STARTUP REPORT

FOR

CALLAWAY PLANT UPRATING

INTRODUCTION

This report describes the testing which supported the increase in licensed power at Union Electric's Callaway Plant from 3411 MWt to 3565 MWt. It is submitted as required by Sections 6.9.1.1, 6.9.1.2 and 6.9.1.3 of the Callaway Technical Specifications.

The licensing submittal for approval to operate at 3565 MWt was made March 31, 1987 (ULNRC-1471). This submittal contained evaluations demonstrating that the NSSS and BOP systems had been reviewed and found to be capable of meeting all applicable safety design bases and power generation bases as defined in the FSAR at the uprated conditions without hardware changes.

A separate licensing submittal (ULNRC-1470) to allow use of VANTAGE 5 fuel, also made on March 31, 1987, contained additional accident, radiological and nuclear evaluations.

The NRC approved the uprating on March 30, 1988. Power was successfully increased to the new licensed level on April 8, 1988.

IMPLEMENTATION OF UPRATING

Procedure changes and instrument loop calibrations which were prerequisites for implementation of the uprating were implemented from April 4 through April 7, 1988. Core power was increased to 3565 MWt in two increments on April 8, 1988.

Although the uprating was approved by the NRC on March 30, 1988, implementation did not begin until April 4. The first step of the uprating, revision of affected software, was executed on April 4. Affected software included procedures, operating curves and computer software. All changes had been identified and prepared prior to this date so that issuance of revisions occurred in an orderly and expeditious manner.

Following completion of software revision, a heat balance calculation was performed per the revised plant procedure OSP-SE-00004, NIS Power Range Heat Balance. This adjusted the nuclear instrumentation to indicate power as a percent of 3565 MWt, the new rated power level.

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Scaling changes were made to plant instrumentation during the subsequent 3 days. Differential temperature indications for all 4 reactor coolant loops, the rod control program, the steam dump program, and pressurizer level control were rescaled. A flux map was taken to verify that F_Q and $F_{\Delta H}$ would not exceed their limits when extrapolated to the uprated power level. On April 8, power was increased to approximately 3565 MWt. Concurrent with and following the power increase, extensive testing was performed to verify the plant's capability to operate at a reactor power of 3565 MWt.

SUMMARY OF TESTING

Reactor

After power had been raised to approximately 3565 MWt and plant conditions were stable, an incore flux map was taken to verify that F_Q and $F_{\Delta H}$ did not exceed their limits. F_Q was determined to be 1.7680, which was below the limit of 1.9773. $F_{\Delta H}$ was 1.3767, compared to a limit of 1.4909.

During and after the power increase, calorimetric data was taken and the power range nuclear instrumentation adjusted to ensure proper indication. After full power was reached, new setpoints were calculated for intermediate range trip and rod stop, which are 25% and 20% of full power, respectively.

Primary Systems

The highest reactor coolant loop outlet temperature, T_{HOT}, was monitored continuously during the power increase. A limit of 620°F was established to minimize potential steam generator tube degradation. The maximum loop outlet temperature recorded was 617.1°F.

Differential temperature was measured for each reactor coolant loop after power was increased to verify that it had been rescaled correctly. Measured ΔT was within 1°F of the scaled full power ΔT for all loops.

Data was also taken to characterize the Callaway thermal hydraulic flow anomaly and compared to similar data taken prior to the uprating. The magnitude of the changes in core exit thermocouple temperatures, reactor vessel differential pressure and excore nuclear power were not affected by the uprating.

Other primary system data trended during the power increase included reactor coolant flow, reactor coolant pump current, and reactor coolant pump vibration. No significant changes were noted in these parameters.

After power was increased, new baseline data was taken for the loose parts monitoring system.

Balance of Plant Systems

Extensive data was taken on the turbine systems prior to and during

the power increase, including steam pressure and temperature at various locations, bearing temperatures, lube oil temperatures, lube oil pressures, bearing vibration, and control valve position. No unexpected changes were observed and operation of the turbine at the uprated power level was satisfactory.

The generator and associated components were also monitored closely. Generator output, winding temperatures, gas temperatures, gas pressure, isophase bus temperatures, and transformer temperatures were recorded. All changes were within the expected range.

Flow, temperature and pressure data were taken in the condensate, feedwater and main steam systems. Also recorded were differential pressure across the condensate polishers, steam generator levels, levels in feedwater heaters, and heater level control valve positions. These parameters were within expected ranges.

Data was taken to verify no adverse affects on containment temperature due to the uprating. Temperatures were recorded at containment cooler fan inlets, control rod drive mechanism shroud return, reactor cavity cooling return, and steam and feedwater piping torsional restraints. Reactor cavity concrete temperatures were monitored. Average containment temperature was also recorded. All temperatures met acceptance criteria.

Pipe vibration data was taken on steam and feed flow piping. There were no significant changes in piping vibration. In addition, new baseline data was taken for vibration of rotating equipment.

A biological shield survey was performed at the uprated power level. Radiation levels did not significantly increase inside containment, and changes in dose rates outside containment were not detectable.

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Gentlemen:

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
FACILITY OPERATING LICENSE NPF-30
STARTUP REPORT

The enclosed Startup Report is submitted pursuant to Sections 6.9.1.1, 6.9.1.2, and 6.9.1.3 of the Callaway Unit 1 Technical Specifications.

Very truly yours,

Donald F. Schnell

DFS/JDB/bjp

Enclosure

cc: Distribution attached

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