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

REGION V

Report No. 50-344/80-07
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, Oregon

Inspection conducted: April 14-18, 1980

Inspectors: R. F. Fish 5/16/80
R. F. Fish, Radiation Specialist Date Signed

Date Signed

Date Signed

Approved by: F. A. Wenslawski 5/22/80
F. A. Wenslawski, Chief, Reactor Radiation Safety Date Signed
Safety Section

Approved by: H. E. Book 5/22/80
H. E. Book, Chief, Fuel Facility and Materials Date Signed
Safety Branch

Summary:

Inspection on April 14-18, 1980 (Report No. 50-344/80-07)

Areas Inspected: Refueling preparations including organization, training, procedures, advanced planning and preparation, personnel monitoring and exposure control, respiratory protection program, surveys, radiation work permits, radioactive and contaminated material control, tour of facility, follow-up of unusual event reported by the licensee, licensee action on IE Bulletin 79-19 and licensee investigation of steam generator radiation safety program. The inspection involved 40 hours onsite by one NRC inspector.

Results: Of the thirteen areas inspected, no items of noncompliance were found in eleven areas. Two apparent items of noncompliance, one in each of two areas, were identified ((a) deficiency - pH in plant effluent exceeded Technical Specification limit - Paragraph 12 and (b) Deficiency - several containers in the waste storage yard were not labeled in accordance with 10 CFR 20.203(f)(2) - Paragraph 13.g).

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DETAILS

1. Persons Contacted

- *W. S. Orser, Manager, Operations and Maintenance
- *C. A. Olmstead, Manager, Technical Services
- D. F. Kielblock, Manager, Plant Services
- *T. O. Meek, Radiation Protection Supervisor
- *R. L. Russell, Assistant Radiation Protection Supervisor
- J. G. Bailey, Radiation Protection Engineer
- D. B. Sommerville, Radiation Protection Specialist
- F. E. Dyson, Chemical and Radiation Protection Technician
- D. T. Flahardy, Chemical and Radiation Protection Technician
- L. D. Larson, Chemical and Radiation Protection Technician
- W. G. Methe, Chemical and Radiation Protection Technician
- T. L. Moore, Chemical and Radiation Protection Technician
- V. A. Parola, Chemical and Radiation Protection Technician
- N. J. Starr, Records Coordinator
- R. E. Susee, Training Supervisor
- J. N. Pickett, Training Assistant
- G. L. Rich, Chemist
- J. D. Reid, Quality Assurance Supervisor

Several contract personnel working in the Radiation Protection group were also interviewed.

*Denotes those present at the exit interview.

2. Organization

The Radiation Protection group is headed by T. O. Meek who assumed the position in February 1980. Meek reports to the Manager of Technical Services. His previous employment was at the Palisades nuclear generating station. For the current outage, which started April 9, the Radiation Protection group has been organized on a functional basis. The dosimetry program (external exposure) has been assigned to the Radiation Protection Engineer. The Radiation Protection Specialist, who is responsible for the respiratory protection program, has also been assigned to supervise the training of the contractor (Allied Nuclear Service) health physics technicians and assure that adequate supplies used in radiation protection are maintained. The division of work supervised by the Assistant Radiation Protection Supervisor has been divided into six major functions with a Chemical and Radiation Protection Technician (CRP technician) assigned responsibility for each such function. Five of the six functions involve the supervisory responsibilities of planning, procedure and guideline generation, exposure projection and personnel direction. A second CRP technician has been assigned to the functions of steam generator work, refueling and routines (design changes, maintenance activities, normal surveys and other non-assigned activities) to provide the necessary supervision and direction during the second shift.

By contract the licensee has temporarily expanded the Radiation Protection group. Allied Nuclear Services (ANS) has supplied 34 senior health physics technicians (6 more to be supplied), 25 Junior health physics technicians and a number of clerks. There are 3 ANS supervisors; however, the ANS technicians and clerks are under the direct supervision of Trojan personnel with respect to job performance. Two radiological engineers have been obtained from Proto-Power to provide support directly to the Radiation Protection Supervisor. These engineers will operate in the areas of radiation safety support and audit and ALARA. Decontamination contracts have been issued to Hydro Nuclear Services for area decontamination and ANS for electro polishing/degreasing of contaminated tools and equipment. Protective clothing is being dry cleaned under a contract issued to Health Physics Systems.

No items of noncompliance were identified.

3. Training

The licensee's radiation safety training program for contractor personnel and others being qualified for unescorted access to the facility was reviewed and found to be as described in Paragraph 5 of IE Inspection Report No. 50-344/79-21. During the inspection the inspector watched the videotape for the first lesson plan which covered the general subject of safety at the facility. At the conclusion of the videotape a written examination on the contents was given to each individual.

The licensee has provided additional training (one day duration) for the ANS health physics technicians. The training has been based on a three page handout given to each technician that covers the Trojan administrative limits (radiation exposure, contamination, radiation areas and respirators) and the more important radiation protection procedures (i.e. RP-102 Survey Techniques, RP-112 Personnel and Clothing Contamination Reports, and RP-119 Airborne Radioactivity Sampling and Analysis). According to the licensee the job performance of the ANS health physics technicians has been judged on observations by the responsible Trojan CRP technician(s) and Radiation Protection supervisor as well as comments received from non-radiation protection personnel (i.e. Trojan maintenance and operator personnel). The Assistant Radiation Protection Supervisor reviews all ANS health physics technician resume's prior to their start of work.

No items of noncompliance or deviations were identified.

4. Procedures

Radiation Protection Procedure RP-120, issued on March 28, 1980, is the only procedure that can be considered to have been generated for the current outage. The procedure provides radiological controls for steam generator maintenance work. Temporary Radiation Protection Procedure TRP-001, approved on November 13, 1979, provided exposure

control for platform access and jumping related to steam generator work. This temporary procedure, applicable when referenced on a radiation work permit (RWP), was issued during the previous steam generator work that was performed in October and November 1979. According to the licensee this temporary procedure will be changed to a regular procedure in the near future. These procedures have been added to the collection of procedures that provide more specific requirements for subjects covered in the Radiation Protection Manual. Both of these procedures, RP-120 and TRP-001, had been approved by the Radiological Protection Supervisor which is the only approval required. The inspection disclosed that all of the radiation protection procedures had been revised or initially approved since August 1979.

No items of noncompliance or deviations were identified.

5. Refueling Advanced Planning and Preparation

CRP technician assignments were made 1-2 months prior to the current outage to allow planning time for the various scheduled major projects. The responsible CRP technicians reviewed the work to be done, met with the involved groups, estimated radiation protection personnel requirements, and generated some written guidelines. The latter were in a memorandum form. Projected man-rem exposures vs time graphs have been made for the major projects (i.e. steam generator, inservice inspection, refueling). Actual man-rem exposures received will be plotted on graphs. According to the licensee inquiries will be made if the actual exposures are significantly higher or lower than the projected values to ascertain the reason(s) for the variance. The responsible CRP will approve all RWPs related to his project.

No items of noncompliance or deviations were identified.

6. Personnel Monitoring and Exposure Control

The licensee still uses Eberline supplied and read TLD's (thermoluminescence dosimeter) to monitor external exposures to radiation. PIC's (self reading pocket ion chamber), worn during entries into controlled areas, provides supporting information. During the outage Eberline personnel will be onsite and have the capability to read the TLD's immediately. The licensee's external exposure program was described in Paragraph 8 of IE Inspection Report No. 50-344/78-22.

The exposure data has been stored in a computer. The licensee generates a daily printout of the exposures received by organization. The following information is shown on the daily exposure report: name and badge number, weekly exposure (PIC information), monthly exposure to date (TLD), monthly exposure to date (PIC), monthly exposure to date total (TLD plus PIC), quarterly exposure to date, yearly exposure to date. The report also provides an "alert" to

indicate a possible problem with one of the licensee's administrative exposure limits - 300 mrem/week, 1000 mrem/quarter, 2500 mrem/quarter, 4500 mrem/year. The report is distributed to the dosimetry section, the control access point and to appropriate supervision (licensee and contractor). PIC exposure data from the RWPs is entered into the computer on a daily basis. According to the licensee the computer program replaces the corresponding PIC data with TLD data when the latter is entered into the computer.

In addition to being fed into the computer on a daily basis, the PIC exposures are recorded on individual cards. These cards are maintained by the radiological protection clerks located at the controlled area access point (45 foot level of the Control Building). These clerks have the responsibility to alert individuals that they are approaching an administrative exposure limit and approval to exceed this limit should be obtained. The control clerks at the access point have been instructed not to issue a PIC to any individual whose exposure, as shown on the cards they maintain, has exceeded an administrative exposure limit unless they have been informed that approval for additional exposure has been granted. This control on the issuance of the PICs provides a means for assuring required administrative reviews and approvals for exposures in excess of the administrative limits. The clerks at the access control point are the only persons who zero the PICs and this is done following the recording of the exposure shown by the individual PIC.

The first finalized daily exposure printout was dated April 16; however, earlier printouts had shown the exposures being accumulated and the data base was being generated on a timely basis. The examination of the April 16 printout showed that the above described information was present and it was divided into the various organizations. The exposures shown reflected the fact that most of the significant exposure projects had not started. The maximum exposures received during the 2nd quarter of 1980 were in the range of 300 - 400 mrem. The quarterly exposures to date for 1980 had not exceeded 10 CFR 20.101 limits.

The licensee uses whole body counting to assess exposure to internal deposition of radioactive materials. The whole body counting program as it relates to a refueling outage where large numbers of non-licensee personnel work in the controlled areas has not changed since the March 1978 refueling. This program has been described in Paragraph 13 of IE Inspection Report No. 50-344/78-09.

No items of noncompliance or deviations were identified.

7. Respiratory Protection Programs

The licensee's respiratory protection program consists of appropriate procedures, training, equipment fitting, equipment maintenance, equipment effectiveness assessment and necessary records. According to the licensee personnel exposure to airborne activity has been and will normally continue to be less than 25 percent of 40 MPC-hours per week. The Radiation Protection Specialist has supervisory responsibility over personnel who operate the testing booth and perform the maintenance and cleaning activities.

The primary respiratory protection training has been performed by the Training Section. The training consists of a video tape followed by a demonstration on the proper methods for donning and removing of such equipment. The participants experience the donning and removing of the respiratory protective masks as well as the wearing of such equipment. The participants receive an additional review of the proper methods for donning and removing of the equipment during the fitting/testing procedure. The Training Section also is responsible for giving the medical questionnaire, spirometer test and eye examination which must be taken prior to the fitting/testing procedure.

Those portions of the program related to procedures, equipment fitting/ testing and equipment maintenance have not changed significantly since the March 1978 refueling (see Paragraph 13 of IE Inspection Report No. 50-344/78-09). A new Radiation Protection Procedure, No. 103.1, was approved and issued on April 8, 1980. This procedure covers the operation of the new breathing air supply manifolds recently purchased by the licensee. The Maintenance Inspection and Repair of Personnel Respiratory Protection Equipment, and Breathing Air Supply Mainfold procedures, Nos. RP 104 and RP 103, were last reviewed and updated in September and October 1979 respectively. The licensee has trained 2-3 utility workers, who administratively work for the Assistant Radiation Protection Supervisor, to clean and examine the respiratory protective equipment. A copy of Radiation Protection Procedure 104 was observed by the inspector to be posted on the wall just outside the controlled area where the equipment was being cleaned and inspected. The fitting/ testing of respiratory protection masks to the personnel has been performed by ANS technicians who received specific training for this job. During this inspection the inspector observed the mask fit testing of one individual in the sodium chloride test chamber.

No items of noncompliance or deviations were identified.

8. Surveys

The licensee's routine survey program, described in the Radiation Protection Manual, was being performed during the refueling outage under the direction of an assigned responsible CRP technician. The surveys included radiation level measurements, smears to detect levels of removable contamination and air samples. In addition to

the routine surveys, non-routine surveys have been performed to assess a specific situation or provide data for a RWP. A series of forms have been generated to record the routine survey results. A separate form was devised for recording non-routine survey results. The survey records for the period April 14-17, 1980 were examined. The required information on the routine survey forms had been recorded. The inspector observed an ANS technician make a smear survey at the main access building to the site. This building also is the main exit point and the survey included smears on both sides of the exit portal monitors. The licensee has assigned full time responsibility for the portable survey meter calibration program to one CRP technician.

No items of noncompliance or deviations were identified.

9. Radiation Work Permits

All work and other activities performed inside a controlled area must be covered by an RWP. Copies of the RWPs have been posted on a bulletin board at the 45 foot level access point in the Control Building. Clerks at this location also have copies of the RWPs. The clerks are recording the names of the individuals on their copies of the RWPs to assure legibility and the "in" and "out" dosimeter (PIC) readings. Except for experienced personnel the clerks are also reading the dosimeters. An additional copy of the RWP has been posted at the work site. An examination of the RWPs on the bulletin board disclosed they were completed and current radiation information had been provided. According to the Assistant Radiation Protection Supervisor, he reviews all RWPs for work in high radiation areas. During the inspection the inspector observed the activities of the clerks responsible for the RWPs at the 45 foot level access point.

No items of noncompliance or deviations were identified.

10. Radioactive and Contaminated Material Control

Most of the areas in the Auxiliary and Fuel Buildings do not require the wearing of protective clothing because of little or no removable contamination. Some specific areas within these buildings have been designated as "controlled areas" and have been appropriately barricaded, posted with warning signs and provided with a step-off pad. The required protective clothing for these areas is shown on the specific RWP. The containment building and the 93 foot level area around the spent fuel pool required a full set of protective clothing including head covers, several foot covers and at least two sets of gloves and coveralls.

A temporary change area has been established on the 93 foot level of the Auxiliary Building for use by personnel entering the Containment/Spent Fuel area. The cleaning of the cloth and rubber protective clothing is being performed by a contractor who is operating an onsite dry cleaning facility that is in trailers. Contaminated equipment and tools are being controlled to prevent the spread of contamination. A "hot" tool room has been established on the 93 foot level of the Fuel Building. A decontamination area has been located adjacent to the "hot" tool room. Extensive use of disposable floor, wall and equipment coverings have been used to limit the spread of contamination. New tents for use around the steam generators and ventilation equipment with HEPA filters, also for steam generator use, have been purchased. The licensee uses vacuum cleaners, wet and dry, equipped with HEPA filters for cleanup purposes.

No items of noncompliance or deviations were identified.

11. Tour of Facility

During the inspection a tour of the Containment, Auxiliary and Fuel Buildings and the radioactive waste storage yard was made. During the tour the inspector observed control of access to the Containment and Auxiliary Buildings, the area postings, contamination control and the postings of RWPs at the job sites. High radiation areas were posted in accordance with 10 CFR 20.203(c)(1) and rope barricades or locked doors were used to prevent unobstructed entrance into such areas. Spots of radiation, where the level was less than 100 mR/hr at 18 inches were so identified. During the tour radiation and contamination areas and containers inside the buildings were found to be posted and labeled in accordance with 10 CFR 20.203 and the licensee's procedures. Surveys made by the inspector, using a licensee GM survey meter that had a current calibration date, confirmed that areas were properly posted, posted radiation levels did not exceed measured levels and no high radiation or radiation areas existed without proper posting. Radiation levels in the unbarricaded or unlocked areas of the Fuel and Auxiliary Building were generally less than 1 mR/hr. The radiation levels at the fence around the radioactive waste storage yard were less than 0.5 mR/hr. The licensee was still in the process of reducing the contamination levels in some areas of the Containment Building.

No items of noncompliance or deviations were identified.

12. Followup of Unusual Event Reported by the Licensee

By letter dated October 24, 1979 the licensee submitted to the Director of the USNRC Region V office a report concerning plant effluents being released with a pH above the Environmental Technical Specification limit of 9.0 (Specification 2.2.4.3 of Appendix B, "shall fall within the range of 6.0 to 9.0"). The inspection

included an examination of the material submitted to the Plant Review Board and a discussion with the Plant Chemist who investigated the matter. The pH recorder in the control room alarmed indicating the plant effluent was not within the technical specification range. The control room personnel requested that a technician obtain a grab sample of the plant effluent to confirm the pH value. The laboratory analysis of the grab sample confirmed a high (9.2) pH. The recorder showed two sharp peaks, one at about 9.05 and the second at about 9.2, over about a 15 minute period around 4:30 p.m. on October 18, 1979. Operations and chemistry personnel could not identify any activity occurring at that time which would have caused the high pH. Chemistry determined that it would require the addition of about 1500 ml of 50 percent sodium hydroxide to raise the effluent pH to the 9.2 value. The licensee also checked the diagrams and found no sources of liquid discharges to the dilution and discharge structure that would have caused the high pH. The laboratory result confirmed the pH instrumentation in the control room was operating properly. The licensee has concluded that the source of the high pH will not be identified and plans no further action on the matter other than instructing all site supervisors to inform the plant chemists prior to disposing of any potentially hazardous chemical.

The pH of plant effluent in excess of the upper limit of 9.0 in the technical specification has been identified as an item of noncompliance and classified as a deficiency.

13. Licensee Action on IE Bulletin 79-19

By letter dated September 26, 1979 the licensee informed the Director, Region V, USNRC of their actions in response to IE Bulletin 79-19. The following information related to the packaging of low-level radioactive waste for transport and burial was obtained during the inspection.

- a. The licensee has current copies of the NRC Regulations.
- b. Current copies of Nuclear Engineering's State of Washington license for the Richland burial site and Chem-Nuclear's State of South Carolina license for the Barr ell burial site are possessed.
- c. Management has assigned the responsibility for the solid radioactive waste program to the Radiation Protection Supervisor; however, the (Plant) General Manager has the overall administrative responsibility of the radioactive waste control program and the plant supervisors are responsible to minimize the generation of solid waste.

- d. One section of the Radiation Protection Manual is devoted to radioactive waste control, including solid radioactive waste. Most of the guidance and instructions pertaining to radioactive material shipments is contained in Radiation Protection Procedure RP-107, Radioactive Material Receipt and Shipment. The procedures reference 10 CFR Part 71 and 19 CFR 171-178 but do not mention 10 CFR 30.41. However, the procedures do address the keeping of records and the records show the license authority of the receiver. Revision 4 of Procedure RP-107 was issued on April 7, 1980. This revision incorporated information on the transuranics.
- e. The licensee's training records showed that NUS Corp. personnel provide instruction on DOT shipping regulations to 8 CRP technicians and the Assistant Radiation Protection Supervisor on February 13, 1979. These records also show that the Assistant Radiation Protection Supervisor provided training to 9 CRP technicians on low level radioactive waste shipments on February 28, 1980. Supervisory observations have been used to ascertain that employees have a sufficient degree of familiarity with the low level radioactive waste procedures to assure safe operations.
- f. The licensee's quality assurance program for operations was changed in February 1980 to incorporate a section devoted to packaging radioactive material for transport. Audits of the operations covered by this section have been included in the routine audit program for the facility. Paragraph 11 of the IE Inspection Report No. 50-344/79-21 discusses the audit performed by the site QA organization in response to Item 8 of IE Bulletin 79-19.
- g. On April 17, 1980 a visit was made to the yard area where the radioactive waste was stored. The waste area, which is within the site fenced and guard controlled area, is fenced and the gates secured with a padlock. The responsible CRP technician has control of the padlock keys. The gates were posted in accordance with 10 CFR 20.203(b) and (e). Additional "Caution Radiation Area" signs were posted on the fence at locations on all four sides. The 55 gallon drums, containing LSA waste, were stacked on pallets. These drums had serial number, labels meeting the requirements of 10 CFR 20.203(f) and were stamped Radioactive - LSA on the side. Some large, banded wooden boxes of radioactive waste were also stored in the yard. The boxes were also labelled in accordance with 10 CFR 20.203(f). Several large (~3 feet diameter by 5 feet high), shielded casks were also in this yard. Some contained resin, some dry radioactive waste and a few were empty. The casks with radioactive waste had labels that showed a radiation caution symbol and the words "Caution Radioactive Material," but did not have any other information. Some of the casks had numbers on them. The licensee stated, and the inspector observed, that the radwaste records related to the cask contents

were coordinated by serial number. However, some of the cask serial numbers were unintelligible due to weathering and the licensee would need to open the casks to observe the contents in order to correlate them to the records. According to the licensee the radiation level at the top of two of these casks, with the shielded lids off, was about 100 and 250 mR/hr respectively. Failure to provide information on the cask labelling to permit individuals handling or using the containers or working in the vicinity thereof to take precautions or minimize exposures constitutes noncompliance with 10 CFR 20.203(f)(2). This noncompliance is classified as a deficiency. (80-07-01)

- h. The inspection included the opening of one 55 gallon drum of compacted, low-level, dry radioactive waste and the checking of a second 55 gallon drum of resin radioactive waste for free standing water. The drum of compacted waste was secured with a bolted ring and a rubber gasket sealed the top to the sides. The drums were labelled with the following information: words "Caution Radioactive Material, a radiation symbol, radiation level at contact (resin was also labelled with radiation level at 3 feet), removable activity on surface, description of contents (resin and compacted rad waste), words "Radioactive - LSA", a serial number and the date of loading. The observation by the inspector also confirmed the presence of the contents and the absence of free standing water in the drum of resin. The inspector, using a licensee GM survey meter that had a current calibration date determined that the radiation level at the surface of the resin drum was <1 mR/hr and the dry waste drum was <0.5 mR/hr on contact. These readings were less than shown on the labels and the difference was due to decay. The waste records for these drums also showed the drum weight. A sample of the resin had been analyzed and a copy of the results (isotopes and concentrations) was with the waste records. The licensee said the activity present in the waste containers was ascertained at the time of shipment.

The only item of noncompliance or deviation has been described in paragraph "g" above.

14. Licensee Investigation of Steam Generator Radiation Safety Program

As the result of an unexpected off scale dosimeter in October 1979 and the potential exposure in excess of 3 rems in a quarter, the licensee established a committee to investigate the radiation safety program related to the steam generator work in progress at that time - see Paragraphs 4 and 13.b of IE Inspection Report No. 50-344/79-21. This inspection included an examination of the committee's formal report of the investigation. The report made a number of recommendations for improving the radiation safety program. By memorandum the Plant General Manager responded to the committee's recommendations. The

investigation report had acknowledged the improvements in the radiation safety program made during the period of the investigation. Most of the corrective actions described in the memorandum response to the report were confirmed during this inspection - i.e. onsite reading of TLD dosimeters during the refueling outage by the contractor, improved availability of survey meters, more formal and better training for contractor radiation protection technicians, improved availability of data on exposures received by all personnel, changes in the radiation safety organization for the period of the refueling outage to better supervise various phase of work performed. Some corrective actions will require a longer period to implement (hiring an instructor for the training organization with a strong radiation safety background and establishment of a company dosimetry responsibility in an organization outside of the plant staff).

No items of noncompliance or deviations were identified.

15. Exit Interview

At the conclusion of the inspection, the inspector met with those licensee personnel so identified in Paragraph 1 of this report. Mr. G. Johnston, Resident NRC Inspector, was also present. The scope of the inspection and the findings were summarized. The licensee was informed that failure to label several containers of radioactive waste in the waste storage yard in accordance with 10 CFR 20.203(f)(2) appeared to be an item of noncompliance. The following items were also discussed.

- a. The licensee's attention was directed to the importance of auditing the activities of the contractor's radiation safety personnel. Trojan management is responsible for assuring that these contractor employees follow the Trojan Technical Specifications, Radiation Protection Manual and other related procedures. Examples of the need for such auditing were given.
- b. The difficulties experienced by the inspector in relating the radioactive waste records to the containers stored in the waste yard were described. The assistant Radiation Protection Supervisor stated he had checked on these records and was surprised at their condition. According to the licensee the radioactive waste records would be improved.
- c. There is no present system for keeping a record of the personnel exposures to airborne radioactivity. It was acknowledged that the licensee operates the radiation safety program so as to preclude exposure at or above the values in 10 CFR 20.103(a)(3). The inspector posed one possibility where such a record would need to be kept and suggested the licensee examine their program to see if they would be in compliance with 10 CFR 20.103(a)(3) under such a circumstance.