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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:

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James P. Gleason, Chairman

Dr. Jerry R. Kline

Mr. Glenn O. Bright

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

In the Matter of

CLEVELAND ELECTRIC ILLUMINATING
COMPANY, et al.

(Perry Nuclear Power Plant,
Units 1 & 2)

Docket Nos. 50-440-OL
50-441-OL

ASLBP No. 81-457-04 OL

~~RECEIVED~~ FEB 28 1985

February 27, 1985

MEMORANDUM AND ORDER
(Motion for Summary Disposition on In-Core
Thermocouples, Issue 14)

We consider here the Cleveland Electric Illuminating Company, et al. (Applicants) motion for summary disposition of Issue 14 (hereinafter "Contention"). The motion is supported by the staff of the Nuclear Regulatory Commission (Staff) and is not opposed by any intervening party in the proceeding.

We conclude, after reviewing the statements, affidavits, interrogatories and filings that no issues of material fact exist relative to this Contention and that the Applicant is entitled to summary disposition as a matter of law.

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The legal standards in NRC proceedings for summary disposition have been correctly cited in prior orders of the Board¹ and in Applicant's and Staff's filings herein.² Consequently, they require no repetition. We do reiterate that where no party opposes a motion for summary judgment, the movant still carries a burden of establishing the absence of a genuine issue of material fact.³

BACKGROUND

The Contention addressed by Applicant's motion was filed by Intervenor, Ohio Citizens for Responsible Energy (OCRE), and as admitted by the Board reads as follows:

Applicant has not demonstrated that the Perry Nuclear Power Plant will meet regulatory safety requirements unless it installs in-core thermocouples as suggested by Staff regulatory guidelines, including Regulatory Guide 1.97, Rev. 2.

The bases for the Contention in addition to the Regulatory Guide are:

- (1) The TMI Action Plan Item II.F.2. (see NUREG-0737) requiring such thermocouples;
- (2) A study by Battelle Laboratory referenced in a letter by a Col. Wheeler to the NRC (April 6, 1981) suggesting that

¹ Cleveland Electric Illuminating Company, et al. (Perry Nuclear Power Plant, Units 1 and 2), LBP-82-114, 16 NRC 1909, 1911-1913 (1982).

² See Applicant's Motion for Summary Disposition of Issue 14, pp. 3-5 (January 14, 1985) and NRC Staff Response, p. 2 (February 4, 1985).

³ Cleveland Electric Illuminating Company, et al. (Perry Nuclear Power Plant, Units 1 and 2), ALAB-443, 6 NRC 741, 753-754 (1977).

thermocouples would indicate inadequate core cooling (ICC) at a rapid rate (1.5 minutes);

(3) The Accident Hazards of Nuclear Power Plants, by Dr. Richard E. Webb, at 59-61. This reference is to a General Electric study wherein there was an indication that localized overheating resulting from a blockage of coolant could result in core meltdown or steam explosions. It was contended by Intervenor that thermocouples would detect such overheating prior to fuel failure and avert the foregoing consequences; and

(4) Another General Electric study (October 1981) evaluating the need for BWR thermocouples wherein it was asserted that thermocouples could provide useful and unambiguous information in the event of a loss of cooling water.

In support of the motion for summary disposition, both Applicant and Staff filed supporting affidavits from qualified witnesses.⁴ The Applicant also filed a statement of material facts as required by 10 CFR, § 2.749(a).

⁴ Applicants: Charles D. Johnson, General Manager and Engineering Consultant, S. Levy, Inc.; Frank R. Stead, Manager, Nuclear Engineering Department, Cleveland Electric Illuminating Company; Gary R. Leidich, Supervising Eng., Nuclear Construction, Engineering Section, Cleveland Electric Illuminating Company; Staff: Summer B. K. Sun, Nuclear Engineer, Core Performance Branch, Office of Nuclear Reactor Regulation, N.R.C.

THE FACTS

The developments concerning regulatory requirements on installing in-core thermocouples in BWR's is evident from the previous filings in this proceeding as well as those supporting this motion. Revision 2 of Regulatory Guide 1.97 (December 1980) carried a provision requiring thermocouples as did the TMI Action Plan, Item II.F.2. As a member of the BWR Owner Group (BWROG) the Applicants adopted the Group's alternative position that additional instrumentation, beyond that existing in the plant, was not required to monitor ICC adequately. The Applicants relied on differential pressure instruments to measure drops in the water level inside the reactor. After several conferences, the Applicant and Staff agreed to have the ICC instrumentation requirement studied further. (See Perry SER, Section 4.4.7, NUREG-0887). The studies, conducted under the auspices of BWROG by S. Levy, Inc., established the following:

1. A detailed analysis of water level measurement systems in BWR's, like Perry, shows that such systems are highly reliable except for flashing and density changes caused by drywell overheating. (Johnson Affidavit at 13).
2. Several design changes in reference leg piping and flow restricting orifices should be implemented in Perry-type BWR's to eliminate such flashing and density changes. (Id. at 14).

3. The water level measurement systems at Perry-type BWR's will function adequately even when instrument failures occur. (Id. at 15).

4. The probability of a core melt accident due to water level instrumentation failure is approximately 0.48 events/million reactor years. (Id. at 18).

5. There are limiting inadequacies that result from placing BWR thermocouples in the only feasible in-core location--inside local power range monitor tubes: a) thermocouples will react to a loss of coolant only after critical time delays; b) thermocouples can indicate erroneous temperature readings; and c) in order to detect localized overheating, the large numbers of thermocouples required would interfere with coolant flow and contribute to localized overheating. (Id. at 25-28).

6. The benefit, if any, that could possibly be expected from the installation of in-core thermocouples would be extremely small. (Id. at 29).

As a result of the BWR0G studies, the thermocouple requirement was deleted from TMI Action Plan (NUREG-0737, Supplement 1) and also by Revision 3 from Regulatory Guide 1.97. (Sun Affidavit at 4). The Staff concluded that improvements to the Applicant's water level instrumentation in the drywell area as recommended by the studies would be sufficient to provide adequate detection of ICC. (Id. at 8). Further, the Staff agreed that in-core thermocouples did not provide unambiguous information and that, aside from the improvements referred to, supra, no additional instrumentation was necessary to detect ICC at Perry. (Id. at 9-10).

The design and construction of the water level measurement system in the drywell area was changed as recommended by the BWROG studies. (Stead Affidavit at 6-8; Leidich Affidavit at 2). Both the Applicant's and Staff's affidavits referred to the Battelle analysis submitted as a basis for Intervenor's Contention and concluded that the short response time for thermocouples reported by Battelle was attributable to a high heat-up rate that was used in its study. When the same heat rate was used, the BWROG and Battelle analysis were comparable. However, the Battelle analysis was seen as too conservative and impractical to justify the use of thermocouples. (Johnson Affidavit at 32; Sun Affidavit at 11).

The 1970 General Electric Report cited by Dr. Webb (p. 2, supra) concluded that localized overheating would not lead to steam explosions or melting propagation throughout the core. (Johnson Affidavit at 33). Subsequent studies by G.E. concluded that even extensive flow blockage resulting in localized overheating would not lead to unacceptable conditions in a BWR. (Sun Affidavit at 12). Finally, the 1981 G.E. study only refers to thermocouples above the core and provides no support for the proposition that in-core thermocouples could provide unambiguous information on ICC. (Johnson Affidavit at 35).

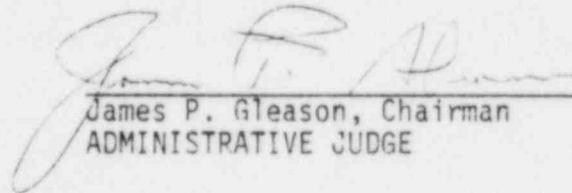
CONCLUSION

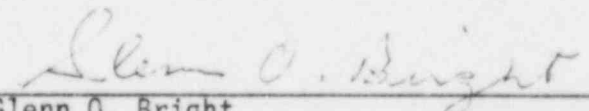
In view of the above uncontradicted statements of fact, and in light of our review of the entire record of this proceeding, we find that no genuine issues of material fact exist concerning this Contention. Nor do we find any issue existing herein concerning public health

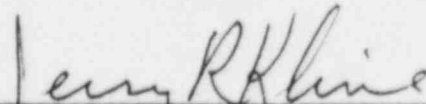
and safety. Accordingly, the Applicant's motion for summary disposition of Contention (Issue) 14 is granted as a matter of law.

ORDERED.

FOR THE ATOMIC SAFETY AND
LICENSING BOARD


James P. Gleason, Chairman
ADMINISTRATIVE JUDGE


Glenn O. Bright
ADMINISTRATIVE JUDGE


Jerry R. Kline
ADMINISTRATIVE JUDGE

Bethesda, Maryland