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
(OL)

January 8, 1982

SUNFLOWER ALLIANCE et al. MOTION TO RESUBMIT CONTENTION 7

Intervenor Sunflower Alliance et al. hereby moves the Board to grant it leave to resubmit its Contention 7, "Hydrogen Control," in this proceeding. Contention 7, which was originally submitted in Sunflower's March 1981 "Petition for Leave to Intervene," was not admitted as an issue because the contention was not of the form required by Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-16, 11 NRC 674 (1980); i.e., a credible LOCA scenario entailing hydrogen generation was not proposed. That deficiency is corrected herein; in addition, it will be shown that this filing satisfies the "good cause" requirements of 10 CFR 2.714 for late filings of contentions.

Hydrogen Control Contention

Sunflower's original hydrogen control contention (Seventh ground of intervention) reads, in part:

> Petitioners allege that there is insufficient documentation of the ability of the containment structures of said facilities to safely inhibit a hydrogen explosion of the magnitude and type which occurred at Three Mile Island Unit 2 near Harrisburg, Pennsylvania and of which the Commission is aware.

These Intervenors still allege this; specifically, they allege that

the conditions set forth in 10 CFR 50.44(c)(1) have not been met, and consequently the containment should be inerted, as required by paragraph (c)(2) of that section. The Applicant in its FSAR makes no claim that the containment could "withstand the consequences of uncontrolled hydrogen-oxygen recombination without loss of safety function." Although the Applicant does claim that such an uncontrolled reaction would not occur prior to the effective operation of the combustible gas control system, this claim lacks proper substantiation, since the Applicant has not considered all possible factors pertaining hereto.

The Board in its Special Prehearing Conference Memorandum and Order (p. 53) points out that the Commission in Metropolitan Edison Company stated that hydrogen gas control should be litigated, not under 10 CFR 50.44, but rather under 10 CFR Part 100, if it can be demonstrated that a credible LOCA scenario exists that would entail hydrogen generation and combustion and resultant breach of containment leading to offsite radiation doses exceeding Part 100 guidelines. It would seem that litigation under Part 100 would be attacking site suitability, which the Board has prohibited in regard to the emergency planning contention (SPC Memo. and Order at 25); however, Sunflower Alliance et al. will follow the Commission decision and provide the required scenario. This Intervenor almost hesitates to do so, for fear that it will be limited to one accident scenario when there exist many such credible scenarios. It objects to the limitation of accidents to the LOCA, when in fact other accident sequences (e.g., ATWS) can also lead to fuel clad melting and subsequent hydrogen generation. Nevertheless, since the language of CLI-80-16 and 10 CFR 50.44

specifies the LOCA, this limitation will be adhered to.

According to the Reactor Safety Study (WASH-1400), successful mitigation of a LOCA depends upon:

1. availability of electrical power, either offsite or onsite (standby);
2. successful actuation of the Reactor Protection System;
3. proper functioning of the vapor suppression system; and
4. ECCS actuation and functionability.

The failure of any one of these systems results in core melting and/or a loss of containment integrity by one of several mechanisms (melt-through, overpressure, leakage, steam explosion, or hydrogen explosion). The mechanism of interest here is the hydrogen explosion. An example of a specific accident scenario is:

1. a pipe break in the reactor coolant pressure boundary causes a LOCA, as defined by 10 CFR 50.46(c)(1).
2. failure of the ECCS to maintain coolant inventory. The cause of this failure may be: electrical or mechanical component failure; common mode failures resulting from the LOCA; design deficiencies which undermine ECCS effectiveness; and/or operator error.
3. the Zircaloy fuel cladding melts; the zirconium reacts with water, liberating hydrogen gas.
4. the hydrogen concentration within the containment increases to the flammability limit before the combustible gas control system becomes effective, or said system never operates effectively.
5. uncontrolled hydrogen-oxygen reaction (explosion) occurs.
6. containment is breached; a substantial fraction of the core inventory of fission products is released to the atmosphere, resulting in offsite doses at the LPZ boundary which exceed the 10 CFR 100.11 guidelines of 25 rems whole body and 300 rems thyroid.

This scenario is admittedly lacking in minute details. CLI-80-16 was unclear as to the degree of detail required for a litigable scenario, and as stated above, this Intervenor hesitates to

commit itself to one highly detailed and specific scenario when doubtless there are other routes leading to the same end.

It is questionable whether the hydrogen gas control system at Perry will be operated in a timely and effective manner. First, all components of this system (analyzers, mixers, recombiners, and purge capability) are activated manually by the operator (FSAR, Section 6.2.5). Relying on manual operation during the stressful emergency situation following a LOCA would likely increase the possibility of operator error. The operation of the hydrogen analyzers, the first step in the hydrogen control sequence, may be delayed for 15 minutes to one hour after the LOCA (FSAR, Section 6.2.5.2.1). This delay seems inappropriate, especially in light of the standard of 10 CFR 50.44(d)(1): "A time period of 2 minutes shall be used as the interval after the postulated LOCA over which the metal-water reaction occurs."

Secondly, the effectiveness of hydrogen recombiners is questioned in Regulatory Guide 1.7 (p. 1.7-4): "Hydrogen recombiners can process the containment atmosphere at a limited rate of 100-150 scfm per recombiner. Therefore, an inordinately large number of recombiners would be required to control the hydrogen concentration that is postulated to be generated in the first 2 minutes of the LOCA." Perry uses 2 recombiners per unit; each recombiner is sized for a 100 scfm flow rate (FSAR, Section 6.2.5.2.3).

This Intervenor considers containment purging as a hydrogen control measure to be unacceptable, as this results in radioactive releases to the environment.

Section 2.714 Requirements for Late Filings

On December 2, 1981 the NRC published its final rule on

"Interim Requirements Related to Hydrogen Control" (46 FR 58484). This rule requires inerting of Mark I and Mark II BWR containments, hydrogen recombiner capability, and high point vents in the reactor coolant system. The proposed rule, published on October 2, 1980 (45 FR 65466), included 12 items; eight of these items were also included in a proposed OL rule (46 FR 26491, May 13, 1981) and therefore were not considered in this final rulemaking. Of the four remaining items, only one would directly address the Perry plant design: item 2, requiring design analyses for Mark III BWRs and PWRs. This item was not incorporated into the final rule; indeed, it is not even given further mention in the Federal Register notice. This failure of the Commission to act definitively on this matter, which had been under consideration for at least a year, clearly indicates that the rulemaking process is not adequately addressing this issue. Plant-specific litigation is therefore appropriate; this Intervenor intends to pursue this avenue and for this reason moves to resubmit Contention 7. The recent notice of final rulemaking and its lack of applicability to the Perry case constitute "good cause" for this late filing, as required by sub-paragraph (i) of 10 CFR 2.714(a)(1).

Sub-paragraph (ii) of that section addresses "the availability of other means whereby the petitioner's interest will be protected." As discussed above, rulemaking is not effectively resolving the hydrogen control issue, especially as it concerns PNPP. Sunflower Alliance et al. is intervening in this specific case; this is the only forum which can properly address its interests concerning PNPP. Involvement in a generic rulemaking proceeding would:

1. divert its scarce resources from the Perry case, and

2. probably not produce a timely resolution of the problem. Safety issues are appropriately addressed before the plant begins operation.

The criteria of sub-paragraphs (iii), (iv), and (v) are likewise satisfied by this Intervenor, whose participation on this otherwise neglected issue will surely aid in developing a sound record. Although OCRE had a similar contention, it too was rejected by the Board, and OCRE has not filed for its resubmission. Thus, no other party is pursuing this issue. The inclusion of this contention will broaden the issues, but the degree of delay, if any, caused thereby is highly speculative.

These factors clearly favor the admission of this contention in this proceeding, and Sunflower Alliance et al. prays that the Board is so moved.

Respectfully submitted,

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PROOF OF SERVICE

A copy of this Motion to Resubmit Contention 7 has been sent to all persons on the attached Service List on this 8th day of January, 1982.

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