SEP 16 1982

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Docket Nos.: 50-440/441

Mr. Dalwyn R. Davidson
Vice President
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The Cleveland Electric Illuminating Company
P. O. Box 5000
Cleveland, Ohio 44101

Dear Mr. Davidson:

Subject: Request for Additional Information Regarding Degraded Core Hydrogen Control for the Perry Nuclear Power Plant (Units 1 and 2)

The NRC staff has identified a number of areas pertaining to the Perry hydrogen ignition system where additional information is required. The information required is addressed in Enclosure (1). Please advise the project manager, John J. Stefano, when we may expect to receive your responses within five (5) days after receipt of this letter.

Your prompt attention to this request will be most appreciated.

Sincerely,

/S/

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

Enclosure:
As stated

cc: See next page

OFFICE	DL:LB#2/PM	DL:LB#2/BC					
SURNAME	JStefano:pt	ASchwencer					
DATE	9/15/82	9/16/82					

Perry

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ENCLOSURE 1

REQUEST FOR ADDITIONAL INFORMATION FOR USE IN THE INTERIM EVALUATION OF THE HYDROGEN IGNITION SYSTEM FOR PERRY MARK III CONTAINMENT.

480.49 Provide a detailed description of the Hydrogen Ignition System (HIS) and its power supplies; include the total number of igniters, the number of circuit breakers, and a simplified electrical system schematic showing all the above stated items and any other major component.

480.50 Provide the following igniter information:

a) Vendor;

b) Model;

c) Qualification Program; and

d) Design Criteria.

480.51 Provide a detailed description of the preoperational surveillance and periodic testing programs of the HIS.

a) How will the system be tested? Specifically, what indicates that a particular igniter is or is not functioning properly?

b) Specify the frequency of testing.

c) Are hydrogen detectors to be used as part of the HIS? If so, please specify the types of detectors, number, location of sampling ports, system response time, and testing format and frequency.

480.52 Describe the glow plug igniter selection program; i.e., how will actual igniters be selected for installation in the assemblies.

480.53 Please provide construction drawings for several "typical" igniter mounts in the wetwell and containment regions. Also, provide a complete list of the approximate elevation,azimuthal and radial coordinates for each igniter in containment, and the corresponding elevation coordinate of the nearest ceiling (include the make-up of the nearest ceiling, i.e., open, solid, grated). Indicate whether all enclosed regions of the containment are served by redundant igniters.

480.54 For each floor within the containment annular region and the drywell, please provide information on the cross-sectional flow area and identify the various areas as gratings, solid regions, or equipment blockage.

480.55 Discuss the design adequacy of the igniter assembly to withstand pool swell events and the drywell negative pressure response.

480.56 Please provide full size sectional drawings of the containment and identify the location of each igniter, it's electrical division, and location of vacuum breaker lines and purge compressor lines.

480.57 Discuss the consideration of local impingement of break spray on the igniter assembly.

480.57 Evaluate whether the sheet-flow into the wetwell impinges on any igniter.

480.58 Discuss the effect of submergence on igniter performance. For those igniters which will continue to be necessary, describe the testing which will be performed to assure igniter performance before, during and after being subjected to submergence conditions.

480.59 Considering the actuation criteria of safety systems including operator action:

a) Under what conditions are the sprays activated?

b) How long after the sprays are actuated does the spray system attain full flow rate?

c) When during an emergency situation would the HIS be activated?

d) What role, if any, would the hydrogen recombiner play with respect to the HIS?

e) What are the emergency procedure criteria for post accident containment purge/vent?

480.60 Regarding the containment atmosphere mixing mechanisms:

a) Describe the flow rate of the ventilation system in the containment/wetwell regions.

b) What are the elevations and radial positions of the spray rings?

c) Which spray ring operates when a single RHR loop is operating and what is the flowrate under such conditions? Does the spray water contain chemical additives?

d) Describe any sprays, fans or other systems that could move air in the annular wetwell region and estimate the air velocities in the region due to these systems.

480.61 Briefly explain the workings of the "drywell purge system" including purge compressors and vacuum breakers. Estimate flowrates from the system during an accident. Describe the operation of the Combustible Gas Control System (CGCS) during hydrogen burns (including a discussion of the logic for the purge compressors and vacuum breakers).

480.62 In Mark III containments, the sprays are not made up of dedicated components but share pumps with other subsystems intended to deliver water cool to the core. A basic postulate of degraded core accidents is that cooling water to the core is unavailable (e.g., cooling pumps unavailable). It appears inconsistent to assume that components of a core cooling system would be available to provide containment spray flow. Therefore, provide justification for the assumption that sprays are available.

480.63 Provide the following plant specific CLASIX-3 containment transient analysis*:

(1) SORV Base Case Transient;

(2) Small Break LOCA Base Case;

(3) Small Break LOCA with a burn criterion of 10% hydrogen concentration and 100% complete combustion in the containment assuming a minimum oxygen concentration of 6.5% in the drywell; and

(4) Small Break LOCA with a burn criterion of 10% hydrogen concentration, 100% completeness and a flame speed of 12 fps.

*Note: If spray availability is questionable, do not consider them in the containment analysis. [Even though the HCOG sensitivity study (HGN-001, Jan., 1982) presents a "no spray" SORV case in which the compartment pressures are relatively low with respect to the SORV base case. This is so, since the containment oxygen concentration is slightly below the five percent molar concentration criterion, which results in the absence of a containment burn. However, if the transient is extended in time, the oxygen concentration would exceed five percent and trigger a containment burn. Hence, the "no-spray" SORV case may be more severe than the SORV base case with respect to peak temperatures and pressures.] If credit is taken for spray availability provide and justify the following inputs to the CLASIX-3 analysis:

(1) flowrates per spray train;
(2) number of spray trains to be used;
(3) containment to wetwell carry-over fraction;
(4) percentage of carry-over which is in droplet form and sheet-flow;
(5) droplet mass mean diameter;
(6) drop efficiency; and
(7) sheet-flow efficiency.

480.64 Identify the most severe pool dynamic load conditions in the wetwell when considering the effect of hydrogen combustion in the drywell. Discuss the effects of the pool dynamic loads on the containment structures and the essential equipment within the zone of influence. Also, evaluate in a similar manner the most severe drywell negative differential pressure transient and the pool dynamic loads created within the drywell.

480.65 Are there any accident sequences that might lead to the introduction of hydrogen and steam directly into the containment without having passed through the suppression pool?

480.66 Provide an evaluation of the potential and consequences of flame acceleration in the various containment regions including consideration of circumstances leading to transition to detonation.

480.67 Provide an analysis of the concomitant effects of the largest conceivable containment detonation which could occur. Demonstrate that the effects of such an event could be safely accommodated by structures and essential equipment. Also, provide an estimate of the limiting size of a cloud of detonable gas with regard to the structural capability of the containment shell and the drywell.