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S. W. Shields
Senior Vice President
Nuclear Division

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Chilk:

Public Service Company of Indiana, Inc. (PSI) appreciates the opportunity to comment on the Ohio Citizens for Responsible Energy's (OCRE) Petition for Rulemaking as published in the June 24, 1982 Federal Register (Ref. 2). This rulemaking would require nuclear power plant design features to protect against Electromagnetic Pulses (EMPs) caused by high altitude nuclear explosions. OCRE contends that an EMP could induce current surges in electrically conducting materials and thereby, disrupt and possibly damage plant control and safety systems. PSI believes that the proposed changes to 10 CFR 50.13 and 10 CFR 50, Appendix A should not be adopted for the following reasons:

- 1) The proposed rule is contrary to well-established NRC regulations and policies.

The Code of Federal Regulation does not presently require licensees to provide for design features which protect against attacks and destructive acts of enemies of the United States or defense activities.

Specifically, 10 CFR 50.13 states:

"An applicant for a license to construct and operate a production or utilization facility, or for an amendment to such license, is not required to provide for design features or other measures for the specific purpose of protection against the effects of (a) attacks and destructive acts, including sabotage,

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directed against the facility by an enemy of the United States, whether a foreign government or other person, or (b) use or deployment of weapons incident to U. S. defense activities."

The intent and basis of this regulation was very clearly stated in the NRC's Statement of Consideration in Reference 3.

"The protection of the United States against hostile enemy acts is a responsibility of the nation's defense establishment and of the various agencies having internal security functions. The power reactors which the Commission licenses are, of course, equipped with numerous features intended to assure the safety of plant employees and the public. The massive containment and other procedures and systems for rapid shutdown of the facility included in these features could serve a useful purpose in protection against the effects of enemy attacks and destructive acts, although that is not their specific purpose. One factor underlying the Commission's practice in this connection has been a recognition that reactor design features to protect against the full range of the modern arsenal of weapons are simply not practicable and that the defense and internal security capabilities of this country constitute, of necessity, the basic "safeguards" as respects possible hostile acts by an enemy of the United States."

Any nuclear explosion that caused an EMP would be covered by 10 CFR 50.13 and the 1967 Statement of Consideration. Any nuclear explosion detonated by the U. S. whether intentional or accidental is certainly "incident to U. S. defense activities." Similarly, the Atomic Safety and Licensing Board for the Perry Nuclear Station Operating Licensing Hearings has previously ruled (Ref. 4) the following:

"If a nation fires a nuclear device which causes electromagnetic pulses over the United States, that nation is responsible for the result. By



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that hostile act, the nation becomes an enemy of the United States and is responsible for direct or indirect consequences resulting from its use of a nuclear weapon. If that weapon damages the control system at Perry, then the nation firing it is responsible for that consequence and we would consider the attack to have been "directed against the facility," as well as against all other targets it destroys through blast, pulses or other foreseeable physical consequences of its act."

Therefore, requirements to protect against defense related activities such as EMPs have specifically been excluded from nuclear power plant's design for over 15 years by both regulation and interpretation. Requiring EMP protection could establish a precedent that would lead to design requirements for more severe defense related accidents (e.g., direct impact of nuclear warheads on containment buildings).

- 2) A previous study of EMP induced effects have shown it is not a serious threat to plant safety.

In 1977, Oak Ridge National Laboratory published a study of EMP induced effects (Ref. 1). The purpose of this study was to "determine if EMP is a serious problem for nuclear power plants and, if necessary, recommend means of protecting these plants from potentially unsafe conditions." By its own admission, the study used "worst-case surges" and the conclusions should be "considered conservative and pessimistic." However, despite these conservatisms, the report concluded the following:

"The most probable effect of EMP on a modern nuclear power plant is an unscheduled shutdown. EMP may also cause an extended shutdown by the unnecessary activation of some safety-related systems. In general, EMP would be a nuisance to nuclear plants, but it is not considered a serious threat to plant safety."

- 3) It is premature to finalize a rule before ongoing engineering studies are complete.



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The NRC has contracted with the Sandia Laboratories to perform a more extensive study of EMPs (Ref. 5) and their induced effects. This study will investigate:

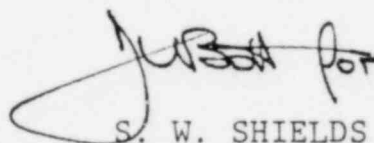
- a) The vulnerability of selected safe shutdown systems to EMPs;
- b) How these vulnerable systems may best be hardened against EMPs;
- c) The effects of EMPs on specific systems of a selected plant.

This study is still ongoing and will probably not be complete until October 15, 1982. The results have not yet been released to the utility industry. It is premature to pursue this rulemaking until the results of this study have been published and reviewed by the industry. At that time, the NRC and nuclear industry can reassess the need for compensating design changes.

However, PSI understands that the preliminary results of this study confirm the conclusions of the earlier Oak Ridge Study. In other words, EMPs are not a significant threat to safety and that compensating design features should not be required.

If clarification or discussion of these comments is desired, please feel free to contact me.

Sincerely,


S. W. SHIELDS

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REFERENCES

- (1) Oak Ridge Report ORNL-5029, "The Effects of Nuclear Electromagnetic Pulse (EMP) on Nuclear Power Plants," P. R. Barnes, et al.
- (2) "Ohio Citizens for Responsible Energy Petition for Rulemaking Concerning Electromagnetic Pulses," NRC Petition PRM-50-32, March 15, 1982.
- (3) 32 FR 13445 - Federal Register, September 26, 1967, page 13445.
- (4) Memorandum and Order: "Concerning OCRE's Motion for Leave to File a Contention about EMPs; and Possible Readmission to Discovery of the ATWS Contention;" USNRC Atomic Safety and Licensing Board; Cleveland Electric Illuminating Company, et al; Dockets No. 50-440-OL and 50-441-OL; October 2, 1981.
- (5) SECY-81-641, NRC Policy Issue, "Electromagnetic Pulse (EMP) - Effects on Nuclear Power Plants," November 5, 1981.