UNITED STATES NUCLEAR REGULATORY COMMISSIONGPU NUCLEAR CORPORATIONMETROPOLITAN EDISON COMPANYJERSEY CENTRAL POWER & LIGHT COMPANYPENNSYLVANIA ELECTRIC COMPANYDOCKET NO. 50-289ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT

The U. S. Nuclear Regulatory Commission (the Commission) is considering issuance of an amendment to Facility Operating License No. DPR-50 issued to GPU Nuclear Corporation (the licensee), for operation of the Three Mile Island Nuclear Station, Unit 1 (TMI-1), located in Dauphin County, Pennsylvania.

ENVIRONMENT ASSESSMENTIdentification of Proposed Action:

The licensee submitted a license amendment request by letter dated March 23, 1990. The purpose of this license amendment would be to extend the duration of the operating license to forty (40) years from the date of issuance of the full-power license. This represents a license extension of 5 years and 11 months to allow operation for the full design life. The current license expiration date of May 18, 2008 is based upon 40 years from issuance of the construction permit. A license term of 40 years from the date of issuance of the full-power license is permitted by NRC regulations, specifically 10 CFR 50.51, and the basis for granting this request has been established by the Commission's current policy in granting operating licenses to new plants. Commission approval of the proposed amendment would be consistent with recent NRC actions.

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The Need for the Proposed Action:

The granting of the proposed license amendment would allow the licensee to operate Three Mile Island Unit 1 for approximately 6 additional years beyond the currently approved expiration date. Without issuance of the proposed license amendment, Three Mile Island Unit 1 would be shut down at the conclusion of the currently approved license duration.

Environmental Impacts of the Proposed Action:

In December 1972 the U. S. Atomic Energy Commission issued the "Final Environmental Statement Related to Operation of Three Mile Island Nuclear Station, Units 1 and 2" (NUREG-0552). This document evaluates the environmental impact associated with the operation of Three Mile Island Units 1 and 2. The Final Environmental Statement (FES) assumed a 40-year operating lifetime for each unit and was based upon a design thermal rating of 2535 MWt for Unit 1 and 2772 MWt for Unit 2. Subsequently, the staff issued a Programmatic Environmental Impact Statement (NUREG-0683) in 1981 and three supplements thereto concerning cleanup of TMI-2. In addition, in July 1988, the staff reviewed the FES to determine if any significant environmental impacts, other than those previously considered, would result from raising the licensed thermal power level for TMI-1 from 2535 MWt to 2568 MWt in response to a licensee request to uprate the power level. Following this review, the staff published an environmental assessment (53 FR 27093, July 18, 1988) and issued License Amendment No. 143 on July 26, 1988, to raise the authorized power level to 2568 MWt.

The staff has reviewed the above assessments, information provided in the licensee's March 23, 1990, request, and other sources of information to determine the environmental impact of operation of TMI-1 for an additional 6 years.

Radiological Impacts

The staff has considered potential radiological impacts for the general public in residence in the vicinity of TMI-1. These impacts include potential accidents, routine radiological exposure to workers, and the impact on the uranium fuel cycle and the transportation of fuel and waste. These impacts are summarized in the following sections.

General Public

The FES discussed population growth or decline by municipality between 1960 and 1970 but did not project population growth for the operating lifetime of TMI-1. However, the FES implied an overall population growth in the area primarily related to growth of Harrisburg International Airport. The trend of population in this area has generally increased very little between 1970 and 1980. In fact, the population of Harrisburg (nine miles northwest of TMI-1) has declined over the past two decades. The population within a 10-mile radius of TMI-1 is predicted to decline from about 167,000 in 1990 to about 157,000 in 2010. The existing Environmental Report estimates 281,446 by the year 2011. Therefore, the existing Environmental Report bounds the anticipated population growth in the immediate vicinity of the plant and would be expected to remain bounding to the year 2014 based on the 1980 population projection trend. The region in the immediate vicinity of the plant site is primarily rural with a number of small communities located within the 10-mile radius.

The 1989 Radiological Environmental Monitoring Report for the Three Mile Island Nuclear Station, submitted to the staff on April 30, 1990, indicates that radiation doses to the public from TMI-1 operation continue to be well below all regulatory limits and well within the assumptions used in the staff's

FES. For example, the FES calculated the maximum exposure to an individual due to liquid and airborne effluents would be 0.72 mrem per year. The environmental monitoring report conservatively estimated this dose to be 0.073 mrem for the year 1989, or about 10% of the FES assumption. By comparison, a typical individual living in the Harrisburg area in 1989 would be expected to receive an annual dose of approximately 288 mrem from natural causes, including radon. The lower observed levels in radioactive effluents from the plant results in a substantially lower radiological impact than assumed in the FES. Therefore, the staff concludes that the radiological impact due to liquid and airborne effluents from TMI-1 is insignificant and is bounded by the FES. A similar comparison can be shown for direct radiation exposure (i.e., irradiation directly from the reactor itself rather than from effluents released from the reactor systems) to members of the public at the site boundary and for potential exposure due to postulated reactor plant accidents. These exposures were conservatively calculated in the FES and were shown to be low.

The staff has assessed the public risks from reactor accidents per year of operation at other reactors of comparable design and power level. In all cases, the estimated risks of early fatalities and latent cancer fatalities per year of reactor operation have been small compared to the risks of many non-reactor type of accidents to which the public is typically exposed, and the natural incidence of fatal cancers. The annual risks associated with reactor accidents did not increase with longer periods of operation of the reactor. If similar risks were estimated for TMI-1, we could expect a similar conclusion. Further, as stated in FES, the integrated exposure to the population

within a 50-mile radius of TMI-1 from each postulated accident would be orders of magnitude smaller than that from naturally occurring background radiation, (i.e., about 0.1 Rem/year). When considered with the probability of occurrence, the annual potential radiation exposure from all the postulated accidents is a small fraction of exposure from natural background radiation.

The staff concludes that the proposed additional years of operation would not significantly increase the annual public risk from radiation exposure or from reactor accidents.

Uranium Fuel Cycle Transportation of Fuel and Waste

In addition to the impacts associated with the operation of the reactor, there are impacts associated with the uranium fuel cycle. The uranium fuel cycle consists of those facilities (e.g., uranium mines and mills, fuel fabrication plants, etc.) that are necessary to support the operation of the reactor. Various NRC reports describe the impacts associated with the uranium fuel cycle (e.g., NUREG-1064). These reports typically assume a 1000 MWe model plant with one initial core load and 29 annual refuelings (approximately one-third of the core is replaced during each refueling). Considering all environmental impacts associated with the uranium fuel cycle for such a plant, the staff has in the past concluded that both the dose commitments and health effects of these activities are very small when compared with the dose commitments and potential health effects to the U. S. population resulting from all natural background sources. These effects are summarized in 10 CFR 51.51. The incremental increase in fuel cycle impacts due to extending operation of TMI-1 by 6 years is, therefore, also very small.

The staff reviewed the environmental impacts attributable to the transportation of fuel and waste to and from the TMI-1 site. With respect to the normal conditions of transport and possible accidents in transport, the staff concludes that the environmental impacts are bounded by those identified in 10 CFR 51.52. The basis for this conclusion is that 10 CFR 51.52 data is based on an annual refueling and shipment of 60 spent-fuel assemblies per reactor year. Presently, TMI-1 is on an 18-month refueling cycle which would, by itself, require fewer spent fuel shipments per reactor year. Future fuel cycles are expected to be as long as 24 months. Reducing the number of fuel shipments reduces the overall impacts related to population exposure and accidents. However, GPU Nuclear has not shipped any TMI-1 irradiated fuel off-site to date and has no plans to do so in the near future. In terms of transportation of solid radioactive waste (other than fuel) from TMI-1, the number of shipments has been well within the assumptions of the FES. The FES stated that from 50 to 200 truckloads of solid radioactive waste would be shipped per year from the TMI site. In 1989, TMI-1 shipped only 24 truckloads of solid radioactive waste.

Occupational Exposures

TMI-1 maintains an aggressive commitment to as low as reasonably achievable (ALARA) exposures. Exposure goals are established for station man-rem to minimize collective doses. ALARA reviews and evaluations of workplans and plant modifications projected to exceed 5 man-rem are conducted. Additional work steps are built into the workplan, where appropriate, to reduce occupational exposure. Pre-job briefings and mockups are utilized, as well as post-job reviews. Robotics and closed circuit television are being used more extensively to perform and monitor tasks resulting in reduced exposures.

Occupational exposure since commercial operation began at TMI-1 is a total of 4,339 person-rem through September 1989. Annual exposure in recent years has been well below the industry average. For example, the annual TMI-1 exposures for 1987, 1988, and 1989 were 148, 210, and 54 person-rem, respectively, compared to an average of about 550 person-rem/year for PWRs. The projected dose for TMI-1 for the years 2008-2014 is also expected to be below the PWR continue to reflect ALARA commitments.

Non-Radiological Impact

Terrestrial

Specific areas of interest originally included the effects of cooling towers on vegetation due to salt stress, and bird impaction. Monitoring programs for both showed minimal impact and have been discontinued with NRC concurrence through License Amendment No. 51, dated January 28, 1980.

Aquatic

Specific areas of interest were impingement of fish into the river water systems. Based on approximately 9 years of aquatic monitoring, the NRC and the Pennsylvania Department of Environmental Resources concluded that there were no adverse environmental impacts resulting from the impingement of fish. Previous aquatic monitoring programs have been discontinued.

Chemical and Thermal Discharge Effect

Chemical and thermal discharges are now controlled by the effective National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act and Pennsylvania's Clean Streams Law. A review of the history of the Environmental Reports provided annually shows no adverse impact to the

environment from the site. Adequate controls are provided to ensure continued monitoring of the plant discharges to the environment throughout plant life. Extension of the operating license by 5 years and 11 months would not adversely affect the environment.

Economic Assessment

Operation of TMI-1 beyond its current operating license period will provide a financial benefit to the customers served by the plant. TMI-1 currently provides approximately 13% of the total electric power requirements of the GPU System. The operation of TMI-1 for an additional 5 years and 11 months would defer the need to design and construct an 800 MW coal-fired replacement facility, and the environmental impacts associated with such construction. The installed cost of this facility, which is assumed to utilize Fluidized-Bed Combustion (FBC) technology, is estimated to cost \$4 billion in 2009. Present value net benefits of operating TMI-1 during the 2009-2014 time period are estimated to be \$100-200 million. These estimated net savings would reduce consumer rates compared to the coal replacement option.

Plant Design Changes

Many modifications and design changes have taken place at TMI-1 since the FES was issued. Those that are safety related or important to safety or require a change to the Facility Operating License or Technical Specifications are submitted to the NRC for review and approval prior to implementation in accordance with 10 CFR Part 50. This review and approval process includes a determination of both radiological and non-radiological environmental effects of the proposed change. Changes that are determined to be outside the scope

of those listed above may be implemented by the licensee without prior NRC approval; however, the licensee must have first completed a safety analysis with respect to the proposed change and retain a copy of this analysis on site for NRC inspection and audit. A description of the changes including a summary of the associated safety analysis is then submitted to the NRC annually. A complete detailed description of the changes and their impact on plant operations and procedures is also included where applicable in required annual updates of the Final Safety Analysis Report (FSAR). These annual submittals are reviewed by the staff to verify that the licensee has correctly determined that these changes did not require prior NRC review and approval. In general, these changes improve plant reliability and do not adversely impact the environment. All changes are conducted in accordance with approved procedures, current license requirements and Technical Specifications and the current NPDES permit. While it is recognized that the requested license extension will require further routine design changes and modifications similar in nature to those already conducted, it is not anticipated that these would have any adverse affect on the environment.

Alternatives to the Proposed Action:

The principal alternative to issuance of the proposed extension would be to deny the application. In this case, TMI-1 would shut down upon expiration of the present operating license.

In Chapter XI of the December 1972 FES, a cost-benefit analysis is presented for operation of TMI-1. Included in the analysis is comparison among various options for producing an equivalent electrical power capacity. Even considering significant changes in the economics of the alternatives, operation of TMI-1 in its present plant configuration for an additional 5 years and 11 months would

only require incremental yearly costs. These costs would be substantially less than the purchase of replacement power or the installation of new electrical generating capacity. Moreover, the overall cost per year of the facility would decrease since the large initial capital outlay would be averaged over a greater number of years. In summary, the cost-benefit advantage of TMI-1 compared to alternative electrical power generating capacity improves with the extended plant lifetime.

Alternative Use of Resources:

This action does not involve the use of resources not previously considered in connection with December 1972 FES.

Agencies and Persons Consulted:

The Commission's staff reviewed the licensee's request and did not consult other agencies or persons.

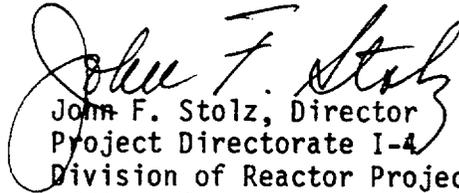
FINDING OF NO SIGNIFICANT IMPACT

The Commission has determined not to prepare an environmental impact statement for the proposed action. The staff has reviewed the proposed license amendment relative to the requirements set forth in 10 CFR Part 51. Based on this assessment, the staff concludes that there are no significant radiological or non-radiological impacts associated with the proposed action and will not change any conclusions reached by the Commission in the FES. Therefore, pursuant to 10 CFR 51.31, an environmental impact statement need not be prepared for this action. Based upon this environmental assessment, the Commission concludes that the proposed action will not have a significant effect on the quality of the human environment.

For further details with respect to this action, see the request for amendment dated March 23, 1990, which is available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, N.W., Washington, D. C., 20555, and at the Government Publications Section, State Library of Pennsylvania, Walnut Street and Commonwealth Avenue, Box 1601, Harrisburg, Pennsylvania 17105.

Dated at Rockville, Maryland this 16th day of July, 1990.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, reading "John F. Stolz". The signature is written in dark ink and is positioned above the typed name and title.

John F. Stolz, Director
Project Directorate I-4
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation