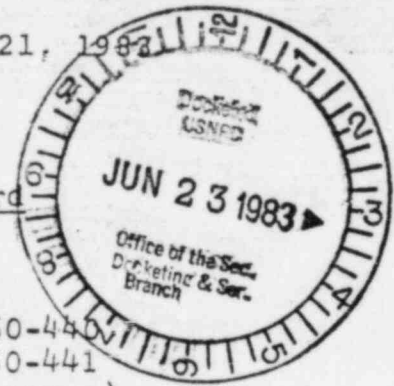


June 21, 1983

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of)

CLEVELAND ELECTRIC ILLUMINATING)
COMPANY, Et Al.)(Perry Nuclear Power Plant,)
Units 1 and 2))Docket Nos. 50-440)
50-441)
(Operating License)OCRE'S RESPONSES TO APPLICANTS' INTERROGATORIES AND
REQUEST FOR PRODUCTION OF DOCUMENTS (FOURTH SET)Issue #13 Turbine Missiles

1-3. OCRE will defer answering these interrogatories pending the appraisal of the referenced documents by consultants possessing expertise in these matters.

Issue #14 In-Core Thermocouples

4. (a) The thermocouple range of 200-2300°F is based on Regulatory Guide 1.97, Revision 2, Table 1, wherein this range is specified.
- (b) The stated accuracy of $\pm 5^\circ\text{F}$ was a judgement of an acceptable accuracy. Since the thermocouples now suggested by OCRE (see "OCRE's Supplemental Response to Applicants' Third Set of Interrogatories") appear to be more accurate than this (calibration tables of temperature vs. output voltage in the reference cited indicate resolution to 1°F throughout the -300 to 2500°F range), the point is moot.
5. As stated in OCRE's response to Interrogatory 15 (Applicants' Third Set), OCRE has not formally analyzed the exact numbers and locations of thermocouples. The basis for the statement quoted in this interrogatory is that the 41 thermocouples in

DSD3

the topmost LPRM thimbles would provide the maximum available coverage at that axial height for detecting inadequate core cooling, core uncover, or localized hot spots (e.g., fuel bundle blockage). The remaining 12 thermocouples (3 per quadrant) would serve this function at another axial height in the core, thereby alerting operators to further uncover of the core.

The numbers given were merely an example of an acceptable system. Using all LPRM locations (164) would provide even more coverage.

6. (a) The GE Evaluation of the Need for In-Core Thermocouples in BWRs, Section 1.0, states that "the most practical location to install in-core thermocouples in a BWR is in the in-core power range monitor (PRM) instrument assemblies. All other locations would require additional penetrations and major redesign of the vessel internals and/or the fuel bundles." OCRE does not accept this premise because this statement does not contain or reference any supporting evidence to support that conclusion.

- (b) Since OCRE has not conducted research into this matter, no such locations have been identified.

7. (a) Although experiments conducted in a fueled reactor would provide the most useful and directly applicable information, both with respect to in-core thermocouples and to general unresolved questions on reactor safety, safety hazards would probably preclude this. In any event, such experiments should not be conducted on the PNPP reactors because of the hazard to public safety. Rather, if experiments are to be conducted

on a fueled reactor, it should be located in a remote, sparsely populated location, with added safety features, such as an extremely strong containment and underground construction.

For the experiments suggested by OCRE with regard to in-core thermocouples, a simulated reactor with fuel rods heated electrically would be sufficient. Such a test reactor should faithfully simulate the geometry of a BWR, with respect to fuel bundles, control rods, steam separators, steam dryers, and other RPV internals, provide feedwater at temperatures typical of BWR operation, have recirculation loops and jet pumps, safety-relief valves, and be capable of simulating various transient and LOCA conditions, as well as typical core power levels throughout the core. Variables to be measured include vessel water level, fuel cladding temperature (with thermocouples affixed to the cladding), and thermocouple response, with thermocouples located in the LPRM thimbles or other possible locations.

(b) The general methodology for such experiments would involve measuring in-core thermocouple response, fuel cladding temperature, and reactor water level in response to various simulated accident conditions suggested below. Detailed examination of the fuel rod cladding after each accident simulation could provide confirmatory information on temperatures reached. The data generated would confirm whether or not in-core thermocouples provide useful, timely, and unambiguous information, and could provide a basis for possible charts, graphs, or computer programs which could aid operators in interpreting thermocouple response.

(c) The accident conditions to be simulated are those involving loss of ^acoolant inventory and/or insertion of reactivity, including but not necessarily limited to the following:

large break LOCA

small break LOCA

(with and without ECCS)

opening of a SRV,

stuck-open SRV

fuel bundle blockage

rod drop accident

loss of feedwater flow

The heat-up rates simulated for these events should be based on the best available data and calculations, including those of the NRC and independent analysts. Since OCRE has not conducted research into these matters, the exact heat-up rates cannot be specified.

The accident conditions identified above were chosen because they represent (1) situations in which reliance is placed primarily on level measurement (in-core thermocouples here serving as a redundant and diverse indication of water level); (2) situations in which the usefulness of in-core thermocouples has been questioned (during ECCS operation and SRV opening); and (3) conditions which would not be detected by existing instrumentation (localized heating, such as fuel bundle blockage).

(d) The experiments described above are the same as the "experimentation" referred to in OCRE's response to Interrogatory #17 of Applicants' Third Set of Interrogatories.

(e) Not applicable.

8. (a) All documents relied upon are identified in the responses.
(b) No such persons have been identified.

Issue #15 Steam Erosion

9. Applicants in their response to OCRE's Interrogatory 9-34 state that MSIV leakage will be detected by Type C tests (see Appendix J to 10 CFR § 50). OCRE considers this general methodology appropriate, if the tests are conducted with sufficient frequency.

IE Information Notice 82-23 states that the NRC is considering the need for, inter alia, more frequent MSIV testing. This would seem prudent, given that the testing programs of the other licensees had failed to detect MSIV leakages in excess of 3000 scfm until the regularly scheduled testing intervals.

10. (a) All documents relied upon are identified in the response.
(b) No such persons have been identified.

General Interrogatories

- 11-14. The relevant information requested is provided in the attached affidavit.

Respectfully submitted,



Susan L. Hiatt
OCRE Representative
8275 Munson Rd.
Mentor, OH 44060
(216) 255-3158