August 29, 1989

Mr. Timothy G. Colburn, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects - III, IV, V, and Special Projects
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Colburn:

Re: Perry Nuclear Power Plant, Docket No. 50-440

On July 12, 1989 the Cleveland Electric Illuminating Co. responded to Generic Letter 89-06, regarding the Safety Parameter Display System ("SPDS"). (CEI letter attached.) In this letter CEI stated that an SPDS display for drywell oxygen concentration will not be provided because the Perry Mark III containment is not inerted.

This is an unacceptable position. Precisely because the Mark III containment is not inerted, it is necessary to monitor oxygen as well as hydrogen concentrations in both the containment and drywell. The need to monitor oxygen is illustrated by a degraded core accident scenario initiated by a reactor coolant system pipe break in the drywell. The initial blowdown will force the drywell air mass through the suppression pool into the containment. The drywell atmosphere will consist of steam, and later, hydrogen produced by the metal-water reaction in the core. This atmosphere, lacking oxygen, is inert. However, oxygen will eventually be reintroduced into the drywell. This will result from operation of the drywell purge compressors (part of the hydrogen mixing system, PNPP USAR Section 6.2.5.2.2), which take suction from the containment. This can also occur if steam in the drywell is condensed, causing depressurization of the drywell and the flow of containment air into the drywell through the drywell vacuum breakers. The Perry USAR indicates that drywell steam condensation will occur during accident recovery, when cold coolant spilling into the drywell will cause the steam to condense (USAR pp. 6.2-10). Drywell steam condensation could also occur from violent suppression pool overflow into the drywell (reverse flow through the horizantal vents) resulting from hydrogen deflagrations in the containment (see NUREG/CP-0038, "Proceedings of the Second International Conference on the Impact of Hydrogen on Water Reactor Safety", p. 291). In the steam condensation scenarios particularly, the

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hydrogen concentration will pass through the detonable range. Whether a detonation occurs (or the strength and resulting overpressure effects of any deflagrations) will depend on the oxygen concentration. Drywell oxygen concentration thus becomes a crucial parameter to be monitored during an accident for effective accident management (e.g., the operators may need to turn off the hydrogen igniter system when the hydrogen concentration is high and when oxygen is present in the drywell).

I therefore urge that the licensee's position on the exclusion of drywell oxygen concentration for the SPDS be rejected.

Sincerely,

Susan L. Hiatt

Susan L. Hiatt
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July 12, 1989
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U.S. Nuclear Regulatory Commission
[illegible] Control Desk
[illegible], D. C. 20555

Perry Nuclear Power Plant
Docket No. 50-440
Generic Letter 89-06
Safety Parameter Display System

Gentlemen:

The subject Generic letter requested our certification that the Perry Safety Parameter Display System (SPDS) meets, or will be modified to meet, the requirements of NUREG-0737 Supplement 1 while taking into account the information provided in NUREG-1342.

By this letter, The Cleveland Electric Illuminating Company certifies that the Perry SPDS meets referenced requirements with the exceptions of providing drywell hydrogen and oxygen concentrations on an SPDS screen. A display for drywell hydrogen concentration will be provided before startup from the second refueling outage. A display for drywell oxygen concentration will not be provided since the Perry Mark III containment is licensed to operate at normal oxygen levels (i.e. not inerted).

The following clarification is provided for section III.A.2 of NUREG-1342 with respect to SPDS sampling rates. Due to system design, the screen refresh rate is faster than the sample rate; however, the SPDS sampling rates are satisfactory in providing the required resolution. SPDS users will be trained to differentiate between screen refresh rates and sample update rates.

Photographs during power operations will be taken in accordance with Generic Letter instructions following startup from our present refueling outage.

If you have any questions, please feel free to call.

Very truly yours,

Al Kaplan
Vice President
Nuclear Group

AK:njc
cc: T. Colburn
Sr. Resident Inspector
NRC Region III

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