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SUBJECT: Special rept: on 870922, quadrant power tilt ratio (QPTR) found to be in excess of 2% during startup after refueling. QPTR calculated every hour until less than 2%. New NIS detector calibr currents calculated.

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L-87-423

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Gentlemen:

Re: Turkey Point Unit 3
Docket No. 50-250
Special Report - Radial Flux Tilt
Greater Than 2% (Voluntary Report)

In accordance with Technical Specification 6.9.3.1 the attached voluntary Special Report is provided for your information.

Should there be any questions on this information, please contact us.

Very truly yours,

C. O. Woody
C. O. Woody
Group Vice President
Nuclear Energy

COW/TCG/gp

Attachment

cc: Dr. J. Nelson Grace, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant

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SPECIAL REPORT

Turkey Point Unit No. 3
October 21, 1987

RADIAL FLUX TILT GREATER THAN 2 %

PURPOSE:

Technical Specification (TS) 6.9.3.1 requires that if the quadrant power tilt ratio exceeds a value of 2% for more than 24 hours, except for physics and rod exercise testing and if design hot channel factors for rated power are not exceeded, an evaluation as to the cause of the discrepancy shall be made and submitted as a report to the Commission. On September 22, 1987, the Quadrant Power Tilt Ratio (QPTR) was found to be in excess of 2% at 1900 hours, and was returned to less than 2% in 22 hours. This report is thus for information only, and is not the result of any Technical Specification requirements or violations since the 24 hour limit was not exceeded.

EVENT:

When Unit 3 started up after refueling, all of the zero power physics test results were within their acceptance criteria. During the initial power ascension on September 13, 1987, the reactor power was held at 30% to perform the first power distribution flux map and for chemistry. The results of this flux map showed the Hot Channel Factors (HCF) to be well within their limits for 30% reactor power, but the incore radial tilt showed a value of +4.50%. At the time the flux map data was analyzed, the reactor had been shut down for the turbine over speed test. It was decided that on the subsequent power ascension, a second power distribution flux map would be taken at 30% reactor power. In order to improve the measured incore radial tilt, it was decided that this second flux map would be taken with Control Bank D further out. Data collection for the second 30% power flux map was completed at 1230 hours of September 22, 1987. The results of this second map again showed the HCF to be within their limits for 30% power and the incore radial tilt improved to 4.11%. At this time the Westinghouse core designers were notified, and the Technical Specifications were reviewed. The incore radial tilt is not limited by Technical Specifications, but the QPTR is limited to less than 2%, and is calculated by use of the excore Nuclear Instrumentation System (NIS) detectors. The Control Room was notified at 1900 hours on September 22 of the incore radial tilt, and were requested to perform a QPTR calculation. The calculated QPTR was 8.9%. It was known that 2 of the 4 power range detectors had been replaced during the refueling, and that the affected channels had not been recalibrated. Prior to this event, the plant was already planning to perform a full recalibration of all four NIS channels and remeasure incore radial tilt prior to increasing

reactor power above 50%. To meet the intent of Interim Technical Specification (ITS) 3/4.2.4 the QPTR was calculated hourly as per ITS 3/4.2.3.2.1. The other conditions of ITS 3/4.2.4 were met because the reactor was in initial power ascension, the High Flux trips were already preset at 80% power, the reactor power was well below the limiting power from the QPTR, and the HCF were within their limits. The plant developed a plan to reduce the QPTR to <2%, and this involved using the two 30% power flux maps to develop new 100% power NIS detector currents and to have the Reactor Control Operator (RCO) borate the reactor to get the Control Rods further out. The new 100% power NIS detector currents were calculated at 1300 hours on September 23, 1987. At 1555, the QPTR calculation was less than 2%.

CAUSE OF THE EVENT:

The incore radial tilt was measured at greater than 2% during the Unit 3 start-up after refueling. This was not considered a highly significant condition considering the reactor power level, the effect of the control rod position and xenon on flux distribution, and the measured HCF being within their limits. The Westinghouse core designers were notified of the condition. The QPTR was calculated as a result of the incore radial tilt and this value was 8.9%. The Turkey Point current and revised Technical Specifications do not require the QPTR to be less than 2% below 50% reactor power. However, the ITS require QPTR to be less than 2% for all of Mode 1 and Mode 2. Because the ITS is more restrictive, the Plant entered ITS 3/4.2.4.

CORRECTIVE ACTION:

- 1) The QPTR was calculated once an hour until it was less than 2%.
- 2) The Plant stayed well below the limiting power for the QPTR value, the High Flux Trip setpoints were already set at 80%, and the HCF were within their limits.
- 3) New NIS detector calibration currents were calculated using the two 30% power flux maps.
- 4) The controlling bank was withdrawn to a higher position in the core.
- 5) The QPTR value was less than 2% within 24 hours of its first being calculated at 8.9%.
- 6) The Reactor Supervisor discussed the event with the Senior Resident NRC Inspector and a visiting NRC Inspector from the Regional office.