



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

PORTLAND GENERAL ELECTRIC COMPANY

THE CITY OF EUGENE, OREGON

PACIFIC POWER AND LIGHT COMPANY

DOCKET NO. 50-344

TROJAN NUCLEAR PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 47
License No. NPF-1

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The proposed modifications of the Building Complex should be permitted in accordance with the amendment to the Operating License set forth below and subject to the terms and conditions therein;
 - B. There is reasonable assurance that operation of the plant, including the activities authorized by the operating license, as thus amended, and including the terms and conditions set forth below, can be conducted without endangering the health and safety of the public;
 - C. There is reasonable assurance that operation of the plant, including the activities authorized by the operating license, as thus amended, and including

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the terms and conditions set forth below, will be conducted in compliance with the Atomic Energy Act of 1954, as amended, and the Commission's regulations;

- D. The issuance of this operating license amendment as set forth below will not be inimical to the common defense and security or to the health and safety of the public;
- E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied; and
- F. The proposed modifications will satisfy the Order of May 26, 1978 by bringing the Control Building into substantial compliance with Technical Specification 5.7.1 of the operating license, and restoring the intended design margins of Technical Specification 5.7.1 such that (a) the Control Building has a capacity to withstand a 0.15g OBE using 2% damping as required by FSAR Table 3.7.1; (b) the Control Building OBE capability of 0.15g and SSE capability of 0.25g are met using a yield strength for reinforcing steel of 40,000 psi; and (c) the masonry portions of the Control Building walls comply with the UBC requirements for reinforced grouted masonry for inplane loading.

2. Accordingly, Facility Operating License No. NPF-1 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, by amending paragraph 2.C.(2), and by adding paragraph 2.C.(12) to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications, except as noted in paragraphs 2.C.(10) through 2.C.(12) below.

(12) Control Building Modifications. The Licensee is authorized to and shall proceed with modifications to the Control Building in order to restore substantially the originally intended design margins. The modification program shall be accomplished in accordance with PGE-1020, "Report on Design Modifications for the Trojan Control Building", as revised through Revision No. 4, and as supplemented by PGE Exh. 27 (Licensee's Testimony ("Broehl, et al."))

on Matters Other Than Structural Adequacy of the Modified Complex, March 17, 1980). Any deviations or changes from the foregoing documents shall be accomplished in accordance with the provisions of 10 CFR part 50.59. The Control Building modification program shall further be subject to the following:

- (a) The modification program shall be completed not later than 12 months from the date of this amendment, provided however that such completion date may be extended by the Director of Nuclear Reactor Regulation upon a showing that the completion of the modification program is necessarily delayed by circumstances wholly beyond the control of Licensee. When all modifications have been completed, license condition 2.C.(10), relating to interim operation pending completion of modifications, is cancelled.
- (b) For the installation of steel plate No. 8, the plant shall be in the cold shutdown condition (Modes 5 or 6) from the time that the plate is lifted from the transporter at Elevation 45 feet until the plate has been secured with 48 inches of weld to the

previously installed plates and attached to the wall with five bolts made snug. During the installation of plate No. 8, both trains of safety-related equipment necessary for maintenance of a cold shutdown condition shall be operable. Prior to the installation, Diesel Generator A shall be started and proper operability verified.

- (c) Solid steel cable tray covers shall be installed over cable trays in work areas where cable damage is possible from accidental dropping of steel plate washers during their installation.
- (d) A fire watch patrol shall be established whose sole responsibility shall be to watch for fires at the plant and which shall make at least hourly inspections at all safety-related areas where combustible materials (e.g., wood framing, planking, plastic, etc.) related to the modification work must remain in the work area (not required for areas in which a continuous fire watch is present). Such hourly inspections shall include direct visual

observations of all combustible materials added to such safety-related areas.

- (e) Scaffolding and timber planking shall be installed against the R line wall in the Cable Spreading Room during the installation of the steel plate washers at each location where a potential plate washer drop onto a cable tray could exceed three feet. The planking shall be placed and constructed to limit the maximum height of a dropped washer to three feet or less.
- (f) Any construction work in the diesel generator combustion/ventilation air pathway which could potentially generate dust, dirt or debris shall be temporarily halted when any diesel generator is in operation.
- (g) In the event that either the Shift Supervisor or NRC Resident Inspector determines that construction noise is resulting in noise levels in the Control Room of such magnitude as to interfere with normal communications, the construction activity shall be halted until alternate means are devised (e.g., lighter weight tools, other

means of concrete/block removal, etc.) to proceed with the work with acceptably reduced Control Room noise level.

- (h) In the event that the NRC Resident Inspector determines that the construction activity in the Electrical Auxiliary s Room or Control Room is generating excessive dust, dirt or debris or the use of water is being improperly controlled, construction work shall be halted until appropriate corrective measures have been taken.
- (i) During periods when safety-related equipment is vulnerable to either external missiles or missiles from construction work (e.g., jackhammers), Licensee shall provide suitable barriers to protect against such exposure or place the plant in cold shutdown during such work.
- (j) During hole drilling in the east and west walls of the Control Building, personnel shall be stationed on the opposite side of the wall from the driller to monitor the drill penetration. Continuous voice communications shall be maintained between the drill operator and the monitor.

- (k) Fire blankets (Claremont Weld Shield 800-24 or FabriCote 1584-white) shall be used over all cables in areas where Cadwelding, welding or cutting will be performed.
- (l) The Battery Room exhaust duct shall not be disabled unless an alternate, equivalent means of Battery Room ventilation is first provided.
- (m) Prior to the installation of plates 1 through 6, a temporary energy absorber shall be installed to preclude exceeding the allowable compressive strength of the underlying concrete in the event of an accidental plate drop.
- (n) An energy absorber shall be placed on plate 4 prior to the installation of plate 7.
- (o) A one-inch-thick, precrushed, stabilized Hexcel pad and timber cribbing shall be used on top of the previously installed plates for energy absorption during the installation of plate 8.
- (p) The work area at 41 R (Elevation 65 feet) shall be protected by a dust-tight flame-retardant enclosure. Similar protective

measures shall be applied at any other locations in the Electrical Auxiliaries Room or Control Room where wall removal is necessary.

- (q) Piping systems, equipment and components within the Control/Auxiliary/Fuel Building Complex required for safe shutdown or to maintain off-site doses from accidents to within 10 CFR Part 100 guideline values shall remain seismically qualified for earthquakes up to and including the SSE throughout all structural modification work. Any changes to piping systems, equipment and components necessary to ensure that this condition is met shall be performed before the structural modifications are made.

- (r) The Licensee shall perform three grout tests for each size and orientation of reinforcing steel (rebar) to be grouted into the existing walls and hole size (considering both depth and radius) in which they are to be grouted prior to proceeding with construction (grouting of rebar), or the Licensee shall perform three grout tests using the maximum bar

size in the minimum diameter hole size and embedment length for each orientation (i.e., horizontal, vertically up and down). These tests shall be designed to demonstrate that the yield strength of the rebar can be developed by the grout. If any test result is unsuccessful, the NRC shall be notified.

(s) Should a drop of plates 7 or 8 occur onto the plates below, the Licensee shall report the circumstances to NRC immediately.

Plates 1 through 6 shall be removed and damage inspection made unless it can be substantiated to the satisfaction of the NRC Staff that plate removal is unnecessary.

(t) Exposure of embedded steel columns in the Control Building, walls during the modification work shall be subject to the following restrictions:

(1) Between Elevation 45 feet and Elevation 65 feet, column 41 Q may not be exposed unless columns 41 R and 41 N are embedded in the original wall or encased in concrete that has attained a compressive strength of 2,000 psi; likewise columns 41 R and 41 N may

not be exposed unless column 41 Q is embedded or encased by 2,000 psi concrete.

- (2) Columns 55 N' and 55 Q may not be exposed concurrently, and the second of these may not be exposed before the concrete encasing the first has attained a compressive strength of 2,000 psi.
- (3) No columns may be exposed above Elevation 65 feet before concrete in the new N' wall has attained a compressive strength of 3,500 psi and the new concrete in the N and R walls below Elevation 65 feet has attained a compressive strength of 2,000 psi.
- (4) Between Elevation 65 feet and Elevation 77 feet, columns 41 N and 46 N may not be exposed unless columns 41 R and 46 R are embedded in the original wall or encased in concrete that has attained a compressive strength of 2,000 psi; likewise columns 41 R and 46 R may not be exposed unless columns

41 N and 46 N are embedded in the original wall or encased in 2,000 psi concrete.

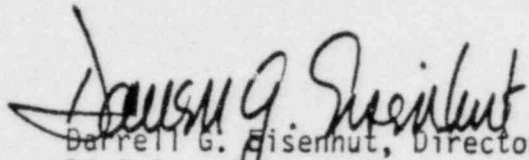
(5) Above Elevation 77 feet, column 41 R may not be exposed unless the new concrete in R line wall below that elevation has attained 2,000 psi compressive strength, and columns 41 N and 46 N are embedded in the original wall and/or encased in 2,000 psi concrete.

(u) Prior to the installation of plate 7, the concrete behind plates 1-4 shall have attained a compressive strength of 3,500 psi. Prior to the installation of plate 8, the concrete behind plates 1-7 shall have attained a compressive strength of 3,500 psi.

(v) In any plane of a wall at any given floor elevation, the wall area removed from drilling pursuant to the proposed modifications, including holes abandoned because rebar was encountered and not filled with grout that has reached design strength, shall be limited to 6%.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION


Darrell G. Eisenhut, Director
Division of Licensing

Attachment:
Changes to the Technical
Specifications

Date of issuance: July 25, 1980

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 47 TO FACILITY OPERATING LICENSE NO. NPF-1

DOCKET NO. 50-344

Revise Appendix A as follows:

<u>Remove Pages</u>	<u>Insert Pages</u>
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PLANT SYSTEMS

3/4.7.11 CONTROL BUILDING MODIFICATION CONNECTION BOLTS *

LIMITING CONDITION FOR OPERATION

3.7.11 The structural adequacy of the through-wall bolts used to tie reinforced concrete and steel plate to the Control Building west and east walls shall be maintained at a level consistent with the acceptance criteria in Specification 4.7.11.1.

APPLICABILITY: ALL MODES

ACTION:

- a. With the structural adequacy of the bolts not conforming to the above requirements, restore the structural adequacy of the bolts to within the limits within 14 days.
- b. If the structural adequacy of the bolts does not conform to the above requirements, report the degradation within 24 hours and prepare and submit a special report pursuant to Specification 6.9.2 within the next 10 days outlining the cause of the degradation and plans for restoring the structural adequacy of the bolts.
- c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.7.11.1 The structural adequacy of the through-wall bolts used to tie reinforced concrete and steel plate to the Control Building west and east walls shall be demonstrated at the end of 6 months and 1, 3 and 5 years after initial tensioning and at 5-year intervals thereafter. Structural adequacy of the bolts shall be demonstrated by:

- a. Demonstrating that each bolt in a random and representative sample of not less than 25 percent of the total number of bolts has a tension equal to or greater than 80 percent of the initial bolt tension. If the tension in any bolt is below 80 percent of the initial bolt tension, the tension in two adjacent bolts shall be measured. If either of these bolts is found to have less than 80 percent of the initial bolt tension, then all bolts shall be tested. All bolts found to have less than 80 percent of the initial bolt tension shall be retensioned to the original installation tension value.
- b. Demonstrating the acceptability of each test sample by showing that $\bar{x} - 2\sigma$ is greater than $0.8X_0$, where \bar{x} is the mean tension for that sample, σ is the standard deviation and X_0 is the

*This Technical Specification shall become effective upon initial tensioning of the connection bolts.

PLANT SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

initial bolt tension. If this criterion is not met, then all bolts shall be tested to the criteria in (a) above. If the mean sample tension \bar{x} is below $0.8X_0$, the circumstances shall be reported pursuant to Technical Specification 6.9.1.8.i.

- c. Determining that there is no evidence of degradation or abnormal conditions by visual inspection of the condition of all bolts in the sample, their end anchorages and concrete or masonry in the vicinity of the anchorage. In addition, each bolt in the sample will be examined by an in situ ultrasonic test inspection for evidence of cracks or other abnormal degradation. Abnormal degradation of the bolt shall be reported pursuant to Technical Specification 6.9.1.8.i.
- d. If the bolts inspected during the first four inspections meet the acceptance criteria of (b) and (c), then the sample for the subsequent inspections may be reduced to not less than 10 percent of the total number of bolts.
- e. Beginning with the third year inspection, a trend analysis shall be used to predict the existing bolt tension at the end of the next inspection interval (2 years or 5 years thereafter). If the predicted bolt tension is below .75 of the initial bolt tension ($\bar{x} - 2\sigma < .75X_0$), this shall be considered as abnormal degradation and reported pursuant to Technical Specification 6.9.1.8.i.
- f. A detailed report of any abnormal degradation [as defined in (b), (c) and (e) above] shall be submitted pursuant to Technical Specification 6.9.2 within 90 days after completion of the surveillance testing.

4.7.11.2 To assure that the surveillance intervals for the first three inspections in Specification 4.7.11.1 are sufficient to maintain mean bolt tension above .75 of the initial bolt tension, the tension in a special sample group of 10 bolts (six in the west wall and four in the east wall) shall be measured at 3-month intervals from initial tensioning. The tension values for the bolts in this special sample group shall be used to determine the pattern of reduction in initial tension with time due to bolt relaxation and shrink/creep of the concrete and grout. Surveillance of the tension in this special sample group of bolts shall continue until tension reductions have stabilized or until the third year at which time the trend analysis of Specification 4.7.11.1.e shall govern. If tension in any bolt in the special sample group falls below .8 of initial bolt tension, the circumstances shall be reported pursuant to Specification 6.9.1.8.i.

PLANT SYSTEMS

BASES

3/4.7.11 CONTROL BUILDING MODIFICATION CONNECTION BOLTS

This limitation ensures that the structural adequacy of the modified Control Building will be maintained consistent with the design. Structural adequacy is required to ensure the capability of the Control-Auxiliary-Fuel Building Complex to withstand safely the Operating Basis Earthquake and Safe Shutdown Earthquake. The measurement of tension in and inspection of the through-wall bolts connecting the new structural elements to the Control Building at the specified intervals are sufficient to ensure that loss of tension or degradation of the bolts will not reduce this capability.

The design initial bolt tension includes a 25 percent allowance for bolt tension losses due to phenomena such as bolt relaxation, creep of the concrete and grout and shrinkage of concrete and grout. The combined effect of such phenomena is expected to produce a reduction in bolt tension which is an approximately logarithmic function of time, thus the decreasing sample frequency and sample size is appropriate. Maintenance of bolt tension above .8 of design initial bolt tension ($.8X_0$) provides margin above the design limit of $.75X_0$. Inspection of the condition of bolts and end anchorages will detect abnormal degradation of bolts which could result in failure of bolts or unexpected loss of function. The surveillance of the special sample group pursuant to Specification 4.7.11.2 and the trend analysis pursuant to Specification 4.7.11.1.e will ensure that mean bolt tension will not fall below $.75X_0$ between inspections.

DESIGN FEATURES

DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained with siphon breakers in the piping extending into the pool which prevent inadvertent draining of the pool below elevation 83'11".

CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 651 fuel assemblies.

5.7 SEISMIC CLASSIFICATION

5.7.1 Those structures, systems and components identified as Category I Items in Section 3.2.1 of the FSAR shall be designed and maintained to the original design provisions contained in Section 3.7 of the FSAR with allowance for normal degradation pursuant to the applicable Surveillance Requirements except for the Control Building Complex which is subject to Specifications 5.7.2.1 and 5.7.2.2.

*5.7.2.1 The Control-Auxiliary-Fuel Building Complex (Complex) shall be designed and maintained to the design provisions contained in PGE-1020, "Report on Design Modifications for the Trojan Control Building", as supplemented by the documentation listed in condition 2.C.(12) of the Operating License with allowance for normal degradation pursuant to the applicable Surveillance Requirements.

*5.7.2.2 No modifications which will result in a net:

- (a) 1 percent increase in lateral shear forces on any story of the Complex;
- (b) 1 percent decrease in lateral shear resistance of any story of the Complex;
- (c) 5 percent increase in combined interstructure displacements between the Control and Turbine Buildings; or
- (d) 5 percent reduction in clear space between the Turbine and Control Buildings

shall be performed without prior approval of the Director of Nuclear Reactor Regulation. The modifications to the Control Building approved in License Condition 2.C.(12) are not subject to the above limitations. An increase in equipment weight not to exceed 10 percent on a per story, per building basis is permissible and excluded from consideration under this specification.

*Effective upon completion of the Control Building modification program

DESIGN FEATURES

5.8 METEOROLOGICAL TOWER LOCATION

5.8.1 The meteorological towers shall be located as shown on Figure 5.1-1.

5.9 COMPONENT CYCLIC OR TRANSIENT LIMIT

5.9.1 The components identified in Table 5.9-1 are designed and shall be maintained within the cyclic or transient limits of Table 5.9-1.