



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

OFFICE OF THE SECRETARY

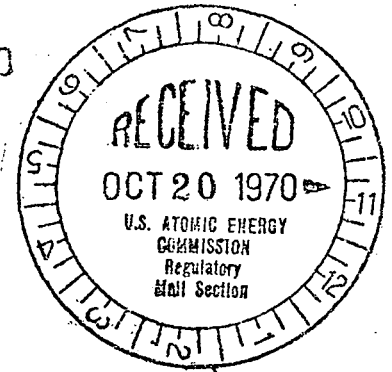
WASHINGTON, D.C. 20201

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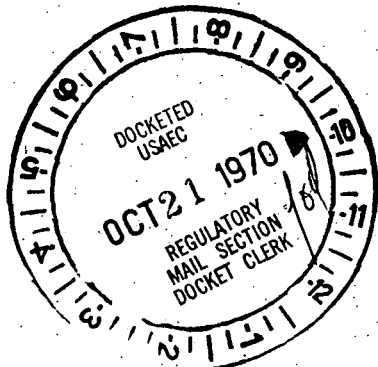


Mr. Harold L. Price
Director of Regulation
U.S. Atomic Energy Commission
Washington, D.C. 20545

Dear Mr. Price:

This is in response to your letter of August 5, 1970, to Mr. Roger Strelow transmitting Commonwealth Edison Company's Environmental Statement for Dresden Nuclear Power Station Unit 3. We are pleased to provide the enclosed report by our Bureau of Radiological Health which states this Department's comments on the proposed operation of the plant based on an evaluation of the public health and environmental aspects of the facility.

The major comment resulting from our review pertains to gaseous radioactive discharges and gaseous waste holdup capability for Dresden Units 2 and 3. It appears to us that it is both prudent and technically and economically feasible for additional gaseous waste holdup capacity to be installed at both Dresden Units 2 and 3 to provide a further reduction of offsite doses to the public. This position is based on Federal Radiation Council guidance, the potential offsite dose from all units at the site, and the feasibility of gaseous waste holdup demonstrated by the recent retrofitting of the Monticello plant in Minnesota. We recognize that retrofitting will result in additional cost, but recommend this step nevertheless for both units. This recommendation is not intended to mean that retrofitting should be done immediately, but in a reasonable time period. An appropriate time might be the end of the first fuel cycle for each unit.

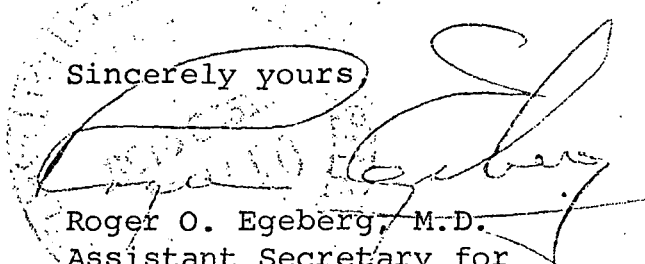


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Page 2 - Mr. Harold L. Price

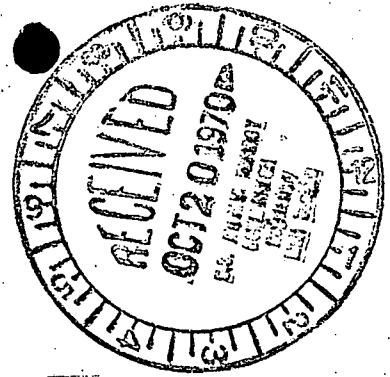
We would appreciate receiving your compilation of comments by other agencies when they are completed. If this Department can assist you further in this matter, we would be happy to do so.

Sincerely yours,



Roger O. Egeberg, M.D.
Assistant Secretary for
Health and Scientific Affairs

Enclosure



50-249

PUBLIC HEALTH REVIEW

DRESDEN NUCLEAR POWER STATION UNIT 3

September 1970

Project Officer:

Ted W. Fowler
Ted W. Fowler

Approved:

E. D. Harward
Ernest D. Harward
Deputy Director
Division of Environmental
Radiation

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Environmental Health Service
Bureau of Radiological Health
Division of Environmental Radiation
Nuclear Facilities Branch

INTRODUCTION AND CONCLUSIONS

The purpose of this report is to summarize the results of an evaluation by the Public Health Service of the potential environmental effects of operation of the Dresden Nuclear Power Station, located on the Illinois River in Grundy County, Illinois, with emphasis on Unit 3. Dresden Unit 3 is located on the same site as Dresden Units 1 and 2 which are both in operation and adjacent to the Midwest Fuel Reprocessing Plant. The evaluation was performed based on information provided by Commonwealth Edison Company in the Safety Analysis Report (SAR) for Units 2 and 3⁽¹⁾ and the Company's Environmental Statement.⁽²⁾ The technical review of these documents was conducted by the staff of the Nuclear Facilities Branch of the Service's Bureau of Radiological Health, Division of Environmental Radiation (DER). This review is an updating of a public health evaluation of the facility performed by the Nuclear Facilities Branch staff prior to start of construction.⁽³⁾ This earlier evaluation was based on information contained in the Plant Design Analysis Report submitted to the Atomic Energy Commission (AEC) by the Commonwealth Edison Company in support of their application for a construction permit for Dresden Units 2 and 3.

The review and evaluation covered by this report are directly responsive to requirements placed on Federal agencies by the National Environmental Policy Act and as such are intended to state the

position of the Department of Health, Education, and Welfare (DHEW) on the potential environmental effects of this facility. The report is also intended, in the traditional role of the Public Health Service, to provide information to the Illinois Department of Public Health for use in conducting their radiological health program relative to this facility. A number of technical documents(4,5) have been developed by the Branch which are used to support the discussions presented.

This review included consideration of radioactive waste discharges, environmental surveillance, and potential radiation doses to the public. Our major conclusions are as follows:

1. Because of the number of units located at this site, the philosophy of the Federal Radiation Council, the recent backfitting of the Monticello plant, and the design of new boiling water reactors, it is our opinion that it is prudent as well as technically and economically feasible to install additional holdup capacity in the gaseous waste discharge systems of Dresden Units 2 and 3 to further reduce offsite doses by a factor of at least 10.
2. The only presentation of estimated offsite radiation dose is for facility operation without any leaking fuel elements. The operating histories of boiling water reactors (BWR) have shown leaking fuel elements usually exist during normal operation. Therefore, the applicant should estimate, based on discharge data obtained from operating BWR power plants, the potential population dose from the combined operation of the three Dresden units for this condition.

3. A more definitive statement of the risks to the public resulting from these potential offsite doses should be presented in the radiation effects section of the environmental statement.
4. The environmental statement does not, but should, contain a commitment by the applicant to use the plant's radioactive waste treatment system to the extent of its capacity and to maintain radioactive waste effluents at as low a level as practicable.
5. Sufficient environmental surveillance will be conducted at the facility to enable public health agencies to determine radiation exposure of the population.
6. Insufficient information is available to us at this time for a reasonable judgment to be made on the adequacy of emergency planning for the site. We encourage the Illinois Department of Public Health and the applicant to work jointly on such a plan for protection of the public in the event of non-routine operational conditions and to make this plan available.
7. Consideration of alternate actions to supply the apparent needs for electricity does not appear reasonable for this facility at this stage of design, nor does it appear that an unreasonable commitment of resources need occur if the plant is operated. Therefore, if the above recommendations are carried out, we are of the opinion that the Dresden Nuclear Power Station Unit 3 can be operated along with Units 1 and 2 at the site without significant effects on the environment and with a minimal risk to the public.

RADIOACTIVE WASTE DISCHARGES

The liquid and gaseous waste treatment system design proposed for Unit 3 is identical to that previously evaluated for Unit 2 and is similar to the design employed in other BWR systems.⁽⁴⁾ Units 2 and 3 have a stack and a circulating cooling water discharge structure separate from the existing Unit 1 structures. Radioactive waste discharges from the two discharge canals will combine following their discharge to the Illinois River and gaseous waste discharges from the two stacks will combine following their discharge to the atmosphere.

In both the environmental statement⁽²⁾ and SAR,⁽¹⁾ the applicant presents an incomplete analysis of population radiation doses for both liquid and gaseous discharges. The applicant refers to "a radiation dose of less than 0.1 mrem/year"^(1,2) for operation without leaking fuel elements and yet no dose estimate was made for operation with leaking fuel elements. Operation with leaking fuel elements should be anticipated and thus, the applicant should have included estimates of population doses under these operating conditions.

The Public Health Service conducted a field study at Dresden Unit 1 in 1968,⁽⁵⁾ during which external offsite dose rates of 5 to 15 mrem/yr were measured at the point offsite with the highest level of radiation exposure. An extrapolation of this dose rate to all three of the

Dresden units indicates that, if the noble gas discharge dose rate increases proportionally to the increase in power level, offsite external dose rates of 25 to 70 mrem/yr could occur. This linear extrapolation of dose rate with power level may be conservative because fuel performance should improve with advances in reactor technology. Another factor contributing to the radiation dose to the population in this vicinity is the operation of the Midwest Fuel Recovery Plant which is presently under construction immediately adjacent to the Dresden site. Even though these population dose estimates are less than the Federal Radiation Council's Radiation Protection Guide of 500 mrem/yr for individual exposure, their potential magnitude is sufficiently high to warrant taking additional actions to keep them as low as practicable.

The applicant has listed specific features of the Dresden plant design "which minimize the amounts of radioactive materials discharged to the environment"⁽²⁾ and the 30 minute off-gas holdup was presented as a specific design feature which "reduces the potential radiation effects on the order of a factor of ten as compared to no holdup." Systems which provide much longer holdup have, however, been designed for four proposed BWRs (Shoreham, Consolidated Edison Units No. 4 and No. 5, Limerick, and Newbold Island) and a gaseous holdup decay system is being retrofitted in the Monticello plant which is already constructed. Gaseous decay systems with approximately one-day holdup capacity

would further reduce the offsite dose at Dresden by a factor of at least 10. It appears to us from this evidence, therefore, that waste holdup decay systems are technically and economically feasible for significantly reducing the offsite external radiation exposures from Dresden Units 2 and 3. We are of the opinion that these systems should be installed at both Dresden Units 2 and 3. This conclusion is in keeping with the recommendations of the Federal Radiation Council⁽⁸⁾ of delivering no radiation exposure without careful considerations of the reasons for doing so.

We are aware that this position appears to be a change of previous policy; however, the DHEW has always adhered to the philosophy of the FRC pertaining to the reasonableness of exposure to the population. The recently available evidence on the feasibility of systems to further reduce offsite radiation doses from boiling water reactors and the complex multiplicity of this site is sufficient cause, in our judgment, to take this posture at this late stage of construction of Dresden Units 2 and 3. If some valid justification, unknown to this Department, exists for not considering the incorporation of an off-gas holdup decay system at Dresden Units 2 and 3 in a reasonable time period, this justification should be documented in the public record.

The noble gas discharge rate estimated by the applicant⁽²⁾ for Dresden Units 2 and 3 appears to be somewhat lower than that measured⁽⁵⁾ at Dresden 1 which has a power level less than one-third of that

proposed for either Dresden Unit 2 or 3. Also, the applicant's estimated noble gas composition did not include the radionuclide ^{88}Kr . It is suggested that the applicant reexamine his estimates since ^{88}Kr has contributed up to 14.2 percent of the noble gases discharged by Dresden 1. (5) The applicant should estimate the total combined discharge of noble gas from all three Dresden units based on Dresden 1 operating experience.

Based on data obtained from the operation of Dresden 1, the discharge rates of the radionuclides in the liquid waste appear reasonable except for the apparently low value for ^{137}Cs . It is suggested that the applicant also include an estimate of the liquid discharge rates of ^{134}Cs , ^{91}Y , ^{144}Ce , ^3H , ^{55}Fe , and ^{54}Mn since these radionuclides did contribute to the radioactivity in the Dresden 1 liquid discharges. (5)

In the environmental statement, the applicant presented in much too general terms a section on the expected radiation effects due to the operation of the Dresden Nuclear Power Station without clearly defining what the effects are. Therefore, a specific analysis of the potential dose to the population from the combined operation of the three Dresden units should be estimated by the applicant and included in this section. In addition to the dose rate in millirems/yr and the whole body dose in man-rems for the population within 50 miles of the Dresden plant, a definitive statement of these effects would be the

inclusion of the estimates of the resulting somatic and genetic effects based on ICRP recommendations.^(6,7)

The applicant's environmental statement also lacks a definitive statement of company policy with respect to the intent of the recently proposed amendments to Parts 20 and 50 of the AEC regulations regarding the reduction of radioactive discharges to the lowest practicable level. It would be desirable for such a statement to be included that would clearly indicate the applicant's intentions with respect to the management of gaseous and liquid radioactive waste discharges to the environment.

ENVIRONMENTAL SURVEILLANCE

The applicant's environmental statement⁽²⁾ indicates that radiological, aquatic-thermal, and meteorological monitoring programs are being conducted by Commonwealth Edison at the Dresden site. Details of the latest version of the surveillance program proposed for Dresden Units 1, 2, and 3 were not included in the environmental statement; however, information available to us from the SAR⁽¹⁾, from site visits, and a study by the Bureau of Radiological Health at this facility have been used in evaluating the adequacy of the routine surveillance program for the site. We believe that the surveillance program submitted by the applicant in the technical specification for Unit 3⁽¹⁾ is adequate for providing data that can be used to evaluate the adequacy of the radioactive waste treatment system and plant controls.

The applicant should report its surveillance results in terms of the specific radionuclides as stated in the technical specifications. If the surveillance program is continually modified as indicated by experience, both the State of Illinois and the appropriate Federal agencies can use the surveillance data provided by the applicant to determine population doses in the environs of Dresden Nuclear Power Station from all sources including the facility.

REFERENCES

1. "Dresden Nuclear Power Station, Units 2 and 3, Safety Analysis Report," Commonwealth Edison Company (November 17, 1967).
2. "Environmental Statement, Dresden Nuclear Power Station Unit 3," Commonwealth Edison Company Docket No. 50-249 (July 24, 1970).
3. Brinck, William L., "Public Health Evaluation, Dresden 3 Reactor," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Nuclear Facilities Branch (August 10, 1966).
4. "A Boiling Water Reactor Nuclear Power Station," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Nuclear Facilities Branch (January 1969).
5. Kahn, Bernd, et al., "Radiological Surveillance Studies at a Boiling Water Nuclear Power Reactor," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Radiological Engineering Laboratory, BRH/DER 70-1 (March 1970).

6. ICRP Publication 8: Report of Committee I on the Evaluation of Risks from Radiation (1965), International Commission on Radiological Protection, Pergamon Press, New York (1966).

7. ICRP Publication 14: Report of Committee I on the Radiosensitivity and Spatial Distribution of Dose, International Commission on Radiological Protection, Pergamon Press, New York (1969).

8. Federal Radiation Council, Report No. 1, Background Material for the Development of Radiation Protection Standards, U.S. Government Printing Office, Washington, D.C. (May 13, 1960).

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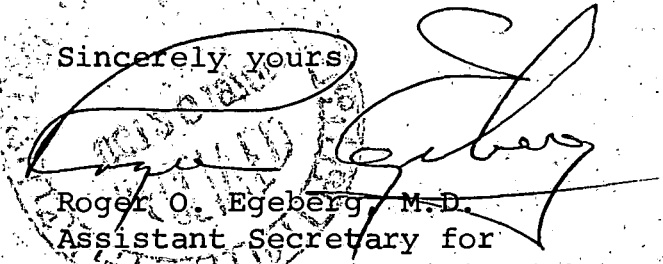
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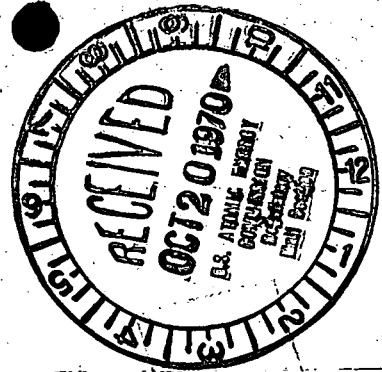
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1970 OCT 20 1970
U.S. ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

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50-249

PUBLIC HEALTH REVIEW

DRESDEN NUCLEAR POWER STATION UNIT 3

September 1970

Project Officer: Ted W. Fowler
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Deputy Director
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5. Kahn, Bernd, et al., "Radiological Surveillance Studies at a Boiling Water Nuclear Power Reactor," U.S. Department of Health, Education, and Welfare, Public Health Service, Bureau of Radiological Health, Division of Environmental Radiation, Radiological Engineering Laboratory, BRH/DER 70-1 (March 1970).

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