

WOLF CREEK

NUCLEAR OPERATING CORPORATION

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July 15, 2010

ET 10-0021

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

- Reference: 1) Letter ET 10-0012, dated April 8, 2010, from T. J. Garrett, WCNOG, to USNRC
- 2) Letter dated June 21, 2010, from B. K. Singal, USNRC, to M. W. Sunseri, WCNOG, "Wolf Creek Generating Station – Request for Additional Information Regarding 16th Steam Generator Tube Inservice Inspection (TAC NO. ME3774)"
- Subject: Docket No. 50-482: Response to Request for Additional Information Regarding the Sixteenth Steam Generator Tube Inservice Inspection

Gentlemen:

Reference 1 submitted the results of Wolf Creek Generating Station's (WCGS's) sixteenth steam generator tube inservice inspection in accordance with WCGS Technical Specification (TS) 5.6.10, "Steam Generator Tube Inspection Report." Reference 2 provided a request for additional information (RAI) based on the Nuclear Regulatory Commission (NRC) staff review of Reference 1. The Attachment provides the NRC's RAI, along with Wolf Creek Nuclear Operating Corporation's (WCNOG's) response following each request item.

This letter contains no additional commitments. If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Richard D. Flannigan at (620) 364-4117.

Sincerely,



Terry J. Garrett

TJG/rlt

Attachment

cc: E. E. Collins (NRC), w/a
G. B. Miller (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

A047
NRC

Response to Request for Additional Information Regarding the Sixteenth Steam
Generator Tube Inservice Inspection

Provided below is the Nuclear Regulatory Commission's (NRC's) request for additional information (RAI), along with Wolf Creek Nuclear Operating Corporation's (WCNOC's) response following each request item.

By letter dated April 8, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML101100676), Wolf Creek Nuclear Operating Corporation (the licensee) submitted the results of the 16th steam generator (SG) tube inservice inspection for Wolf Creek Generating Station (WCGS).

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided by the licensee and determined that the additional information is needed in order for the NRC staff to complete its review as follows:

- 1. In its letter dated April 8, 2010, the licensee indicated that no precursor signals were found in tubes identified as potentially having an elevated residual stress condition. Please provide the number of tubes with this condition for each of the four SGs. Also, please discuss whether locations in these tubes that may elevate the residual stresses (e.g., dents, dings, expansion transitions) were examined preferentially with a rotating probe.*

WCNOC Response:

Outside diameter stress corrosion cracking (ODSCC) at tube support plates (TSPs) has occurred in a small number of alloy 600 thermally treated tubes within the industry. These have been attributed to potentially elevated residual stresses in these tubes. A screening method was developed to identify tubes with potentially elevated residual stress in low row tubes. There are no tubes in Rows 1 through 10 in the four WCGS SGs that exhibit the characteristic signal that indicates the presence of elevated residual stresses and potential susceptibility to ODSCC.

Because there are no definitive criteria to identify an elevated residual stress condition for the long row tubes (row 11 and greater), a statistical criterion was established that defines those tubes with a U-bend offset voltage less than the population mean minus 2-sigma value of U-bend offsets for each row as a susceptible tube. This relative ranking produced 31 tubes in SG A, 11 tubes in SG B, 10 tubes in SG C, and 7 tubes in SG D that are considered tubes with potentially elevated residual stress. None of these tubes have ever exhibited potential precursors to ODSCC, such as distorted support plate indications (DSIs).

Preferential examination of tubes identified as potentially having elevated residual stress with a rotating probe is not necessary since the bobbin technique is qualified to detect axial ODSCC at tube support plates, which is the potential damage mechanism based on the relevant industry operating experience. The bobbin coil inspections will determine if further characterization with a rotating probe is required. Likewise, other tubing conditions (e.g., dents, dings, expansion transitions) are examined with qualified

techniques and in accordance with frequencies as documented in the Degradation Assessment. Tubes identified as potentially having elevated residual stress are not preferentially examined with a rotating probe.

- 2. Please clarify whether all new dents and dings were examined with a rotating probe or whether just 50 percent of these locations were examined.*

WCNOC Response:

Freespan dings > 5 volts and dents at structures > 2 volts are inspected with the mid-range Plus Point probe. The total population includes new and existing dings and dents. A 50% sample of this population was inspected in accordance with the Degradation Assessment.

- 3. For the wear indications at the tube supports and flow distribution baffle, please discuss whether the depths of these indications have changed since the last inspection (i.e., changed beyond what would be expected as a result of normal measurement variability).*

WCNOC Response:

Wear indications at the tube support plates and flow distribution baffle are not progressing and have not changed since the prior inspection (beyond normal measurement variability).

- 4. Please clarify whether any degradation was observed during the secondary side inspections.*

WCNOC Response:

Minor degradation is being monitored during upper steam drum inspections at a few J-Nozzle to Feeding interface locations. Visual inspections and ultrasonic measurements are periodically performed at these locations. All results have been within the acceptance criteria. No other degradation has been observed during the secondary side inspections.

5. *In its letter dated April 8, 2010, the licensee indicated that analysis of the data collected for scale profiling was on-going. Please discuss whether this analysis has been completed, and, if so, briefly describe the results. In particular, please discuss the extent to which the tube support openings (e.g., quatrefoil shaped holes) are blocked.*

WCNOC Response:

The initial draft of the scale profiling report has been completed and is currently being reviewed by WCNOC. Scale profiling analysis was performed on the Refuel 17 bobbin data and on selected Rotating Pancake Coil (RPC) data for SG A. The majority of the freespan tube scale deposits are located in between the sixth support plate extending upward through the U-bend region on the hot leg side. The RPC data was reviewed from approximately 130 intersections in the regions of highest deposit accumulation; TSP 5 through TSP 7 on the Hot Leg. The tube support plate RPC quatrefoil evaluations indicated that the majority of the locations examined were free of deposit. All flow holes sampled appeared open and free of deposits. Very light deposits were identified at a small number of intersections on land contact areas. Monitoring of any deposit buildup in these locations is performed and the results are trended in order to plan for future maintenance and cleaning strategies.