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December 2, 1982

Mr. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Regulatory Commission
Washington, D. C. 20555

Perry Nuclear Power Plant
Docket Nos 50-440; 50-441
SER Outstanding Issue No. 10 and
Confirmatory Issue No. 20

Dear Mr. Youngblood:

This letter and its attachment is provided in response to outstanding issue number 10, regarding continuous containment purge (SER Ref. 6.2.4) and the related confirmatory issue number 20 regarding subcompartment pressure analysis (SER Ref. 6.2.1.6). The attachment addresses the design, evaiuation and operation of the containment vessel and drywell purge system.

The Perry Mark III containment design enhances public safety by providing an isolatable primary boundary for the majority of reactor coolant systems. The present design basis for the purge system provides continuous filtered purging of the containment during normal operation, to allow personnel entry for equipment inspection and maintenance requirements, within ALARA levels and 10 CFR 20 limits.

As a result of the NRC staff position on the use of continuous containment purge, we have re-evaluated expected coolant leakages and estimated personnel occupational exposure levels in containment. CEI proposes that intermittent containment purge be permitted up to a limit of 2550 hours per year as specified in the plant technical specifications for Perry. Our evaluation in the attached report is based on realistic estimates, however, a re- assessment will be made based on Perry operating experience, regarding maintenance requirements, purge valve operability and a containment airborne radioactivity levels. This re-evaluation of the intermittent purge commitment will be provided prior to startup following the first regularly scheduled refueling outage.

Finally, with the proposed intermittent operation of the purge system, the blow-out panels for the Reactor Water Cleanup rooms are no longer included in the Perry design. Thus, the analysis to show that damaging misseles are not generated by the blowout panels is not necessary and the confirmatory item regarding sub-compartment pressure analysis can be resolved.

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We believe that this information provides justification for the proposed intermittent operation of containment purge system. Upon resolution of this issue, appropriate sections of the Perry FSAR will be revised.

Please advise if additional information is required.

Very truly yours,

Murray R. Edelman
Vice President
Nuclear Group

MRE:kh

cc: Jay Silberg, Esq.
John Stefano
Max Gildner
J. Kudrick
T. Greene
R. Pender

Attachment to:
Ltr. to J. Youngblood
Dated Dec. 2, 1982

PERRY NUCLEAR POWER PLANT

INTERMITTENT REACTOR BUILDING PURGE

Present System Design

The present design of the Perry Containment Vessel and Drywell Purge system provides continuous purging of the containment to reduce the radioactivity levels during normal plant operations. This allows continuous access to the equipment located inside containment for inspection and maintenance.

The containment and drywell purge system is described in the FSAR Section 9.4.6 and briefly described herein. A continuous purge rate of 5,000 scfm is the design flow rate to draw air from the Reactor Water Cleanup (RCWU) equipment rooms. These areas are maintained at a slight negative pressure relative to the rest of containment to prevent airborne activity originating there from increasing radiation levels throughout containment.

For purging of containment atmosphere there are two principal valving/system arrangements, namely continuous normal plant purge (5,000 scfm) and refueling purge (30,000 scfm). Both lineups pass the exhaust flow through a charcoal filter system prior to release to the atmosphere, and include redundant isolation valves.

Rated purge flow during refueling of 30,000 scfm is provided through two 42-inch diameter penetrations and isolation valves. The reduced air flow supply path for continuous purge is through an 18-inch diameter line that branches off between the inboard and outboard 42-inch isolation valves.

The normal continuous purge pathway with the 18-inch isolation valve is parallel to the 42-inch normally closed isolation valve located inside containment, and the 42-inch normally open outboard isolation valve. This design provides for the smallest size effective penetration while allowing for optimum air flow of 5,000 cfm for normal plant purging. This flow path is shown on attached FSAR Figure 9.4-17.

Proposed Use of Containment Purge

An evaluation was conducted to determine the acceptability of intermittent purge of the Perry reactor building. Based on revised expectant coolant leakages this evaluation concluded that a specified intermittent purge could meet the ALARA limits and the requirements of 10 CFR 20. Parametric studies were done to determine the allowable time between purges and establish the total number of purge hours per year. CEI proposes that intermittent purge up to a total of 2550 hours per 365 days. The limits for intermittent purging will apply during plant operational conditions 1 and 2 (power operation and startup) to reduce airborne activity levels. Use of the purge system will be administratively controlled and cumulative usage determined at least weekly.

It should be noted that the radiological evaluation was based on expected leakages. A more accurate assessment of coolant leakages and airborne radioactivity inside containment can be made with plant operating experience. Prior to startup following the first scheduled refueling outage a re-evaluation will be provided based on Perry Plant operating experience. Considerations will include equipment maintenance considerations, purge valve operability data, actual coolant leakages, and actual containment airborne radioactivity levels.

Radiological Evaluation

As a result of NRC concerns with continuous purging of primary containment, we have re-evaluated the basis for the present system design and the viability of intermittent purge system operation. To ensure that continued plant operation will not be jeopardized by a commitment to intermittent purge, analysis have been performed to determine the potential maximum levels for the whole body gamma dose rate and the airborne iodine concentrations inside the accessible portions of the reactor building. The design objective is to maintain the contribution from the airborne contaminants to the whole body dose rate as less than 1 mr/hr and to maintain the peak total fraction of MPC as less than 1 for the iodine isotopes.

The parameters used in evaluating the radiological consequences of intermittent purge were the expected leakages of reactor coolant and the design basis radiation source terms specified by General Electric. The coolant fission product concentrations, with assumed partition factors and half life, combined with the expected leakage values for design purposes, formed the basis for determining the airborne radioactivity levels for a given purge scenario.

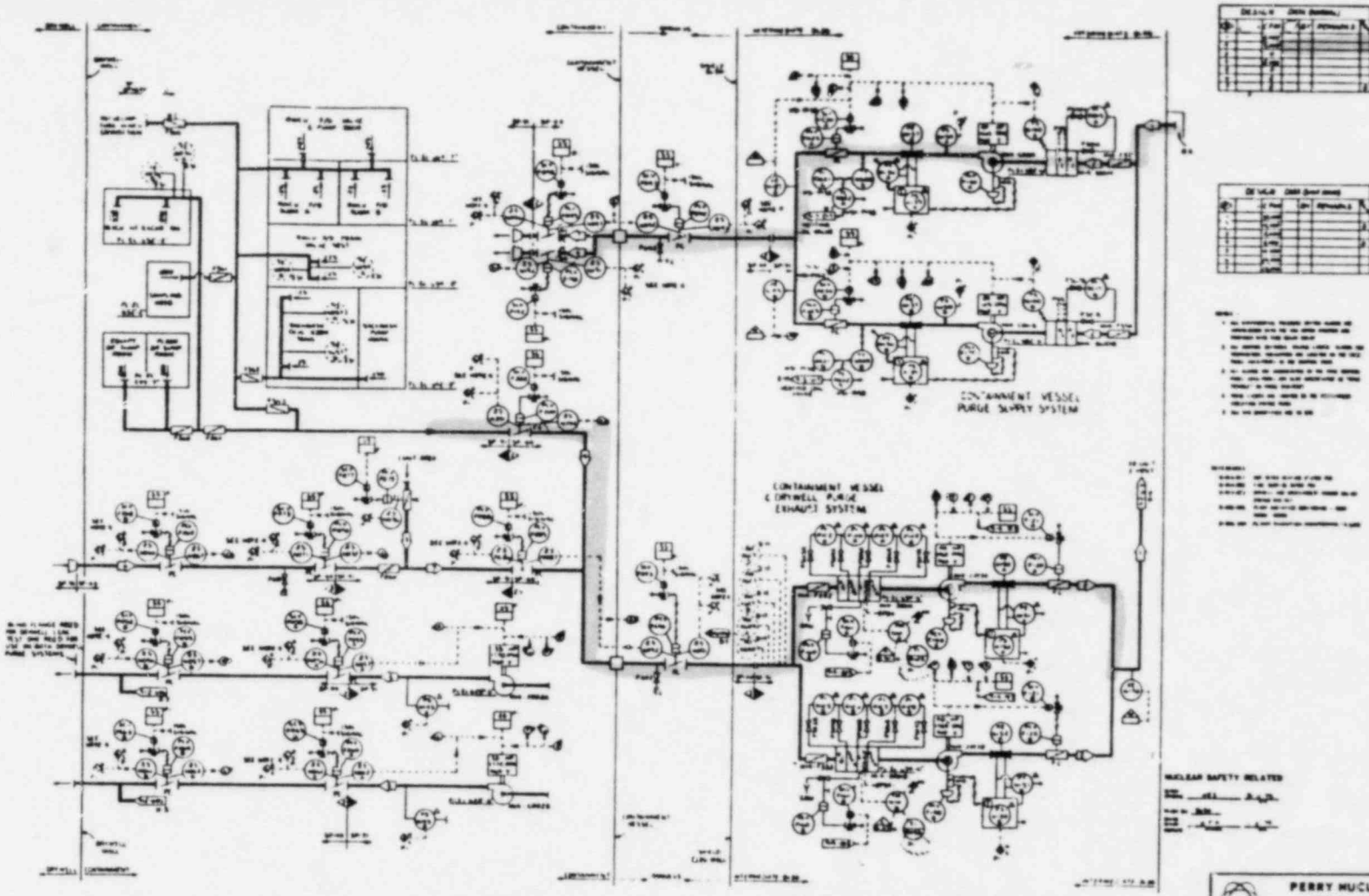
The objective of this evaluation using design basis assumptions and parameters has been satisfied with the proposed intermittent purge. The limits established allow for any minor upset conditons that may occur during power operations. The evaluation has established a minimum of a 10 hour purge following a 3 day buildup period as satisfying the ALARA and 10 CFR 20 limits. Other possible combinations of purge frequency and duration may also provide low radiation levels, however, actual purge time period and frequency will be determined by operating experience and controlled by plant technical specifications, to assure that the design objective is met.

Containment Isolation Valve Testing and Operability

Each purge system containment isolation valve will undergo periodic surveillance testing for closure time and leakage. These valves are included in the Pump and Valve Inservice testing program, schedule for submittal in early 1983.

The purge valve operability analysis required as part of TMI Action Item II.E.4.2 is underway and will be provided by March 1983. The results of this analysis are expected to confirm that under design basis accident conditions, the containment purge isolation vaives will close within the required time to maintain accident doses within required limits.

This analysis, along with the valve surveillance program, will provide adequate assurance that the isolation valves will function as required.



PERRY NUCLEAR POWER PLANT
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Containment Vessel and
Drywell Purge

Figure 9.4-17 (Sheet 1 of 2)
(GAI Dwg. D-912-604)