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VPN-014-2005

Trojan Nuclear Plant
Docket 50-344
License NPF-1

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Revision 21 of PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan)

The enclosure to this letter provides Revision 21 to Portland General Electric Company's PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan). The attachment to this letter provides a description of the changes incorporated into Revision 21. Revised portions of the TNP Decommissioning Plan are denoted by sidebars.

If you have any questions concerning this submittal, please contact Mr. Jerry D. Reid, of my staff, at (503) 556-7013.

Sincerely,

Stephen M. Quennoz
Vice President, Generation

Attachment

Enclosure

c: Director, NRC, Region IV, DNMS
J. T. Buckley, NRC, NMSS, DWM
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NMSS01

Description of Changes

The following provides a description of the changes incorporated into PGE-1061, "Trojan Nuclear Plant Defueled Safety Analysis Report and License Termination Plan (PGE-1078)" (a.k.a., TNP Decommissioning Plan), Revision 21. The changes were evaluated and determined to not require prior NRC approval pursuant to 10 CFR 50.59. The changes are listed under their corresponding Licensing Document Change Request (LDCR) number.

LDCR 2005-001	Section 3.1.3.4.2 was updated to address the use of default DCGLs rather than developing reduced DCGLs as previously described.
LDCR 2005-006	Chapter 5 and Tables 5-1 through 5-6 were revised to provide the required annual decommissioning cost estimate update.

PGE-1061, "TNP Decommissioning Plan"

Revision 21

Pages to your Controlled Copy of PGE-1061, "TNP Decommissioning Plan," are to be replaced as indicated below:

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The analytical results for each monitoring well were compared with background groundwater quality to determine if any radionuclides are present above background levels. The identification of groundwater moving toward the buried valley and the tritium in MW-8 met the requirements of the Trojan license condition to implement the second phase of the groundwater monitoring program.

Phase II

The scope of the Phase II groundwater monitoring program was based on the Phase I results. Phase II included the installation of additional monitoring wells in the buried valley (to the west of Trojan Hill).

Seven additional wells were planned and drilled to support Phase II activities. The wells were installed using the same procedures as described in the Phase I description above. Two groups of nested wells were installed in the buried valley just west of the Trojan access road. The nested wells consisted of two wells, a shallow well approximately 25 feet deep and a deep well approximately 55 feet deep. The intent of the nested wells is for the shallow well to target the top of the groundwater table and the deep well to reach the bedrock. Two wells were installed in the upper parking lot on the north and south end. A seventh well was installed on the east side of the Industrial Area near the area where the diesel fuel oil tanks were located. The well in the Industrial Area was drilled to approximately 22 feet to provide down gradient sampling for Phase I well MW-8. Sampling and analysis methods were repeated for Phase II wells. Phase I wells were also resampled to ensure the time period between sampling Phase I wells and Phase II wells would not lead to errors in radionuclide concentration determination due to the time elapsed between the Phase I and Phase II activities. A total of 17 wells were installed at Trojan. Figure 3-2 shows the approximate locations of the wells.

Water samples collected during Phase II sampling (with the exception of samples analyzed for Tritium) were acidified to ensure that radioactivity would not plate out during the period of storage and transport of the samples for analysis. The Trojan groundwater sampling procedure provides the guidance for sample collection and treatment. The data collected during all phases of the study were combined to provide an overall assessment of the potential dose to a member of the public from residual radioactivity in the Trojan groundwater. If it had been required, PGE planned to subtract the potential dose from groundwater radioactivity from the allowable annual dose limit (25 mrem/year), and the default Derived Concentraiton Guideline Levels (DCGLs) would have been reduced by the fractional dose contribution from groundwater and used as site-specific DCGLs.

This reduction of the DCGLs was determined not to be necessary even though low concentrations of tritium had been detected in monitoring well MW-8 and in excavated site areas. This is because the groundwater tritium concentrations and potential doses are so low that reductions of the default soild DCGLs were not necessary to keep the total annual dose well below the 25 mrem unrestricted release criterion. On this basis, PGE adopted the default DCGLs for use as the Troja site-specific soil DCGLs.

3.1.3.4.3 Surface Water Survey

Surface water was sampled from indicator sites on PGE property surrounding TNP. A 1 gallon sample was obtained from each site for gamma and ^{90}Sr analysis and a 60 ml sample for tritium analysis. The water samples were analyzed for gamma emitters using a gamma spectroscopy system located onsite. Water samples were analyzed for tritium in the onsite counting laboratory. Selected samples were analyzed for ^{90}Sr.
To determine background, water samples were collected from four locations around TNP. The locations included:

1. Fishhawk Lake (approximately 18 miles west of TNP containment);

2. Ponds at the intersection of Goble and Bishop Roads (approximately 3 miles southwest of TNP containment);

3. Kress Lake (approximately 1 mile east-northeast of TNP containment); and

4. Deer Island ponds (approximately 7 miles south of TNP containment).

Analyses for gamma emitters and tritium were completed on the samples. No gamma emitters other than naturally occurring radionuclides were identified in the samples. Tritium values were less than detectable. The four samples analyzed for ^{90}Sr were less than detectable. Minimum detectable activity (MDA) for ^{137}Cs, tritium, and ^{90}Sr was approximately 4, 450, and 0.3 pCi/l, respectively.

For the survey of unaffected water areas, samples were collected from random locations in Whistling Swan and Reflection Lakes located on PGE-owned property surrounding the TNP site. No nonnaturally occurring radionuclides were detected in the samples by gamma spectrometry. Neither tritium nor ^{90}Sr was detected in the samples.

For the biased survey, samples were taken from the potentially affected Recreation Lake, also located on PGE-owned property surrounding the TNP site. No nonnaturally occurring radionuclides were detected in the samples. MDAs for the biased and unbiased survey analyses were the same.

3.1.3.4.4 Bottom Sediment Survey

Bottom sediment samples were taken from PGE property around TNP. Approximately 1 liter of sediment was obtained at each sampling site. The sediment samples were dried and analyzed for gamma emitters using a gamma spectroscopy system located onsite. Selected sediment samples were analyzed for ^{90}Sr by TMA/Eberline.

Specific isotopic background sediment samples were not collected. Instead, soil background results were used as sediment background. Background soil samples were analyzed as part of the site characterization effort, and the mean ^{137}Cs concentration was 0.49 pCi/g. A comparison of the ^{137}Cs concentration in preoperational sediment samples to the background soil samples

showed a high correlation with the sediment mean equal to 0.51 pCi/g and the soil mean equal to 0.49 pCi/g.

In conducting the survey of unaffected sediment areas, samples were taken from Whistling Swan and Reflection Lakes. The mean value for ^{137}Cs was 0.36 pCi/g with a standard deviation of 0.22 pCi/g and a range of 0.02 to 0.86 pCi/g. The unaffected area sediment samples contain ^{137}Cs at levels below the release value for ^{137}Cs. ^{90}Sr content of the two sediment samples sent to TMA/Eberline were 0.05 and 0.03 pCi/g. The lower level of detectability for the ^{90}Sr analysis was 0.02 pCi/g. These results are within the preoperational range of ^{90}Sr which was from 0.01 to 0.44 pCi/g with a mean of 0.08 pCi/g. The ^{90}Sr content of the sediment samples was also below the corresponding screening release level.

For the biased sediment survey sample population, samples were taken from the berm and main areas of Recreation Lake. Results of the analyses indicate a mean of 0.28 pCi/g with a standard deviation of 0.37 pCi/g and a range of 0.04 to 1.12 pCi/g. The affected area samples contain ^{137}Cs in amounts below the release level. No other gamma emitters were detected.

3.1.3.4.5 Pavement Survey

Pavement scans and sampling were performed. Pavement was scanned for beta contamination. In areas where there was interference from the RWST, a 1 ft^2 sample was collected and analyzed using a gamma spectroscopy system located onsite.

No specific background pavement locations were monitored for this survey. Sample locations located in the TNP park and recreational areas were used to estimate background levels. Since these areas were unaffected by TNP operation, the survey data for these locations was determined to be an acceptable estimate of background levels of radioactive material in pavement. The mean gross beta reading was 610 dpm/100 cm^2 with a standard deviation of 94 dpm/100 cm^2 and a range of 456 to 764 dpm/100 cm^2.

For the survey of unaffected pavement areas, randomly selected 100 ft^2 sections of pavement in other areas of the TNP site which were unaffected by operations were scanned with an ESP-2 and BP-100 detector. The mean value was 657 dpm/100 cm^2 with a standard deviation of 74 dpm/100 cm^2. The range of measurements was from 542 to 788 dpm/100 cm^2.

For the biased pavement survey, the affected areas consisted of pavement around the tank farm and its drainage to the west, pavement around the oily water separator, and the paved equipment laydown area around the cooling tower. Pavement samples were taken from affected areas with at least two samples from each affected area. The only detectable nonnaturally occurring radionuclide found in the pavement samples was ^{137}Cs in low concentrations. The results of the biased samples exhibited a mean of 0.16 pCi/g with a standard deviation of 0.40 pCi/g and a range of 0.019 to 1.5 pCi/g. ^{137}Cs content of the biased pavement samples was similar to that found in background and indicator soil samples obtained for site characterization. One sample, taken from the curb at the southeast corner of the circulating water pump pit area, had the highest ^{137}Cs concentration of 1.5 pCi/g. For comparison,

conservatively assuming the ^{137}Cs was from the top 1 cm of the concrete and covered a 100 cm^2 area, then the calculated contamination level would be 799 dpm/100 cm^2.

3.1.3.4.6 Exposure Rate Survey

Exposure rates were measured at locations where affected and unaffected site characterization indicator soil samples had been collected. The measurements were made with a Reuter-Stokes pressurized ion chamber instrument positioned 1 meter above the sample site.
Data for exposure rate background was collected during preoperational surveys at TNP using a high pressure ion chamber, the same type of instrument used during the site characterization survey. The preoperational mean reading was 7.1 μR/hr with a standard deviation of 1.0 μR/hr and a range of 5.6 to 9.4 μR/hr. The survey locations coincide with the Radiological Environmental Monitoring Program locations.

For the exposure rate survey of unaffected areas, surveys were taken at the unaffected soil sampling locations. Exposure rates ranged from 5.2 to 9.0 μR/hr at the unaffected area locations. The mean exposure rate was 6.4 μR/hr. Data compared favorably with preoperational data, indicating no effect from TNP operation.

For the biased survey, exposure rates were measured at affected area soil sample sites where it was determined that radioactive content of surrounding structures would not influence the measurements. Measurements made at two locations were influenced by the RWST and were not included. Exposure rates at four locations were not measured because of radiation levels from the RWST. Exposure rates at two locations were not measured because of radiation levels from the Low-Level Radioactive Waste Storage and Fuel Buildings. The values at the remaining locations ranged from 6.0 to 8.3 μR/hr with a mean of 6.8 μR/hr. This is consistent with background data.

3.1.4 SITE CHARACTERIZATION QUALITY ASSURANCE

TNP site characterization activities are conducted under the auspices of PGE-8010, "Trojan Nuclear Plant Quality Assurance Program," as incorporated into Section 7 of this TNP Decommissioning Plan. TNP's Nuclear Quality Assurance Program ensures that survey activities are performed in a manner that assures the results are accurate and that uncertainties have been adequately considered. Surveys are performed by trained individuals who follow standard written procedures and are using properly calibrated and source-checked instruments. The custody of samples is tracked from collection to analysis, with every step of the process documented in a way that can be audited. In addition, QA practices ensure that offsite laboratory analyses are conducted using approved Radiological Environmental Monitoring Program (Reference 3-12) procedures. Finally, characterization data, as well as calibration and source check documentation, are maintained as quality-related decommissioning records.

3.1.5 CONCLUSION

In summary, several general overall conclusions regarding the site characterization survey can be made about the four sections: structures, systems, activation, and environment. First, plant

structures contain radioactive material that will require removal prior to license termination. The contamination consists of radioactive material incorporated (fixed) into the upper layer of concrete/block and deposited on the surface (loose). Although the levels of radioactivity are generally low, structures within what was the RCA in 1993, including building surfaces and piping, are considered potentially contaminated and will require, as a minimum, a wipe or wash down.

Second, some plant systems contain deposited radioactive material due to plant operation. The majority of the radioactive material is contained in RCS piping and systems directly connected to the RCS (e.g., CVCS, safety injection system, and residual heat removal [RHR] system). Although some systems contain contamination, the systems are not expected to be greater than Class A waste.

Third, activated components contain the vast majority of the radioactive material not contained in fuel. Most activity is primarily concentrated in the vessel internals and shield wall. The reactor vessel lower internals contain the highest activity. Although radionuclide distributions are provided for the reactor vessel and vessel internals, they will have been removed before final survey data collection begins in the Containment. Neutron activation products have been found in samples of containment concrete in various structures, including the reactor vessel shield wall, steam generator missile shields, and the containment wall itself. Remediation of the activated components will be required to meet the site release criteria and facilitate license termination.

Fourth, and finally, the environmental survey results indicated that no radioactive material requiring remediation is present in the various materials sampled, and that no radioactivity requiring remediation has been spread to the environment outside the TNP industrial area. The final survey may require additional background data for a number of the sample media. Preliminary results indicate no radioactivity at TNP has been spread to the environment inside the industrial area in quantities requiring remediation.

5. UPDATE OF SITE-SPECIFIC DECOMMISSIONING COSTS

In accordance with Paragraphs (a)(4) and (a)(9)(ii)(F) of 10 CFR 50.82 (Reference 5-1), and consistent with the guidance of Regulatory Guide 1.179 (Reference 5-2), the TNP-specific cost estimate and funding plan as incorporated into this section provides:

1. An updated estimate of total and remaining TNP decommissioning costs;

2. A comparison of the estimated costs with present funds set aside for decommissioning; and

3. The plan for assuring the availability of adequate funds for completion of decommissioning and release of the TNP site for unrestricted use.

5.1 DECOMMISSIONING COST ESTIMATE

This section provides the results of and basis for a site-specific cost estimate for the decommissioning of TNP. Incorporated into this cost estimate are costs of activities involved in radiological decommissioning necessary for termination of TNP's Part 50 license, as well as expenditures necessary to complete nonradiological site restoration activities. The costs of removal and disposal of nonradioactive structures and materials beyond that necessary for license termination have been identified separately from radiological decommissioning costs.

Also separately identified are costs incurred for construction of the Trojan Independent Spent Fuel Storage Installation (ISFSI), and cost projections and funding requirements for ISFSI storage operations and maintenance (O&M) until possession and title of the irradiated fuel is transferred to DOE for ultimate disposal. ISFSI decommissioning costs and associated funding and financial assurance requirements are provided in PGE-1069, Trojan ISFSI Safety Analysis Report.

5.1.1 COST ESTIMATE RESULTS

Summarizing the results of the TNP cost estimate, Table 5-1 provides estimates of total decommissioning costs as well as decommissioning costs that remain as of January 1, 2005. As indicated in Table 5-1, the costs (in 1997 dollars) for the selected decommissioning alternative are estimated to total approximately $211,670,000 for radiological decommissioning activities, approximately $40,228,000 for nonradiological decommissioning activities (site restoration), and approximately $169,951,000 for ISFSI construction and storage O&M (hereafter referred to as spent fuel management). Costs associated with securing and maintaining decommissioning financial assurance and bridging funds are projected to total approximately $16,000. A detailed schedule of TNP's decommissioning and spent fuel management costs, totaling approximately $421,865,000 of decommissioning fund-related expenditures, is provided in Table 5-2 and described in Section 5.1.2.

5.1.2 COST ESTIMATE DESCRIPTION

The initial Decommissioning Plan decommissioning cost estimate was based largely on the TNP-specific cost estimate performed for PGE by TLG Services, Inc. in May 1994. The methodology used to develop the cost estimate followed the approach presented in AIF/NESP-036, "Guidelines to Producing Decommissioning Cost Estimates" (Reference 5-3) and the DOE "Decommissioning Handbook" (Reference 5-4). These guidance documents utilize a unit cost factor method for estimating decommissioning activity costs. Unit cost factors incorporate site-specific considerations whenever practicable. Using plant drawings and inventory documents, quantities and volumes of the equipment and material to be removed during decommissioning were estimated. Unit cost factors were applied to the volumes and quantities to estimate the "activity dependent" costs. "Period dependent" costs were determined from a critical path schedule based on the removal activity duration.

At the end of each year, PGE updates the TNP decommissioning cost estimate based on actual decommissioning progress and with an estimate of remaining costs based on the best available information about the remaining scope of the decommissioning effort. The update generally results in changes to the timing of fund expenditures, and may reflect changes to the scope of major projects. The cost estimate reflects updated staffing requirements and work/activity schedules, remaining scheduled decommissioning equipment removal efforts, adjustments for current radioactive waste disposal volumes and costs, and an update of the estimate to disposition non-radiological hazards.

The results of PGE's decommissioning cost estimate have been incorporated into Table 5-2, which provides a comprehensive expenditure schedule for the decommissioning of TNP. This table incorporates an annual breakdown of projected costs associated with radiological and nonradiological decommissioning, spent fuel management, and decommissioning expenditure financing activities. The decommissioning cost estimate expenditure schedule contained in Table 5-2 is described in the remainder of this section.

5.1.2.1 Radiological Decommissioning Costs

The cost schedule for radiological decommissioning activities is incorporated into Table 5-2, which reflects the results of the decommissioning cost estimate for TNP. Consistent with current NRC policy, the TNP decommissioning cost estimate considers radiological decommissioning costs to be only those costs associated with normal decommissioning activities necessary for termination of the Part 50 license and release of the site for unrestricted use. The decommissioning cost estimate does not include in radiological decommissioning costs those costs associated with spent fuel management or the disposal of nonradioactive structures and materials beyond that necessary to terminate TNP's Part 50 license.

Radiological decommissioning activity costs are separately identified in Table 5-2. Burial costs were derived from PGE modeling and analysis of low-level radioactive waste disposal costs as updated in early 1999, which more conservatively reflect projected burial rates. Contingencies were applied to each area of the cost estimate (i.e., decontamination and dismantlement, waste

disposal, final survey, etc.) at appropriate rates. No credit was taken for equipment salvage value.

Standard ongoing financial controls have been established and executed to ensure funds are expended consistent with the provisions of 10 CFR 50.82(a)(8) and 10 CFR 50.75(h)(2) (Reference 5-5). Throughout the budgetary process and budget year, costs associated with new projects or activities are evaluated to determine their correct cost classification, i.e., spent fuel management, radiological decommissioning, nonradiological decommissioning, capital, etc. As a result, only costs that meet the intent of this TNP Decommissioning Plan and the established decommissiioning trust fund are submitted for reimbursement from the decommissioning trust. Periodically, variances between the estimate and actual costs are reviewed as they relate to the total cost estimate to provide assurance that the cost estimate continues to be reasonable. This complies with 10 CFR 50.82(a)(8)(i)(A). In addition, PGE corporate finance personnel review the TNP co-owners' trust fund activity and balance periodically, as applicable. Any significant activity which is inconsistent with this TNP Decommissioning Plan would be brought to the attention of TNP management.

The decommissioning cost estimate reflects costs in 1997 dollars, and has been updated to account for work performed through 2004 where TNP expended funds for decommissioning activities. The decommissioning cost estimate reflects updated staffing requirements and work/activity schedules, remaining scheduled decommissioning equipment removal efforts, and adjustments for radioactive waste disposal volumes and costs.

In accordance with 10 CFR 50.82(a)(8)(i)(C) and 10 CFR 50.75(e) (Reference 5-5), the TNP co-owners periodically assess the financial assurance amount required to complete radiological decommissioning. The established financial assurance mechanisms (e.g., external trust fund, statement of intent, and/or letter of credit, as applicable) are adjusted as necessary to ensure the completion of radiological decommissioning. Financial assurance is described in Section 5.2. "Bridge" funds are also described in Section 5.2.

5.1.2.2 Nonradiological Decommissioning Costs

Although not required by NRC regulations, the decommissioning cost estimate for TNP incorporates nonradiological decommissioning costs, as indicated in Table 5-2. The TNP decommissioning cost estimate considers nonradiological decommissioning costs to be those costs associated with site remediation and demolition and removal of uncontaminated structures. The decommissioning cost estimate does not include in nonradiological decommissioning costs those costs associated with spent fuel management or radiological decommissioning activities.

5.1.2.3 Spent Fuel Management Costs

Implementation costs associated with spent fuel management, including ISFSI construction and O&M, are reflected in the projected cost schedule detailed in Table 5-2. With ISFSI construction completed and the spent nuclear fuel now transferred from the TNP Spent Fuel Pool to the Trojan ISFSI, the remaining spent fuel management costs consist of expenditures associated with ongoing Trojan ISFSI storage O&M. Trojan ISFSI storage O&M will continue

until possession and title of the irradiated fuel is transferred to the DOE for ultimate disposal (due to DOE delays, the revised estimate for completion is 2023). Costs and associated funding necessary for ISFSI decommissioning activities are detailed in PGE-1069, Trojan ISFSI Safety Analysis Report.

5.1.2.4 Financial Activity Costs

Additional costs may be incurred by each TNP co-owner as necessary during decommissioning to secure and maintain assurance that adequate funds will be available to complete radiological decommissioning of the TNP site, and to secure loans or other "bridging" mechanisms to augment existing funds to cover near-term decommissioning costs. Financial assurance costs indicated in Table 5-2 were the costs associated with securing a letter of credit until PGE could pre-fund the external trust fund.

5.2 DECOMMISSIONING FUNDING PLAN

5.2.1 CURRENT DECOMMISSIONING FUNDING CAPABILITIES

Each of the TNP co-owners separately collect through rates the funds for the decommissioning of TNP. PGE and PP&L deposit these funds in external trust funds in accordance with 10 CFR 50.75(e), while the BPA provides EWEB's portion of TNP decommissioning funds as necessary as described in Section 5.2.2.2. Because the TNP was shut down prematurely, the external trust funds established by PGE and PP&L may contain during some periods only a portion of the total amount needed for site radiological decommissioning. Table 5-3 summarizes the status of PGE's and PP&L's decommissioning trust funds as of December 31, 2004.

As indicated above, there may be periods during which the trusts established by PGE and PP&L for decommissioning do not contain the funds necessary for completion of radiological decommissioning. During such periods, PGE and PP&L are required to secure an additional financial assurance mechanism allowed by 10 CFR 50.75(e). If required, PGE and PP&L have each elected to use a letter of credit as the additional financial assurance mechanism. During any period prior to TNP license termination that a co-owner's external decommissioning trust fund does not contain the funds necessary to complete radiological decommissioning, the affected co-owner must maintain this additional financial assurance.

Furthermore, a decommissioning trust fund balance may be reduced to a point where it will be necessary in certain instances to borrow or otherwise provide "bridging" funds to complete decontamination activities and allow scheduled collections to restore the decommissioning trust fund balance.

5.2.2 TNP CO-OWNERS' DECOMMISSIONING FUNDING PLANS

Each TNP co-owner maintains a decommissioning fund collection schedule which ensures that each co-owner's portion of the decommissioning activity expenditures will be fully funded. These funding schedules are based on funding requirements for both radiological and nonradiological decommissioning costs, as well as financing costs and specific spent fuel management costs as discussed in Section 5.1.2. The decommissioning funding cash flow for each of the TNP co-owners, based on the expenditure schedule in Table 5-2 and the co-owner contribution schedules, is described below.

5.2.2.1 PGE Funding

Table 5-4 provides PGE's decommissioning funding cash flow in nominal dollars (2.31% escalation) during decommissioning. Funded from an external trust fund, the expenditures described in this table are PGE's share (67.5%) of the expenditures described in Table 5-2. The funding schedule described in Table 5-4 ensures that PGE's portion of the decommissioning activity expenditures will be fully funded. This decommissioning funding schedule reflects projected needs, if any, and associated costs and funding for bridging funds and/or a letter of credit, if required.

As indicated in Section 5.2.1, during any period prior to TNP license termination that PGE's external trust fund does not contain the funds necessary for completion of radiological decommissioning, PGE must secure a letter of credit as an additional financial assurance mechanism for radiological decommissioning costs as allowed by 10 CFR 50.75. The methodology used to determine the size of the letter of credit ensures that if a given amount of the decommissioning trust fund is used for purposes other than radiological decommissioning activities during a current year, the portion of the financial assurance provided by the letter of credit must be increased by the same amount. This methodology can be summarized as follows:

$$L_{fa} = T_1 - T_2 + T_3 \quad \text{where}$$

L_{fa} = Letter of Credit Portion of Financial Assurance Needed for Current Year
T_1 = Total costs of remaining radiological decommissioning activities
T_2 = Current decommissioning trust fund balance
T_3 = Portion of trust balance planned for purposes other than radiological decommissioning costs during current year

Financial assurance for remaining radiological decommissioning activities will be calculated at the beginning of each year and will be periodically reviewed during each year to ensure that an adequate level of financial assurance is maintained.

5.2.2.2 EWEB/BPA Funding

BPA is obligated through Net Billing Agreements to pay costs associated with EWEB's share of TNP, including decommissioning and spent fuel management costs. BPA fulfills the decommissioning funding obligations of EWEB, including providing financial assurance for EWEB's portion of decommissioning costs in a manner stipulated in 10 CFR 50.75(e)(1)(iv) for Federal government licensees as detailed further below. Table 5-5 provides BPA/EWEB's decommissioning funding cash flow in nominal dollars (2.31% escalation) during decommissioning. The expenditures described in this table are BPA/EWEB's share (30%) of the expenditures described in Table 5-2. The funding schedule described in Table 5-5 ensures that BPA/EWEB's portion of the decommissioning activity expenditures will be fully funded.

As allowed by 10 CFR 50.75(e)(1)(iv), BPA, as a Federal government entity fulfilling the decommissioning funding obligations of EWEB, a licensee, provides financial assurance in the form of a statement of intent. The statement of intent contains a reference to the TNP decommissioning cost estimate described in Section 5.1, indicating that funds for radiological decommissioning of the TNP will be obtained when necessary.

5.2.2.3 PP&L Funding

Table 5-6 provides PP&L's decommissioning funding cash flow in nominal dollars (2.31% escalation) during decommissioning. Funded from an external trust fund, the expenditures described in this table are PP&L's share (2.5%) of the expenditures described in Table 5-2. The funding schedule described in Table 5-6 ensures that PP&L's portion of the decommissioning activity expenditures will be fully funded. This decommissioning funding schedule reflects projected needs, if any, and associated costs and funding for bridging funds and/or a letter of credit, if required.

As indicated in Section 5.2.1, during any period pror to TNP license termination that PP&L's external trust fund does not contain the funds necessary for completion of radiological decommissioning, PP&L must secure a letter of credit as an additional financial assurance mechanism for radiological decommissioning costs as allowed by 10 CFR 50.75. The methodology for determining the size of the letter of credit is as described in Section 5.2.2.1, "PGE Funding."

5.3 REFERENCES FOR SECTION 5

5-1 Code of Federal Regulations, Title 10, Part 50.82, "Application for Termination of License," August 28, 1996.

5-2 Regulatory Guide 1.179, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors," January 1999.

5-3 AIF/NESP-036, "Guidelines to Producing Decommissioning Cost Estimates."

5-4 U. S. Department of Energy DOE/EV/10128-1, "Decommissioning Handbook," November 1980.

5-5 Code of Federal Regulations, Title 10, Part 50.75, "Reporting and Recordkeeping for Decommissioning Planning."

Table 5-1

Estimate of Decommissioning Costs
(1997 dollars)

	Total (Start-to-Finish) Costs	Total Costs Remaining As of January 1, 2005
Radiological (NRC) Decommissioning Costs		
Reactor Vessel and Internals Removal and Disposal	21,495,000	0
Dismantlement, Decontamination, and Remediation	143,207,000	6,315,000
Waste Disposal	39,391,000	61,000
Final Survey	7,577,000	0
Total	211,670,000	6,376,000
Nonradiological Decommissioning Costs		
Site Restoration	40,228,000	36,474,000
Total	40,228,000	36,474,000
Dry Spent Fuel Management Costs		
ISFSI Construction	74,161,000	0
ISFSI Operation and Maintenance	95,790,000	88,768,000
Total	169,951,000	88,768,000
Financing Costs		
Financial Assurance	16,000	0
Total	16,000	0
Total Decommissioning Expenditures	$ 421,865,000	$ 131,618,000

Table 5-2

Decommissioning Cost estimate for Trojan Nuclear Plant
Itemized Decommissioning Expenditure Schedule
(1997 $ x 1000)

Total Decommissioning Expenditures					
Year	Total Radiological Decommissioning Costs	Total Nonradiological Decommissioning Costs	Total Spent Fuel Management Costs	Total Financing Activity Costs	Total Combined Decommissioning Costs
1993	2,673	0	0	0	2,673
1994	5,320	68	0	0	5,388
1995	15,896	45	1,100	0	17,041
1996	9,087	243	3,144	0	12,474
1997	19,238	350	7,974	0	27,562
1998	34,321	62	9,703	0	44,086
1999	37,970	1,313	17,980	0	57,263
2000	33,172	777	3,354	0	37,303
2001	8,383	198	6,731	0	15,312
2002	8,329	(46)	15,608	0	23,891
2003	13,876	244	12,896	0	27,016
2004	17,030	500	2,692	16	20,238
2005	6,375	3,383	4,760	0	14,518
2006	0	186	3,970	0	4,156
2007	0	0	3,676	0	3,676
2008	0	0	3,849	0	3,849
2009	0	0	3,799	0	3,799
2010	0	0	3,750	0	3,750
2011	0	0	3,693	0	3,693
2012	0	0	3,704	0	3,704
2013	0	0	3,693	0	3,693
2014	0	0	3,693	0	3,693
2015	0	0	3,693	0	3,693
2016	0	0	3,669	0	3,669
2017	0	0	3,693	0	3,693
2018	0	0	3,693	0	3,693
2019	0	0	3,693	0	3,693
2020	0	0	3,693	0	3,693
2021	0	0	3,693	0	3,693
2022	0	0	3,693	0	3,693
2023	0	18,687	20,662	0	39,349
2024	0	14,218	0	0	14,218
Total	211,670	40,228	169,951	16	421,865

Table 5-3

Status of Decommissioning Trust Funds
As of December 31, 2004

Trojan Co-Owner	Fund Balance as of 12/31/04
Portland General Electric (PGE)	$19,259,000[a]
Eugene Water & Electric (EWEB)/ Bonneville Power Administration (BPA)	N/A[b]
Pacific Power & Light (PP&L)	$1,223,000[a]
Total	$20,482,000

[a] The 2004 end-of-year trust fund balance includes an adjustment for trust expenditures incurred in November and December 2004 that were not paid out of the trust in 2004.

[b] BPA provides decommissioning funding from its operating budget as such funds are needed. Financial assurance is provided by a Statement of Intent, dated March 21, 2001. Therefore, no external trust fund is required.

Table 5-4

Portland General Electric
Decommissioning Funding Cash Flow
(Nominal $ x 1000)

Year	PGE Trust Fund Expenditures A	PGE Trust Fund Contributions B	PGE Trust Fund Net Earnings C	PGE Trust Fund EOY Balance D	Prefund Refund E	Bridge Funds Interest F	Letter of Credit G	Letter of Credit Fee H
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								
2004				19,259				
2005	(11,810)	13,343	835	21,627				
2006	(3,458)	13,343	1,266	32,778				
2007	(3,130)	13,343	1,726	44,717				
2008	(3,352)	13,343	2,550	57,258				
2009	(3,385)	13,343	3,135	70,351				
2010	(3,420)	6,934	3,442	77,307				
2011	(3,446)		3,432	77,293				
2012	(3,534)		3,420	77,179				
2013	(3,607)		3,411	76,983				
2014	(3,690)		2,945	76,238				
2015	(3,775)		2,912	75,375				
2016	(3,837)		2,875	74,413				
2017	(3,952)		2,832	73,293				
2018	(4,043)		2,784	72,034				
2019	(4,136)		2,730	70,628				
2020	(4,232)		2,669	69,065				
2021	(4,330)		2,603	67,338				
2022	(4,430)		2,530	65,438				
2023	(48,280)		692	17,850				
2024	(17,850)		0	0				
Total	(141,697)	73,649	48,789		0	0		0

NOTE 1 : Positive numbers indicate cash flow into trust fund; negative numbers indicate cash flow out of trust fund.
NOTE 2 : Current EOY balance = previous year EOY balance + current year A + B + C + E + H.

Table 5-5

EWEB / BPA
Decommissioning Funding Annual Cash Obligations
(Nominal $ x 1000)

Year	Eugene Water and Electric Board / Bonneville Power Administration Decommissioning Obligations
1996	
1997	
1998	
1999	
2000	
2001	
2002	
2003	
2004	
2005	5,249
2006	1,537
2007	1,391
2008	1,490
2009	1,505
2010	1,520
2011	1,531
2012	1,571
2013	1,603
2014	1,640
2015	1,678
2016	1,705
2017	1,756
2018	1,797
2019	1,838
2020	1,881
2021	1,924
2022	1,969
2023	21,459
2024	7,933
Total	62,977

Note 1: BPA provides decommissioning funding from its operating budget as such funds are needed. Financial assurance is provided by a Statement of Intent, dated March 21, 2001. Therefore, no external trust fund is required.

Table 5-6

Pacific Power & Light
Decommissioning Funding Cash Flow
(Nominal $ x 1000)

Year	PP & L Trust Fund Expenditures A	PP & L Trust Fund Contributions B	PP & L Trust Fund Net Earnings C	PP & L Trust Fund EOY Balance D	Bridge Funds E	Bridge Funds Interest F	Letter of Credit G	Letter of Credit Fee H
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								
2004				1,223				
2005	(437)	349	25	1,160				
2006	(128)	349	34	1,415				
2007	(116)	349	50	1,698				
2008	(124)	349	61	1,984				
2009	(125)	349	72	2,280				
2010	(127)	349	83	2,585				
2011	(128)	350	95	2,902				
2012	(131)		107	2,878				
2013	(134)		105	2,849				
2014	(137)		104	2,816				
2015	(140)		103	2,779				
2016	(142)		101	2,738				
2017	(146)		100	2,692				
2018	(150)		98	2,640				
2019	(153)		96	2,583				
2020	(157)		94	2,520				
2021	(160)		91	2,451				
2022	(164)		88	2,375				
2023	(1,788)		62	649				
2024	(661)		12	0				
Total	(5,248)	2,672	1,581					0

NOTE 1 : Positive numbers indicate cash flow into trust fund; negative numbers indicate cash flow out of trust fund.
NOTE 2 : Current EOY balance = previous year EOY balance + current year A + B + C