

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

—
In the Matter of
COMMONWEALTH EDISON COMPANY
(Dresden Nuclear Power Station
Unit 1)

)
Docket No. 50-10
)

DETERMINATION WITH RESPECT TO VARIANCE
FROM THE INTERIM ACCEPTANCE CRITERIA
AND EXTENSION IN SUBMITTING EVALUATIONS
FROM THE ACCEPTANCE CRITERIA FOR EMERGENCY
CORE COOLING SYSTEM [10 CFR § 50.46(a)(2)(111)]

By letter dated June 10, 1974, the Commonwealth Edison Company (licensee) requested a variance for the Dresden Nuclear Power Station Unit 1 reactor from the requirement for achieving compliance with the Commission's Interim Acceptance Criteria (IAC) for Emergency Core Cooling Systems (ECCS) for Light-Water Power Reactors set forth in the Commission's Interim Policy Statement by July 1, 1974 (36 F.R. 12247, June 29, 1971). The variance requested was for an extension of time until January 1, 1976, to meet the requirements of the IAC. On July 19, 1974, the licensee supplemented its request for variance from the IAC by requesting the period of variance be extended from January 1, 1976, to September 1, 1976.

On June 14, 1974, the Director of Regulation published (39 F.R. 20834) a notice of the receipt of the licensee's request for a variance. This notice advised that the Director of Regulation was considering granting a variance from the IAC. This notice also invited the submission of views and comments by any interested persons. No comments were received. On

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In consideration of (1) the extremely low probability of a LOCA occurring simultaneously with a loss of all offsite power and (2) the capability of primary coolant leak detection and inservice surveillance to discover leaks or potential leaks before cracks can propagate appreciably, the staff has concluded that there is reasonable assurance that granting such variance will not adversely affect the health and safety of the public. We have considered and determined that a variance from the IAC for the full period requested, until September 1, 1976, would be acceptable, provided that the licensee makes additional modifications by September 1, 1976, to reduce the vulnerability of the Dresden Unit 1 ECCS to failure of a single onsite power source and continues inservice inspection at triple the frequency required by Technical Specifications. However, the licensee is also subject to the requirements of the Commission's revised acceptance criteria set forth in 10 CFR 50.46. As a result of the licensee's request for an extension of time to file an evaluation of ECCS performance in accordance with 10 CFR 50.46, the licensee will be required to file a preliminary evaluation of performance with the revised acceptance criteria by October 31, 1974. See discussion below. At that time the licensee may request an exemption from the Commission from the operating requirements of 10 CFR 50.46. Accordingly, this variance extends only until operation in conformity with the acceptance criteria of 10 CFR 50.46 is required, unless an exemption from such requirements is granted by the Commission.

In addition, this variance is subject to a requirement that the

~~licensee report periodically, but not less than once every three months~~

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commencing with the date of this determination to the Director of Regulation

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VARIANCE FROM INTERIM CRITERIA

By letter of May 1, 1972, the licensee submitted a report analyzing the conformance of Dresden 1 to the IAC. The report indicated that by use of an engineered safety system (the core spray system), installed after publication of the IAC and systems which are not specifically designed as engineered safety systems (emergency condenser and the primary feedwater system) the fuel clad temperatures and metal water reactions would remain below the limits specified in the IAC for any size primary system pipe break at any location. Cooling for small and intermediate breaks would be provided by the primary feedwater system. Cooling for large breaks, including a double ended rupture of the largest pipe below core level would be provided by the core spray system. In February 1973 the licensee submitted additional analyses based on the use of the same systems and accounting for the effects of fuel densification which again indicated that the IAC limits had been met. The Regulatory staff evaluated the analyses and in a letter to the licensee dated February 22, 1974, it concluded that even with densification effects, Core IX (the present core) meets the IAC limit of peak fuel clad temperature of less than 2300°F. Analyses submitted by the licensee also indicated that for a spectrum of large break sizes below the core, including the double ended break of the largest line, the IAC limits could be met without reliance on the feedwater system or offsite power. Therefore, in the event of a loss-of-coolant accident (LOCA), it is highly unlikely that the IAC limit for fuel clad temperature and metal water reaction would not be achieved.

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The requirement that the core temperature be reduced and decay heat be removed for an extended period of time, as required by the long-lived radioactivity remaining in the core, is fulfilled by the existing core spray system operated in a mode which recirculates water within the containment building and powered by either onsite or offsite power.

Although systems are available which can maintain fuel clad temperatures below 2300°F after a LOCA, the redundancy and level of reliability of installed systems should be improved in consideration of long-term operation, i.e., the system can be substantially reduced in effectiveness by a single failure independent of and coincident with a LOCA. The feedwater system would not be operable for small and intermediate size primary system pipe breaks if offsite power were lost coincident with a LOCA. Also the controls for the feedwater system were not specifically designed to meet single failure criteria and have not been evaluated for their vulnerability to single failure. The low pressure core spray system would not be available for large size primary system breaks if the LOCA were accompanied by loss of all offsite power and a loss of the single onsite emergency diesel generator.

Because the design of the present ECCS does not meet the IAC, the licensee has committed to installing a high pressure coolant injection system by September 1976 which would supersede the feedwater system and emergency condenser and would eliminate the need for offsite power for motive power for the high pressure pumps. Since the system as proposed would still be dependent on the single onsite diesel generator and single

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battery system, the licensee will be required to make additional modifications to remove the vulnerability to failure of single onsite power sources. In discussions with the licensee, the Regulatory staff has been informed that the requirement for another diesel generator and battery system would not prolong the schedule for completion of an upgraded ECCS.

Since publication of the IAC, the licensee has taken steps to decrease the probability of occurrence of primary system pipe cracks and large coolant leaks. By letters dated November 11, 1971, and December 29, 1971, the licensee proposed an augmented reactor coolant system pressure boundary inservice inspection program in accordance with Section IV.c.1.b.(3) of the IAC. In a letter of February 2, 1972, the Regulatory staff approved the program as fulfilling the inservice inspection requirements of the IAC. In response to proposed program revisions from the licensee dated January 25 and May 17, 1973, the Regulatory staff again evaluated the inservice inspection program and approved the revised program by letter of September 17, 1973.

The Dresden Unit 1 reactor is equipped with highly sensitive leak detection systems. Two of the systems, a continuous containment air monitor and a continuous stack air monitor are capable of detecting leaks well under one gpm. In addition, a containment compartment sampling system is available which is less sensitive than the continuous air monitors but which has capability for leak detection and is an aid in locating a leak. By amendment dated July 29, 1974, the Regulatory staff issued Technical Specifications which require that on detection of a radiation level increase equivalent to a leak rate of about 0.01 gpm, action be initiated to either

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The Dresden Unit 1 reactor is one of the earliest boiling water reactor designs. As a consequence, an ECCS evaluation model and accompanying ECCS performance analysis had to be developed by the licensee and its contractors taking into account the specific Dresden Unit 1 reactor design. This has and continues to involve significant amounts of time in order to perform and evaluate the various computations. The licensee has informed us that additional delays were encountered in obtaining enough information to estimate design requirements of the HPCI. As a result of these delays in obtaining the required information and analyses to design the system, the licensee was only recently able to request bids for equipment with long lead time. Additional time is now required by the licensee for awarding contracts, fabrication, delivery, erection, and testing.

The Regulatory staff met with the licensee representatives on July 18, 1974 to review the licensee's schedule for completion of the modifications. The staff examined the various equipment delivery and installation schedules presented at the meeting and in the licensee's letter of July 19, 1974 and in light of the staff's knowledge of the general installation requirements and procurement situation for nuclear reactor grade equipment it is satisfied that the proposed schedule for having all proposed additional components installed and operable by September 1, 1976, represents a reasonable, minimum time to complete the major modifications which are planned and required. The staff has determined that good cause exists for authorization of the requested variance from the requirements of the IAC.

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In consideration of (1) the extremely low probability of a LOCA occurring simultaneously with a loss of all offsite power and (2) the capability of primary coolant leak detection and inservice surveillance to discover leaks or potential leaks before cracks can propagate appreciably, the staff has concluded that there is reasonable assurance that granting such variance will not adversely affect the health and safety of the public. We have considered and determined that a variance from the IAC for the full period requested, until September 1, 1976, would be acceptable, provided that the licensee makes additional modifications by September 1, 1976, to reduce the vulnerability of the Dresden Unit 1 ECCS to failure of a single onsite power source and continues inservice inspection at triple the frequency required by Technical Specifications. However, the licensee is also subject to the requirements of the Commission's revised acceptance criteria set forth in 10 CFR 50.46. As a result of the licensee's request for an extension of time to file an evaluation of ECCS performance in accordance with 10 CFR 50.46, the licensee will be required to file a preliminary evaluation of performance with the revised acceptance criteria by October 31, 1974. See discussion below. At that time the licensee may request an exemption from the Commission from the operating requirements of 10 CFR 50.46. Accordingly, this variance extends only until operation in conformity with the acceptance criteria of 10 CFR 50.46 is required, unless an exemption from such requirements is granted by the Commission.

In addition, this variance is subject to a requirement that the

~~licensee report periodically, but not less than once every three months~~
commencing with the date of this determination to the Director of Regulation
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its efforts in attempting to achieve compliance with the IAC. Should these reports reveal that the licensee is not pursuing such compliance in a reasonably diligent manner, the variance may be subject to revocation.

Extension of Time for Submission of Evaluation in Conformity with § 50.46 - *all copy*

In support of its request for an extension of time, the licensee states that it does not expect to receive the ECCS evaluation model and analyses from the General Electric Company (GE) for Dresden Unit 1 before March 1, 1975. The licensee states that the requested extension will allow approximately one month to review the results of the analyses and develop appropriate Technical Specifications changes. The basis for the remaining time of the requested extension was to allow time for filing a request for exemption in the event that became appropriate.

It is evident from the licensee's request that the basis for an extension of time is the unavailability of the necessary evaluation models and analyses from GE. Since the promulgation of the regulation, the Regulatory staff has been engaged in a continuing effort to develop an AEC evaluation model which would meet the requirements of Appendix K of 10 CFR Part 50. A similar effort has been underway by the four vendors of nuclear steam supply systems for light-water nuclear power reactors, including GE. As the Regulatory staff recognizes from its efforts, this development work has involved a considerable amount of time.

Furthermore, the Dresden 1 reactor is an older design which requires significant changes in the evaluation models now being calculated for most of GE's newer designs. GE must therefore prepare a separate evaluation

model and analysis which is tailored to the Dresden 1 reactor, which will

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involve additional time beyond the time estimated for submission of the evaluation models for the newer designs.

Based upon the Regulatory staff's experience and its knowledge of the efforts on the part of GE to develop adequate evaluation models and analyses, the Regulatory staff believes that the licensee's statements regarding delay by GE in completing and submitting to it an evaluation model and analyses constitute good cause for extension of the August 5, 1974, deadline for the submittal of the information required by 10 CFR Section 50.46.

The Regulatory staff, however, does not believe the licensee has justified in its submittal the length of time requested. The Regulatory staff has independently developed a schedule of the steps and average times that should be sufficient for internal review by the licensee after transmittal by GE of the GE evaluation and analyses to the licensee.

This schedule takes into account the review schedules submitted by all licensees who have requested extensions as well as the Regulatory staff's own views as to the minimum time which should be required for the licensees to conduct the necessary reviews and to prepare the necessary information for submittal to the Regulatory staff. The Regulatory staff's schedule is as follows:

1. Engineering review (including Q/A review) of evaluation models and analyses. (7 days)
2. Preparation of proposed Technical Specifications and revised operating procedures. (14 days)
3. Review by plant operations and nuclear safety committee and

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appropriate company nuclear review committee. (10 days)

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4. Submit. (4 days)

Total Time: 35 days.

Based upon the above, the Regulatory staff has concluded that an extension of time of 35 days should be granted to the licensee commencing with the date of transmittal by GE of the GE model and analyses to the licensee.

The Regulatory staff has taken the comments of Friends of the Earth and Consolidated National Intervenors into account in reaching its determination reflected herein. In this regard, the Regulatory staff believes that, as noted above, the licensee has shown good cause for the granting of an extension of time. The Regulatory staff did not consider in its determination of good cause the need for additional time in which to file an exemption request.

However, while there may be good cause for the licensee's inability to supply a complete evaluation of ECCS performance in accordance with section 50.46, including all required and acceptable elements and documentation in accordance with Appendix K, until April 4, 1975, the Regulatory staff believes that preliminary evaluation, based on conservative assumptions, but not necessarily including all of the detail and documentation called for by Appendix K, but which nevertheless provides a conservative assessment of ECCS performance under the Commission's Acceptance Criteria, should be provided by October 31, 1974. The staff recognizes that simplifying, but conservative, assumptions must be made in order to provide the evaluation by October 31, 1974, but the submittal must present details of such assumptions and estimates and supporting discussion to demonstrate that the preliminary evaluation meets

the Commission's acceptance criteria, and include proposed operation limits, if any, required to bring the reactor into conformity with the Commission's acceptance criteria. Upon receipt of the final evaluation model and analysis from the vendor, the licensee shall submit this evaluation model and analysis for concurrent review by the Regulatory staff.

ACCORDINGLY, based on the foregoing considerations, the Director of Regulation has granted a variance for the Dresden Nuclear Power Station Unit 1 which extends the date for compliance with the requirements of the Interim Acceptance Criteria until September 1, 1976, provided (1) the licensee shall report periodically, but not less than once every three months commencing with the date of this determination to the Director of Regulation its efforts in attempting to achieve compliance with the IAC. Should these reports reveal that the licensee is not pursuing such compliance in a reasonably diligent manner, the variance may be subject to revocation, (2) this variance extends only until operation conformity with the acceptance criteria of 10 CFR 50.46 is required. If an exemption from such requirements is granted by the Commission, such exemption shall govern any further operation of the facility.

In addition, based on the considerations set forth above and for good cause shown, the Director of Regulation hereby grants an extension of time to the licensee which extends the date for compliance with the requirements of 10 CFR subsection 50.46(a)(2)(11) from August 5, 1974, until April 4, 1975, provided that (1) upon receipt of the final evaluation model and analysis from the vendor, the licensee shall submit this evaluation model

and analysis for concurrent review by the Regulatory staff and (2) on or before October 31, 1974, the licensee shall submit a preliminary evaluation of ECCS performance consistent with the requirements of Appendix K although not necessarily containing the full detail and the full documentation called for in Appendix K, along with proposed license amendment or Technical Specification changes which would bring reactor operation into conformity with the requirements of section 50.46. Upon submission, the licensee shall operate within the limits of such proposed technical specification and all technical specifications previously imposed by the Commission, including the requirements of the Interim Policy Statement (36 F.R. 12247, as amended by 36 F.R. 24082 December 18, 1971), or any variance granted from such requirements unless the licensee files with the Commission a request for exemption from the requirements of section 50.46. and such request is granted.

Dated at Bethesda, Maryland, this 5th day of August 1974.

FOR THE ATOMIC ENERGY COMMISSION

(signed) L. Manning Muntzing

L. Manning Muntzing
Director of Regulation

*Noted by Abila
R. Howard 8/5/74
A. M. Reed
PDR*

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