GPU Nuclear

GPU Nuclear
100 Interpace Parkway
Parsippany, New Jersey 07054
201 263-6500
TELEX 136-482
Writer's Direct Dial Number:

September 24, 1985
RFW-0620

Mr. John A. Zwolinski, Chief
Operating Reactors Branch No. 5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Zwolinski:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Containment Vent and Purge System

Reference: 1) Letter, Dennis Ziemann (NRC) to I. R. Finfrock, Jr., (JCP&L) dated November 29, 1978;

2) Letter, I. R. Finfrock to Director of Nuclear Reactor Regulation, dated January 23, 1979;

3) Letter, Darrell G. Eisenhut (NRC) to All Light Water Reactors, dated September 27, 1979;

4) Letter, Dennis Zeimann to I. R. Finfrock, Jr., dated October 23, 1979;

5) Letter, I. R. Finfrock, Jr. to Director, Nuclear Reactor Regulation, dated December 17, 1979;

6) Letter, I. R. Finfrock, Jr. to Darrell G. Eisenhut, dated June 10, 1980;

7) Letter, I. R. Finfrock, Jr. to Director, Nuclear Reactor Regulation, dated July 31, 1980;

8) Letter, I. R. Finfrock, Jr. to Dennis M. Crutchfield, dated April 9, 1981;

9) Letter, Philip R. Clark (GPUN) to Director, Nuclear Reactor Regulation, dated August 27, 1981;

10) Letter, D. M. Crutchfield to P. B. Fiedler, dated January 4, 1982;

11) Letter, Peter B. Fiedler to Darrell G. Eisenhut, dated April 15, 1983;

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12) Letter, Dennis M. Crutchfield to P. B. Fiedler, dated January 13, 1984;

13) NEDO 22155 "Generation and Mitigation of Combustible Gas Mixtures in Inerted BWR Mark I Containments", dated June 1982;

14) Letter, P. B. Fiedler to Dennis M. Crutchfield, dated May 14, 1984;

15) Letter, P. B. Fiedler to Director, Nuclear Reactor Regulation, dated July 19, 1984.

The purpose of this letter is to summarize GPU Nuclear's position regarding modifications to the containment vent and purge system. Our letter of July 26, 1985 identified containment vent and purge as an item for which GPU Nuclear believes a technical justification exists for permanent cancellation.

In accordance with our current docketed submittals, GPUN had committed to the following plant changes:

1) Replacement of all large (greater than three inches) containment vent and purge valves with valves qualified to close from the full open position against the dynamic loads of the design bases LOCA. (References 5 and 9).

2) Installation of single failure proof valve manifolds for: 1) the containment vent line from the drywell; 2) the nitrogen purge line to the drywell; and 3) the nitrogen purge line to the torus (References 6 and 8).

3) Utilization of a containment high radiation signal to isolate the large containment vent and purge valves (References 8 and 11).

4) Installation of a pressure relief vent in the exhaust duct of the drywell and incorporation of a five second time delay on the opening of the Standby Gas Treatment system (SBGT) filter inlet valves (Reference 14).

5) Replacement of all two position control switches with three position control switches for the large containment vent and purge valves (Reference 8).

The above modifications were committed to based upon the following chronology of events.

Your letters of November 29, 1978, September 27, 1979 and October 23, 1979 directed all utilities to review the containment vent and purge systems to verify that 1) no safety signals are overridden during the purging process; and 2) that the containment isolation valves will shut without degrading containment integrity during the design basis LOCA. As a result

of our review of the containment vent and purge system we committed to 1) not overriding any safety actuation signal circuits while purging (Reference 2); and 2) physically limiting the valves to 30° open while we perform a cost benefit analysis on testing vs. replacement (Reference 4). This was consistent with the NRC's interim position attached to the October 23, 1979 letter. In our letter of July 31, 1980, we committed to replacing all containment vent and purge isolation valves with qualified valves rather than qualifying the existing valves. Our letter of August 27, 1981 requested an extension in the schedule for replacing the containment vent and purge valves from December 1, 1981 to the end of our Cycle 10 reload refueling/maintenance outage. We justified this delay because we were following the NRC's interim guidelines for these valves, and the fact that they are normally closed, and when opened are mechanically restricted from opening more than 30°. Attached to the submittal was our engineering evaluation (Technical Data Report No. 266) showing that these valves can close against the full dynamic loads associated with the design basis LOCA from the 30° position with stresses in the valves not exceeding 90% of the yield strength of the materials used.

In response to the requirements of NUREG 0578, item 2.1.5a, our letter of June 10, 1980 provided a brief description of the planned modifications to improve the reliability of the containment penetrations for the nitrogen purge and vent system. We stated that Oyster Creek used its normal containment vent and purge system for post accident venting and purging of the containment atmosphere. As a result of this operation, we committed to modifying the system to be safety grade/single failure proof for both operation and isolation.

In response to NUREG 0737, items II.E.4.2.4 and II.E.4.2.7 we committed in our letter April 9, 1981 to 1) replace all two position control switches associated with the vent and purge valves with three position switches; and 2) utilize a containment high range radiation signal to isolate the purge and vent valve.

The proposed installation of a pressure relief vent in the exhaust duct of the drywell and the incorporation of a five second time delay on the opening of the SBGT filter inlet valves was in response to your letter of January 4, 1982 (question 4) and committed to in our of letter May 14, 1984.

The Oyster Creek Technical Specifications previously required that the drywell atmosphere be maintained at one psi above the torus atmosphere due to the postulated loadings imposed on the torus during the Design Basis LOCA. Your letter of January 13, 1984 found acceptable our analysis and resultant modifications to restore the original design safety margin to the Mark I Containment at Oyster Creek. The analyses were made assuming no drywell to torus differential pressure. As a result, a Technical Specification change deleting the pressure differential requirement between the drywell and the torus was requested and approved. Amendment No. 87 dated July 1, 1985 incorporates this change.

The Oyster Creek Technical Specifications also require, while the reactor is in the run mode, to demonstrate operability of the torus-to-drywell vacuum breakers monthly. Deletion of the Technical Specification requirement for a drywell to torus differential pressure has eliminated the need to open the large containment vent and purge valves following the vacuum breaker operability test. Therefore, the amount of time we would be operating with the large containment vent and purge valves open has been greatly reduced.

As mentioned previously, we have performed analyses (Technical Data Report No. 266) that demonstrates the adequacy of the present large containment vent and purge valves. The results of these analyses concluded that the valves will close, and remain operable under the fluid dynamic forces associated with the design basis LOCA from their presently restricted 30° open position. These analyses addressed the NRC Guidelines for Demonstration of Operability of Purge and Vent Valves, dated September 27, 1979. Operation of these valves from their presently restricted 30° open position presents no nuclear safety significance since the fail safe position of these valves is closed, and they are not required to operate after the Design Bases accident, except in the very long term (after 6 years).

Also, during a meeting which was held on February 13, 1985, the NRC staff recommended that some changes be made to the analysis in order to demonstrate the adequacy of the existing valves. First, the NRC staff requested that the effects of turbulence at pipe elbows be considered in the analysis and that safety factors of 1.5 and 3.0 be utilized for valve shaft in plane and out of plane, respectively, if the valve is located within five pipe diameters after the elbow. Secondly, the DBA pressure used for the Mark I Containment Long Term Program was determined to be appropriate for use in this analysis. As a result of these two recommendations, the analysis (TDR No. 266) has been revised and is being submitted for review (TDR No. 266, Revision No. 1). With the above assumptions included, the valves are still assured to close from their 30° open position.

In summary, GPU Nuclear feels that the analysis performed on the existing valves and having deleted the Technical Specification required drywell-to-torus pressure differential combine to demonstrate adequate valve performance during DBA-LOCA loads and reduces the probability of exposure to such load. We, therefore, propose that the existing valves are qualified to function from their mechanically restricted 30° open position during the highly unlikely DBA-LOCA.

With respect to our commitment to install single failue proof/safety grade nitgrogen purge and venting capability in order to comply with 10CFR50.44, an analysis was performed by General Electric (NEDO-22155) for the BWR Owners Group subsequent to this commitment (in June 1982). This analysis concluded that the peak oxygen concentrations for Mark I plants with inerted containments is below the allowable Regulatory Guide 1.7 limit without the need for containment venting. The G.E. analysis further

contends that even if limited containment venting was required, the offsite dose consequences would be minimal since the venting would not occur until six years elapsed time. Airborne activity at this time would be negligible, because even if only radioactive decay was considered, the iodine activity level in containment after 6 years would be only 10^{-80} of its original value according to the G.E. report. Also, in addition to radioactive decay, there are inherent BWR design features which act to mitigate the radiological release. Among these is the suppression pool, which acts as an efficient scrubber for particulate fission products which are released from the core. The Standby Gas Treatment System also provides decontamination capabilities with respect to particulates and iodine. In addition, gravitational settling, absorption and deposition will also occur within the containment to further reduce fission product release. Consequently, the offsite doses from even limited venting would be insignificant.

In order to fully comply with the G.E. analysis, a Technical Specification Change Request was submitted for Oyster Creek on July 19, 1984. This Technical Specification Change Request was approved and issued as Amendment No. 86 on June 7, 1985. Therefore, we do not feel that a safety grade (for operation) purge system is required. With respect to the system being safety grade for isolation purposes, our existing system meets single failure criteria for isolation.

Modifications to the containment vent and purge system which have been completed are the installation of a five second time delay on the opening of the SBGT filter inlet valves and the replacement of the two position control switches with three position control switches for the large containment vent and purge valves.

The commitment to install a containment high range radiation signal to isolate the large containment vent and purge valves is currently being reexamined by GPU Nuclear corporation. The resolution of this item will be addressed in a separate submittal which will be furnished at a later date.

The commitment to install a pressure relief vent in the exhaust duct from the drywell has been reevaluated. The calculations show that, following a LOCA, there will be no rupture of the duct. The overall conclusion is that there is no need for any modification to the duct system.

Based on the foregoing, we therefore propose to:

1. Cancel the proposed modification to replace the large containment vent and purge valves,

2. Cancel the proposed modification that would upgrade the nitrogen vent and purge sustem to safety grade status, and

3. Cancel the porposed modification to install a pressure relief vent in the exhaust duct.

Your review and concurrence of our proposals is requested.

If you have any questions, please contact Mr. Michael Laggart, Manager-BWR Licensing at (201)299-2341.

Very truly yours,

R. F. Wilson
Vice President and Director
Technical Functions

RFW:gpa
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cc: Dr. Thomas E. Murley, Administrator
Region I
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

Mr. Jack N. Donohew, Jr.
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue, Phillips Bldg.
Bethesda, MD 20014
Mail Stop No. 314

NRC Resident Inspector
Oyster Creek Nuclear Generating Station
Forked River, NJ 08731