November 30, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	
CLEVELAND ELECTRIC ILLUMINATING COMPANY, Et Al.	Docket Nos. 50-440 50-441
(Perry Nuclear Power Plant, Units 1 and 2)	(Operating License)

OHIO CITIZENS FOR RESPONSIBLE ENERGY RESUBMISSION OF SIXTH SET OF INTERROGATORIES TO STAFF WITH THE PRESIDING OFFICER AND MOTION REQUESTING THE PRESIDING OFFICER TO REQUIRE THE NRC STAFF TO ANSWER SAME

I. Introduction

On September 13, 1982, Intervenor Ohio Citizens for Responsible Energy ("OCRE") filed its Sixth Set of Interrogatories, pertaining to Issue #8, to the NRC Staff. By letter dated October 29, 1982, counsel for Staff informed OCRE's Representative that the Staff would not voluntarily answer any of the interrogatories, claiming that they are beyond the scope of Issue #8, as defined by the Appeal Board in ALAB-675, 15 NRC 1105 (1982). During the conference call held on November 15, 1982 in an attempt to resolve this controversy between OCRE and the Staff,[1] the Licensing Board deter-

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1/ OCRE does not believe that this conference call totally solved the dispute. An accident scenario still has not been determined. Although there was some discussion of an accident scenario involving a worst-case small break LOCA, with defeat by plant operators of all make-up water and heat removal systems, entailing an 80% metal-water reaction, no conclusions were made either to adopt this scenario or to solicit filings from the parties as to the

(continued next page)

mined that, in order to compel discovery on the Staff, OCRE would have to refile the interrogatories, pursuant to 10 CFR 2.720(h)(2)(ii), and make the showings required therein before the Board could direct the Staff to answer the interrogatories. The Licensing Board accepted OCRE's suggested deadline of November 30, 1982 for this filing.

OCRE hereby resubmits the interrogatories (attached) and moves the presiding officer to require the Staff to answer the interrogatories specifically identified in Part III below.

II. The Standards for Discovery Against the NRC Staff

10 CFR 2.720(h)(2)(ii) governs discovery by means of interrogatories against the Staff. In order to compel the Staff to answer interrogatories, a two-fold test must be met: first, that the answers to the interrogatories are necessary to a proper decision in the proceeding, and, second, that the answers to the interrogatories are not reasonably obtainable from any other source. OCRE will demonstrate that both of these criteria have been met in Part III below.

Some of the interrogatories are in fact document requests. Document requests to the Staff are governed by 10 CFR 2.744. Subpart (d) to that section again defines two criteria for the

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1/ continued. suitability or credibility of the scenario. It is OCRE's position, in accordance with the explicit directives of ALAB-675, that it is the Licensing Board's responsibility to define the scenario. OCRE would appreciate the Board's prompt attention to this matter, as counsel for Staff has indicated to OCRE's Representative the possible intention of the Staff to move for summary disposition of Issue #8 if such a scenario is not promptly determined. This would obviously prejudice OCRE if it were deprived of the right to litigate such an important issue.

production of Staff documents; first, that the document is relevant to the proceeding, and second, that the information is not reasonable obtainable from any other source. However, the decision in Consumers Power Company (Palisades Nuclear Power Facility), ALJ-80-1, 12 NRC 117 (1980) held that document requests against the Staff must be enforced where relevancy has been demonstrated unless production of the document is exempt under 10 CFR 2.790. In that case, and only then, must it be demonstrated that disclosure is necessary for a proper decision in the proceeding. The Staff has not claimed that any of the documents requested by OCRE are exempt under 10 CFR 2.790; OCRE will therefore only demonstrate relevancy in its document requests.

Although the regulations do not specifically address this issue, OCRE feels that it is incumbent upon the Licensing Board to consider the public interest in compelling discovery against the Staff. OCRE is a public interest group with limited financial resources; it cannot be expected to participate meaningfully in this proceeding without access to NRC documents.[2/] Indeed, it is essential to fairness and justice that the Board, by compelling discovery against the Staff, alleviate to some

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2/ Counsel for Staff has repeatedly informed intervenors that NRC documents are available for inspection and copying at the NRC's Public Document Room in Washington, D.C. However, OCRE members do not live in Washington. It becomes rather inconvenient to drop by the PDR to examine documents when one lives in Ohio. If OCRE members are forced to journey to Washington to obtain documents, this can only result in the delay of this proceeding.

degree the disadvantage at which OCRE finds itself due to the vast disparity of resources between Staff and Applicants, on one hand, and intervenors, on the other.

III. Discussion of Specific Interrogatories

Interrogatories 6-1, 6-2, and 6-25: These interrogatories must be answered by specific individuals on the Staff; the information requested is not available otherwise. Counsel for Staff has admitted that Interrogatory 6-1 is relevant to Issue #8 (see letter dated October 29, 1982 from James M. Cutchin IV to Susan L. Hiatt); however, the Staff refused to answer the interrogatory properly (under oath or affirmation) as required by 10 CFR 2.740b(b). All 3 of these interrogatories concern accident scenarios, the determination of which, according to the Appeal Board in ALAB-675, is the first step in the litigation of Issue #8. This information is thus necessary for a proper decision in this case.

Interrogatories 6-3 and 6-4: These interrogatories concern the MARCH code, a methodology which is capable of analyzing many plant conditions and parameters as a function of time for different accident sequences. Rate and quantity of hydrogen production are among the items calculated; such information is obviously relevant to Issue #8. Indeed, the Staff, by refusing to release this information, places OCRE in a Catch-22 situation the Staff expects OCRE to define the TMI-2 type accident scenari for Perry, yet will not provide OCRE with the information neces to do so. MARCH code calculations for Perry (or Grand Gulf,

if the Staff has not performed calculations for Perry) would obviously aid the Board in the selection of a scenario and would be necessary for the subsequent litigation of the adequacy of PNPP hydrogen control methods once the scenario is selected. It is also important to know the limitations of the MARCH code to ensure that the data being relied upon is accurate. OCRE is not aware that this information is available from any other source.

Interrogatories 6-5, 6-12, 6-13, 6-26, and 6-30: These interrogatories pertain to the strength of the Mark III containment used at PNPP. OCRE considers this concern to be of central importance to Issue #8; this information is thus necessary to a proper decision and must be provided by individual members of the NRC Staff.

Interrogatories 6-6, 6-7, and 6-10: These interrogatories pertain to the suitability and efficacy of the various hydrogen control systems proposed for the BWR Mark III containment. It is vital that the Staff's position on these methods be fully delineated and explained. Obviously this information cannot be obtained from any other source than the particular Staff members responsible for same. (OCRE would note that the fact that this same information was requested of Applicants does not nullify the showing on the second criterion of 10 CFR 2.720(h)(2)(ii), i.e., that the information is not available elsewhere. It is the Staff's perspective that OCRE seeks, and this may well be vital to a proper decision in this proceeding.)

Interrogatories 6-8, 6-14, 6-15, 6-32, and 6-34: These interrogatories deal with the effectiveness and safety of using

recombiners to control hydrogen in the containment. Although recombiners are intended for use during the design basis LOCA, rather than a degraded core accident, OCRE is unsure whether the recombiners might be used during the early phases of such an accident. (Applicants' procedures for the hydrogen control system are not yet developed.) If in fact recombiners are used in early phases of a severe accident, and the hydrogen generation rate increases rapidly, it is possible that the rate of hydrogen production will exceed the capability of the recombiners; it is even possible, under such circumstances, that the recombiners will trigger an expolsion. Information concerning the effective range of H_2 concentrations of the recombiners and the degree to which they might become ignition sources, including data on explosions in off-gas systems which might be due to the recombiners used therein, becomes relevant to Issue #8. OCRE believes that this information must be provided by individual Staff members.

Interrogatories 6-9 and 6-11: These interrogatories deal with the proposed hydrogen control rule and the ongoing research referred to therein. It is important for OCRE to be aware of both regulatory developments and new research pertinent to Issue #8. OCRE is not aware that this information is available elswhere.

Interrogatories 6-16, 6-17, 6-18, and 6-24: These interrogatories concern the safety and efficacy of using glow-plug igniters as a hydrogen control method. Applicants have proposed the use of igniters at Perry to control hydrogen resulting from a degraded core accident. It is therefore obvious that the in-

formation requested herein in necessary for a proper decision in this case and that this information must be supplied by particular Staff members.

Interrogatories 6-19 and 6-21: These interrogatories question whether the Perry hydrogen control system (including igniters) meet all NRC regulatory requirements. This information is necessary for a proper decision in this case and cannot be obtained from any source other than the NRC Staff.

Interrogatory 6-20: This interrogatory pertains tc sources of ignition within the Perry containment. This information is relevant to Issue #8, as at low concentrations (less than 18 vol-%) an ignition source must be present to cause burning of hydrogen. OCRE maintains that this information must be supplied by individuals on the Staff.

Interrogatory 6-22: This interrogatory concerns the qualification for accident environments of the hydrogen analyzers to be used at PNPP. Use of the analyzers is the first step in the hydrogen control sequence at Perry; the timely initiation of the analyzers may be dependent upon the environment to which they will be exposed. This interrogatory must be answered by individuals on the NRC Staff.

Interrogatories 6-23, 6-31, and 6-33: These interrogatories pertain to the hydrogen mixing system to be employed at Perry. Although the mixing system is primarily designed for the design basis accident, OCRE is unsure whether they might be used along with the igniters for a more severe accident (Applicants have not yet developed procedures addressing this

matter). Also, it is possible that the mixers would be used at the early phases of an accident which later escalates to a more severe condition. The effectiveness of the mixers could affect later stages of the accident, with regard to containment integrity. The information is thus relevant to Issue #8 and must be supplied by the Staff.

Interrogatories 6-27, 6-28, and 6-29: These interrogatories concern the pressure and temperature transient experienced by the Perry containment as a result of hydrogen combustion. Such information is necessary to a proper decision in this case, and must be provided by individual Staff members.

Interrogatory 6-35: This interrogatory questions whether the Staff has found the manual initiation of the Perry hydrogen control system to be acceptable. OCRE suspects that manual actuation of this system may be unreliable due to the chance of operator error. The hydrogen control system cannot be effective if it is not initiated in a timely manner. Thus, this information is vital to a proper decision in this matter. Only the Staff can provide this information.

Interrogatory 6-37: This is a general interrogatory, the answer to which may provide OCRE with information that is necessary to a proper decision in this proceeding. It can only be answered by members of the Staff.

Respectfully submitted,

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CERTIFICATE OF SERVICE

This is to certify that copies of the foregoing OHIO CITIZENS FOR RESPONSIBLE ENERGY RESUBMISSION OF SIXTH SET OF INTERROGATORIES TO STAFF WITH THE PRESIDING OFFICER AND MOTION REQUESTING THE PRESIDING OFFICER TO REQUIRE THE NRC STAFF TO ANSWER SAME were served by deposit in the U.S. Mail, first class, postage prepaid, this 30th day of November, 1982 to those on the service list below.

Susan L. Hiatt

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September 13, 1982

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

Before the Atomic Safety and Licensing Board

'82 DEC -2 A10:08

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)

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

OHIO CITIZENS FOR RESPONSIBLE ENERGY
SIXTH SET OF INTERROGATORIES TO NRC STAFF

Ohio Citizens for Responsible Energy ("OCRE") hereby propounds its sixth set of interrogatories to the NRC Staff, pursuant to the Licensing Board's Memorandum and Order of July 28, 1981 (LBP-81-24, 14 NRC 175).

Issue #8

Statement of Purpose: The following interrogatories are designed to ascertain the Staff's assessment of the hydrogen control features to be implemented at Perry and the ability of the Perry containment to withstand a hydrogen explosion.

6-1. What does the Staff consider to be the equivalent of a TMI-2 accident at Perry? Provide the probability of its occurrence and a thorough description of its consequences, including fuel failure modes, effect on containment integrity, and off-site doses to the public at 2, 5, 10, and 50 miles from PNPP.

6-2. What does the Staff consider to be the worst-case accident in terms of H_2 generation at Perry? Provide the probability of its occurrence and a thorough description of its con-

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sequences, including fuel failure modes, effect on containment integrity, and off-site doses to the public at 2, 5, 10, and 50 miles from PNPP.

6-3. Has the Staff (or anyone on its behalf or to its knowledge) performed MARCH code calculations specific to Perry for any accident sequences? If so, produce these analyses. If Perry-specific calculations have not been performed, produce all MARCH code analyses performed for Grand Gulf (most useful are graphical presentations of the calculated parameters versus time, e.g., pp. C-13 to C-44 of NUREG/CR-1659, Volume 4).

6-4. Describe in detail the capabilities and limitations of the MARCH code. Discuss any approximations and assumptions and their bases. Specifically, can the MARCH code account for the effects of steam concentration on hydrogen flammability, effects of containment structures or equipment on flame fronts, effectiveness of the hydrogen control system, and effects of deliberate hydrogen ignition on the containment and equipment therein?

6-5. Commissioner Gilinsky has stated that the Mark III is a weak containment that should be required to be stronger (47 FR 2300, January 15, 1982). How could the Perry containment be strengthened? Include a cost estimate of all measures that could strengthen the Perry containment.

6-6. SECY-80-107A contains view-graphs presented by General Electric to the NRC which state that containment inerting, hydrogen ignition, recombiners, and purging are all impractical for significant rates of H_2 production. Does

the Staff agree? If not, why not?

6-7. The Commission has stated that hydrogen control methods that do not involve burning provide protection for a wider spectrum of accidents than do those that involve burning (46 FR 62282, December 23, 1981). What are the bases for this statement?

6-8. NUREG/CR-1561 at p. 49 states that spontaneous hydrogen deflagrations or detonations have occurred in the off-gas systems (handling quantities of H_2 due to radiolysis) of of several BWRs (Cooper, Browns Ferry 3, Millstone 1).

(a) What were the magnitudes and consequences of these explosions?

(b) Did these incidents occur because of the failure or inadequacy of the recombiners?

(c) Did the recombiners provide the ignition source?

(d) Are these recombiners similar to those to be used at Perry?

6-9. What is the status of the proposed rule to 10 CFR Part 50, "Interim Requirements Related to Hygrogen Control," 47 FR 62281, December 23, 1981?

6-10. What types of hydrogen control systems are available for preventing H_2 buildup and/or explosion in Mark III containments? Briefly discuss each system, listing the advantages and disadvantages of each. Which system is favored by the Staff? Why?

6-11. It is stated in the discussion of the proposed rule (46 FR 62282) that there are ongoing programs of research pertaining to hydrogen generation, release, burning, and

control. Please list all such research programs. Briefly describe the status of each, along with any interim findings and the expected date of completion and publication of results.

6-12. SECY-80-107 at p. 30 states that the Staff believes that the Mark III containment has a failure pressure of at least twice the design pressure.

(a) Is this estimate based on static or dynamic pressures?

(b) Provide all factual bases and experimental evidence supporting this belief.

6-13. Has the Staff performed any analyses on the ultimate strength of the Perry containment? If so, produce them. Discuss all assumptions, judgements, and approximations made in the analyses and the bases for them.

6-14. At what range of concentrations (volume-%) of H_2 are recombiners of the type to be used at PNPP effective in reducing the H_2 concentration below flammable limits?

6-15. If the recombiners were ineffective in reducing H_2 concentrations, would the recombiners become an ignition hazard? At what H_2 concentration?

6-16. At what range of H_2 concentrations (volume-%) are glow plug igniters effective in reducing H_2 concentrations below flammable limits?

6-17. Does the Staff believe that the igniters could pose a hazard to the integrity of the containment and the equipment therein by causing severe detonations?

6-18. Does the Staff believe that the normal, expected operation of the igniters (controlled ignition) could pose a threat

to the integrity of the containment or the equipment therein by causing high temperatures and cyclic pressure pulses?

6-19. In the Staff's opinion, has the Perry hydrogen control system met the requirements of GDC 41, 42, and 43 of 10 CFR Part 50? List all criteria not met.

6-20. Has the Staff analyzed the Perry containment for sources of ignition? If so, produce the results of the analysis.

6-21. Has the Staff analyzed the Perry hydrogen control system against all applicable regulations, regulatory guides, branch technical positions, and other standards? If so, produce the results of this analysis, especially describing any instances in which criteria and guidelines have not been met. If this analysis has not been performed, when does the Staff intend to do so?

6-22. FSAR Section 6.2.5.2.1 states that delaying the start of the analyzers until 15-60 minutes following the LOCA will avoid exposing the analyzer to severe sample conditions. In the Staff's opinion, can severe conditions persist beyond 15-60 minutes after the LOCA? After transient sequences?

6-23. In the Staff's opinion, for containment H_2 concentrations above 4 vol-%, would the mixers accelerate combustion by providing a uniformly combustible atmosphere in the containment? Why or why not?

6-24. In the Staff's opinion, could the ignition of hydrogen by the glow plugs produce missiles that could damage the containment or equipment therein?

6-25. Provide off-site radiation doses (whole body and thyroid) to the public at 2, 5, 10, and 50 miles from PNPP resulting from containment purge following each of the following accidents:

(a) what the Staff considers to be the equivalent of a TMI-2 accident at Perry;

(b) what the Staff considers to be the worst-case accident in terms of H_2 generation for Perry;

(c) the following accident sequences as defined in NUREG/CR-1659, Volume 4 (RSS Methodology applied to Grand Gulf):

(1) AI

(2) AE

(3) AC

(4) SI

(5) SC

(6) SE

(7) T_1PQI

(8) T_1PQE

(9) $T_{23}PQI$

(10) $T_{23}PQE$

(11) T_1QW

(12) T_1QUV

(13) T_1C

(14) T_1QUW

(15) $T_{23}C$

(16) $T_{23}QW$

(17) $T_{23}QUW$

(18) $T_{23}QUV$

6-26. In the Staff's opinion, would overpressure from H_2 production alone (no explosion) be sufficient to rupture the containment? From what % metal-water reaction?

6-27. Describe the pressure and temperature transients which would be experienced by the containment from the complete combustion of the following concentrations of hydrogen (vol-%, assume abundant oxygen):

(a) 4%

(b) 6%

(c) 9%

(d) 12%

(e) 18%

(f) 24%

(g) 33%

6-28. Are the results given above based on any experimental data or studies specific to either the Perry or the generic Mark III containment? Produce all such studies.

6-29. List any assumptions made in the preparation of such studies, e.g., regarding the quenching effects of steam/humidity or the effect of containment structures and equipment on flame fronts.

6-30. If the Staff has performed any analyses of the Perry containment, did this analysis consider containment penetrations as possible points of rupture? If not, why not?

6-31. In the Staff's opinion, could blowdown through the suppression pool or direct drywell-to-containment

leakage exceed the capacity of the mixers?

6-32. In the Staff's opinion, could direct drywell-to-containment leakage dissipate hydrogen outside the area from which the recombiners take suction or outside the regions where the igniters are located?

6-33. In the Staff's opinion, would the drywell-to-containment differential pressure ever be great enough (e.g., after upper pool dump) that the mixer compressor head is insufficient to clear the upper suppression pool vents?

6-34. In the Staff's opinion, could the recombiners produce "hot spots" which could adversely affect the containment or equipment therein?

6-35. Does the Staff consider the manual actuation of all components of the Perry H_2 control system acceptable? If so, how can this be justified, since large amounts of H_2 can be produced within minutes of core overheating (NUREG/CR-1651, pp. 36-37; SECY-80-107, p. 6)?

6-36. NUREG/CR-1561 at pp. 36-37 states that once the core temperature exceeds 1400°K, only minutes remain before significant quantities of H_2 are produced. 1400°K corresponds to 2061°F. 10 CFR 50.46(b)(1) limits the cladding temperature to 2200°F. Does this mean that, even if the ECCS Evaluation Model meets this criterion, substantial hydrogen could still be generated? Are 10 CFR 50.46 (b)(2) and (b)(3) consistent with the amounts of hydrogen expected to be generated when the cladding temperature reaches 2200°F?

6-37. List all documents relied upon in answering the above

interrogatories, and list all persons responsible for the answers, along with their professional qualifications.

Respectfully submitted,

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