NRC PDR

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

December 5, 1980

Alan S. Rosenthal, Esq., Chairman
Dr. John H. Buck, Member
Dr. W. Reed Johnson, Member
Atomic Safety and Licensing Appeal Board
Washington, D.C. 20555

In the Matter of
Portland General Electric Company, et al.
(Trojan Nuclear Plant)
Docket No. 50-344 (Control Building)

Gentlemen:

In my letter to you of November 24, 1980, I enclosed a letter from the Office of Inspection and Enforcement, Region V, to Portland General Electric Company dated October 14, 1980 which stated that Region V plans to increase the frequency and/or scope of future inspection activities at Trojan Nuclear Plant for completeness of licensee's reviews of facility changes pursuant to the requirements of 10 CFR 50.59.

The increased inspection emphasis was stated to be based on apparent weaknesses in this area recently identified in a Health Physics Appraisal.

On November 28, 1980, the Office of Nuclear Reactor Regulation received a copy of this Appraisal, dated October 31, 1980. Pertinent extracts of this report, which gives the details of the apparent weaknesses, are attached for your information.

Sincerely,

Thomas M. Novak, Assistant Director
for Operating Reactors
Division of Licensing

Enclosure:
Extracts from Trojan Health
Physics Appraisal dated October 31, 1980

8012180042

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Portland General Electric Company

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Trammel

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION V
1990 N. CALIFORNIA BOULEVARD
SUITE 202, WALNUT CREEK PLAZA
WALNUT CREEK, CALIFORNIA 94596

OCT 31 1980

Docket No. 50-344

Portland General Electric Company
121 S.W. Salmon Street
Portland, Oregon 97204

Attention: Mr. Bart D. Withers
Vice President Nuclear

Gentlemen:

Subject: Health Physics Appraisal

The NRC has identified a need for licensees to strengthen the health physics programs at nuclear power plants and has undertaken a significant effort to assure that action is taken in this regard. As a first step in this effort, the Office of Inspection and Enforcement is conducting special team appraisals of the health physics programs, including the health physics aspects of radioactive waste management and onsite emergency preparedness, at all operating power reactor sites. The objectives of these appraisals are to evaluate the overall adequacy and effectiveness of the total health physics program at each site and to identify areas of weakness that need to be strengthened. We will use the findings from these appraisals as a basis not only for requesting individual licensee action to correct deficiencies and effect improvements but also for effecting improvements in NRC requirements and guidance. This effort was identified to you in a letter dated January 22, 1980, from Mr. Victor Stello, Jr., Director, NRC Office of Inspection and Enforcement.

During the period of July 7-18, 1980, the NRC conducted the special appraisal of the health physics program at the Trojan Nuclear Plant. Areas examined during this appraisal are described in the enclosed report (50-344/80-16). Within these areas, the appraisal team reviewed selected procedures and representative records, observed work practices, and interviewed personnel. It is requested that you carefully review the findings of this report for consideration in effecting improvements to your health physics program. The findings of the appraisal at Trojan indicate that although your overall health physics program is adequate for present operations, several significant weaknesses exist. These include the following:

(1) radiation protection training program deficiencies,

(2) deficiencies in the worker breathing zone air sampling program,

(3) radioactive waste management deficiencies,

(4) failure to fully implement an ALARA program,

(5) air flows below industry standards in engineered systems designed to protect against airborne radioactive materials, and,

(6) deficiencies in emergency response capability.

These findings are discussed in more detail in Appendix A, "Significant Appraisal Findings." We recognize that an explicit regulatory requirement pertaining to each significant weakness identified in Appendix A may not currently exist. However, to determine whether adequate protection will be provided for the health and safety of workers and the public, you are requested to submit a written statement within twenty (20) days of your receipt of this letter, describing your corrective action for each significant weakness identified in Appendix A including: (1) steps which have been taken; (2) steps which will be taken; and (3) a schedule for completion of action. This request is made pursuant to Section 50.54(f) of Part 50, Title 10, Code of Federal Regulations.

During this appraisal, it was also found that certain of your activities did not appear to have been conducted in full compliance with NRC requirements as set forth in the Notice of Violation enclosed herewith as Appendix B. The items of noncompliance in Appendix B have been categorized into the levels of severity as described in our Criteria for Enforcement Action dated December 13, 1974. Section 2.201 of Part 2, Title 10, Code of Federal Regulations, requires you to submit to this office, within twenty (20) days of your receipt of this notice, a written statement or explanation in reply including: (1) corrective steps which have been taken by you and the results achieved; (2) corrective steps which will be taken to avoid further items of noncompliance; and (3) the date when full compliance will be achieved.

You should be aware that the next step in the NRC effort to strengthen health physics programs at nuclear power plants will be the imposition of a requirement by the Office of Nuclear Reactor Regulation (NRR) that each licensee develop, submit to the NRC for approval, and implement a Radiation Protection Plan. Each licensee will be expected to include in the Radiation Protection Plan sufficient measures to provide lasting corrective action for significant weaknesses identified during the special appraisal of the current health physics program. Guidance for the development of this plan will incorporate pertinent findings from the special appraisals and will be issued for public comment prior to the end of this calendar year.

APPENDIX A

Portland General Electric Company
121 S. W. Salmon Street
Portland, Oregon 97204

Docket No. 50-344

License No. NPF-1

Significant Appraisal Findings

Based on the Health Physics Appraisal conducted July 7-18, 1980, the following items appear to require corrective actions. (Section references are to the Details portion of the enclosed Inspection Report).

1. Personnel Selection, Qualification and Training

   The existing radiation protection training program failed to:

   (A) place the relative biological risk of exposure to radiation in the proper perspective for the layman participant in the general employee training program; and further requested that same layman to certify to the receipt of training to a standard which was neither supplied nor explained. (Section 3.3.1)

   (B) implement and document the training program described in existing procedures for the Chemical and Radiation Protection Technicians. In addition a specialized training, retraining and replacement training program in radiation protection, appropriate for each discipline, had not been established, implemented, maintained and documented for the plant staff. (Section 3.3.2 and 3.3.3)

2. Exposure Controls - Surveillance Program

   The available air sampling equipment and methods of use did not provide for worker breathing zone sampling or for continued sampling during the performance of work with the potential for generation of airborne radioactive materials. (Section 4.3.2 and 4.3.4 Continuous Air Monitors)

3. Radioactive Waste Management

   (A) The failure to review and document changes in the facility as described in the Safety Analysis Report causes the team to express concern. In one instance, the required review was not performed. In another instance records, which included the written safety evaluation, had not been maintained. (Section 5.2.2 and 5.2.3)

APPENDIX B

Portland General Electric Company
121 S.W. Salmon Street
Portland, Oregon 97204

Docket No. 50-344

License no. NPF-1

NOTICE OF VIOLATION

Based on the results of an NRC inspection conducted on July 7-18, 1980, it appears that certain of your activities were not conducted in full compliance with NRC regulations as indicated below. Items A and B are Infractions.

A. 10 CFR 50.59, "Changes, tests and experiments", authorizes the licensee to make changes in the facility and procedures described in the safety analysis report, and to conduct tests or experiments not described in the safety analysis report without prior Commission approval, unless the proposed change, test or experiment involves a change in the technical specifications incorporated in the license or an unreviewed safety question. The licensee must maintain a record of such a change, test or experiment that includes a written safety evaluation which provides the basis for the determination that the change, test or experiment does not involve an unreviewed safety question. Final Safety Analysis Report Section 5.1.3.3 states in part: "If the RCS is to be opened during the shutdown, the hydrogen and fission gas in the reactor coolant is reduced by degassing the coolant in the volume control tank."

Contrary to this requirement, from April 11 to April 14, 1980, the reactor coolant system (RCS) was degassed by venting the pressurizer vapor space via a jumper to the coolant volume control system holdup tank and an evaluation was not made of this change, test or experiment to determine that it did not involve an unreviewed safety question. (Section 5.2.2)

B. 10 CFR 19.12, "Instructions to workers", states in part, that all individuals working in or frequenting any portion of a restricted area shall be instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material.

Contrary to this requirement, on July 7, 1980, three individuals were granted unescorted access to portions of the restricted area including areas posted "Caution: Evacuation Alarm or Paging System Cannot be Heard", and were not instructed in the administrative controls necessary to permit an appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material. (Section 8.2)

U. S. NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT

REGION V

Report No. 80-16

Docket No. 50-344 License No. NPF-1 Safeguards Group ______

Licensee: Portland General Electric Company

121 S.W. Salmon Street

Portland, Oregon 97204

Facility Name: Trojan

Inspection at: Rainier, and Portland, Oregon

Inspection conducted: July 7-18, 1980

Inspectors:	H S North	10/31/80
	H. S. North, Radiation Specialist	Date Signed
	G P [illegible]	10/31/80
	G. P. Yuhas, Radiation Specialist	Date Signed
	HS North for	10/31/80
	J. B. Smathers, PhD., University of California at Los Angeles	Date Signed
	HS North for	10/31/80
	D. H. Cannam, Senior Research Scientist Battelle/Pacific Northwest Laboratories	Date Signed
Approved by:	F A Wenslawski	10/31/80
	F. A. Wenslawski, Chief, Reactor Radiation Safety Section	Date Signed
Approved by:	H E Book	10/31/80
	H. E. Book, Chief, Fuel Facility and Materials Safety Branch	Date Signed

Inspection Summary:

Inspection on July 7-18, 1980 (Report No. 50-344/80-16)

Areas Inspected: Special, announced appraisal of the health physics program, including organization and management, qualifications and training, quality assurance, procedures, external and internal exposure controls, survey and access controls, instrumentation, ALARA, radioactive waste, facilities and equipment and accident response capabilities. The inspection involved 335 inspector-hours onsite by four NRC inspectors.

Results: Significant strengths in the areas of management's commitment to and support of radiation protection and ALARA and staffing were observed. Several significant weaknesses in the health physics program were identified. These weaknesses are in the areas of training (Section 3.3), surveillance (Section 4.3.1), radioactive waste management (Section 5.2), ALARA (Section 6.0), facilities and equipment (Section 7.8) and emergency response capabilities (Sections 8.2 and 8.3). Two apparent items of noncompliance were identified (infraction) failure to perform a review pursuant to 10 CFR 50.59 (Section 5.2.2), (infraction) instruction of workers pursuant to 10 CFR 19.12 (Section 8.2).

RV Form 219(2)

The Shift Supervisor is responsible for:

- Authorizing liquid and gaseous releases according to appropriate plant instructions.
- Ultimate release of all radioactive wastes.
- Expeditiously locating and stopping any unplanned release.
- Reporting any unplanned release in accordance with appropriate instructions.

The Chemistry Supervisor is responsible for:

- Recommending methods of minimizing and processing liquid and gaseous radwastes.
- Monitoring liquid and gaseous radioactive waste discharges.
- Ensuring that the individual and cumulative liquid and gaseous releases are in compliance with state and federal regulations.
- Reporting cumulative radioactive release information.

No single individual is designated responsibility for day to day management, review and oversight of the integrated radioactive waste program. The supervisors of Operations, Chemistry and Radiation Protection each monitor their areas of assigned responsibility. Generation Licensing and Analysis Department distributes a quarterly "Radioactive Effluent Summary" to PGE management. This summary is a comparison of liquid and gaseous effluents released each quarter since 1976.

5.2 Waste Processing Systems

5.2.1 Liquids

Liquid radioactive waste has been processed and released in accordance with the design objectives stated in Section 11.2.1 of the Final Safety Analysis Report (FSAR).

Based on initial operating experience, the clean radwaste evaporator has not been routinely used for several years. The evaporator was found to be ineffective, difficult to maintain, costly to operate, and produced an inordinate amount of low quality concentrate which the licensee was not prepared to solidify. Therefore, the evaporator has been relegated to a standby status and the alternate system, steam generator blowdown ion exchangers are routinely used. In the event that the steam generator blowdown ion exchangers could not meet system processing demand the licensee intends to contract for vendor supplied processing capacity.

Several changes have been made to the liquid radwaste processing system as described in the FSAR. Most of these changes have been reviewed and documented as required by the regulations expressed in 10 CFR 50.59. These included Plant Design Change Nos. 76-121, 76-294 and 77-029. During a tour of the liquid processing area the Team noted what appeared to be a temporary filter system installed upstream of the dirty radwaste filter which is described in Table 11.2-9 of the FSAR. This temporary bag type filter was installed under Data Acquisition Procedure No. 12, "Temporary Dirty Radwaste Filter", Revision 0, dated November 16, 1977. On April 21, 1980 the Plant Review Board (PRB 80-224) reviewed and approved an operating procedure for operating the temporary dirty radwaste bag filter. The Engineering Supervisor stated that this change did not require a review pursuant to 10 CFR 50.59.

During each refueling outage the Operations Supervisor appoints an individual, usually a senior licensed operator, to coordinate a liquid radwaste reduction program. This individual involves himself in outage planning and directs processing and reuse of liquid radwastes. Review of Semiannual Effluent Release Reports indicated a downward trend in both liquid volume and total activity discharge each year since 1977.

Operating Instruction OI-6-1, "Liquid Radwaste" Revision 5, dated July 7, 1980 provides the programatic requirements for liquid effluents. Lower tier procedures provide detailed guidance to accomplish the task. "Liquid Radwaste Discharge Permit Preparation Procedure" Revision 8, dated June 1, 1980 was reviewed and found to contain the steps necessary to prepare a liquid discharge in accordance with the FSAR, Technical Specifications and 10 CFR 20 limits.

Three liquid discharges, Liquid Radwaste Discharge Nos. 16-80, 53-80, 96-80, were reviewed and found to conform to the procedural requirements.

Although the licensee's response to IE Bulletin No. 80-10, "Contamination of Nonradioactive Systems and Resulting Potential for Unmonitored, Uncontrolled Release of Radioactivity to Environment" had not yet been received, the Team observed several actions in progress to minimize potential release paths. One involved installation of a temporary line rerouting turbine building drains from the recreation lake to the discharge dilution structure. Another involved directing steam generator sample drains to the dirty waste drain tank.

5.2.2 Gaseous

The gaseous radioactive wastes have been processed and released in accordance with the general design objectives stated in Section 11.3.1 of the FSAR. With one exception it appears that the gaseous waste systems are constructed and operated as described in the FSAR. Several changes, (Plant Design Change Nos. 76-104, 76-503, 78-024) have been made and documented as required pursuant to 10 CFR 50.59.

Section 5.1.3.3 of the FSAR states in part: "If the RCS is to be opened during the shutdown, the hydrogen and fission gas in the reactor coolant is reduced by degassing the coolant in the volume control tank." Section 11.3.5.1 "Gas Collection System" states in part that: "The volume control tank vent is used only during degasification purging of the Reactor Coolant system. The degasification will normally only be required prior to a cold shutdown, approximately 9335 scf of gas will be purged during each cold shutdown. Maximum gas flow will be 32 scfm."

Operating Instruction OI-3-8, "Primary Coolant Chemistry Addition and Control" Revision 7, dated December 12, 1979 in Section IV, "Removal of Dissolved Gases" presents a detailed procedure for degassing the reactor coolant system to the volume control tank.

From review of operating history and from discussions with licensee representatives the team learned that adherence to procedure OI-3-8 typically results in filling three Waste Gas Decay Tank (WGDT) volumes. This procedure was felt by the licensee to be time consuming and inefficient, in that, considerable nitrogen is used; the WGDTs are released with short decay time; and substantial operator effort is required to perform the procedure.

In 1979 a test was performed to evaluate the effectiveness of degassing the primary coolant system via the pressurizer vapor space through the primary sample system to the

Volume Control Tank (VCT). This concept was found to be ineffective in that flow was limited by the sample "drag valve" and nearly the same volume of nitrogen was used in purging the VCT.

From discussions with licensee representatives it was learned that during the spring 1980 refueling outage a C&RPT designed, fabricated and installed a jumper that permitted degasification of the reactor coolant system from the pressurizer vapor space via the primary sample system directly to the Coolant Volume Control System (CVCS) Holdup Tank (HUT). This approximately 20 ft. section of thick wall stainless steel tubing assembled with compression type fittings was connected upstream of the sample "drag" valve SS-036 at back flush valve SS-029 and at the pressurizer liquid sample point SS-059. This jumper and a valve line up not described in either the FSAR or OI-11-2 "Sampling" Revision 1, dated October 12, 1979 permitted a direct flow path from the pressurizer vapor space to the HUT tank. From a review of records it appears that this lineup was used from 5:50 p.m. April 11 to 1:00 a.m. April 14. The C&RPT stated that he had made the Plant Chemist and an Operations Shift Supervisor aware of this degasification technique and assumed that they had developed written procedures to authorized its use.

In the "Water King Report for Refueling Shutdown 1980" the following statement appears.

> "1 New RCS degas procedure required 1½ WGDT vice 3 WGDT in old procedure".

In a "Plant Problem Report" initiated by the Plant Chemist on May 13, 1980 and signed by the Chemistry Supervisor on May 15, 1980 the following statements were made.

> "Tests show that degas can be accomplished easier, in less time, with fewer WGDT Discharges when the pressurizer vapor space is vented directly to the HUT. Recommend a direct connection be made from the pressurizer vapor space to HUT with control of valves from control. Recommend either a flow limiting orifice or capillary tube so throtting of valves may be minimized."

On July 11, 1980, while the plant was heating up prior to the start of low power physics testing minor problems were identified with a reactor coolant pump seal and an incore detector seal tube connection. Correction of these problems required cool-down and depressurization of the reactor coolant system. On July 14, 1980, the Team observed that the jumper was in place and connected at the primary sample station. A licensee representative stated that it had been used to degas the reactor coolant system over the weekend.

The Team and the NRC Resident Inspector reviewed records, interviewed the C&RPT, Plant Chemist, Chemistry Supervisor, Operations Shift Supervisor, Operations Supervisor and Engineering Supervisor regarding use of this jumper to degas the primary coolant system to the CVCS holdup tank. All individuals interviewed were aware of this evolution. The licensee representative acknowledged that a review of this change was not performed pursuant to 10 CFR 50.59; procedures were not written, reviewed or approved covering design, fabrication, installation and operation of this jumper.

Trojan Chemistry Manual, Table II-6.9, page 2-42, lists O_2 less than 5%, and H_2 less than 4% as limits for the CVCS holdup tanks. FSAR Table II.1-5 lists the following activities expected to be present in the pressurizer vapor space with a nominal 1% clad defect.

Isotope	Vapor Activity (uCi/cc)
Kr-85	5.1 E1
Kr-85m	1 E-1
Kr-87	1.8 E-2
Kr-88	1.2 E-1
Xe-131m	4.7
Xe-133	360
Xe-133m	1.8
Xe-135	6.5 E-1
Xe-135m	5.0 E-4
Xe-138	2.2 E-3

The jumper was installed in the primary sample room which is located on the 45' elevation of the Control Building. Preliminary evaluation of the degasification performed

April 11 to April 14 indicated that about 73.5 Ci of ^{133}Xe and 10.4 Ci ^{85}Kr were transferred to the CVCS HUT tank, (based on a clad integrity of 99.99%). The HUT vapor space hydrogen concentration increased from 8 to an estimated 66%.

Based on the potential chemical energy and radioactivity transferred via the jumper and contained in the HUT tank an unreviewed safety question may have existed in terms of potential radiation dose to control room operations personnel and potential danger to safety related systems and components located in proximity to the HUT tanks.

Failure to perform a written safety evaluation which provides the bases for determination that degassing the reactor coolant system via a jumper to the CVCS holdup tank did not involve an unreviewed safety question represents noncompliance with 10 CFR 50.59 (50-344/80-16-01).

Operating Instruction OI-6-2, "Gaseous Radwaste" Revision 3, dated January 3, 1980 provides the programatic requirements for gaseous effluents. Lower tier procedures provide detailed guidance to accomplish the task.

"Containment Purge Discharge Permit Procedure" Revision 3, dated January 1, 1979 was reviewed and found to contain the steps necessary to prepare a containment purge discharge in accordance with FSAR, Technical Specifications and 10 CFR 20 limits.

Three containment purges, (Trojan Nuclear Plant Containment Discharge Permit Nos. G-15-80, G-16-80, and G-20-80) were reviewed. Numerous errors, omission and failure to comply with procedural requirements were observed. These errors, mostly administrative in nature, did not result in exceeding effluent release criterion. They do point to a lack of formality in executing the discharge permits and to an apparent lack of timely management review.

"Waste Gas Decay Tank Discharge Permit Procedure" Revision 2, dated February 25, 1978 was reviewed and found to contain the steps necessary to prepare a waste gas decay tank discharge in accordance with FSAR, Technical Specifications and 10 CFR 20 requirements.

Three waste gas decay tank releases (WGDT Discharge Permit Nos. G-25-80, G-5-80, G-3-80) were reviewed. These permits also contained several omissions.

This lack of formality was discussed with the Plant Chemist and the Chemistry Supervisor. Problems of this same nature had been identified in previous onsite Quality Assurance Audits. To minimize this problem a new position, "Effluent Specialist", has been created. This position will be responsible for monitoring liquid and gaseous effluents, review of discharge permits and preparation of the Semi-annual Effluent Release Report input data. It is expected that this position will be filled in the near future.

5.2.3 <u>Solid</u>

Solid radioactive wastes have not been processed in accordance with the design objectives stated in Section 11.5.1 of the FSAR. In particular the Solid Waste Processing Module described in Section 11.5.3.1.3 has never successfully operated. This process apparently produces a solid product with freestanding caustic liquid residue.

Licensee representatives stated that a request for design change (RDC) has been submitted for extensive modification of the solidification facility to accommodate a new solidification agent. It is expected that work on this process will begin next year.

As an interim measure the licensee has contracted a mobile solidification unit owned and operated by a vendor. This unit was used to solidify CVCS resins in March 1979.

A safety evaluation was performed pursuant to 10 CFR 50.59 for utilization of this vendor process. Documentation of this safety evaluation was apparently lost and therefore this change was not discussed in the 1979 Annual Report. Review of the reconstructed safety evaluation dated July 8, 1980, indicates that potential failure of the portable system was considered and found not to constitute an unreviewed safety hazard.

FSAR Table 11.5-2, "Annual Spent Resin Waste Volume" and Section 11.5.4 indicate an expected annual total of 400 cubic ft. to be processed. In 1979 the licensee shipped approximately 2330 cubic ft of spent resin. Most of this resin is from the steam generator blowdown ion exchanger and full flow condensate demineralizers.

time of the inspection the contaminated spool piece had been replaced and was being decontaminated.

When releases are made through the monitors, grab samples of waste water or gas are taken and analysed using the calibrated Ge(Li) system. Based on this assay and the Victoreen calibration curves, a predicted monitor response is calculated. Comparison of this calculated response to actual monitor response was noted to be within ± 25% of the analyzed value, based on a review of records.

5.4 Conclusions: Radioactive Waste Management

Based on the above findings, improvements in the following areas are required to achieve an acceptable program:

(1) PGE management representatives have stated that they believed that safety evaluations pursuant to 10 CFR 50.59 were only required for Seismic Category 1 and 2 systems.

10 CFR 50.59 requirements must be performed and documented as stipulated in the regulations.

(2) Solid radioactive shipping procedures lack sufficient detail to assure compliance with the many requirements in this area.

(3) Documentation of procedural compliance involving radioactive effluents indicates a lack of formality and supervisory review.

The following matters should be considered for improvement of the program:

(1) The RPS should not be responsible for waste processing activities. He and his staff should be involved in providing appropriate radiation protection control rather than performing such work.

(2) A single individual having sole responsibility for managing the radioactive waste program should be designated.

(3) Consideration should be given to the creation of adequate radioactive material and waste storage facilities.

(4) Radioactive waste processing capabilities need to be reviewed and action taken to insure viability in the years ahead.