UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

December 26, 2017

Mr. Adam C. Heflin
President, Chief Executive Officer,
and Chief Nuclear Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 – REVIEW OF THE 2016 STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT (CAC NO. MF9696; EPID L-2017-LRO-0010)

Dear Mr. Heflin:

By letter dated May 2, 2017, Wolf Creek Nuclear Operating Corporation (the licensee) submitted the summary of the results of the fall 2016 steam generator (SG) inspections performed at Wolf Creek Generating Station, Unit 1, during refueling outage 21. The SG tube inspection report was submitted in accordance with Technical Specification (TS) 5.6.10, "Steam Generator Tube Inspection Report."

Based on its review, the U.S. Nuclear Regulatory Commission (NRC) staff concludes that the licensee has provided the information required by TS 5.6.10, and that no followup is required at this time. A summary of the NRC staff's review is enclosed. If you have any questions, please contact me at 301-415-3016 or via e-mail at Balwant.Singal@nrc.gov.

Sincerely,

Balwant K. Singal, Senior Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure:
Review of the Steam Generator Tube
Inspection Report

cc: Listserv

SUMMARY OF THE REVIEW OF THE 2016 REFUELING OUTAGE 21

STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION, UNIT 1

DOCKET NO. 50-482

By letter dated May 2, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17129A604), Wolf Creek Nuclear Operating Corporation (the licensee), submitted information summarizing the results of the fall 2016 steam generator (SG) inspections performed at Wolf Creek Generating Station, Unit 1 (WCGS) during refueling outage 21 (RFO 21).

The SG tube inspection report was submitted in accordance with Technical Specification (TS) 5.6.10, "Steam Generator Tube Inspection Report."

WCGS has four Westinghouse Model F SGs. Each SG contains 5,626 thermally treated Alloy 600 tubes. Each tube has a nominal outside diameter of 0.688 inches and a nominal wall thickness of 0.040 inches. The tubes are supported by stainless steel tube supports with quatrefoil-shaped holes and V-shaped chrome-plated Alloy 600 anti-vibration bars.

The licensee provided the scope, extent, methods, and results of its SG tube inspections in its letter dated May 2, 2017. In addition, the licensee described corrective actions, such as tube plugging, taken in response to the inspection findings.

Based on the U. S. Nuclear Regulatory Commission (NRC) staff's review of the information provided by the licensee, the staff have the following observations/comments:

- A single circumferential primary water stress corrosion cracking indication was detected in the tube in Row 19, Column 83, of SG D, during the hot-leg top-of-tubesheet (TTS) inspection. The planned scope of this inspection was 50 percent. The indication was 0.71 inches below the hot-leg TTS and was associated with a geometric anomaly that had bulge-like characteristics. The geometric anomaly was not previously reported. The indication measured 33 degrees of circumferential extent with a maximum depth of 23 percent through-wall, which is a percent degraded area (PDA) of 2 percent, or a PDA of 9.2 percent (assuming 100 percent through-wall flaw over the entire circumferential extent). Historical eddy current data review showed precursors of this indication dating back to 1997, thus indicating little to no cycle-to-cycle growth. The tube was stabilized and plugged.

- A single circumferential outside diameter stress corrosion cracking (ODSCC) indication was detected in the tube in Row 41, Column 70, in SG C, during the hot-leg TTS inspection. The planned scope of this inspection was 50 percent. The flaw was located within the hydraulic expansion at the hot-leg TTS. This was the first occurrence of ODSCC being detected in the SGs at WCGS. The ODSCC indication measured 112 degrees of circumferential extent with a maximum depth of 86 percent through-wall. The total PDA of the indication was 21.1 percent. An in situ pressure test was

performed and no leakage was detected up to steam line break pressure. Pressure testing at three times the normal operating tube differential pressure was not required, as the indication was within the structural performance criterion limit. Following the in situ test, eddy current inspection determined there was no change to the flaw characteristics. The tube was stabilized and plugged.

- Due to the two circumferential indications, the +Point™ probe tubesheet inspection scope was increased to 100 percent of the hot leg tubes in all four SGs, from +3/-15.2 inches at the hot-leg TTS. No other indications were detected.

- An area of channel head wastage (due to a cladding breach) was reported in SG A during RFOs 19 and 20. Visual inspection from the channel head interior during RFO 21 showed no change from previous outages. The licensee finished an evaluation of the channel head wastage and reported that the channel head was determined to be acceptable for 40 years of continued operation.

Based on a review of the information provided, the NRC staff concludes that the licensee provided the information required by WCGS TS 5.6.10. In addition, the staff concludes there are no technical issues that warrant followup actions at this time, since the inspections appear to be consistent with the objective of detecting potential tube degradation and the inspection results appear to be consistent with industry operating experience at similarly designed and operated units.

SUBJECT: WOLF CREEK GENERATING STATION, UNIT 1 – REVIEW OF THE 2016 STEAM GENERATOR TUBE INSERVICE INSPECTION REPORT (CAC NO. MF9696; EPID L-2017-LRO-0010) DATED DECEMBER 26, 2017

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