

ENVIRONMENTAL ASSESSMENT
BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO THE CHANGE IN THE EXPIRATION DATE OF
FACILITY OPERATING LICENSE NO. DPR-63
NIAGARA MOHAWK POWER CORPORATION
OSWEGO COUNTY, NEW YORK
NINE MILE POINT NUCLEAR STATION UNIT NO. 1
DOCKET NUMBER 50-220

DATED: AUGUST 7, 1991

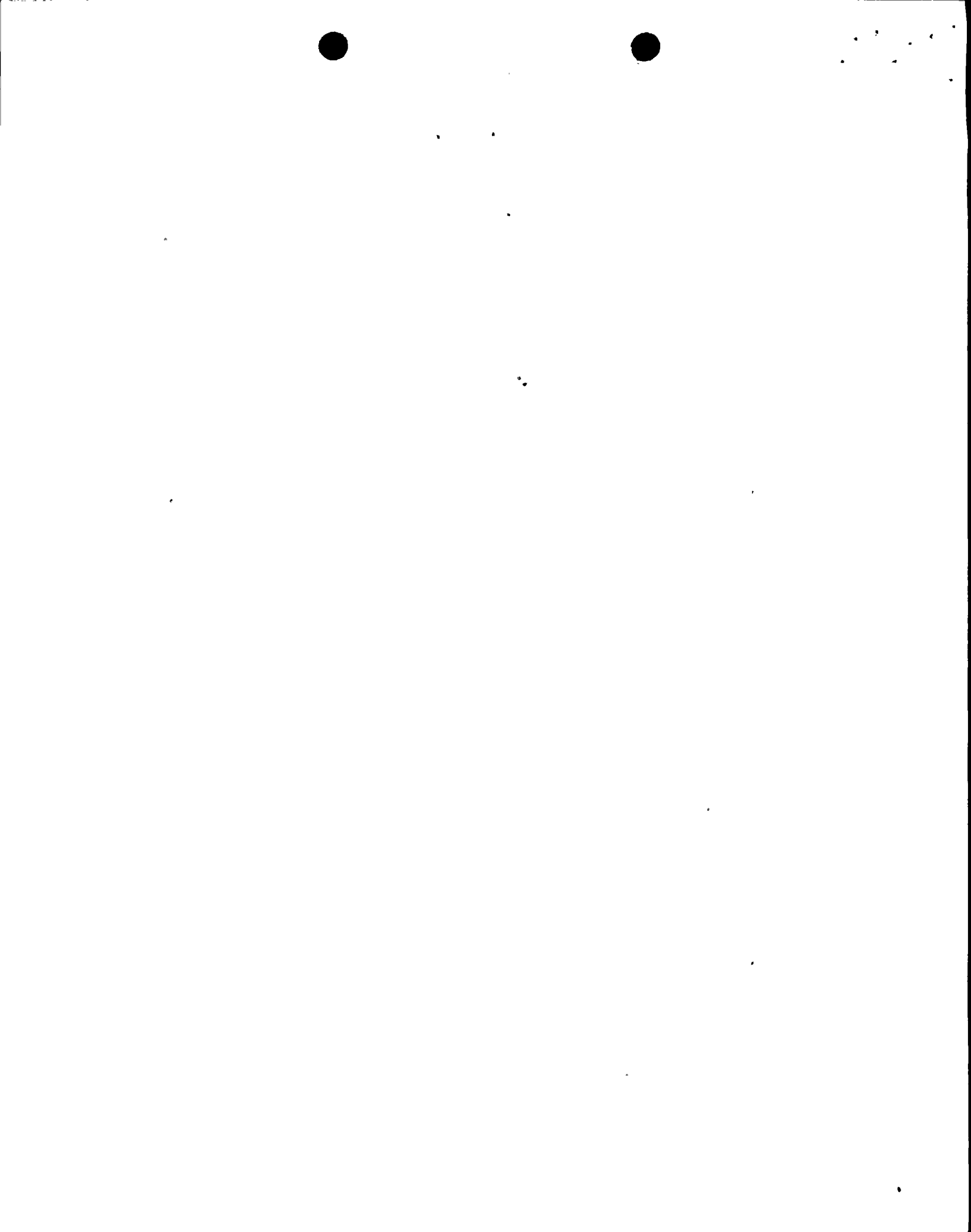
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1.0 INTRODUCTION

The United States Nuclear Regulatory Commission is considering the issuance of a proposed amendment which would extend the expiration date of Facility Operating License No. DPR-63 for the Nine Mile Point Nuclear Station Unit No. 1 (NMP-1) from April 11, 2005, to August 22, 2009. NMP-1 is operated by Niagara Mohawk Power Corporation (the licensee) and is located in the County of Oswego, New York.

2.0 IDENTIFICATION OF THE PROPOSED ACTION

The currently licensed term is 40 years commencing with the issuance of the construction permit on April 11, 1965. Accounting for the time that was required for construction of the plant, this represents an effective operating license term of 35.7 years. The licensee's application of July 27, 1988, as supplemented May 21, 1991, requests extension of the expiration date of the operating license to August 22, 2009, which represents 40 years from the date of issuance of Provisional Operating License No. DPR-17 which was superseded in its entirety by full-term Facility Operating License No. DPR-63 issued on December 26, 1974.

3.0 THE NEED FOR THE PROPOSED ACTION

The granting of the proposed license amendment would allow the licensee to operate for 4.3 additional years beyond the currently-approved license expiration date. Without issuance of the proposed license amendment, the plant would be shut down at the end of the currently-approved license term.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

On January 21, 1974, the United States Atomic Energy Commission issued the "Final Environmental Statement Related to Operation of Nine Mile Point Nuclear Station Unit 1." This document was issued in support of the application for the conversion of Provisional Operating License No. DPR-17 to full-term Facility Operating License No. DPR-63. This document provides an evaluation of the environmental impacts associated with plant operation. The NRC staff has reviewed the Final Environmental Statement (FES), and additional information provided by the licensee in its license amendment submittal, to determine the environmental impacts of operation of NMP-1 for 4.3 additional years.

4.1 Radiological Impacts

The NRC staff has considered potential radiological impacts for the general public in residence in the vicinity of NMP-1. These impacts include potential accidents and normal radiological releases. In addition, the NRC staff has considered the impacts of radiation exposure to workers at the plant. Finally, the impacts attributable to the transportation of fuel and waste have been considered. These impacts are summarized in Sections 4.1.1 through 4.1.3 below.



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4.1.1 General Public

In order to assess radiological impacts on the general public as a consequence of the proposed extended period of operation of NMP-1, population estimates set forth in the original FES were reexamined.

Oswego County, where NMP-1 is located, contains the most concentrated population in the vicinity of the plant, primarily the City of Oswego. The actual population growth of Oswego County has not kept pace with the population growth for this area predicted by the NMP-1 FES. The FES predicted 1980 and 1990 populations for Oswego County were 122,000 and 147,000, respectively. These predictions were based on the 1970 census. However, the 1980 and 1990 census reported actual populations of 113,901 and 126,732 for 1980 and 1990. The 50-mile radius population was likewise overestimated in the FES. The FES projected a 1980 population of 1,060,000 for the 50-mile radius; however, the 1990 census reported an actual population of only approximately 924,000 United States residents within the 50-mile radius. Therefore, the NRC staff concludes that the original FES overestimated the population growth in the vicinity of the plant. The NRC staff expects the existing FES to remain bounding for the anticipated population growth in the vicinity of the plant up to the year 2009.

Review of effluent release reports from NMP-1 (Semi-Annual Radioactive Effluent Release Reports and Semi-Annual Reports of Operation) from the period of 1970 to 1990 showed a general decrease in the amount of radioactivity released from NMP-1. This trend is mainly attributed to the installation of an off-gas treatment system in 1976 (also called the augmented waste treatment system). Prior to the operation of the off-gas system, noble gas releases were in excess of 500,000 curies annually. The average annual release for 1977-1987 was approximately 1075 curies. For the period 1988 to mid-1990, the plant was shut down. As a result, the annual release for that period averaged 6 curies.

In the FES dated January 21, 1974, the staff calculated the dose commitment to the population residing around the NMP-1 site to assess the impacts on people from radioactive material released as part of the normal operation of the plant. Table 5.10 of the FES lists the estimated Annual Dose to the General Population for Operation of Nine Mile Point Unit 1. The population dose due to both gaseous and liquid effluent was projected in the FES to be approximately 2.5 person-rem annually with the augmented radwaste system in operation. Population dose during the period 1982-1986 ranged from $2.42E-2$ person-rem to $6.78E-2$ person-rem. For the period 1988 to mid-1990, the plant was shut down. As a result, population doses during that period were a fraction of the average population doses for the previous years as reflected by the effluent release data discussed above. Therefore, the NRC staff concludes that the original FES overestimated the annual dose to the population. For the relatively short



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additional proposed period of operation, population estimates do not indicate that an increased incremental dose to the general public would result due to population changes in the vicinity of the plant. Doses to the general public are expected to remain well within the estimates based on the predictions on which the original license was issued.

The licensee has an extensive environmental monitoring program. The Radiological Environmental Monitoring Program (REMP) was established to detect and evaluate any possible impact to the environment surrounding the NMP-1 area resulting from operations at the site and to verify the effectiveness of effluent controls and limitations. Samples representing food sources such as fish, milk, water samples, sediment samples, airborne radioiodine and particulate samples, and thermoluminescent dosimeters are all included in the monitoring program. Environmental sampling results have demonstrated a decreasing trend in offsite doses since 1976 with minimal impact from station operation. The 1990 Annual Radiological Environmental Operating Report for Nine Mile Point Nuclear Station concludes that any possible impact to the environment or to man resulting from operations at the site are a minute fraction of the dose to man from naturally occurring sources. Consequently, the impact is minimal and negligible.

The NRC staff has assessed the public risks from reactor accidents per year of operation at commercial power reactors. In all cases, the estimated risks for early fatalities and latent cancer fatalities per year of reactor operation have been small compared to the risks of many nonreactor type of accidents to which the public is typically exposed, and to the natural incidence of fatal cancers. The annual risks associated with reactor accidents did not increase with longer period of operation of the reactor. If similar risks were estimated for NMP-1, a similar conclusion would be expected. Further, the integrated exposure to population within a 50-mile radius of the site from each postulated accident would be orders of magnitude smaller than that from naturally occurring background radiation. When considered with the probability of occurrence, the annual potential radiation exposure of the population from all the postulated accidents is an even smaller fraction of the exposure from natural background radiation and, in fact, is well within naturally occurring variations in the natural background. The NRC staff concludes that the proposed additional years of operation would not increase the annual public risk from reactor accidents.

Therefore, the NRC staff has concluded that the effect on the general public of continued plant operation through the year 2009 as a result of the license extension would not increase over that previously evaluated.

4.1.2 Occupational Exposures

The NRC staff has evaluated the licensee's dose assessment for the years 2005 to 2009, the additional years during which NMP-1 would operate, and compared it



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with current NMP-1 and overall industry dose experience. Augmented Inservice Inspection (ISI) work and special modifications in 1980, 1981, and 1986 required by the Three Mile Island (TMI) Action Plan, torus improvements, radwaste system modifications, and Induction Heat Stress Improvement activities resulted in higher than normal occupational exposures in those years. However, the average dose for NMP-1 over the five-year period covering 1982 through 1987 has been 783 person-rem per year, which is lower than the industry average of 851.9 person-rem per unit per year for operating boiling water reactors in the United States for the same time period. Similarly, an average of 406 person-rem for the 1987-1990 period, compares favorably with an industry average of 497 person-rem for the 1987-1989 period.

Improvements in ALARA practices and modification planning activities have reduced and are expected to continue to reduce yearly doses. The licensee's estimate of projected dose for the 1991-2009 time frame is 750 person-rem for outage years and 150 person-rem for non-outage years. These projections not only reflect the strong existing ALARA program but also the new site engineering group activity, an increase in decontamination activity, improved chemistry control, and a stronger emphasis on modification prioritization in terms of anticipated exposures. The NRC staff expects that increased doses from maintenance and corrosion product buildup will be offset by a continually improving ALARA program.

Although additional occupational exposures will result from decommissioning of NMP-1, these doses will be incurred with or without the license extension period. The inventory of activation products and radioactivity levels will not increase significantly in the period of extended operation. Any increases in corrosion product buildup during the period of extension are expected to be compensated for by improved chemistry controls and other ALARA measures. Consequently, the extended operation time should have no measurable adverse effect on decommission dose requirements.

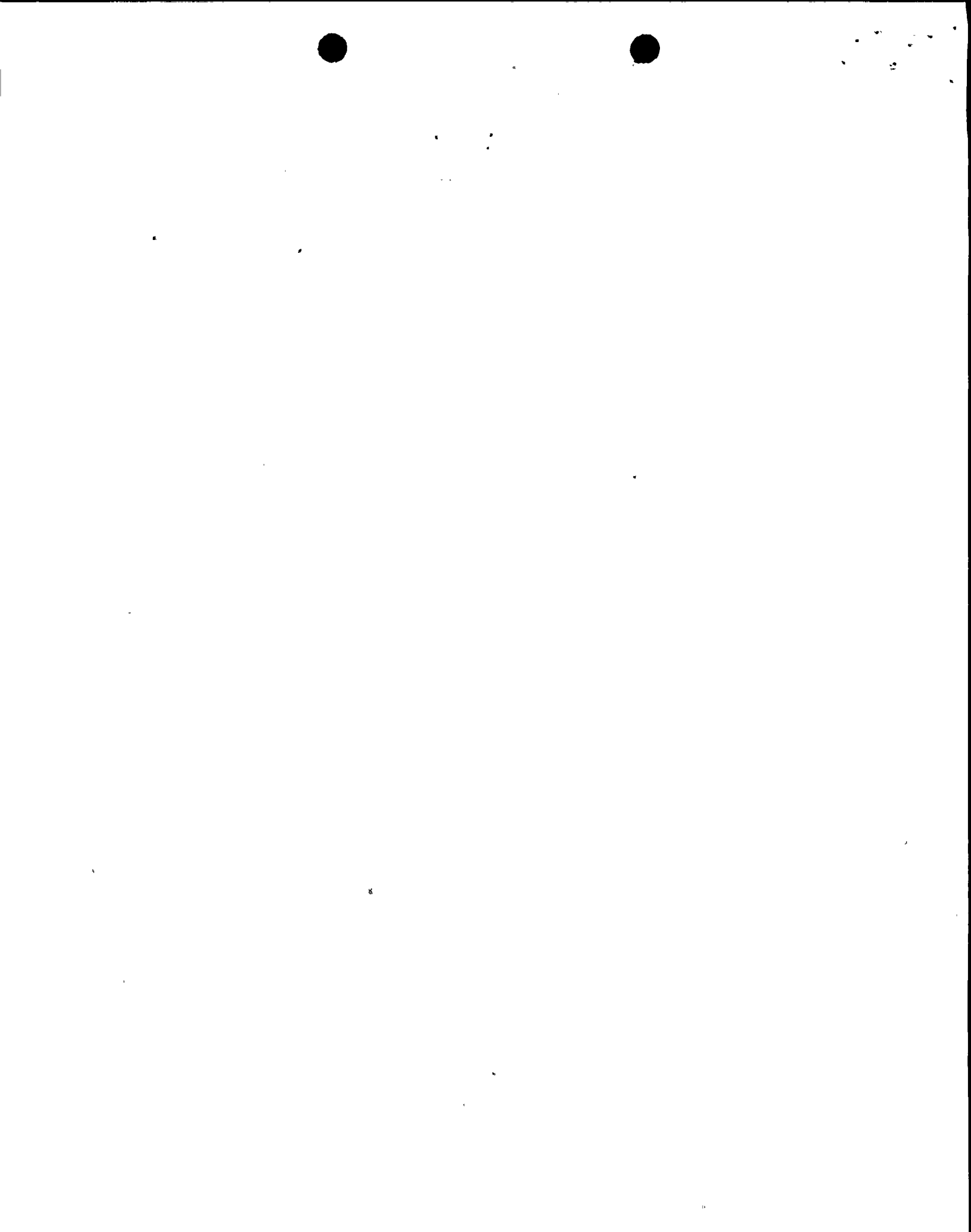
Onsite storage of at least one full core discharge of spent fuel is available through March of 1994. Additional onsite storage through the use of fuel rod consolidation, transshipment, reracking or dry cask storage will be added as necessary. The radiological and environmental effects of providing additional onsite storage capacity for spent fuel (including fuel to be used during the proposed time extension) will be evaluated by the NRC staff as needed.

The NRC staff concludes that the licensee's dose assessment is acceptable and that the radiation protection program at NMP-1 is adequate to ensure that occupational radiation exposures will be maintained ALARA and in continued compliance with the requirements of 10 CFR Part 20.

Therefore, the NRC staff concludes that the environmental impact associated with a 40-year operating license duration is not significantly different from that associated with the 35.7-year operating term authorized by the existing license which was previously assessed in the NMP-1 FES.

4.1.3 Transportation of Fuel and Waste

The NRC staff has reviewed the environmental impact attributable to the transportation of fuel and waste to and from the NMP-1 site. With respect to



the normal conditions of transport and possible accidents in transport, the NRC staff concludes that the environmental impacts are bounded by those identified in Table S-4, "Environmental Impact of Transportation of Fuel and Waste To and From One Light-Water-Cooled Nuclear Power Reactor," of 10 CFR 51.52. The bases for this conclusion are that: (1) Table S-4 is based on an annual refueling and an assumption of 60 spent-fuel shipments per reactor year. At the present time, the NMP-1 reactor has completed a transition to a 24-month refueling cycle which would result in fewer than 60 spent fuel shipments per year, if fuel shipments were, in fact, being made. Reducing the number of fuel shipments would reduce the overall impacts related to population exposure and accidents discussed in Table S-4. (2) Table S-4 represents the contribution of such transportation to annual radiation dose per reactor year to exposed transportation workers and to the general public. Even if the spent fuel exceeds the average fuel irradiation level specified in 10 CFR 51.52(a)(3) (which is used as the bases for Table S-4) it will still be less than 60 gigawatt days per metric ton (GWD/MTU). The NRC has previously found (53 FR 6040, February 29, 1988) that the environmental impacts summarized in Table S-4 of 10 CFR 51.52 are conservative and bound the corresponding impacts for burnup levels up to 60 GWD/MTU. By comparison, the maximum burnup of NMP-1 fuel to date has been approximately 30.4 GWD/MTU and the maximum expected burnup of future fuel assemblies is approximately 47 GWD/MTU. Therefore, the Table S-4 analyses are bounding for NMP-1. The radiation levels of transport fuel casks are limited by the Department of Transportation and are not dependent on fuel enrichment and/or irradiation levels. Therefore, the estimated doses to exposed individuals per reactor year will not increase over that specified in Table S-4.

The annual radiation dose to individuals would not be changed by the extended period of operation. Although some integral risk with respect to normal conditions of transportation and possible accidents in transport would be attributed to the additional years of operation, the integral risk would not be significant because the annual risk for such transportation is small.

4.2 Nonradiological Impacts

The staff has reevaluated the nonradiological impact associated with operation at NMP-1 to include the 4.3 additional years of operation associated with changes in the expiration date of the operating license. The nonradiological impact on land environment is shown in the FES to be quite minor. With regard to the nonradiological impact on water, ecological studies began at NMP-1 in 1963. The purpose of these studies was to evaluate the impact of existing and proposed power station operation at the site on local aquatic biota. No effects of power plant operation on water quality other than temperature were discernable from these studies. Although these studies did indicate a temperature change between intake and discharge, no substantial effects on plankton or other species were observed. Effects of plant operation on the aquatic ecology of Lake Ontario has been minimal. The proposed extension of plant operation will result in no additional effects on the water quality of the aquatic community that have not already been evaluated.



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All discharges to Lake Ontario from NMP-1 are permitted through the Nine Mile Point State Pollutant Discharge Elimination System (SPDES) permit and regulated by the New York State Department of Environmental Conservation (DEC). Any design change which may alter a discharge to the lake is reviewed and evaluated by the DEC. Such review, in conjunction with the SPDES permit limitations, ensures that the consequences of any potential environmental impact will be maintained within accepted standards.

We conclude, therefore, that the nonradiological impacts associated with the proposed changes in the license expiration date are acceptable.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

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

In Sections 9 and 10 of the FES, alternative energy sources and sites and a benefit-cost analysis are presented. Included in the analysis are comparisons among various options for producing an equivalent electrical power capacity. Even considering significant changes in the economics of the alternatives, operation of NMP-1 in the present configuration for an additional 4.3 years 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 NMP-1 compared to alternative electrical power generating capacity improves with the extended plant lifetime.

6.0 ALTERNATIVE USE OF RESOURCES

This action does not involve the use of resources not previously considered in the January 21, 1974, FES.

7.0 AGENCIES AND PERSONS CONSULTED

The Commission's staff reviewed the licensee's request and consulted with the State of New York Energy Office, which had no objection to the proposed operating license extension.

8.0 BASIS AND CONCLUSIONS FOR NOT PREPARING AN ENVIRONMENTAL IMPACT STATEMENT

The Commission has determined not to prepare an environmental impact statement for the proposed action. The NRC staff has reviewed the proposed license amendment relative to the requirements set forth in 10 CFR Part 51. Based on this assessment, the NRC staff concludes that there are no significant radiological or nonradiological impacts associated with the proposed action and it 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



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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.

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