ENCLOSURE 4

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(47 FR 27371)

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Secretary of the Commission
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
ATTN: Docketing and Service Branch

Re: PRM-50-32, OCRE Petition for Rulemaking, 47 FR 27371 (June 24, 1982)

The undersigned, the representative of Ohio Citizens for Responsible Energy in the operating license proceeding currently before the Atomic Safety and Licensing Board, In the Matter of Cleveland Electric Illuminating Co. et al, Perry Nuclear Power Plant, Docket Nos. 50-440/441, hereby submits comments and additional information on the petition for rulemaking by OCRE concerning electromagnetic pulse.

Electromagnetic pulse (EMP) is an effect resulting from an high-altitude explosion of a nuclear device. This phenomenon is described in detail in Science, Vol. 212: p. 1009 (29 May 1981), p. 1116 (5 June 1981), and p. 1248 (12 June 1981) and Science News, Vol. 119: p. 300 (May 9, 1981), p. 314 (May 16, 1981), and p. 359 (June 6, 1981). Briefly, high-altitude nuclear explosions produce intense electromagnetic fields covering large areas of the earth. EMP induces large voltage/current transients in conducting materials that can disrupt, damage, or destroy electronic circuits and components, especially semiconductor devices. The duration of the pulse is so short that protective devices cannot respond in time. Obviously such damage cannot be tolerated in the control systems of a nuclear reactor. At least one NRC safety engineer, Demetrios L. Basdekas, has suggested that EMP could cause core meltdowns.

EMP vulnerability makes the U.S. nuclear power program

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inimical to the common defense and security of our nation. An enemy or terrorist group could easily cripple our nation by exploding a nuclear weapon high in the atmosphere over mid-America. This explosion would have no blast and little radiation effects, but the resultant EMP would induce multiple meltdowns across the country (along with the disruption of our normal communications systems just at the time when they would be most needed). Indeed, EMP-induced nuclear accidents would be the ultimate terrorist act; such possibilities cannot be ignored at this time, when world hostilities are increasing.

EMP could also be generated by the accidental detonation of a U.S. nuclear weapon, or by the possible commercial exploitation of nuclear explosions, e.g., in space travel. Such uses of nuclear explosions have been seriously considered in the past.

EMP hardening is indeed feasible. Electrical circuits can be protected by shielding (Faraday cages), the use of less sensitive components (vacuum tubes and relays in place of semiconductors) and by reducing conductor antenna effects (use of fiber optics in place of wire). The military is actively engaged in hardening its control and communications systems (Science, Vol. 213, p. 1228, 11 September 1981). Nuclear power plants should be required to harden not only power and control systems, but also communications and meteorological and radiological monitoring equipment as well, as these systems are essential in determining and implementing protective responses for the public during a nuclear accident.

10 CFR 50.13, as presently written, was obviously promulgated

before the effects of EMP were known. While it is unreasonable to expect a nuclear plant (or any structure) to withstand the blast and heat effects from a nuclear explosion, it is not only reasonable but imperative that nuclear plants be hardened against EMP. 10 CFR 50.13, by ignoring EMP, does not enhance the health and safety of the public and should obviously be amended as per PRM-50-32. The same can be said for GDC 4 of Appendix A to 10 CFR Part 50.

The suspension of the Perry proceeding pending disposition of PRM-50-32 is likewise imperative. OCRE has tried diligently to have EMP considered in this proceeding, but its efforts were to no avail. Although the Licensing Board seemed to share OCRE's concern about EMP, any consideration of this contention was seen as an impermissible challenge to 10 CFR 50.13. OCRE must therefore turn to this rulemaking in order to protect its interests. These interests, of course, are not protected if the Perry licensing proceeding goes on to completion, and the plant is allowed to operate, before this petition for rulemaking is accepted. This has the effect of exposing OCRE members (and the general public) to the risk of EMP-induced nuclear accidents at the Perry facility.

These risks are indeed considerable. A likely EMP accident scenario in a BWR such as Perry might start with a turbine trip caused by EMP, with scram failure because the EMP also disabled the RPS, with failure of the RPT feature (again due to EMP) which is supposed to mitigate such ATWS events. Within seconds this situation would accelerate to a power excursion accident, with such overpressure of the reactor coolant system that the RPV would probably rupture, with pieces of the RPV becoming missiles which would rupture containment, thus providing a direct route of escape for the fission product inventory. (For a description of this type of accident see <u>The Accident Hazards of Nuclear Power Plants</u> by Dr. Richard E. Webb, Univ. of Mass. Press, 1976) The consequences of this scenario are obviously unacceptable, especially in the highly populated regions near Perry. For this reason alone the suspension of the safety-related portions of the Perry proceeding is appropriate.

Respectfully submitted,

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ENCLOSURE 5