

DCD-016

June 18, 1982

Docket No. 50-220

Mr. Donald P. Dise  
Vice President - Engineering  
c/o Miss Catherine R. Seibert  
Niagara Mohawk Power Corporation  
300 Erie Boulevard West  
Syracuse, New York 13202

Dear Mr. Dise:

Subject: Replacement Furnace Sensitized Stainless Steel Safe-Ends

Re: Nine Mile Point Nuclear Station, Unit No. 1

The Commission has issued the enclosed Amendment No. 49 to Facility Amendment Operating License No. DPR-63 for the Nine Mile Point Nuclear Station, Unit No. 1. The filing of an amendment was mutually agreed to by members of your staff.

The amendment approves the recirculation system safe-end replacement program, including the cutting and welding of safe-ends and the worker dose mitigation program, and it provides license conditions related to the replacement program.

On April 21, 1982, a letter was forwarded requesting information regarding reactor vessel safe-end replacement at the Nine Mile Point Nuclear Station. Specifically, you were directed to provide information for NRC approval prior to undertaking significant and irreversible repair programs.

By letter dated May 24, 1982, you provided, and requested approval for, plans with respect to mitigation of worker radiation doses. Subsequently, there was on May 27 and 28, 1982, a meeting held at the Nine Mile site during which the NRC staff responded to your submittal and clarified staff requirements. Finally, by letter dated June 1, 1982, you forwarded the appropriate information and commitments to allow staff review of your dose mitigation program.

By letter dated June 7, 1982 you provided information regarding the actual cutting out and removal of the existing safe-ends and welding of the replacement safe-ends. Subsequently, there was a site visit on June 9, 1982 during which the staff reviewed your welding and observed your reactor vessel safe-end mock-up.

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SURNAME ▶	.....	.....	.....	.....	.....	.....	.....
DATE ▶	.....	.....	.....	.....	.....	.....	.....

Mr. Donald P. Dise

- 2 -

Copies of the SE, EIA and Notice of Issuance are enclosed.

Sincerely,

ORIGINAL SIGNED BY

Domenic B. Vassallo, Chief  
Operating Reactors Branch #2  
Division of Licensing

Enclosures:

- 1. Amendment No. 49 to DPR-63
- 2. Safety Evaluation
- 3. Environmental Impact Appraisal
- 4. Notice

cc: See next page

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Mr. Donald P. Dise  
Niagara Mohawk Power Corporation

cc:

Leonard M. Trosten, Esq.  
LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N. W.  
Suite 1100  
Washington, D. C. 20036

Carl D. Hobelman, Esq.  
LeBoeuf, Lamb, Leiby & MacRae  
1333 New Hampshire Avenue, N.W.  
Suite 1100  
Washington, D.C. 20036

T. K. BeBoer, Director  
Technological Development Programs  
State of New York  
Energy Office  
Swan Street Building  
CORE 1 - Second Floor  
Empire State Plaza  
Albany, New York 12223

Ronald C. Haynes  
Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
631 Park Avenue  
King of Prussia, PA 19406

Mr. Robert P. Jones, Supervisor  
Town of Scriba  
R. D. #4  
Oswego, New York 13126

Niagara Mohawk Power Corporation  
ATTN: Mr. Thomas Perkins  
Plant Superintendent  
Nine Mile Point Nuclear Station  
P.O. Box 32  
Lycoming, New York 13093

U.S. Environmental Protection Agency  
Region II Office  
Regional Radiation Representative  
26 Federal Plaza  
New York, New York 10007

State University at Oswego  
Penfield Library - Documents  
Oswego, New York 13126

Resident Inspector  
c/o U.S. NRC  
P. O. Box 126  
Lycoming, New York 13093



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

NIAGARA MOHAWK POWER CORPORATION

DOCKET NO. 50-220

NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 49  
License No. DPR-63

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The filings by Niagara Mohawk Power Corporation (the licensee) dated May 24, 1982 and June 7, 1982 comply with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the Facility License No. DPR-63 is hereby amended by adding paragraph 2.D(6) to read as follows:

2.D(6) Recirculation System Safe-end Replacement

The recirculation system safe-end repair program including the cutting and welding of the replacement safe-ends and the dose mitigation program (ALARA) is approved, subject to the following conditions:

- a. The final welding procedures involving the stainless steel, inconel and heat sink welding (if applicable) shall be reviewed by the NRC.
- b. All fuel and control rods shall be removed from the reactor pressure vessel and stored in the spent fuel pool during the period that work on the safe-end replacement program is in progress.

- c. The licensee shall update the collective occupational dose estimate weekly. If the estimate exceeds from the 2906 person-rem estimate by more than 10%, the licensee shall provide a revised estimate, including the reasons for such changes, to the NRC within 15 days of determination.
- d. Progress reports shall be provided at 90 day intervals from the start of the repair program and due 30 days after close of the interval, with a final report within 60 days after completion of the repair. These reports will include:
- (1) a summary of the occupational dose received to date by major task, and
  - (2) a comparison of estimated doses with the doses actually received.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Domenic B. Vassallo, Chief  
Operating Reactors Branch #2  
Division of Licensing

Date of Issuance: June 18, 1982



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY  
NUCLEAR REACTOR REGULATION  
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT NUCLEAR STATION, UNIT NO. 1  
RECIRCULATION SYSTEM  
FURNACE SENSITIZED STAINLESS STEEL SAFE-END  
WORKER DOSE MITIGATION PROGRAM EVALUATION  
AND REPLACEMENT EVALUATION

DOCKET NO. 50-220

## 1.0 Introduction

At the completion of a cold shutdown during March 1982, Niagara Mohawk Power Corporation (licensee) conducted a 900 psig test of the recirculation system at the Nine Mile Point Nuclear Station, Unit No. 1. Leakage was observed in two recirculation loop safe-end welds. Specifically, three leaks were observed in the No. 11 recirculation pump discharge safe-end, and one leak was observed in the No. 15 recirculation pump suction safe-end. All of these leaks were in the heat affected zone of the safe-end to pipe weld.

By letter dated April 21, 1982, Niagara Mohawk Power Corporation was requested to provide information regarding the reactor vessel safe-end replacement program. The following safety evaluation (SE) and environmental impact appraisal (EIA) review the Nine Mile Point worker dose mitigation program.

By letter dated May 24, 1982, the licensee provided plans with respect to mitigation of worker radiation doses. Subsequently, a meeting was held at the Nine Mile site during which the staff clarified NRC requirements. Finally, the licensee forwarded by letter dated June 1, 1982, the information and commitments to allow staff review of the Nine Mile Point Station, Unit No. 1 dose mitigation program.

By letter dated June 7, 1982, the licensee provided information regarding the actual removal and replacement of safe-ends. Subsequently, on June 9, 1982, there was a site visit during which the staff reviewed the licensee's cutting and welding program as well as observed the reactor vessel safe-end mock-up. The following evaluation also reviews the welding aspects of the replacement program.

## 2.0 Evaluation

### 2.1 Dose Mitigation Program Evaluation

Niagara Mohawk has taken into account "as-low-as-reasonably-achievable" (ALARA) considerations for the activities involved in the replacement of safe-ends on the Nine Mile Point primary coolant recirculation lines. The licensee has also committed to implement an overall radiation protection/ALARA program for the replacement project that includes: (1) job planning and evaluation; (2) training of personnel, including mock-up training; (3) review of work while in progress to detect problems and implement improvements; and (4) post-task evaluation to incorporate lessons learned into subsequent tasks.

Pre-job planning has considered alternative methods of replacing the safe-ends and an evaluation of alternative techniques for specific tasks. Activities specifically directed to reducing occupational doses include: (1) coolant pipe decontamination; (2) use of temporary shielding; (3) use of audio-visual communication equipment to minimize the number of personnel in high dose rate areas; (4) training of workers through use of mock-ups; (5) use of automated pipe cutting machines, welding equipment and weld crown reduction tools; (6) use of portable ventilation equipment to reduce airborne radioactivity; and (7) use of water shielding in the primary coolant system where appropriate. These considerations are consistent with Regulatory Guide 8.8 and are acceptable.

The training of workers includes use of two full-scale mock-ups of the inlet nozzle and outlet nozzle areas of the reactor vessel. The radiation protection training program is based on Regulatory Guides 8.13, 8.27 and 8.29 and is acceptable.

During the period the repair work is in progress, the licensee proposes to summarize daily personnel doses by individual and by task. The licensee has committed to a daily review of these dose reports by site supervisors. Doses will be based on pocket dosimeter readings. Furthermore, the licensee has committed to implement a pocket dosimeter test program in accordance with Regulatory Guide 8.4.

The licensee has committed to supplement the plant radiation protection staff with engineers and technicians necessary to complete the project. In addition, the licensee has committed that technicians in responsible positions: (1) will be qualified in accordance with ANSI 18.1, and (2) will be qualified on plant procedures that they are to perform.

The licensee provided a detailed breakdown of the tasks to be performed, the measured or estimated dose rates in the areas where work will be performed, the projected person-hours for each task, and the estimated person-rem for each task. The licensee has committed to review the person-hour estimates, as appropriate, based on the experience from the mock-up training. The licensee has also committed to update the dose rate projections after decontamination of components and after draining the reactor vessel. The licensee will use these updates to review the person-rem estimates as appropriate. In addition, the licensee will refine the estimates as the work progresses to incorporate dose reductions based on experiences gained during the first loop safe-end replacement. The experience gained will then be applied to subsequent work on the remaining four loop modifications, which may result in further dose reductions. The Environmental Impact Appraisal provides more detailed information.

Based on our review of information provided by the licensee, we conclude that the estimated person-rem dose for the project appears to be reasonable and that the licensee intends to implement appropriate occupational ALARA actions. We conclude that the licensee has provided reasonable assurance that individual radiation doses will be maintained within the limits of 10 CFR Part 20 and the total person-rem doses are consistent with the ALARA guidelines of Regulatory Guide 8.8. We therefore find the proposed occupational dose control aspects of the proposed safe-end replacement project to be acceptable.

## 2.2 Replacement Program Evaluation

By letter dated June 7, 1982, the licensee provided a description of the replacement program for all ten recirculation system safe-ends. In essence, Niagara Mohawk plans to cut off the existing safe-ends, leaving present enough of the original inconel weld metal to permit welding of the replacement safe-ends without necessitating post-weld heat treatment. Once removed, the replacement welds and elbows (risers) will be positioned and welded into the recirculation system.

Regarding the cutting and removal of the existing safe-ends the probability of an additional step beyond weld heat treatment should be avoided. In order to ensure that steps beyond heat treatment of new welds are not required the licensee intends to make precise cuts of the existing safe-ends to nozzle weld which will ensure that at least 1/8 inch of the original weld metal remains. The licensee has indicated that appropriate measures will be taken to positively locate the safe-end to nozzle weld since there may be inaccuracies between the actual as-built piping dimensions and the original design drawing dimensions. Once located, the licensee has indicated that the actual cutting process will be controlled with precision.

Niagara Mohawk has provided the two written cutting procedures for NRC review: (1) Newport News Industrial Corporation Controlled Work Instruction, CWI-1399k-2-11, "Removal and Replacement of Recirculation Nozzle Safe-End and Piping For Pump No. 11 Discharge For Niagara Mohawk Power Corporation, Nine Mile Point Unit One," Revision A, Dated May 19, 1982; and (2) Newport News Industrial Corporation Controlled Work Instruction, CWI-1399K-1-5, "Removal and Replacement of Recirculation Nozzle Safe-End and Piping For Pump No. 1 Suction For Niagara Mohawk Power Corporation Nine Mile Point Unit 1, Revision B, Dated June 1, 1982. In addition, the licensee has built an accurate full scale mock-up to verify procedures and train operators.

We have reviewed these procedures and have observed the mock-up. Based on this, we conclude that all reasonable care will be taken: (1) to locate the cutting location properly, and (2) to perform the cutting operation in a controlled manner. We believe that with the use of these procedures, there is a very low probability

that the cutting and associated weld joint configuration preparation will be in error enough to require a post weld heat treatment process. We therefore conclude that the cutting will result in minimum personnel radiation exposure and that the cutting and weld preparation activities may proceed.

Regarding the welding of the replacement safe-ends Niagara Mohawk has indicated that two, and possibly three, procedures will be required. These procedures are for stainless steel, inconel and heat sink welding, if applicable. The licensee has indicated that these procedures are being developed at this time and that welding will not be undertaken until procedures have been reviewed and approved and welding personnel have been trained in accordance with the final procedures. Finally, the licensee indicated that welding of new replacement safe-ends will not occur before June 26, 1982.

Based upon the above the staff review of procedures is pending. However, the licensee has agreed to a condition of the Nine Mile Point license which requires NRC staff review of the final welding procedures prior to any welding activities. We find the fact that NRC will review these procedures prior to use to be acceptable.

### 3.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Author: Philip J. Polk  
Douglas M. Collins  
Warren S. Hazelton  
Frank Skopec

Date: June 18, 1982



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

ENVIRONMENTAL IMPACT ASSESSMENT BY NRR  
NIAGARA MOHAWK POWER CORPORATION  
NINE MILE POINT NUCLEAR STATION, UNIT NO. 1  
RECIRCULATION SYSTEM  
FURNACE SENSITIZED STAINLESS STEEL SAFE-END  
WORKER DOSE MITIGATION PROGRAM ASSESSMENT

DOCKET NO. 50-220

## 1.0 Introduction

At the completion of a cold shutdown during March 1982, Niagara Mohawk Power Corporation (licensee) conducted a 900 psig test of the recirculation system at the Nine Mile Point Nuclear Station, Unit No. 1. Leakage was observed in two recirculation loop safe-end welds. Specifically, three leaks were observed in the No. 11 recirculation pump discharge safe-end, and one leak was observed in the No. 15 recirculation pump suction safe-end. All of these leaks were in the heat affected zone of the safe-end to pipe weld.

By letter dated April 21, 1982, Niagara Mohawk Power Corporation was requested to provide information regarding the reactor vessel safe-end replacement program. The appraisal reviews the Nine Mile Point worker dose mitigation program only. Other aspects of the safe-end replacement program have been, or will be, the subject of other NRC evaluations.

By letter dated May 24, 1982, the licensee provided plans with respect to mitigation of worker radiation doses. Subsequently, a meeting was held at the Nine Mile site during which the staff clarified NRC requirements. Finally, the licensee forwarded by letter dated June 1, 1982, the information and commitments to allow staff review of the Nine Mile Point Station, Unit No. 1 dose mitigation program.

## 2.0 Evaluation

### 2.1 Occupational (On Site) Dose

Niagara Mohawk Power Corporation has estimated that the reactor recirculation nozzle safe-end replacement project for Nine Mile Point Unit 1 will result in approximately 2900 person-rem to workers. This collective occupational radiation dose estimate is obtained by adding the dose estimate of approximately 600 person-rem for the inlet nozzle safe-end replacement work and approximately 2300 person-rem for the outlet nozzle replacement

work<sup>1/</sup>. We have reviewed this estimate and conclude that it is a reasonable estimate of collective dose. (See staff Safety Evaluation dated June 18, 1982.) To determine the relative environmental significance of the estimated maximum occupational dose of 2900 person-rem, the following comparisons were made: (1) the dose from the repair was compared with the dose expected from normal operation of Nine Mile Point and the annual average dose expected from other nuclear plants, (2) the risks to the individually exposed worker were compared to non-nuclear industrial risks, and (3) the risks resulting from the collective doses to the workforce were compared to the risk of naturally occurring cancers and genetic effects.

Regarding comparison of the dose associated with the repair program, Table 4.1 shows the occupational dose history for Nine Mile Point, Unit No. 1<sup>2/</sup>, <sup>3/</sup>. From 1970 through 1981 the average annual dose for Nine Mile Point was 700 person-rem. Assuming that the total Nine Mile Point dose for 1982 is comprised of the 2900 person-rem for the safe-end replacement project, the average annual dose for the 13 years of dose at Nine Mile Point (1970 through 1982) will be approximately 870 person-rem<sup>(\*)</sup>.

For perspective, the staff has summarized the annual occupational radiation doses at U.S. commercial nuclear power reactors for the years 1969 through 1981

(See Table 4.2)<sup>3/</sup>. Average collective occupational dose information for 180 BWR reactor years of operation is available for those plants operating between 1974 and 1981. (The year 1974 was chosen as a starting date because the dose data for years prior to 1974 are primarily from reactors with average rated capacities below 500 MWe.) These data indicate that the average reactor annual collective dose at BWRs has been about 770 person-rem, with some plants experiencing an average plant lifetime annual collective dose to date as high as <sup>3/</sup>, <sup>5/</sup> 1700 person-rem. These dose averages are based on widely varying yearly doses at BWRs. The wide range of annual collective doses experienced at BWRs in the United States results from a number of factors such as the amount of required maintenance and the amount of reactor operations and inplant surveillance. Although the dose for these particular plants far exceeds the average of 770 person-rem for BWRs, these doses are included in the average, particularly since such maintenance contributed to effective and safe plant operation. As Table 4.2, shows, the 2900 person-rem estimate for the safe-end replacement project is within the historical range of doses for a single unit in a year.

Summarizing, including this operation, the Nine Mile plant's annual average occupational dose increases from 700 to 870 person-rem, which is not a major change to the Nine Mile Point annual average collective dose to date. Thus, the 2900 person-rem expected will not significantly increase the collective dose when considered over the 30 year life of the plant. Furthermore, the 870 person-rem dose will continue to compare favorably with the industry annual average collective dose.

(\*) Occupational exposure estimates were not specifically considered in the Nine Mile Point, Unit No. 1 Final Environmental Statement (FES)<sup>4/</sup>, but were discussed during the licensing hearing. Finally, the 2900 per-rem is within the range of doses experienced at other plants that have performed major maintenance.

Regarding the risks to individual plant workers at Nine Mile Point, these risks have been evaluated assuming: (1) an average worker exposure of about 1 rem per year, and (2) a maximally exposed worker receiving about 12 rems per year (the maximum annual dose allowed by 10 CFR 20 to workers who satisfy certain dose history criteria). Using the risk estimators derived from the BEIR I Report,\* the worker receiving an average dose of about 1 rem/year would incur a cancer risk of about 1 chance in 10,000 for one year of exposure. For the maximally exposed individual, the worker would incur a cancer risk of about 1 chance in 1,000. These incremental increases in risk are small in comparison to the natural incidence of cancer which is approximately 16 chances in 100.

In addition to comparing the risk of potential fatal cancers for an exposed individual to the risk of the natural incidence of fatal cancers, the risk to nuclear plant workers can be compared to risks incurred in other occupations by use of average mortality rates. As indicated in Table 4.3 the risk to a nuclear power plant worker exposed at the industry wide average exposure is comparable to that of workers in other industries\*\*. Based on these comparisons, the staff concludes that the risk to an average plant worker is within the range of the risks associated with other occupations. In addition, since the dose to an individual worker is controlled by 10 CFR 20, any increase in individual risk as a result of the repair program is not considered significant.

Regarding the collective occupational dose estimate for the safe-end replacement, the risk from 2900 person-rems corresponds to about 0.4 potential premature fatal cancers in the exposed workforce population and a total of about 0.8 potential genetic effects to the ensuing five generations of the exposed workforce population. The value of 0.4 cancer deaths means that the probability of one (1) additional cancer death over the lifetime of the entire workforce as a result of exposure associated with the repair is about 4 chances in 10. The value of 0.8 potential genetic disorder means that the probability of 1 additional genetic disorder in the five subsequent generations of the entire workforce as a result of exposure associated with the repair is about 8 chances in 10.

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\*\* The risk to a maximally exposed worker would be about 15 times higher than the risk to an average plant worker shown in Table 4.3. It should be noted that the mortality rates in Table 4.3 are for average workers and not for the worker at maximum risk.

\* Note that new information in the BEIR III Report <sup>6/</sup> would lead to slightly lower estimated risk for premature fatal cancers.

These risks are incremental to the normal risks of fatal cancers and genetic effects. The size of the workforce exposed during the repair is estimated to be about 500 persons. For a population of 500, normal cancer and genetic risks that are unrelated to the repair at the Nine Mile Point Nuclear Station would be expected to result in about 90 cancer deaths in that population and about 250 genetic effects among the succeeding five generations of their descendants. The values of 0.4 potential cancer deaths and 0.8 potential genetic disorder are very small fractions of the natural incidence of cancer among the exposed population and the natural incidence of genetic effects among the descendants of the exposed population, respectively. Furthermore, these numbers of potential fatal cancers and potential genetic disorders are so small that they would not be observable in the population since the normal variation in cancer incidence is much greater. Since the expected fatal cancer incidence in a representative population is between 15 and 20%, the expected number of cancer fatalities over the lifetimes of 500 people would be about  $190 \pm 12$  fatal cancers. The preceding estimate of 0.4 potential cancer deaths would not result in a significant difference in observed cancers or in the uncertainty in the observed cancers.

In summary, the NRC staff has drawn the following conclusions regarding occupational radiation dose. Based on our review of the licensee's proposed health physics program, we conclude that the licensee has taken appropriate steps to ensure that the individual occupational doses will be maintained within the limits of 10 CFR Part 20. In addition, we conclude that the licensee's program is capable of maintaining individual and collective doses to as low as is reasonably achievable (ALARA) levels. Niagara Mohawk's estimate of 2900 person-rem for the safe-end replacement project at Nine Mile Point, Unit No. 1 is a reasonable estimate of collective dose. This dose falls within the normal range of annual occupational doses which have been observed in recent years at operating reactors. Although the doses resulting from the reactor recirculation nozzle safe-end replacement will increase the annual occupational dose average of Nine Mile Point, Unit No. 1 to approximately 870 person-rem, this is still well below the 1700 person-rem per unit annual average of BWRs

3/, 5/  
experiencing high levels of special maintenance . The risk to the individual is not significant because doses to individuals will be controlled by 10 CFR 20. Although the collective worker dose increases, the calculated impacts to the worker population are not significant. For the foregoing reasons, we conclude that the environmental impact due to occupational dose will not significantly affect the quality of the human environment.

## 2.2 Public (Off-Site) Radiation Exposure

By letter dated May 7, 1982,<sup>1/</sup> the liquid radwaste handling and control aspects of the replacement program were reviewed and approved. In essence, liquid effluents will be shipped off-site for burial.

At this time, the licensee has estimated that no significant amount of airborne radioactivity will be released in gaseous effluents as a result of the safe-end replacement project. Table 4.4 presents effluent releases for 1979<sup>7/</sup>, 1980<sup>8/</sup>, and 1981<sup>9/</sup> from Nine Mile Point, Unit No. 1 and the FES<sup>7/</sup> annual average effluent release estimates, and compares the expected releases from the safe-end replacement project with FES estimates and actual annual radiological effluent releases at Nine Mile Point. Based on this comparison, we conclude that the offsite environmental impact that may occur during the period of this repair project will be smaller than that which occurs during normal operation.

In addition, since we do not expect an increase in radioactive effluents from Nine Mile Point, Unit No. 1 after the safe-end replacement project, we conclude that the impact on biota other than man will also be no larger after the safe-end replacement project is completed.

In summary, the radioactive releases resulting from the safe-end replacement project will be less than those due to normal plant operation. These releases are also much less than the estimates presented in the FES. The doses due to these releases are small compared to: (1) the limits of 40 CFR Part 190, and (2) the annual doses from natural background radiation. Therefore, the radiological impact of the safe-end replacement project will not significantly affect the quality of the human environment.

Based on our review of the proposed reactor recirculation nozzle safe-end replacement project, we conclude that:

- (1) The estimated occupational exposure of 2900 person-rem for the safe-end replacement project is within the expected range of doses incurred at light water power reactors in a year.
- (2) Workers are limited by regulation to 3 rems/calendar quarter with a maximum annual dose of 12 rems given that workers satisfy certain dose history criteria. Since the dose to an individual worker is controlled by 10 CFR 20 any increase in individual risk as a result at the repair is not considered significant. Although the collective dose to plant workforce increases as a result of this repair, the estimated impacts to the worker population are nonsignificant.

- (3) Niagara Mohawk Power Corporation has taken appropriate steps to ensure that occupational dose will be maintained as-low-as-reasonably-achievable and within the limits of 10 CFR Part 20.
- (4) Offsite doses resulting from the project will be:
  - (a) smaller than those incurred during normal operation of Nine Mile Point, Unit No. 1, and
  - (b) negligible in comparison to the dose members of the public in the vicinity of Nine Mile Point, Unit No. 1 receive from natural background radiation.

### 3.0 Conclusion

On the basis of the foregoing, we conclude that the proposed safe-end replacement project at the Nine Mile Point, Unit No. 1 will not significantly affect the quality of the human environment.

We have reviewed this proposed safe-end replacement project relative to the requirements set forth in 10 CFR Part 51 and the Council of Environmental Quality's Regulations 40 CFR Part 1500. We have determined that the proposed action will not significantly affect the quality of the human environment.

On the basis of the foregoing analysis, it is concluded that there will be no significant environmental impact attributable to the proposed action. Having made this conclusion, the Commission has further concluded that no environmental impact statement for the proposed action need be prepared and that a negative declaration to this effect is appropriate.

Date: June 18, 1982

## REFERENCES

1. Nine Mile Point Unit 1 Reactor Recirculation Nozzle Safe End Replacement Report prepared by the Niagara Mohawk Power Corporation, May 24, 1982 (revised June 1, 1982) and the prior NRC approval of radwaste handling and control as forwarded by letter dated May 7, 1982, from D. B. Vassallo (NRC) to D. P. Dise (Niagara Mohawk).
2. NUREG-0713, Vol. 1, Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1979, U.S.N.R.C., March 1981.
3. NUREG-0713, Vol. 2, Occupational Radiation Exposure at Commercial Nuclear Power Reactors, 1980, U.S.N.R.C., December 1981.
4. Final Environmental Statement related to operation of Nine Mile Point Nuclear Station, Unit No. 1, United States Atomic Energy Commission, January 1974.
5. NUREG-0692, Final Environmental Statement Related to Steam Generator Repair at Surry Power Station, Unit No. 1, July 1980.
6. The Effects on Population of Exposures to Low Levels of Ionizing Radiation "BEIR III Report," report of the committee on the Biological Effects of Ionizing Radiations, National Academy of Sciences - National Research Council, 1980.
7. Niagara Mohawk Power Corporation, Nine Mile Point, Unit No. 1, Semiannual Monitoring Reports, January 1, 1979 through June 30, 1979 and July 1, 1979 through December 31, 1979.
8. Niagara Mohawk Power Corporation, Nine Mile Point, Unit No. 1, Semiannual Monitoring Reports, January 1980 through June 30, 1980 and July 1, 1980 through December 31, 1980.
9. Niagara Mohawk Power Corporation, Nine Mile Point, Unit No. 1, Semiannual Monitoring Reports, January 1981 through June 30, 1981 and July 1, 1981 through December 31, 1981.

TABLE 4.1

ANNUAL COLLECTIVE<sup>5,6</sup>  
OCCUPATIONAL DOSE AT NINE MILE POINT UNIT NO. 1\*

<u>YEAR</u>	<u>COLLECTIVE OCCUPATIONAL DOSE (person-rems)</u>
1970	44
1971	195
1972	285
1973	567
1974	824
1975	681
1976	428
1977	1383
1978	314
1979	1497
1980	591
1981	1592**

\*First commercial operation 12/69

\*\*Calculated by C. Hinson and R. Pedersen, U.S. NRC, RPS, RAB, from data supplied in May 6, 1982 letter from T. E. Lempges, Vice President, Nuclear Generation, Niagara Mohawk (NM) Power Corporation to Director of Management and Program Analysis, U.S. NRC in compliance with 10 CFR Part 20, Section 20.407

TABLE 4.2

ANNUAL OCCUPATIONAL RADIATION DOSES AT  
U.S. COMMERCIAL NUCLEAR POWER REACTORS<sup>6</sup>  
 (person-rems per reactor unit)

<u>Year</u>	<u>PWR Average</u>	<u>BWR Average</u>	<u>Low</u>	<u>High</u>
1969	165	195	42	298
1970	684	127	44	1639
1971	307	255	50	768
1972	464	286	61	1032
1973	783	380	85	5262
1974	331	507	71	1430
1975	318	701	21	2022
1976	460	549	58	2648
1977	396	828	87	3142
1978	429	604	48	1621
1979	510	733	31	2140
1980	578	1,136	22	3626
1981*	656*	985*	68*	3254*

\*Calculated by C. Hinson, U.S. NRC, RPS, RAB, from data supplied by operating reactor sites in compliance with 10 CFR Part 20, Section 20.407.

TABLE 4.3

## Incidence of Job-related mortalities

Occupational Group	Mortality Rates (premature deaths per 10 <sup>5</sup> person-years)
Underground metal miners*	~1300
Uranium miners*	420
Smelter workers*	190
Mining**	61
Agriculture, forestry, and fisheries**	35
Contract construction**	33
Transportation and public utilities**	24
Nuclear-plant worker*** (Average)***	23
Manufacturing**	7
Wholesale and retail trade**	6
Finance, insurance, and real estate**	3
Services**	3
Total private sector**	10

\*The President's Report on Occupational Safety and Health, "Report on Occupational Safety and Health by the U.S. Department of Health, Education, and Welfare," E. L. Richardson, Secretary, May 1972.

\*\*U.S. Bureau of Labor Statistics, "Occupational Injuries and Illness in the United States by Industry, 1975," Bulletin 1981, 1978.

\*\*\*The nuclear-plant workers' risk is equal to the sum of the radiation-related risk and the nonradiation-related risk. The estimated occupational risk associated with the industry-wide average radiation dose of 0.8 rem is about 11 potential premature deaths per 10<sup>5</sup> person-years due to cancer, based on the risk estimators described in the following text. The average non-radiation-related risk for seven U.S. electrical utilities over the period 1970-1979 is about 12 actual premature deaths per 10<sup>5</sup> person-years as shown in Figure 5 of the paper by R. Wilson and E. S. Koehl, "Occupational Risks of Ontario Hydro's Atomic Radiation Workers in Perspective," presented at Nuclear Radiation Risks, A Utility-Medical Dialog, sponsored by the International Institute of Safety and Health in Washington, D.C., September 22-23, 1980. (Note that the estimate of 11 radiation-related premature cancer deaths describes a potential risk rather than an observed statistic.)

TABLE 4.4

## RADIOACTIVE EFFLUENTS FROM NINE MILE POINT UNIT NO. 1

Type of Radioactive Effluent	Estimates for Releases During Safe-end Replacement (Ci)	Nine Mile Point Unit No. 1 Releases (Ci)			FES <sup>7</sup> Estimates of Annual Releases (Ci)
		1979	1980	1981	
<u>Gaseous</u>					
Noble Gases	Negligible <sup>b</sup>	1.0(+3) <sup>c</sup>	5.9(+2)	6.1(+2)	1.1(+4)
Iodine & Particulates <sup>a</sup>	Negligible <sup>b</sup>	3.5(-2)	2.6(-2)	1.5(-2)	3.9(0)
Tritium	Negligible <sup>b</sup>	4.1(+1)	1.1(+2)	6.3(+1)	d
<u>Liquid</u>					
Mixed fission and activation products	Negligible <sup>b</sup>	1.9(0)	0.0	5.4(0)	4.0(0)
Tritium	Negligible <sup>b</sup>	6.8(0)	0.0	5.1(0)	2.0(+1)

<sup>a</sup>Radioactive half lives 8 days or more

<sup>b</sup>Below lower limits of detectability for plant instrumentation

<sup>c</sup>1.0(+3) =  $1.0 \times 10^3$

<sup>d</sup>No estimate was given in FES

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NO. 50-220NIAGARA MOHAWK POWER CORPORATIONNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSEANDNEGATIVE DECLARATION

The U.S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 49 to Facility Operating License No. DPR-63 issued to Niagara Mohawk Power Corporation (the licensee) which revised the license operation of the Nine Mile Point Nuclear Station, Unit No. 1 (the facility) located in Oswego County, New York. The amendment is effective as of its date of issuance.

The amendment approves the recirculation system safe-end replacement program, including the cutting and welding of safe-ends and the worker dose mitigation program, and it provides license conditions related to the replacement program.

The application for the amendment complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations 10 CFR Chapter I which are set forth in the license amendment. Prior public notice of this amendment was not required since the amendment does not involve a significant hazards consideration.

The Commission has prepared an environmental impact appraisal for the proposed approval and has concluded that an environmental impact statement for this particular

action is not warranted because there will be no significant environmental impact attributable to the proposed action.

For further details with respect to this action, see (1) the licensee's filing dated May 24 and June 8, 1982, (2) Amendment No. 49 to License No. DPR-63, (3) the Commission's related Safety Evaluation, and (4) the Commission's related Environmental Impact Appraisal. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Penfield Library, State University College at Oswego, Oswego, New York 13126. A copy of items (2), (3) and (4) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Licensing.

Dated at Bethesda, Maryland this 18th day of June 1982.

FOR THE NUCLEAR REGULATORY COMMISSION



Domenic B. Vassallo, Chief  
Operating Reactors Branch #2  
Division of Licensing