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U. S. Environmental Protection Agency comments on Enviro Impact Statement for Nine Mile Point Unit 2

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

50-410

25 MAY 1973

RECEIVED
MAY 29 1973
U.S. ATOMIC ENERGY COMMISSION
Regulatory Mail Section

OFFICE OF THE ADMINISTRATOR

Mr. L. Manning Muntzing
Director of Regulation
U.S. Atomic Energy Commission
Washington, D.C. 20545

Dear Mr. Muntzing:

The U.S. Environmental Protection Agency has reviewed the draft environmental impact statement for Nine Mile Point Nuclear Station, Unit 2. Our detailed comments are enclosed. The delay in providing our formal comments on this facility occurred because of the necessity to review the AEC's generic approach to transportation and reactor accidents and to subsequently re-evaluate our position on the critical issues involved. In order to avoid undue delays in the impact statement and licensing processes, however, we provided the AEC staff on March 10, 1973, with draft versions of our comments on all topics (excluding the transportation and reactor accident section).

With the exception of the potential radioiodine releases from the turbine building, the radioactive effluents expected to be discharged from Nine Mile Point Unit 2 are considered to be consistent with the "as low as practicable" philosophy and are expected to be within the guidelines of the proposed Appendix I to 10 CFR Part 50.

The potential annual dose to a child's thyroid from consumption of milk produced by a cow grazing at the site boundary may be 51 mrem or more. Although at the present time the nearest cow or pasture is beyond this site boundary, there is no surveillance program planned to assure that the critical pathway, or receptor does not move nearer the plant. In the absence of such a program, the proposed Appendix I guidelines should be applied at the site boundary.

Our analysis of the cooling system indicates that the intake structure, as designed, will preclude the survival of any entrained aquatic organisms. An assessment of the anticipated losses, due to impingement and entrainment of aquatic biota, should be presented and the resultant impact on the total ecosystem estimated. In addition, a biological sampling program should be established by the applicant to gather data that would provide a baseline from which long term trends can be deduced.

Based on the information provided in the statement, it is anticipated that the Nine Mile Point Unit 2 discharge, in combination with Unit 1 and the Fitzpatrick discharges, will violate the New York State water quality standards for both disruption of the thermocline and the temperature criteria for thermal discharge. Therefore, alternate cooling system strategies to alleviate this problem must be considered in the final statement.

In light of our review of this draft statement and in accordance with EPA procedure, we have classified the project as ER (Environmental Reservations) and rated the draft statement as Category 2 (Insufficient Information). We have enclosed a detailed explanation of our classification system for your information. In addition, we would be pleased to discuss our classification or comments with you or members of your staff.

Sincerely yours,

Sheldon Meyers

Sheldon Meyers
Director
Office of Federal Activities

Enclosures

U.S. Environmental Protection Agency Procedures for Classifying Federal Projects and Associated Draft Environmental Impact Statements

Environmental Impact of the Project

LO--Lack of Objections

EPA has no objections to the proposed project as described in the draft impact statement; or suggests only minor changes in the proposed project.

ER--Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed project. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU--Environmentally Unsatisfactory

EPA believes that the proposed project is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this project. The Agency recommends that alternatives to the project be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1--Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project as well as alternatives reasonably available to the project.

Category 2--Insufficient Information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3--Inadequate

EPA believes that the draft impact statements does not adequately assess the environmental impact of the proposed project, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft impact statement is assigned a Category 3, no rating will be made of the project, since a basis does not generally exist on which to make such a determination.

U. S. ENVIRONMENTAL PROTECTION AGENCY

Washington, D.C. 20460

May 1973

ENVIRONMENTAL IMPACT STATEMENT COMMENTS

Nine Mile Point Nuclear Station, Unit 2

TABLE OF CONTENTS

INTRODUCTION AND CONCLUSIONS

The Environmental Protection Agency (EPA) has reviewed the draft environmental statement for the Nine Mile Point Nuclear Station Unit 2, prepared by the U.S. Atomic Energy Commission (AEC) and issued on January 17, 1973. Following are our major conclusions:

1. With the exception of the potential radioiodine releases from the turbine building, the radioactive effluents expected to be discharged from Nine Mile Point Unit 2 are considered to be consistent with the "as low as practicable" philosophy and are expected to be within the guidelines of the proposed Appendix I to 10 CFR Part 50.

2. There is a discrepancy within the draft statement concerning the point of discharge of radiogases from the turbine building to the environment. In one place, the draft statement indicates that radiogases are to be discharged from the turbine building vent, yet in another place it indicates that they will be discharged from a 100 meter stack. Since the discharge point directly affects the dose consequences to the public, this contradiction should be resolved in the final statement.

3. In general, the use of engineered radioactive effluent controls within the plant is preferable to using the dilution capacity of the environment to meet applicable standards. In this regard, the final statement should include a cost-effectiveness analysis of alternatives to the presently proposed stack discharge system such as (a) reduction of leakage, (b) collection of radioactive discharges in closed systems, and/or (c) provisions for filtration

of the turbine building air prior to release (whether via vent or stack).

4. The potential annual dose to a child's thyroid from consumption of milk produced by a cow grazing at the site boundary may be 51 mrem or more. Although at the present time the nearest cow or pasture is beyond this site boundary, there is no surveillance program planned to assure that the critical pathway, or receptor does not move nearer the plant. In the absence of such a program, the proposed Appendix I guidelines should be applied at the site boundary.

5. The design and operation of the intake structure will act to entrap fish and entrain other organisms such as fish eggs and larvae, juvenile fish, and plankton, thus precluding their survival. The applicant should institute a monitoring program that will give a sound assessment of the effects of entrapment and entrainment.

6. Sufficient characterization of the Lake's water quality is lacking and should be provided in light of the Lake's eutrophic trend. Data for nitrate, phosphate, and dissolved oxygen concentration should be provided on a seasonal basis.

7. Based on the information provided in the statement, it is anticipated that the Nine Mile Point Unit 2 discharge, in combination with Unit 1 and the FitzPatrick discharges, will violate the New York State water quality standards for both disruption of the thermocline and the temperature criteria for thermal discharges. Therefore, alternate cooling system strategies to alleviate this problem must be considered in the final statement.

RADIOLOGICAL ASPECTS

Radioactive Waste Management

With the exception of the radioiodine releases from the turbine building, the potential effluents from Nine Mile Point Nuclear Station Unit 2 appear to be within the guidelines of the proposed Appendix I to 10 CFR Part 50 and to be consistent with the "as low as practicable" philosophy.

There is a discrepancy in the draft statement as to the release point of radiogases from the turbine building. Page 3-31 of the draft statement indicates that the radiogases from the turbine building ventilation system will be released to a 100 meter stack, while page 5-11 states that, at the nearest pasture, "...the dose to a child's thyroid ... was estimated to be about 0.37 mrem/yr, totally due to the iodine-131 released from the turbine building vent." In Supplement 5 (page R9.5-1) of the PSAR, the applicant indicates that the turbine building air will be released via the stack. The final statement should resolve this discrepancy.

Since the dose consequences from radioiodine are essentially due to turbine building releases, engineered controls, if practical should be used to limit these releases rather than depending on the dilution capacity of the environment. Some possible design alternatives that have been used at other stations include (1) reduction of leakage, (2) collection of leakage in closed systems, and (3) filtration of the turbine building air prior to release (whether by vent or by stack). Design alternative should be discussed in the final statement, including an analysis of their cost-effectiveness relative to stack discharges.

Dose Assessment

With the exception of the radioiodine discharges from the turbine building, the dose consequence due to normal operation of Nine Mile Point Unit 2 are expected to be within the guidelines of the proposed Appendix I to 10 CFR Part 50.

Two independent evaluations were made of the dose to a child's thyroid due to potential radioiodine releases from the turbine building. Both evaluations assumed (1) a release rate of 0.58 Ci/year of iodine-131 (Table 3.5 of the draft statement), (2) a grazing factor of 5 months (page 5.11 of the draft statement), and (3) consumption of one liter/day of milk from the nearest dairy by a child.

Based on these evaluations, if a 100 meter stack were used as the discharge point, the dose consequences would be within the guidelines of the proposed Appendix I to 10 CFR Part 50. But, if the discharges were from the turbine building vent (using the X/Q given in the FitzPatrick draft statement for a vent release), a dose of approximately 10 mrem/year could result. Considering that approximately 12 mrem/year are contributed from the Nine Mile Point Unit 1 and the FitzPatrick plants, we estimate that the dose consequences of all the iodine discharges at this site could result in a dose of approximately 22 mrem/year, which exceeds the dose guidelines of the proposed Appendix I. The final statement should reevaluate the potential radioiodine dose consequences from operations at both the Nine Mile Point and FitzPatrick sites, and should indicate how compliance with the proposed Appendix I guidelines will be assured.

The draft statement indicates that the radioiodine released from all site sources could result in a site boundary dose of 51 mrem/year to a child's thyroid, which is excessive. Calculation of doses at the nearest receptor and/or at the nearest potential pasture is an acceptable approach for evaluating potential dose consequences due to effluent discharges from the nuclear facility, only if there is assurance that the receptor will not move nearer the plant or to the point of maximum off-site concentrations. However, if this alternative is adopted (as opposed to using a site boundary limit), some method of documenting, on a periodic basis, the location of the critical receptor, or pasture, should be required of the applicant. If no such program is initiated to obtain this assurance, then the proposed Appendix I limit for iodine of 5 mrem/year should be applied at the site boundary.

Although some vegetable farming takes place in the county (over 4,000 acres according to Appendix C of the James A. FitzPatrick environmental report) no dose estimates via a vegetable consumption pathway were given. Vegetables may become contaminated either by exposure to the plume, or by irrigation with water extracted from the lake, which is said to occur to some extent. This potential pathway should be considered, especially since it may contribute significantly to the total dose. It is the total potential dose which is of importance and must be assessed.

Transportation

EPA, in its earlier reviews of the environmental impact of transportation of radioactive material, agreed with the AEC that many aspects of this problem could best be treated on a generic basis. The

generic approach has reached the point where on February 5, 1973, the AEC published for comment in the Federal Register a rulemaking proposal concerning the Environmental Effects of Transportation of Fuel and Waste from Nuclear Power Reactors. EPA commented on the proposed rulemaking by a letter to the AEC, dated March 22, 1973, and by an appearance at the public hearing on April 2, 1973.

Until such time as a generic rule is established, the EPA is continuing to assess the adequacy of the quantitative estimates of environmental radiation impact resulting from transportation of radioactive materials provided in environmental statements. The estimates provided for this station are deemed adequate based on currently available information.

Reactor Accidents

EPA has examined the AEC analysis of accidents and their potential risks which AEC has developed in the course of its engineering evaluation of reactor safety in the design of nuclear plants. The various categories of in-plant accidents are common to all nuclear power plants of given types. EPA, therefore, concurs with AEC's approach to evaluate the environmental risk for each accident class on a generic basis. AEC has in the past and still continues to devote extensive efforts to assure safety through plant design and accident analyses in the licensing process on a case-by-case basis. EPA, however, favors the additional step now being undertaken by AEC of a thorough analysis on a more quantitative basis of the risk of potential accidents in all ranges. We continue to encourage this effort and again urge the AEC to press forward to its timely completion and publication. EPA believes

that this will result in better understanding of the possible risks to the environment.

Discussion is underway between the two agencies to reach an understanding for timely EPA participation in the review and discussions of the results of the generic studies directed at quantitative evaluation of accident risks. EPA asks to be kept informed of the scope and directions of these studies. EPA asks to be briefed periodically on the status and progress that have been made and EPA seeks to have prompt and complete access to the results of the studies. Concurrently, the results of EPA efforts which may contribute to the quantitative evaluation of accident risks will be provided to the AEC in a similar fashion. Meanwhile, EPA will continue its review of environmental impact statements in its areas of responsibility and will transmit its comments to AEC. We conclude that the level of safety developed through the present procedures and analyses on a case-by-case basis appears justified based on currently available information. However, we believe that the application of evaluative techniques and quantification procedures, now being pursued by AEC quantitative risk studies, should permit a more objective and consistent means of appraising accident risks. If unwarranted risks are identified during the course of the generic studies, EPA will make its views known. In this event, we are confident that the AEC will take appropriate action.

NON-RADIOLOGICAL ASPECTS

Biological Considerations

It is our opinion that operation of the once-through cooling system could cause unacceptable biological damage for the following reasons. The intake structure is to be located at a depth of 26.5 feet with a velocity through the bar racks of 1 fps. Velocity through the intake tunnel is to be 5 fps and through the intake screens 1 fps. It should be pointed out that the intake structure is located at a depth at which fish have been observed to be present in highest concentration. The high velocities through the system preclude escape once fish are drawn into the intake structure. In summary, the intake has the potential of serving as a highly efficient fish trap. Studies done at other facilities in the area (notably at Oswego Units 1-4) would indicate a potential for large periodic fish kills. This potential could have been evaluated during the period for which Nine Mile Point Unit 1 has been operative. Unfortunately, the applicant did not take advantage of this opportunity. In addition, the region around the intake is also used for spawning by certain species. This enhances the probability of kills during spawning seasons.

The entrained organisms (planktonic fish forms (fish eggs, fish larvae, and juvenile fish) and planktonic organisms) will be exposed to a temperature increase for over 9 minutes (page 5-27). The discharge-intake temperature difference will be about 30°F when Units 1 and 2 are operating together. Virtually all fish, fish eggs, and larvae entering the cooling-water intake structure will be killed (page 10-5). The applicant has not made adequate studies of the plankton present at the

plant site and on plankton entrainment and has not determined the entrainment damage due to the operation of the Nine Mile Point Unit 1.

The applicant should institute a program that will give a sound assessment of the effects of fish entrapment and plankton entrainment due to the operation of Nine Mile Point Unit 1, and Units 1 and 2 combined with FitzPatrick. Further, the significance of these effects on the plankton population and fish life in and around the Nine Mile Point and FitzPatrick area should be evaluated.

Water Quality

Over the past 50 to 60 years the total dissolved solids in the lake has increased and the transparency of the lake has decreased. This indicates a eutrophic trend (page 2-12). The possibility of increasing the eutrophic trend of Lake Ontario with the operations of Nine Mile Point Units 1 and 2 and FitzPatrick should be discussed in more detail. The pre and post operational dissolved oxygen values in and around the sites should be plotted and the effects these plants will have on dissolved oxygen should be determined.

It is stated in the draft statement that sampling during August 1969 and May 1970 for nitrates and phosphates yielded variable results. These data, however, were not included in the statement. They should be submitted in the final statement along with a complete characterization of the lake water for each of the four seasons.

Thermal Considerations

As was the case with the thermal discharge from the FitzPatrick plant, we are concerned with the possible deleterious effects of the heated effluent and its ability to meet New York State standards. It

appears to be doubtful whether (1) the unit will meet New York State regulations governing discharge below a thermocline, and (2) whether the combined discharges of Units 1 and 2, or Units 1, 2, and the FitzPatrick plant will meet New York criteria for thermal discharges. The following points expand on this statement.

1. Discharge below a thermocline:

The draft statement insists repeatedly that discharge at 40 ft. depth will be into the epilimnion of the lake. We might make the following comments with regard to this. Temperature (depth) studies (submitted to us in reference to Oswego #6, which is nearby) show a thermocline varying in depth from 10 to 70 feet from June through August. For data taken in summer of 1964, 6 to 7 sampling runs show a definite thermocline at depths above 40 feet where the discharge structure will be located. Now, the applicant's contention that he is not discharging beneath a thermocline is based on the fact that the depth of the thermocline stablizes <u>somewhat</u> in September at an average depth of about 85-90 ft. It will then break up with fall holomixis. Therefore, we question the applicant's claim that the deepest depth reached in late summer, just before holomixis, defines the stable thermocline. It is our opinion that the applicant would be discharging beneath a well defined thermocline for an appreciable portion of the hot weather months which would represent a violation of New York State regulations.

2. New York State Temperature Criteria:

New York State Water Quality Standards states that for lakes the area within the 3°F excess isotherm cannot exceed the equivalent

area of a circle with a radius of 300 feet. With the present operation of Nine Mile Point Unit 1 Nuclear Plant (610 MW) and the scheduled operations (1978 and 1973 respectively) of the Nine Mile Point Unit 2 Nuclear Facility (1150 MW) and the James A. FitzPatrick Nuclear Station (820 MW), there will be two nuclear generating stations with an electrical generating capacity of 2370 MW operating within a half a mile of each other. Two discharges with a combined flow of 1.7 billion gallons per day (534 mgd from FitzPatrick and a combined flow of 1.16 billion gallons per day from the two units of Nine Mile Point) will be within 3000 feet of each other and will be discharged into Lake Ontario. These two discharges will cause a surface area of 14 acres in Lake Ontario to be within the 3°F excess isotherm (page 5-30). This is equivalent to a circle with a radius of 456 feet. Therefore, when the cumulative impact of all plants is considered, a violation of water quality standards will result.

Because of this apparent violation of temperature criteria, the projected breakdown of the thermocline, and the adverse biological effects associated with the once through cooling system, cooling system alternatives must be considered. These could range from modification of the present once through cooling system to resolve the problems mentioned, to the adoption of a closed cycle cooling alternative.

Air Quality

The draft statement should provide a discussion of the mechanical equipment at the facility which has a potential of emitting non-radioactive air pollutants; for example, auxiliary boiler and diesel engine pollutant emissions should be presented in the final

environmental impact statement in a fashion that provides technical information as to the size or capacity of the units in addition to the fuel type and fuel analysis. A discussion should also be presented dealing with the frequency of use and hourly fuel use rate related to the mechanical equipment. Also, the draft statement should provide information as to turbine peaking equipment that may be located at the site. If there is such equipment, non-radioactive air pollutant emissions should be estimated.

Information should also be provided in the final impact statement related to the impact of the high voltage transmission line ozone production rate and its potential environmental impacts.

Annual averages for site meteorological conditions are referred to in section 5.4.2. Section 2.6 or an appendix of the Final Environmental Statement should present these data as well as tabulations of any other meteorological data used when the staff's safety review of section 7.1 is finally made.

The following comments refer to the applicant's Environmental Report for Unit 2 dated June 1972.

The applicant, in section 2.6.1, points out that the micrometerology of the site is substantially different from that of inland locations such as Syracuse. He should not, then, apply the data from the site tower to the whole fifty-mile radius covered in calculating dosages. It is pointed out that in addition to the possibility of utilizing the National Weather Service's (NWS) Star Program to assess stability classes and frequencies at stations such as Watertown and Syracuse, the applicant could use the NWS file of upper air data taken at Griffiss AFB

(Rome, N.Y.). Applicant's present calculations in section 7 underestimate the impact of airborne pollutants substantially.

From the applicant's T data presented in Figures D-7 through D-12 it can be shown, using AEC Safety Guide 23, Table 2, temperature criteria, that the atmosphere over Nine Mile Point is stable approximately 45 percent of the year. Applicant's Table 2.6-2 gives a value of 13 percent based on an entirely unsubstantiated and otherwise unknown "Niagara Mohawk" classification. Section 2.6.5 relates the Niagra Mohawk classification to selected Pasquill classes and Brookhaven values <u>by definition</u>. This same Table 2.6-2 accounts for 100 percent of the occurrences of annual stability but does not indicate any Pasquill Class C, E or G. These three classes exist in the area of concern at least one quarter of the year.

Treatment of the applicant's meteorological data in a manner similar to that of the Duane Arnold Energy Center environmental report, Amendment 2, October 1972, by Iowa Electric Light and Power Company is recommended. DAEC's Table 2-2.6-4 is specifically recommended.

Regulatory File Cy