

PORTLAND GENERAL ELECTRIC COMPANY
EUGENE WATER & ELECTRIC BOARD
AND
PACIFIC POWER & LIGHT COMPANY

Operating License NPF-1
Docket 50-344
License Change Application 181

This License Change Application (LCA) requests modifications to Operating License NPF-1 for the Trojan Nuclear Plant to change the minimum requirement for number of operable in-core detector thimbles from 75 percent to 50 percent for Cycle 12 operation.

PORTLAND GENERAL ELECTRIC COMPANY

By T. D. Walt
T. D. Walt
General Manager
Technical Functions

Acting for Vice President, Nuclear
Subscribed and sworn to before me this 20th day of October 1989.

Roll Nelson
Notary Public of Oregon

My Commission Expires: 3/12/90

Description of Change

Trojan Technical Specification (TTS) 3.3.3.2, "Movable Incore Detectors", requires a minimum of 75 percent of the 58 in-core detector thimbles operable whenever that system is used for recalibration of the axial flux offset detection system (Quadrant Power Tilt Ratio greater than 1.02), monitoring the Quadrant Power Tilt Ratio, or measurement of $F_{\Delta H}$ and $F_Q(z)$. The proposed change will revise TTS 3.3.3.2 to require a minimum of 50 percent of the detector thimbles operable for the remainder of Cycle 12 operation as opposed to the present 75 percent.

Reason for Change

The proposed change would allow an increase in plant operating flexibility while maintaining sufficient data collection capability to ensure that the plant is operated within licensed limits. The flexibility is needed due to the number of thimbles which were declared inoperable as a result of eddy current inspections performed during the past refueling outage. Details of that inspection have been provided in accordance with the reporting requirements contained in NRC Bulletin No. 88-09, "Thimble Tube Thinning in Westinghouse Reactors". There were 11 thimbles inoperable at the start of Cycle 12 and more flexibility is needed to accommodate future failures beyond the presently allowed 14. The proposed change will allow in-core detector system operation with up to 29 thimbles inoperable (50 percent) for the remainder of Cycle 12 operation. That percentage is consistent with approvals granted by NRC to other licensees for operation of their in-core detector systems.

Determination of Significant Hazards Considerations

In accordance with the requirements of Title 10, Code of Federal Regulations, Part 50.92, "Issuance of Amendment", this License Change Request is judged to involve no significant hazards based upon the following information:

1. Does the proposed license change involve a significant increase in the probability or consequences of an accident?

During the recent start-up of Cycle 12, a flux map was made with the in-core detector system. By doing so, we have confirmed that a misloaded core is not present for Cycle 12 operation. Consequently, the probability of not detecting a misloaded core [Final Safety Analysis Report (FSAR) Section 15.4.7] has not changed. Likewise, the probability of occurrence of other FSAR Chapter 15 accidents have not changed, since the in-core detector system is not used for operational plant control.

An analysis was performed to determine the impact of the proposed change upon predicted peaking factors relative to base cases. The consequences upon accident analysis will not be increased so long as the predicted peaking factors are conservative. The base cases conform to the current TTS requirement for number of thimbles operating and represent actual measurements taken during the previous cycle under both Beginning of Cycle (BOC) and End of Cycle (EOC) conditions.

We are required to verify compliance with TTS 3/4.2, "Power Distribution Limits", every 31 effective full-power days by use of flux traces obtained from in-core detector thimble locations. The data is taken and analyzed with the INCORE computer code. The measured power distribution values, including the heat flux hot channel factor, $F_Q(z)$, and the enthalpy rise peaking factor, $F_{\Delta H}$, are compared to TTS limits to verify compliance. The measured $F_Q(z)$ is increased by 5 percent to allow for measurement uncertainty (and 3 percent for manufacturing tolerances) prior to comparison to the limit, and likewise the $F_{\Delta H}$ value is increased by its measurement uncertainty of 4 percent.

In order to determine if the calculation of peaking factors using only 50 percent of the instrument thimbles significantly increases these measurement uncertainties, we have reanalyzed our previous cycle full-power measurements using only 50 percent of the thimbles. Five randomly selected patterns of 29 thimbles, illustrated in Figure 1, were analyzed near BOC 11. Five different randomly selected patterns of 29 thimbles, illustrated in Figure 2, were analyzed near EOC 11. These figures depict the core location of instrument thimbles. Operating thimbles are in black while the white circles depict inoperable thimbles. Known locations of inoperable thimbles (i.e., those locations which failed the recent eddy current test) have been included for all test cases. Table 1 gives the results for the ten cases analyzed and compares the predicted value of $F_Q(z)$ and $F_{\Delta H}$ to the value of the base cases. As shown, the calculated peaking factors using only 29 of the 58 instrument thimbles were higher in all but one case. And for that case, the $F_{\Delta H}$ was 0.4 percent lower than the base case and $F_Q(z)$ was 0.7 percent lower than the base case. Although the one case is judged insignificant, we propose to increase our measurement uncertainty by 1 percent to completely encompass all cases. Plant procedures will be revised to require that whenever less than 75 percent of the thimbles are operable, the measurement uncertainty for $F_Q(z)$ will be increased from 5 percent to 6 percent and $F_{\Delta H}$ will be increased from 4 percent to 5 percent.

Because the peaking factors are conservative relative to the base cases and additional measurement uncertainty is proposed for operation with less than 75 percent thimbles operable, the consequences of an accident will not be increased due to the proposed change.

We have also determined that there is no significant impact upon monitoring the Quadrant Power Tilt Ratio, since the required minimum number of thimbles per core quadrant is not changed.

2. Does the proposed license change create the possibility of a new or different kind of accident from any accident previously analyzed?

The only change proposed is a reduction in the number of operable thimbles. This change does not introduce any new equipment or methods into plant operation and thus cannot create an accident of a different type.

3. Does the proposed license change involve a significant reduction in a margin of safety?

The results from Table 1 show that with a reduced number of thimbles the predicted peaking factors will increase. Since all cases remain below the TTS peaking limits, the margin of safety has not been reduced.

In the March 6, 1986 Federal Register, the NRC published a list of examples of amendments that are not likely to involve a significant hazards consideration. Example (vi) from this list states:

"A change which either may result in some increase to the probability or consequences of a previously-analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria with respect to the system or component specified in the Standard Review Plan, e.g., a change resulting from the application of a small refinement of a previously used calculational model or design method".

Our analysis shows that the results of the change are clearly within all acceptance criteria of the Standard Review Plan. Therefore, the proposed change is similar to Example (vi) discussed above and does not involve a significant hazards consideration.

Safety/Environmental Evaluation

Safety and environmental evaluations were performed as required by Title 10, Code of Federal Regulations, Part 50, "Domestic Licensing of Production and Utilization Facilities", and the TTS. The review determined that the proposed change does not create an unreviewed safety question, nor does it create an unreviewed environmental question.

Schedule Considerations

It is requested that the effective date of the amendment be 15 days after issuance by the NRC.

TABLE 1

PEAKING FACTOR RESULTS FOR RANDOMLY SELECTED OPERATING THIMBLE PATTERNS

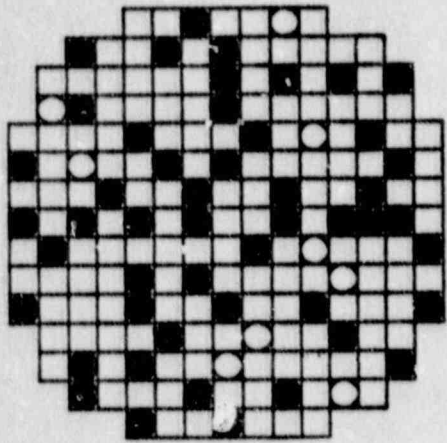
Thimble Pattern	No. of Thimbles	F_{AH}	% Difference	F_Q	% Difference
Base Case - BOC	49	1.4381	--	1.7912	--
Test Case 1	29	1.4628	1.7	1.8082	0.9
Test Case 2	29	1.4415	0.2	1.8198	1.6
Test Case 3	29	1.4587	1.4	1.8268	2.0
Test Case 4	29	1.4512	0.9	1.8185	1.5
Test Case 5	29	1.4517	0.9	1.8191	1.6
Base Case - EOC	50	1.3740	--	1.6038	--
Test Case 1	29	1.4096	2.6	1.6272	1.5
Test Case 2	29	1.3755	0.1	1.6055	0.1
Test Case 3	29	1.3680	-0.4	1.5919	-0.7
Test Case 4	29	1.4126	2.8	1.6304	1.7
Test Case 5	29	1.4116	2.7	1.6300	1.6

$$\% \text{ Difference} = \frac{\text{Reanalyzed Case} - \text{Base Case}}{\text{Base Case}} \times 100$$

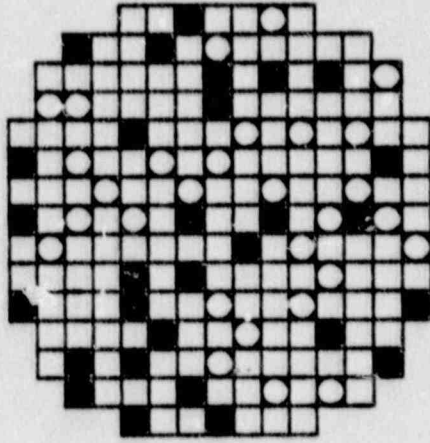
DBO/bsh
3419W.1089

Figure 1

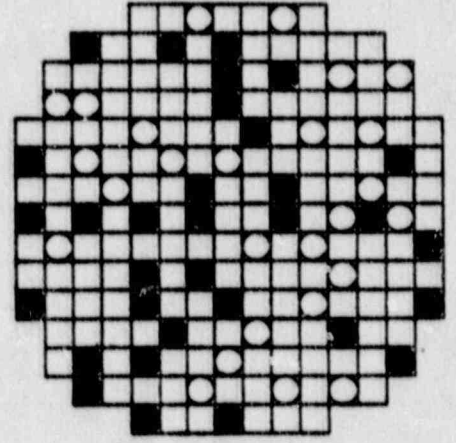
Trojan BOC 11



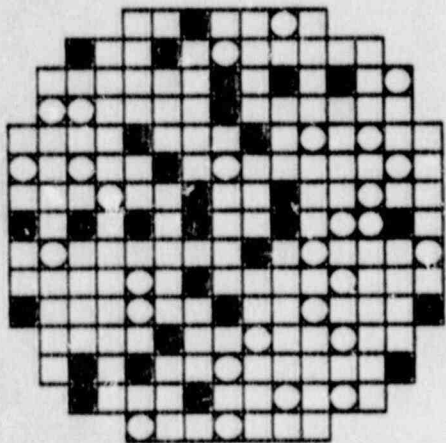
Base Case



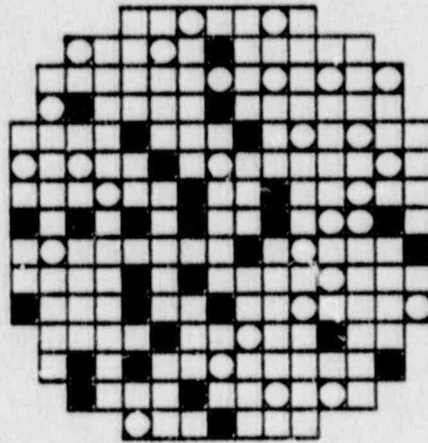
Test Case # 1



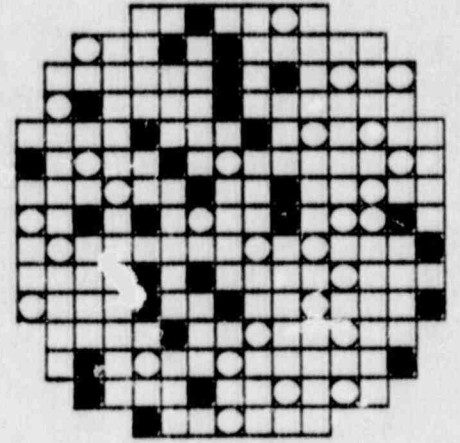
Test Case # 2



Test Case # 3



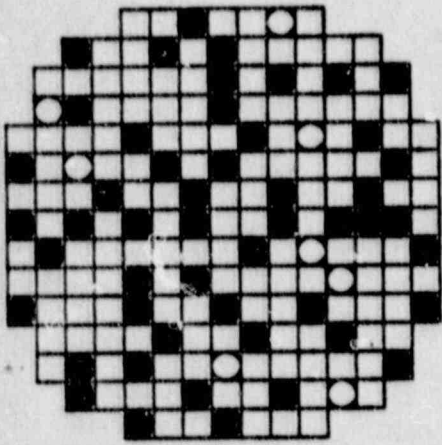
Test Case # 4



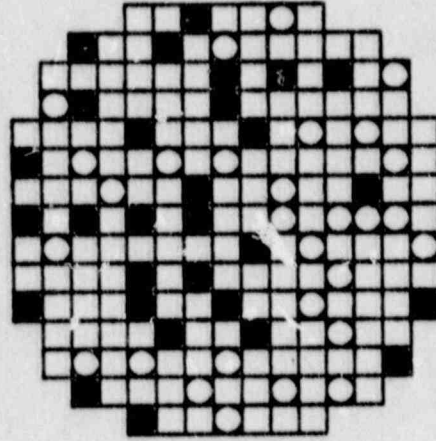
Test Case # 5

Figure 2

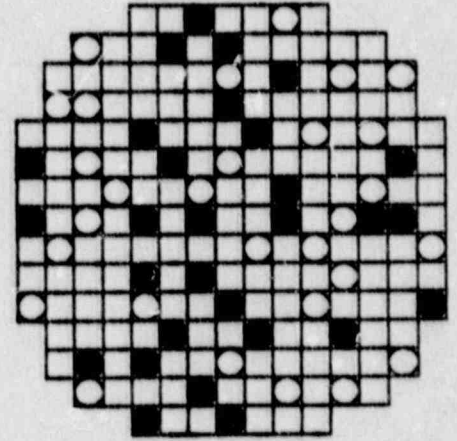
Trojan EOC 11



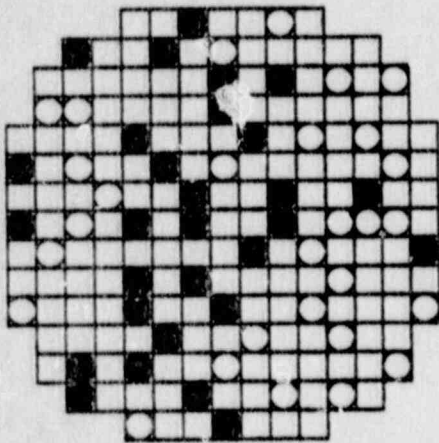
Base Case



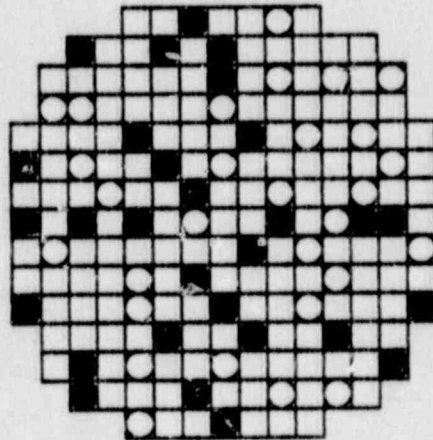
Test Case # 1



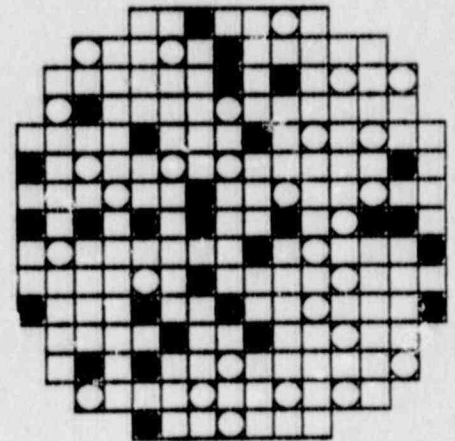
Test Case # 2



Test Case # 3



Test Case # 4



Test Case # 5