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ENCLOSURES:
Environmental Protection Agency comments on Environmental Impact Statement for H.B. Robinson Unit #2.

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ACKNOWLEDGED

PLANT NAME: H.B. Robinson #2

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

13 AUG 1973

OFFICE OF THE
ADMINISTRATOR

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

Dear Mr. Muntzing:

The Environmental Protection Agency has reviewed the draft environmental statement for the H. B. Robinson Nuclear Steam Electric Plant Unit 2, and our detailed comments are enclosed.

Since H. B. Robinson is an operating plant, actual operating data would provide some bases for making estimates of plant performance. In the final statement the AEC should utilize the operating data that has been available since August 1971, to estimate liquid and gaseous radionuclide releases and the potential impact they may have on the environment.

According to the draft statement, the liquid radioactive discharge from H. B. Robinson will exceed the guidelines of the proposed Appendix I to 10 CFR Part 50. Additional treatment equipment may be necessary since the present equipment does not have sufficient capacity to treat the major source of this discharge, the steam generator blowdown. The final statement should indicate the actions that will be required of the licensee to bring the liquid waste discharges within the proposed Appendix I guidelines.

Lake Robinson may be eligible for classification as "navigable" under the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). As such, it would be subject to federally approved intra-state water quality standards which include, among other things, specific thermal limits. In our opinion, the draft statement does not supply sufficient information to determine compliance with these

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thermal standards or to evaluate the thermal impact on the lake or in Black Creek downstream of the dam site. Since compliance with standards and the "best practicable" - "best available" provisions of the FWPCA may require change in the plant's cooling system, we recommend that the applicant consider the costs and benefits of alternative cooling systems and that such considerations be included in the final statement.

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

Sincerely,

Sheldon Meyers

Sheldon Meyers
Director
Office of Federal Activities

Enclosure


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Washington, D.C. 20460

AUGUST 1973

ENVIRONMENTAL IMPACT STATEMENT COMMENTS

H.B. Robinson Nuclear Steam Electric Plant Unit 2

TABLE OF CONTENTS

INTRODUCTION AND CONCLUSIONS

The Environmental Protection Agency (EPA has reviewed the draft statement for the H. B. Robinson Nuclear Steam-Electric Plant Unit 2 prepared by the U.S. Atomic Energy Commission (AEC) and issued on April 23, 1973. Following are our major conclusions:

1. The final statement should present and utilize operating data collected during the past two years to estimate liquid and gaseous radionuclide releases and their potential environmental impacts.
2. The final statement should clearly indicate the actions that will be required to bring the liquid waste discharges into compliance with the proposed Appendix I to 10 CFR 50. Additional treatment equipment may be necessary since the present equipment does not have sufficient capacity to treat the steam generator blowdown.
3. Lake Robinson, formed by damming Black Creek, supplies cooling water to the H. B. Robinson plant (Units 1 and 2) and receives its discharge. This lake may be eligible for classification as "navigable" under the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). As such, it would be subject to federally approved intrastate water quality standards which require, among other things, the maintenance of an average monthly water temperature limit of 30°C (90°F) and a maximum increase above ambient of 1.7°C (3°F) after allowance for adequate mixing. The draft statement does not supply sufficient information to determine compliance with these thermal standards or to evaluate the thermal impact on the lake or in Black Creek downstream of the dam site. Additional information on, and analyses of the thermal plume and its impact should be presented in the final statement.

4. The FWPCA requires that effluents, including those of power plants, receive "best practicable control technology currently available" by July 1, 1977, and "best available technology, economically achievable" by July 1, 1983. Although definitions of these terms have not yet been promulgated by EPA, it is anticipated that modifications to the thermal treatment system of the H.B. Robinson plant may be required. Likely application of these effluent limitations and water quality standards (see 3 above) argues for the applicant to consider further the costs and benefits of alternative cooling systems, including off-stream cooling, for units 1 and 2. A full discussion of such alternatives should be included in the final statement.

5. In our opinion, the high intake velocity of this plant (2.1 fps) is considerably higher than the 0.5 to 0.8 fps EPA has recommended in the past. We therefore concur with the AEC that additional studies be conducted to determine the extent of impingement losses and would call to the applicant's attention that section 316(b) of the FWPCA requires that "...cooling water intake structures reflect the best technology available for minimizing adverse environmental impact." The results of these studies and the means to mitigate any impacts should be discussed in the final statement.

RADIOLOGICAL ASPECTS

Radioactive Waste Management

Since this is an operating plant, actual operating data, especially for the last two years, would provide some bases for making estimates of plant performance. We, therefore, suggest that AEC utilize operating data available since August 1971, to evaluate the radiological impact of the plant and to compare the data with the assumptions used in the standard AEC models.

According to the draft statement (Table 3.5), under normal operating conditions, the plant's liquid radioactive discharge will exceed the activity discharge guidelines of the proposed Appendix I to 10 CFR Part 50. The major source of this discharge is the steam generator blowdown (29 curies of the total plant discharge of 30 curies), which is now discharged without treatment. The draft statement mentions that the licensee will control this effluent to within the limits of the Technical Specifications, which restrict the release of radioactive liquids, other than tritium, to 9.5 curies/yr while the proposed Appendix I level is 5 curies/yr. The final statement should clearly indicate the actions that will be required to conform with the proposed Appendix I. It appears that additional treatment equipment may be necessary since the equipment described in the draft statement does not have sufficient capacity to handle the steam generator blowdown rate.

Dose Assessment

From the information available on the site and the surrounding area, it appears that, although the potential thyroid dose from consumption of milk produced by the nearest existing milk cow is acceptable, there is

land suitable for pasturage closer to the plant. Since the potential thyroid dose from dairy cows pastured there could exceed the levels in the proposed Appendix I to 10CFR50, the applicant should institute a program of monitoring and reporting of the location of milk cows in this area during the operational life of the facility. We are confident that, if the monitoring program shows that an unacceptable dose is possible through this pathway, the AEC will require corrective actions to be taken.

We concur in the AEC's recommendations concerning the need to broaden the applicant's present radiological sampling programs, as discussed in Section 6.2.2 of the draft statement. Details of the improved programs should be included in the final statement. Particular attention should be paid in the monitoring program to the buildup of radionuclides in the lake. Although such a build up (except in the case of tritium) has not yet been observed during field studies, it remains as one of the most likely radiological impacts on the environment from routine operation of this facility. In addition to the specific pathways mentioned by the AEC, we recommend that some of the new wells that have been dug on the land bordering the eastern shore of Lake Robinson be monitored for radionuclides.

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. Since these accidents are common to all nuclear power plants of a given type, EPA concurs with the AEC's approach to evaluate the environmental risk for each accident class on a generic basis. The 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 the 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 urge the AEC to press forward to its timely completion and publication. EPA believes this will result in a better understanding of the possible risks to the environment.

In order to provide a fuller understanding of the direction of these efforts, it is requested that the final statement (either directly or by publicly available reference) provide information on the nature, expected schedule, and level of effort of those generic studies which are expected to lead to a basis for a subsequent assessment by the AEC concerning the risk from all potential accident classes in the H. B. Robinson plant. It is recognized that this subsequent assessment may be either generic or specific in nature depending on the outcome of the generic studies. In addition, the final statement should include an AEC commitment that this assessment will be made publicly available within a reasonable time period following completion of the generic studies. Clearly, if the above efforts indicate that unwarranted risks are being taken at the H. B. Robinson plant we are confident that the AEC will assure appropriate corrective action. Similarly, if EPA efforts related to the accident area uncover any environmentally unacceptable conditions related to the safety of the H. B. Robinson plant, we will make our views known.

NON-RADIOLOGICAL ASPECTS

Thermal Effects

The H. B. Robinson Plant consists of two generating units. Unit 1 is fossil-fuel powered, produces 185 MWe, and was placed in service in 1960; Unit 2 is nuclear powered, produces 700 MWe, and was placed in service in 1970. This draft statement concerns the issuance of a continuation of operation license for Unit 2.

Condenser cooling, for both units, is accomplished by a once-through flow of water pumped from Lake Robinson through adjacent but separate intake structures and discharged back to the lake via a 6.8 kilometer (4.2 mile) common canal at a temperature of 11.0°C (21°F) above ambient.

Lake Robinson was constructed in 1959 by placing a dam across Black Creek approximately 0.16 kilometer (0.1 mile) downstream from the plant. The lake was constructed primarily for industrial cooling and recreation and receives no discharges other than that of H.B. Robinson.

Until the passage of the 1972 amendments to the Federal Water Pollution Control Act (FWPCA), Lake Robinson, an on-stream impoundment of an intra-state stream, was under the sole jurisdiction of South Carolina. Under the amended FWPCA, however, all navigable waters of the United States, both interstate and intrastate, became subject to federally approved state water quality standards and other provisions of the Act pertaining to discharge permits, effluent limitations and other controls. Recently published EPA regulations, 38 F.R. 13528, May 22, 1973, implementing Section 402 and 405 of the FWPCA define navigable water, in part, as "Intrastate lakes, rivers and streams which are utilized by interstate travelers for

recreational or other purposes," and, "Intrastate lakes, rivers and streams which are utilized for industrial purposes by industries in interstate commerce." Lake Robinson could be considered to fall in both of these categories and thus be eligible for classification as a navigable lake and coverage by the standards.

Lake waters subject to present federally approved South Carolina standards require maintenance of an average monthly water temperature limit of 30°C (90°F) and a maximum allowable increase above ambient of 1.7°C (3°F) after allowance for adequate mixing.

The draft statement does not supply sufficient information to fully evaluate the thermal effects of Unit 2 on Lake Robinson or the downstream impact on Black Creek. In particular, we feel that Unit 2 cannot be evaluated without relevant information about Unit 1. However, the simple, qualitative, thermal analysis supplied in the draft statement does indicate highly complex temperature patterns in the lake. To facilitate a full evaluation of the thermal impact, the following information should be included in the final statement:

1. A detailed, mathematical analysis which characterizes both horizontally and vertically, the thermal mixing zones required for both units 1 and 2 at 100 percent load factor under average and critical meteorological and hydrological conditions, and at maximum lake drawdown; and

2. Maximum anticipated temperatures of the lake discharge compared to the lake inflow under each of the above conditions.

In addition, section 301 of the FWPCA requires that effluents, including those of power plants, receive "best practicable control technology currently available" by July 1, 1977, and "best available technology economically achievable" by July 1983. Although definitions of these terms have not yet been promulgated, it is anticipated that modifications to the thermal treatment system of H. B. Robinson plant may be required. Likely application of these effluent limitations and water quality standards argues for the applicant to consider further the costs and benefits of alternative cooling systems, including offstream cooling, for units 1 and 2. A full discussion of such alternatives should be included in the final statement.

Section 316 of the FWPCA allows point sources of thermal discharges subject to section 301 or 306 of the Act the opportunity to demonstrate to the Administrator that the effluent limitations are "more stringent than necessary to assure the project and propagation of a balanced, indigenous population of shellfish, fish and wildlife in and on the body of water into which the discharge is made;" The Administrator may then impose an appropriate effluent limitation.

Biological Effects

The Unit 2 cooling water intake structure, consisting of three inlet bays, is located on the bank of Lake Robinson. Velocity through the traveling screen openings is about 0.7 meters/second (2.1 fps). EPA has recommended in the past that, for the protection of aquatic biota, intake velocities be maintained between 0.15 and 0.17 meters/second (0.5 fps and 0.8 fps). In this regard, it should be recognized by the applicant that section 316(b), FWPCA, requires "...that the location, design, construction, and capacity of cooling water intake structures reflect the

best technology available for minimizing adverse environmental impact."

We concur with AEC that the applicant should conduct additional studies to obtain a clearer picture of impingement losses and recommend that these studies be described in sufficient detail in the final statement. A parallel study of impingement losses at the Unit 1 intake (immediately adjacent to Unit 2 intake) should also be conducted to allow an evaluation of total plant impact. Accompanying such studies, there should be an investigation of means to reduce these losses.

The draft statement supplies very limited information about the bass-bluegill fishery in Lake Robinson. In order to assess fully the effects of plant operation (thermal and impingement) on the lake biota, studies should be conducted to document the size of the present fishery (pounds per acre per species) and to determine the availability of food in the fishery. The final statement should include a discussion of these studies. Such studies will be of prime importance should an evaluation of alternative effluent limitations be requested by the applicant under Section 316 of the FWPCA.

Chemical Effects

Federally approved state water quality standards for South Carolina do not designate limits for any chemical included in the H. B. Robinson discharge. However, the waste disposal permit issued to the applicant by the South Carolina Pollution Control Authority, limits the amount of chromate in Lake Robinson to 50 parts per billion. The draft statement identifies chromate as one of the discharge constituents but does not define the concentration. Since chromate can be very toxic to various lower organisms in the aquatic food chain, the final statement should

discuss the monitoring procedure to insure that the concentration does not exceed the above mentioned limit of 50 parts per billion. Chromium is being considered by EPA for inclusion on the toxic pollutant list as specified under Section 307(a) of the FWPCA.

Due to the lack of slime growth in the condensers, chlorination has not, as yet, become necessary. If a need does arise, the applicant intends to alternately chlorinate each of the two condensers for two 30-minute periods per day. The concentration of chlorine in the cooling water leaving the condenser is not expected to exceed 0.5 parts per million.

The diluting effect resulting from the mixing of the chlorinated and non-chlorinated condenser cooling water and the high chemical oxygen demand of the cooling water should reduce the residual chlorine concentration to the 0.2 mg/liter level recommended by EPA. We concur with AEC that if chlorination becomes necessary, both free and combined residual chlorine should be monitored by the amperometric method along and at the end of the discharge canal.

Table 2.5 of the draft statement indicates the presence of 35 parts per billion of phenols in the lake water but offers no explanation of their origin. Chlorination, if conducted, will likely result in the formation of chlorinated phenols which can impart an odor to the lake and an unpleasant taste to the fish. The applicant should consider the possibility of mechanical cleaning of the condensers if this is found to be a problem.

In view of the eventual requirements which section 301 of the FWPCA may impose on the chemical discharge of the plant, we recommend that the applicant evaluate and discuss in the final statement:

1. Treatment of laundry and similar waste streams containing organics, ammonia, and other nitrogen compounds by secondary biochemical and/or equivalent physical/chemical procedures; and
2. Treatment of all other non-radioactive chemical wastes in a closed-cycle system with ultimate in-plant reuse of treated water.

ADDITIONAL COMMENTS

During the review we noted in certain instances that the draft statement did not present sufficient information to substantiate the conclusion presented. We recognize that much of this information is not of major importance in evaluating the environmental impact of the H. B. Robinson Nuclear-Steam Electric Plant Unit 2. The cumulative effects, however, could be significant. It would, therefore, be helpful in determining the impact of the plant if the following topics were addressed in the final statement:

1. The descriptions of the gaseous waste treatment system presented in the applicant's environmental report and the AEC's draft statement do not agree. The applicant indicates that the waste gas decay tanks provide 45 days of holdup while the draft statement indicates only 27 days of holdup. The waste gas decay tank capacity indicated in the draft statement is similar to several other plants which estimate 45 days of holdup. It should be indicated whether this difference in the decay time is reflective of actual operating restrictions or capabilities of the system or is due to some other cause. Although the doses resulting from normal operations of this plant after 27 days of holdup are within the guidelines of the proposed Appendix I to 10CFR50, there is a possible need to reevaluate other plants which utilize similar gas decay systems, if a generic design problem is the reason for the indicated shorter than design holdup.

2. As indicated in the draft statement, the applicant is required by the South Carolina Pollution Control Authority to maintain a discharge over the Lake Robinson dam of at least 1.47 times the

stream flow measure upstream at the point where the U.S. Highway 1 crosses Black Creek. Data presented for 1960 through 1969 indicate that this requirement is not being routinely met except during low-flow periods. In particular, data presented for 1968 and 1969 indicate that average monthly flow values did not meet the requirement for 10 out of the 12 months of this period. Increased evaporation due to the Unit 2 thermal discharge has probably further reduced the water available for release. Further clarification and discussion of this situation should be presented in the final statement.

3. Information on the lengths of time required to pass the entire volume of water in the lake through the plant should be clarified to indicate whether data presented in the draft statement refers to both units or just Unit 2. Flow rates should be specified for water passing through the condenser and the entire plant system for both units.

4. Intake screen debris should be disposed of at an approved sanitary fill or by another approved method rather than in Black Creek via the storm sewer.

5. Table 2.3 contains data from two lake areas marked "F". One should probably be marked "E".

6. Low flow data should be based on seven-day low flow with a 10-year recurrence interval since this is the basis on which low flow is determined in the South Carolina water quality standards.

7. Routine analyses of suspended solids and BOD should be performed on the sanitary system influents and effluents to determine operational efficiency.

8. The depth of penetration of the surface skimmer of the Unit 2 intake structure is not shown in either Figure 3.4 or 3.5. Since skimmers extend from the water surface to varying depths, they control the depth from which incoming water is taken and, therefore, its characteristics. The depth and impact of the Unit 2 skimmer should be discussed in the final statement.

9. Limited air quality impact from the intermittent operation of the two auxiliary boilers and the two diesel generators can be expected. Even though the impact on air quality from the operation of these facilities is expected to be minimal, the final statement should provide information on the emission of air pollutants. The information needed to calculate these emissions includes the type of fuel (BTU rating and sulfur content) and the number of hours operated, including hourly and annual fuel use rate.

Regulatory File Cy.