Portland General Electric Company

Charles Goodwin Jr. Assistant Vice President

September 5, 1980

Trojan Nuclear Plant
Docket 50-344
License NPF-1

Mr. Lynn Frank, Director
State of Oregon
Department of Energy
Labor & Industries Bldg., Room 111
Salem, OR 97310

Dear Mr. Frank:

This letter describes evaluations and actions related to Licensee Event Reports (LERs) 80-05, 80-09 and 80-10 as requested by your letter of July 25, 1980.

I. Summary of Follow-up Action

PGE's intended follow-up action on the events described in your letter are summarized as follows (more detailed comments in Section II):

A. PGE intends to test closure of the main steam isolation valves (MSIVs) with steam flow and, if consistent with Plant safety and the Operating License, may adopt such a procedure to replace the periodic test procedure now performed to satisfy Technical Specification (T. S.) 4.7.1.6.

B. PGE will continue evaluating design modifications (including the proposed double-acting air cylinder) to prevent a recurrence of stuck MSIVs.

C. Radiological and safety consequences of any proposed modifications to the MSIV design will be analyzed and appropriate actions, such as radiological monitoring and control, will be taken.

D. PGE will evaluate the necessity of relocating area radiation monitor ARM-13 to detect increasing radiation levels from the Spent Fuel Pool (SFP).

A001
S 1/0
ADD: LE 1 0
MICHELSON 1 0
ADENSAM 1 0
OLSHINSKI 1 0
MALMROS-IE 1 0

E. PGE will re-evaluate the current policies and practices related to reportable occurrence reviews and LER issuance following completion of the review of PGE's nuclear operations by BETA Corporation.

II. Specific Comments

Following are specific comments on each of the three occurrences described in your letter:

A. Main Steam Isolation Valves:

Regarding Licensee Event Report 80-05 and failure of the MSIVs to close:

1. Following extensive investigation and discussion with the valve vendor as to possible causes for the valves' sticking open, we continue to believe that packing friction forces are the most likely cause and that steam flow through the valves can overcome the binding forces due to packing friction. Nevertheless, PGE is continuing to evaluate this situation.

2. Conclusive test data or calculations are difficult without an opportunity to measure the binding forces due to the packing in a stuck valve (i.e., following another occurrence such as that reported in LER 80-05), and even those measurements are not likely to be completely conclusive because of possible variations in conditions.

3. A procedure has been written to test MSIV closure with steam flow. Although the test is written as a one-time Special Plant Test, if the test method is proven adequate and safe, it can be converted into a periodic test. Of course, proving that a stuck valve will close with steam flow again requires another occurrence of a stuck valve. In addition, as you are aware, such a test, whether a one-time or periodic test, must be performed carefully to prevent unnecessary transients and/or actuations of safeguards features (such as safety injection due to steam line differential pressure).

4. Design solutions to this situation are being evaluated. Aspects of the solution suggested by the

Oregon DOE (double acting air operators) which must be evaluated prior to implementation include:

a. Effect on valve integrity of combined actuator and maximum steam flow closing forces on the valve.

b. The required redundancy required for such an active closure mechanism (i.e., train A and B air accumulators and associated valves for each MSIV).

c. Comparative reliability of the proposed active-active closing mechanism (air cylinder requiring active venting of "open" air and active application of "closing" air) versus the active-passive mechanism existing (active venting of "open" air and combined forces due to operator closing springs, gravity and steam flow).

Other measures such as different styles of packing are also being investigated. The safety implications of any such measures must be evaluated.

5. The Plant is not currently operating with packing steam leaks from the MSIVs. The small amount of leakage which existed at hot standby ceased as the Plant increased power (thereby decreasing steam pressure). Steam leakage is not a desirable alternative; however, a small amount of leakage can be accepted temporarily as an alternative to compromising Plant safety.

6. A radiological assessment of packing leakage has been performed. Packing leakage is insignificant when compared to steam flow into the condenser where the noble gases are released to the atmosphere. In addition, even when iodine partitioning in the condenser is considered, using FSAR assumptions, less than 1 percent of iodine in the steam could be released through packing leakage. Therefore, packing leaks are not significant release paths and the present radiological monitoring of the secondary system is adequate.

B. Spent Fuel Pool Level:

Regarding LER 80-09 and the inadvertent draining of the Spent Fuel Pool (SFP):

1. PGE does not consider this event to have had a significant potential for impact on the health and safety of the public.

2. Even if the water level decrease had continued undetected, the fuel would have remained covered with water, cooling of the spent fuel would not have been interrupted and no radiological releases would have occurred. In accordance with T.S. 3.9.11, water level in the pool would have been restored prior to handling irradiated fuel or heavy loads in the vicinity of the pool which could result in fuel damage and release of iodine (the basis for the Spent Fuel Pool level T. S. 3.9.11 is to limit iodine release from a fuel handling accident).

3. Several diverse indications of an abnormal level decrease in the SFP exist which serve as a natural backup to the low level alarm. These indications include:

   a. Visual observation of level by operators or other personnel involved in an evolution such as draining of the refueling cavity.

   b. Increasing radiation levels in the areas of the SFP, possibly reaching the alarm setpoint of ARM-13.

   c. During evolutions such as draining of the refueling cavity, a greater than expected volume of water would be transferred to the RWST. Draining of the SFP along with the refueling cavity and transfer canal involves 1740 gal./in. of level compared with 1030 gal./in. if the SFP is not being drained. If 350,000 gal. were drained from the cavity and the pool starting from normal SFP level, greater than 6 ft. of water would remain over the fuel.

4. The semi-annual functional test of the SFP level switch will involve an actual lowering of water level to verify the setpoint and alarm functions of the instrument.

5. Although we believe that the existing available indications are commensurate with the consequences of inadvertent water level decreases in the SFP, we are evaluating the necessity of relocating ARM-13 to detect increases in radiation levels due to SFP water level decreases (ARM-13 may respond well, despite the existing geometry).

C. Shutdown Margin:

Regarding LER 80-10 and dilution of RCS below Technical Specification boron concentration for Mode 6:

1. For the reasons outlined below, PGE does not consider this event to have had a significant potential for effect on the health and safety of the public.

2. A review of the applicable Technical Specifications and Bases reveals the following limits which involve RCS boron concentration:

   a. T. S. 3.1.1.2 - Shutdown margin in Mode 5 must be $\geq$1 percent $\Delta k/k$ to preclude inadvertent criticality.

   b. T. S. 3.9.1.a - In Mode 6 (reactor head unbolted or removed) K_{eff} of 0.95 or less to prevent criticality during refueling operations.

   c. T. S. 3.9.1.b - In Mode 6, boron concentration of $\geq$2000 ppm to ensure the reactor will remain subcritical during CORE ALTERATIONS.

   The root cause of the occurrence was a misinterpretation of operational mode since, although the Plant was not in an obvious normal refueling configuration (i.e., reactor head removed and refueling cavity flooded) the Plant remained in Mode 6 because the installed reactor vessel head was unbolted (see footnote for T. S. 3.9.1). If the head had been bolted, shutdown margin could have approached 1 percent $\Delta k/k$ without a T. S. violation. Even with the boron concentration below the 2000 ppm required by T. S. 3.9.1.b, the existing K_{eff} of 0.92 was well within the required $\leq$0.95 of T. S. 3.9.1.a and no CORE ALTERATIONS were in progress.

3. The procedure for cleaning the steam generator channel head was not inconsistent with the Technical Specifications. The procedure requires that calculations and boron additions be made to assure maintenance of the appropriate shutdown margin

without specifying what those shutdown requirements are, since the procedure could be employed in Modes 5 or 6. As stated above, the error was not in the procedure, but rather on the part of the personnel performing the required calculations.

4. Each quality-related procedure utilized onsite is reviewed for consistency with the Operating License and Technical Specifications before it is approved in its original or revised form. We do not believe that the occurrence described in LER 80-10 indicates a general inconsistency of Plant procedures with the Technical Specifications, nor do we believe that the administrative processes for review and approval of procedures are inadequate to identify and prevent such inconsistencies.

5. PGE has been considering installation of an on-line boron analyzer for over 5 yr. During that time, no adequate on-line boron analyzer system has been found. In addition to lack of required accuracies during normal operation, during shutdown periods, when RCS flows are low, concentration variations would result in undependable concentration information. An analyzer installed in the CVCS letdown line, as suggested by ODOE would not be functional during refueling and other shutdown periods when CVCS letdown flow is low or nonexistent.

We are willing to meet and discuss any of these matters with you or your representatives at your convenience.

Sincerely,

C. Goodwin, Jr.
Assistant Vice President
Thermal Plant Operation and
Maintenance

CG/JWL/LWE/4sa7B1

c: Mr. R. H. Engelken, Director
U. S. Nuclear Regulatory Commission
Region V

Mr. Charles M. Trammell
Operating Reactors Branch No. 3
Division of Licensing
U. S. Nuclear Regulatory Commission