WOLF CREEK
NUCLEAR OPERATING CORPORATION

Michael J. Westman
Manager Regulatory Affairs

March 4, 2013

RA 13-0030

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

Subject: Docket No. 50-482: Wolf Creek Generating Station Biennial 50.59 Evaluation Report

Gentlemen:

This letter transmits the Biennial 50.59 Evaluation Report for Wolf Creek Generating Station (WCGS), which is being submitted pursuant to 10 CFR 50.59(d)(2). The attachment provides the WCGS Biennial 50.59 Evaluation Report including a summary of the evaluation results.

This report covers the period from January 1, 2011, to December 31, 2012, and contains a summary of 50.59 evaluations implemented during this period that were approved by the WCGS onsite review committee.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-8831 ext. 4009 or William Muilenburg at (620) 364-8831 ext. 4511.

Sincerely,

FOR
Michael J. Westman

MJW/rlt

Attachment

cc: E. E. Collins (NRC), w/a
C. F. Lyon (NRC), w/a
N. F. O'Keefe (NRC), w/a
Senior Resident Inspector (NRC), w/a

IE47
NRR

WOLF CREEK NUCLEAR OPERATING CORPORATION

Wolf Creek Generating Station

Docket No.: 50-482
Facility Operating License No.: NPF-42

BIENNIAL 50.59 EVALUATION REPORT

Report No.: 23

Reporting Period: January 1, 2011 through December 31, 2012

SUMMARY

This report provides a brief description of changes, test, and experiments implemented at Wolf Creek Generating Station (WCGS) and evaluated pursuant to 10 CFR 50.59(c)(1). This report includes summaries of the associated 50.59 evaluations that were reviewed and found to be acceptable by the Plant Safety Review Committee (PSRC) for the period beginning January 1, 2011 and ending December 31, 2012. This report is submitted in accordance with the requirements of 10 CFR 50.59(d)(2).

On the basis of these evaluation of changes:

- There is less than a minimal increase in the frequency of occurrence of an accident previously evaluated in the Updated Final Safety Analysis Report (USAR).
- There is less than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the USAR.
- There is less than a minimal increase in the consequences of an accident previously evaluated in the USAR.
- There is less than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the USAR.
- There is no possibility for an accident of a different type than any previously evaluated in the USAR being created.
- There is no possibility for a malfunction of a SSC important to safety with a different result than any previously evaluated in the USAR being created.
- There is no result in a design basis limit for a fission product barrier as described in the USAR being exceeded or altered.
- There is no result in a departure from a method of evaluation described in the USAR used in establishing the design bases or in the safety analyses.

Therefore, all items contained within this report have been determined not to require a license amendment.

Evaluation Number: 59 2011-0001 Revision: 0

Title: Heat Tracing of BG System Boric Acid Pipes in Room 1113

Activity Description:

Permanently designed heat tracing and insulation was installed on the normal and emergency boration lines in room 1113 in order to maintain the solution temperature in the line at or above 65 °F. This non-safety related heat trace is fed from one of two redundant diesel generator backed power sources. The non-safety related heat trace is fed from an automatic transfer switch that has a primary electrical source from the safety related NG01A motor control center (MCC) 120 volt distribution panel. The secondary (back-up) electric source to the transfer switch is the safety related NG01B MCC 120 volt distribution panel. Isolation fuse panels NG100A and NG100B were installed to provide separation between the safety related and non-safety related circuits.

50.59 Evaluation:

The non-safety heat trace circuit is fed from 2 redundant diesel backed power sources, from the class 1E distribution panels NG01AA1 and NG02AA1. To ensure the safety related power circuits are protected due to electrical disturbances on the non-safety related components and circuit, isolation fuses were installed between the safety related and non-safety related circuits as defined in IEEE standard 384-1992 (7.1.2 Isolation devices). The isolation fuses are 30 amp fast acting 250 volt fuses. The 2 fuses in series between the safety related and non-safety related circuits are installed on the hot conductor of each of the 2 feeds. Though not required, the neutral conductor of each safety related feed also has 2 isolation fuses for an unlikely fault through the neutral conductors.

The upstream protective devices, which cannot trip prior to the isolation fuses clearing a fault, are 480 volt circuit breakers NG001ABF5 and NG002ACF5. These 2 circuit breakers feed the 120 volt distribution panels NG01AA1 and NG02AA1. The Bussmann BAF 30 amp isolation fuses' time current curve is well within the curve for the 480 volt circuit breakers. The isolation fuses will clear any fault from the non-safety related circuit well before the safety related distribution panel transformer breakers, and prevent disruption to the other panel loads.

The maximum start-up inrush current for the heat trace is 18.75 amperes. Circuit breakers NG01AA1-39 and NG02AA1-23 are rated for 20 amps. As either NG01AA1 or NG02AA1 can feed the heat trace circuit, either of the two diesel generators NE001 or NE002 may have the added load.

The heat trace adds 1.250 KW to the total load on the distribution panels' transformers. The heat trace 1.250 KW load increases the distribution panel transformers' KVA load by 1.290 KVA. The total KVA load is 17.69 KVA on XNG01A and 17.87 KVA on XNG02A. The load increase is well within the capabilities of the transformers and leaves a significant amount of margin on each. As this load is well within the available margin, it will not trip on a Safety Injection Signal during a design bases accident.

Evaluation Number: 59 2011-0002 Revision: 0

Title: Control Room Habitability of a Postulated LOCA, Based on a Control Room Unfiltered Inleakage of 20 cfm

Activity Description:

This calculation change notice (CCN) increases the control room unfiltered inleakage (UI) rate assumed in the control room dose consequences calculation (AN-99-020, Rev.1) from 10 cfm to 20 cfm. As a result, the control room dose consequences are expected to be higher than the current Analysis of Record (AOR) results, but still remain well below the regulatory limits.

50.59 Evaluation:

This change, assuming a higher control room unfiltered inleakage rate, affects the calculated radiological consequences of a postulated loss of coolant accident as described in USAR Section 15.6.5. The current AOR analysis, documented in Calculation AN-99-020 Revision 1, is based on an assumed unfiltered inleakage of 10 cfm for the control room envelope. With an assumed unfiltered inleakage of 20 cfm for the control room, the control room dose consequences were calculated to be higher than the current AOR results. With the dose conversion factors (DCFs) based on the more updated values such as those tabulated in Environmental Protection Agency (EPA) Federal Guidance Reports (FGR) No. 11 and 12, approved in Wolf Creek Generating Station (WCGS) License Amendment 170 (reference Tech. Spec. (TS) Section 1.1 "Definitions"), employed in the analysis, the results of the calculation show that the control room doses are comparable to the current AOR results. That is, the changes are less than 10 percent of the difference between the current calculated dose values and the regulatory guideline values. Therefore, this change does not result in more than a minimal increase in the consequences of an accident previously evaluated in the USAR.

Evaluation Number: 59 2011-0004 Revision: 0

Title: NN Inverter Replacement

Activity Description:

This modification impacted the 120VAC Vital Instrument Power supply to each of the 120VAC Vital Instrument Distribution Panels NN001, NN002, NN003 and NN004. The modification replaced the existing Westinghouse 7.5KVA NN Inverters (NN011, NN012, NN013, and NN014) and removed the existing spare inverter NN015. The 480/120VAC Class 1E Vital backup instrument power transformers, XNN05 (backup for NN001 or NN003) and XNN06 (backup for NN002 or NN004) were determinated and removed. Each new inverter assembly has its own integral 480/120 backup power transformer, which is an improvement because in the current configuration the failure of one 480/120VAC backup transformer (XNN05 or XNN06) potentially affects 2 inverters, whereas with the new configuration a failure of one of the integral 480/120VAC backup transformers can only affect one inverter.

Two additional inverters were installed, NN015 (replacement) and NN016, which are utilized as swing inverters. The purpose of the swing inverter is to function as a replacement for either of the two inverters in the same train. The addition of permanent swing inverters adds additional redundancy. The 480VAC and 125VDC supplies to NN015 and NN016 are maintained off unless the unit is needed for operation or testing. The 120VAC output of NN015 and NN016 is routed through a three-position integral manual transfer switch that can be connected to the output of either (not both at the same time) of the two NN inverters in the same train. Integral two-position manual transfer switches on NN011 through NN014 are used to connect the 120VAC Vital Instrument Distribution Panel to NN015 or NN016. The new inverter equipment, in conjunction with the existing Station Class 1E Battery/Battery Charger System, functions as a complete Uninterruptible Power Supply (UPS) system for each of the 120VAC Vital Instrument Buses currently supplied by the existing inverters and normally deenergized backup transformers, XNN05 and XNN06.

With the new inverter assemblies, the in-service 120VAC Vital Instrument Power supply has the backup 480/120VAC Class 1E power source energized/available. An internal static switch is used to automatically transfer the input power from the 125VDC input to the 480/120VAC input if the assembly control logic senses a fault with the inverter section. This prevents a loss of power to the 120VAC Vital Instrument Distribution panel in the event of an inverter failure.

50.59 Evaluation:

The new Class 1E components installed are designed and routed to be independent from one another. The 480/120VAC power sources within each train are obtained from the same 480VAC Class 1E Motor Control Center as the current design. Each 125VDC power source continues to remain independent. Each inverter continues to receive Class 1E 125VDC from the associated 125VDC separation group's 125VDC switchboard. Any failure of the 480VAC power supply will not impact the 125VDC power supply. The replacement inverter units are the same size as the installed inverter units and the transformer used in each inverter unit is the same size as the existing Class 1E backup transformer. An individual breaker at the MCC for the single load protects the input to each 480VAC transformer.

With the new automatic transfer feature, the 480/120VAC power source is continually available at the inverter assembly. In the event of an inverter problem that results in incorrect inverter parameters on the input or output or a loss of the inverter, an internal static switch automatically shifts the load to the internal 480/120VAC transformer output to maintain power to the 120VAC

Vital Instrument panel supplied by the inverter. This eliminates an existing manual Operator action to energize the Class 1E 480VAC backup transformer. If the 125VDC power source is lost and the 480/120VAC power source does not assume the load (new failure point), this could result in the loss of one protection group, which is the same end result as the current configuration.

The addition of NN015 and NN016 provides an installed backup that can be used to replace the failed inverter assembly in a short period of time that would be less than the Technical Specification time limit [2 hours] for restoring power to a 120VAC Vital Instrument Distribution panel. The addition of these permanent swing inverters adds additional redundancy.

Evaluation Number: 59 2012-0001 **Revision: 0**

Title: Radiological Consequences Analysis of a Loss of Coolant Accident

Activity Description:

Calculation AN-99-020 Rev. 01 is the analysis of record (AOR) for determining control room, Exclusion Area Boundary (EAB) and Low Population Zone (LPZ) radiological doses. This analysis was updated by calculation change notice AN-99-020-001-CN002 when the control room unfiltered infiltration rate was increased from 10 cfm to 20 cfm.

AN-99-020 Rev. 1 had taken credit for the Refueling Water Storage Tank (RWST) Outlet Isolation valve (BNV0011) being closed at 16 hours and reducing the leakage rate from the Emergency Core Cooling System (ECCS) to the RWST from 5 gpm to 2 gpm. BNV0011 is not in the Inservice Testing (IST) program and is not tested to ensure that it can satisfy the leakage requirements. This manual valve is not the isolation valve provided by design to isolate the various pathways back to the RWST from the ECCS pumps and Containment Spray pumps. The post Loss of Coolant Accident (LOCA) doses are recalculated with a constant leakage rate from the ECCS to the RWST of 3.8 gpm, in calculation change notice AN-99-020-001-CN003, without the credit for the isolation of valve BNV0011. This change results in increasing the ECCS leakage to the RWST to 3.8 gpm in place of 2 gpm that was assumed after 16 hours.

As a result of this CCN, dose received by the control room personnel and offsite locations have marginally increased.

50.59 Evaluation:

The change assuming higher leakage from the ECCS to the RWST affects the calculated radiological consequences of a postulated loss of coolant accident as described in USAR Section 15.6.5. The current Analysis of Record (AOR) is documented in Calculation AN-99-020 Rev. 01 including CCNs 001 & 002. CN002 uses dose conversion factors (DCFs) based on more updated values tabulated in EPA Federal Guidance Reports (FGR) No. 11 & 12, approved in Wolf Creek Generating Station License Amendment 170, Technical Specification (TS) Section 1.1, Definitions. CCN 003 also uses these DCFs. The increased ECCS leakage to the RWST from 2 gpm to 3.8 gpm result in a net increase to doses for control room personnel as well as offsite personnel but this increase is less than 10 percent of the difference between the current calculated dose values and the regulatory guidelines. Therefore, this change does not result in more than minimal increase in the dose consequences of a LOCA.