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UNITED STATES OF AMERICA

ATOMIC ENERGY COMMISSION

In the matter of the application by COMMONWEALTH EDISON COMPANY For a Provisional Construction Permit for the Dresden Nuclear Power Station Unit 2 (DRESDEN 2)	)	DOCKET NO. 50-237

File Copy (Original) 12-29-65

Appearances

Arthur C. Gehr, Esq., Charles A. Bane, Esq. and David J. Rosso, Esq.
On behalf of the Applicant

Troy B. Conner, Jr., Esq.
On behalf of the U. S. Atomic Energy Commission
Regulatory Staff

INITIAL DECISION

Preliminary Statement

1. This proceeding involves the application of Commonwealth Edison Company (Applicant) for a construction permit for a boiling water reactor designed to operate at 2255 megawatts thermal (715 megawatts electrical) to be located at the Dresden Nuclear Power Station, Grundy County, Illinois. The application, as currently amended, contains comprehensive information concerning the site, describes the principal features and characteristics of the proposed facility, and fully states the financial and technical qualifications of the Applicant to design and construct the facility.

2. The application has been reviewed by the regulatory staff of the Atomic Energy Commission (Staff) and by the Advisory Committee on Reactor Safeguards (ACRS): each review concluded that the proposed reactor can be

built and operated at the proposed site without undue risk to the health and safety of the public. The reports of these reviews and the entire application, together with numerous documents which underlie and support them, are in the evidentiary record.

3. The Atomic Energy Act requires that the license for a facility such as this be issued only after duly notified hearing proceedings in accordance with the Administrative Procedure Act.[1/] Consistently therewith and with the Commission's Rules and Regulations, a prehearing conference and a hearing were conducted in Morris, Illinois on November 9 and December 7-8, 1965. The Commission's notice of hearing directed that determinations be made upon the stated issues as set out in Appendix A which is here incorporated by reference. Procedural steps toward simplifying and expediting the hearing and decision were derived and applied during the conference, the hearing, and the decisional process.

4. The parties to this proceeding were the Applicant and the Staff. No persons sought to intervene, but oral and written statements were presented by way of limited appearances (Rules § 2.715) on behalf of seven

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1/ Although the application requests a construction permit and pertinent licenses, the notice of hearing specified that this proceeding was to be concerned only with the application for a provisional construction permit, the issuance of which is authorized and governed by § 50.35 of the Commission's regulations. The issuance of construction permits and the matters to be shown in support thereof are discussed in other regulations, e.g., §§ 50.23, 50.33 and 50.34. The cardinal premise for licensing action under § 50.35 is that all of the technical information required to support a construction permit has not been supplied.

persons, some of whom were representatives of state and local government bodies. These statements on the record did not include probative evidence upon any of the matters required to be considered in deciding the issues assigned for hearing. The transcript of the proceedings and certain exhibits and papers therein identified are a part of the decisional record, which also includes proposed findings of fact and conclusions and briefs which have been submitted by counsel for each party. Consideration has been accorded to all matters of record relating to the issues, but procedural questions of threshhold importance warrant some explanation, which follows.

Procedures for Decision

5. Prehearing conference discussions forecast, and there ensued at the conclusion of the evidentiary hearing, exchanges of views among all participants concerning the substance and form necessary for inclusion in this Initial Decision. A major premise for this discussion was and is that this hearing record presents clearly a so-called non-contested proceeding. The Board adopts these findings as proposed by the Staff upon this point: There are no unresolved safety questions pertinent to the issuance of a provisional construction permit. There are no controverted matters of fact or law between the parties to this proceeding.

6. The Staff presented at the conclusion of the evidentiary hearing a specimen copy of proposed findings and conclusions in the form of a proposed initial decision. The sufficiency of that document, four pages in length, was urged by Staff counsel at the hearing and in a brief received on

December 20. Counsel for the Applicant at first supported the Staff's proposal, but later in the discussion suggested that the initial decision should include more information than is shown in the Staff document. Nevertheless, the Applicant waived its rights to ruling on its proposed findings, and the Board accepted that waiver. These divergent views upon the procedural problem, which are deemed not to be controverted matters of law between the parties, have been weighed in seriously striving for a lawful and practical solution to the potential problem of undue delay in the decisional process.

7. The Board is favorably impressed by the Staff's bold approach. The concept of brevity which it exemplifies appeals to all participants. Without expressing its opinion on the Staff's position that the short proposed decision fulfills the requirements of the Administrative Procedure Act, the Board encounters difficulty with the Commission's statement of considerations for adopting its current rules governing board hearings. 2/

8. The Staff brief suggests that the statement of considerations imposes no special requirement because ". . . we do not believe that there are any unique advances in reactor technology of significance from a

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2/ "Boards will be expected in their opinions to discuss the principal safety matters involved in issuance of the proposed construction permit or license with emphasis on those advances in reactor technology which might be of significance from a safety standpoint. In this sense, the board's opinion should be prepared with the objective of familiarizing the Commission with the reasons for the board's conclusions." (27 Fed. Reg. 12184, December 8, 1962)

safety standpoint which need to be discussed in the Board's decision." Rejecting this contention, the Board endeavors to heed the request that it familiarize the Commission with the reasons for its conclusions. An effort successful in this respect succeeds also in fulfilling the requirements of applicable law.

Findings of Fact

9. Specified Issue No. 1 and the final portion of Issue No. 4 shown in Appendix A relate to the nature and design of the proposed facility and its potential impact upon the health and safety of the public. The necessarily more extensive findings upon those matters are deferred until consideration is accorded to the other issues which may be more concisely disposed of.

10. The Applicant is a large electric utility corporation with assets in excess of $1.9 billion and providing service to more than two million customers. The evidence shows in some detail the Applicant's fiscal structure and operating experience. The financial qualifications thus portrayed leave no room to doubt that the budgeted $81.75 million cost of the proposed facility can readily be met by the Applicant without impairing the orderly conduct of its fiscal and public service operations.

11. The Applicant's experience in generating and distributing electricity include constructing and operating successfully its Dresden 1 nuclear powered generating station. The success of that activity, as amply shown by this record, provides assurance of the competence of the Applicant to construct and operate the facility here proposed. The affirmative evidence--there being none to the contrary--shows that both the

trained personnel within the Applicant's organization and the experienced contractors which it has selected are technically capable of carrying out the Dresden 2 project as proposed.

12. It follows from the foregoing findings that the Applicant is financially and technically qualified to design and construct the proposed facility. Affirmative answers thus emerge to specified Issues Nos. 2 and 3 in Appendix A.

13. The record suggests no reason to believe that the common defense and security will be in any respect adversely affected by the issuance of a provisional construction permit.

14. Safety is a word central to the issues remaining for consideration. Issues Nos. 1(3) and 1(4) inquire about safety questions, and the health and safety of the public are of concern in Issues Nos. 1(4) and the latter part of 4. An agreed and acceptable definition of "safety" as used in these issues was derived in the hearing. The Staff's chief witness stated that, "Safety, . . . relates to the potential adverse radiological effects on public health." The Applicant's principal witness declared that, ". . . safety means the control of fission products wherever they may be." The Staff witness explained further,

> "We do not consider non-radiological safety matters, nor do we consider any economic considerations which might be involved in the course of the design and operation of a nuclear reactor facility."

The Board's determinations upon the safety-related issues here are likewise so limited in their derivations.

15. The record evidence was presented by documents and written testimony supplemented by oral examinations of panels of witnesses, all in the

manner which has recently become the accepted practice in nuclear facility licensing proceedings before atomic safety and licensing boards. An innovation of promising significance was made in the Staff's written safety evaluation. Much of the content of that document was organized to consider serially each of 27 stated criteria by which reactor safety is evaluated. Under each topic were stated facts and reasons supporting the Staff's opinions that each criterion either had been or would be met in the design, construction, and operation of the Dresden 2 facility. That systematic approach to presenting a technical analysis of the proposed reactor facility is a contribution to the licensing review process. For the first time in public proceedings the Staff has explicitly informed the public, the Applicant, and the Board concerning its yardsticks for measuring reactor hazards and safeguards, and also the techniques and results of the measurements thus taken. The Staff stated that these criteria emerge from a history of internal usage. Sharing the Staff's awareness that improved statements of criteria are desirable, the Board commends this approach toward codifying factors to be weighed in making reactor safety judgments.

16. The Board's comments here are addressed to observed and desired values to the hearing process offered by the topical approach used by the Staff. In some instances clarity of meaning in criterion statements is obscured or lost by the quality and quantity of phrasing employed. Sternly applied tests of discernible relationships to public safety questions might helpfully diminish the total number and length of significant

criteria. Particularly desirable for greater assistance in the hearing process would be a presentation of criteria organized quite pointedly in response to the specific issues as notified for public inquiry. Worthy of quote here is the prehearing conference exhortation by Dr. Albert J. Kirschbaum, then a member of this Board, ". . . it would be most helpful if the staff in its written evidence or exhibits attempts to address itself to the issues that the Board is considering, specifically. . . . Point to them. Say this concerns itself with Issue No. 1, and so on. . . . think in terms of the Board's problem there." In sum, however, the identified topical approach has materially assisted this Board.

17. Descriptive findings concerning this proposed facility are limited primarily to new or different safety-related features which have not been considered and approved by the Commission in published opinions concerning other power reactor facilities.

18. The proposed reactor is to be located adjacent to the currently operating Dresden 1 nuclear power plant which is described in the Commission's decision published at 1 AEC 223 (1962). Dresden 2 will be in virtually all respects an independent plant. However, some power sources, the cooling and effluent water intakes and outlets, and the 300-foot stack for gaseous release, will be shared. The locations and arrangements of the two plants are designed to preclude the possibility that a single accident might render both plants unsafe or that an accident at one unit might propagate to the other. The gaseous and liquid effluents from the combined operation will be monitored and continuously maintained well

below the maximum concentration limits permitted by the Commission's regulations. The evidence indicates that the health and safety of the public will not be adversely affected on account of the adjacency of location of Dresden 2 to the existing atomic power reactor.

19. A significant new feature of the reactor here proposed is that its power is substantially greater than that of any existing or authorized nuclear plant. Its power rating is about 50% higher than the recently authorized Oyster Creek and Nine Mile Point plants. The reactor core, pressure vessel, and associated components have been scaled upward to achieve the higher power output. The approximate power density, the basic design of zircaloy clad fuel, the hydraulically operated control rods, and in-core neutron monitoring instrumentation have been demonstrated in one or more boiling water reactors now in operation. The proposed reactor containment and pressure suppression systems are comparable in principle to those in use at Humboldt Bay (as described at 1 AEC 511, ¶¶ 45 et seq.) and those under construction in the Oyster Creek and Nine Mile Point facilities.

20. The unprecedented size of the Dresden 2 pressure vessel, about 21 feet in diameter and 68 feet in height, the integrity of which is important to the control of fission products, elicited expressions of concern in the ACRS report. The Applicant's criteria for design and construction of the vessel, and the promised careful attention to these matters by the Applicant's and the Staff's technical personnel offer assurances that problems likely to be encountered in this pressure vessel's construction and testing will be recognized and solved. It is noted that the thick

water layer surrounding the core essentially eliminates the usual problem of radiation damage to the pressure vessel.

21. The possibility of accident conditions leading to a failure of the containment structure was considered in evaluating plant safeguards. A containment rupture or breaching by reason of overpressure or missile penetration, together with other internal reactor failures, could jeopardize public health and safety. An unlikely large accident such as a major coolant line break would not lead to an intolerable overpressure condition because the pressure suppression system and cooling facilities in redundancy are capable of overcoming excessive pressure and heat conditions. The possibility of increased or explosive pressures from an accompanying metal-water reaction is guarded against by maintaining an inert--less than 5% oxygen--atmosphere in the containment structure during reactor operation. Cautious attention to details of both design and construction should avoid the possibility that pipe failure or internally generated missiles might violate the integrity of the containment structure.

22. A major design feature of this facility which has not been used or authorized in other plants is the inclusion within the pressure vessel of a number of jet pumps to facilitate internal circulation of the primary coolant liquid. Detailed dimensions and arrangements of the twenty jet pumps have not been finally determined. The design of the jet pump system is such that most of the core can be reflooded in the event of a loss of flow accident. Studies and tests are being conducted to establish that multiple jet pumps within the pressure vessel will function as planned and without contributing to reactor instability. This proposed

innovation in reactor design portends no adverse impact upon public health and safety.

23. The record evidence shows and the Board therefore finds that the Applicant's design for construction of the Dresden 2 facility has been or can be conducted so as to fulfill all of the discernible requirements set out in the 27 criteria which were utilized by the Staff in its safety analysis of the project. The Applicant and the Staff have analyzed in detail the possible adverse effects upon public health and safety of major accidents within the realm of credible postulation. The Staff's more conservative assumptions and techniques corroborated--but with smaller margins--the Applicant's showing that radiation hazards from the postulated accidents are substantially below the maximum offsite dcses countenanced by the applicable regulations.

24. In response to Board inquiries at the prehearing conference, the Applicant submitted written comments, which were made a part of the record at the hearing, addressed in part to the general subject of relating the massive evidence--sometimes not inappropriately, or maybe conservatively, referred to as the 35 pounds of documents--specifically to each aspect of the stated issues. It was there urged that in this proceeding the Board properly could find that ". . . no further technical information and no research and development program is required to resolve any safety questions appropriate for consideration at the construction permit stage." Although this subject is accorded only affirmatively declared conclusions

in the Staff's proposed short decision, the Staff stated at the hearing that five features require further research and development.[3/]

25. The Board finds the Applicant's position to be well taken because none of the items cited as requiring further design effort are significant to the safety judgments now required to be made. The Staff analysis states, and underlining emphasizes, that, "On all components which are important for the safe operation of the Unit, the architectural and engineering criteria have been described." What remains to be done about the five cited features, as well as in many other architectural areas, is the development of details of design to meet known objectives. All such efforts will be analyzed and evaluated by the Applicant and the Staff as the project goes forward and all will be considered prior to licensing the facility for operation. Those matters are beyond the horizon at this provisional construction permit stage in the licensing process. Any apparent inconsistency between this holding and the Board's ultimate findings arises from a constraint to recite in rote language, to avoid misunderstanding, that the specified issues have been resolved favorably to the licensing action which is authorized.

Conclusions

26. Upon the basis of the consideration of the entire record in this proceeding, and in the light of the findings and discussion hereinabove

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3/ The five subjects for further R&D are these:

1. Development of in-core instrumentation,
2. Development of control rod worth minimizer,
3. Development of a rod dropout velocity limiter,
4. Development of jet pumps, and
5. Development of control rod thimble support.

set out, the Board has concluded that:

1. The Applicant has not supplied initially all of the technical information required to complete the application and support the issuance of a construction permit which approves all proposed design features; however,

2. In accordance with the provisions of 10 CFR § 50.35(a),

   (1) The Applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components on which further technical information is required;

   (2) The omitted technical information will be supplied;

   (3) The Applicant has proposed, and there will be conducted, a research and development program reasonably designed to resolve the safety questions, if any, with respect to those features or components which require research and development; and

   (4) On the basis of the foregoing, there is reasonable assurance that (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility and (ii) taking into consideration the site criteria contained in Part 100, the proposed facility can be constructed

and operated at the proposed location without undue risk to the health and safety of the public;

3. The Applicant is technically qualified to design and construct the proposed facility;

4. The Applicant is financially qualified to design and construct the proposed facility;

5. The issuance of a permit for the construction of the facility will not be inimical to the common defense and security or to the health and safety of the public.

Pursuant to the Act and the Commission's regulations, IT IS ORDERED this 29th day of December 1965, that, subject to review by the Commission upon its own motion or upon petition for review, if any is filed, Commonwealth Edison Company is authorized to construct the nuclear facility described in its application and in accordance with the evidence and representations presented and made in the record at the hearing, all in accordance with the principal architectural and engineering criteria set forth therein; and

IT IS FURTHER ORDERED that the Director of the Division of Reactor Licensing is directed to issue a provisional construction permit pursuant to § 104b of the Act substantially in the form of Attachment A hereto;

IT IS FURTHER ORDERED[4/], in accordance with § 2.764 of the Commission's Rules of Practice, that this Initial Decision shall become effective

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4/ The Applicant's motion for expedited effectiveness of this Initial Decision, being supported by good cause, is here granted.

ten days after the date of issuance thereof, and that in the absence of any further order from the Commission, it shall constitute the final decision of the Commission forty-five days after the date of issuance hereof, subject to the filing of a petition for review and to any order by the Commission upon such petition or upon its own motion.

ATOMIC SAFETY AND LICENSING BOARD

Eugene Greuling

Eugene Greuling

Hugh C. Paxton

Hugh C. Paxton

Attachments:
Attachment A
Appendix A

J. D. Bond

J. D. Bond, Chairman

Issued:
December 29, 1965
Germantown, Maryland

ATTACHMENT A

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-237

PROVISIONAL CONSTRUCTION PERMIT

Construction Permit No. CPPR-

1. Pursuant to Section 104b of the Atomic Energy Act of 1954, as amended (the Act), and Title 10, Chapter 1, Code of Federal Regulations, Part 50, Licensing of Production and Utilization Facilities, and pursuant to the order of the Atomic Safety and Licensing Board, the Atomic Energy Commission (the Commission) hereby issues a provisional construction permit to Commonwealth Edison Company (the applicant) for a utilization facility (the facility), described in the application and amendments thereto filed in this matter by the applicant and as more fully described in the evidence received at the public hearing upon that application. The utilization facility, known as Dresden Unit 2, is a single cycle boiling, light water reactor which is part of a facility designed to operate at 2300 megawatts (thermal) to be located at the Dresden Nuclear Power Station, Grundy County, Illinois.

2. This permit shall be deemed to contain and be subject to the conditions specified in Sections 50.54 and 50.55 of said regulations; is

subject to all applicable provisions of the Act, and rules, regulations and orders of the Commission now or hereafter in effect; and is subject to the conditions specified or incorporated below:

A. The earliest date for the completion of the facility is August 1, 1968, and the latest date for completion of the facility is June 1, 1969.

B. The facility shall be constructed and located at the site as described in the application, as amended, at the Dresden Nuclear Power Station, Grundy County, Illinois.

C. This construction permit authorizes the applicant to construct the facility described in the application and the hearing record in accordance with the principal architectural and engineering criteria set forth therein.

3. This permit is provisional to the extent that a license authorizing operation of the facility will not be issued by the Commission unless: (A) the applicant submits to the Commission, by amendment to the application, the complete final hazards summary report, portions of which m may be submitted and evaluated from time to time; (B) the Commission finds that the final design provides reasonable assurance that the health and safety of the public will not be endangered by the operation of the facility in accordance with procedures approved by it in connection with the issuance of said license; and (C) the applicant submits proof of financial protection and the execution of an indemnity agreement as required by Section 170 of the Act.

4. Pursuant to Section 50.60 of the regulations in Title 10, Chapter 1, CFR, Part 50, the Commission has allocated to the applicant for use in the operation of the reactor 8420.3 kilograms of uranium 235 contained in uranium in the isotopic ratios specified in the application. Estimated schedules of special nuclear material transfers to the applicant and returns to the Commission are contained in Appendix A which is attached hereto. Transfers by the Commission to the applicant in accordance with Column 2 in Appendix A will be conditioned upon the applicant's return to the Commission of material substantially in accordance with Column 3 (including the sub-columns headed Scrap and Depleted Fuel) of Appendix A.

FOR THE ATOMIC ENERGY COMMISSION

R. L. Doan, Director
Division of Reactor Licensing

Attachment:
Appendix A [not attached, see Item 9 of Joint Exhibit A]

Date of Issuance:

APPENDIX A TO INITIAL DECISION

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-237

ISSUES SPECIFIED IN THE NOTICE OF HEARING

The following issues will be considered at the hearing:

1. Whether in accordance with the provisions of 10 CFR § 50.35(a)

   (1) The applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components on which further technical information is required;

   (2) The omitted technical information will be supplied;

   (3) The applicant has proposed, and there will be conducted, a research and development program reasonably designed to resolve the safety questions, if any, with respect to those features or components which require research and development; and

   (4) On the basis of the foregoing, there is reasonable assurance that (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility and (ii) taking into consideration the site criteria contained in Part 100, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public;

2. Whether the applicant is technically qualified to design and construction the proposed facility;

3. Whether the applicant is financially qualified to design and construct the proposed facility;

4. Whether the issuance of a permit for the construction of the facility will be inimical to the common defense and security or to the health and safety of the public.

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

Formal File Copy

In the Matter of)
) Docket No. 50-237
COMMONWEALTH EDISON COMPANY)

CERTIFICATE OF SERVICE

I hereby certify that copies of the Initial Decision issued December 29, 1965 and Order Correcting Transcript issued December 29, 1965 in the captioned matter were served on the following by deposit in the United States Mail, first class or air mail, this 29th day of December, 1965:

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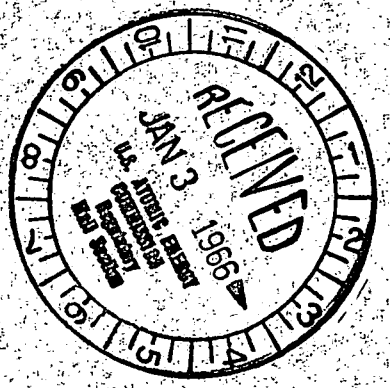

Info copies of Initial Decision to:

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Office of the Secretary

cc: J. B. Bond, Chairman, AS&L Board
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