WOLF CREEK
NUCLEAR OPERATING CORPORATION

June 30, 2011

Russell A. Smith
Plant Manager

WO 11-0033

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

Reference: Letter WO 11-0018, dated April 9, 2011, from R. A. Smith, WCNOC, to USNRC

Subject: Docket No. 50-482: Cancellation of Licensee Event Report 2011-001-00, "Potential for a CVCS Through-Weld Leak to Affect Reactor Coolant System Inventory After a Loss of Coolant Accident"

Gentlemen:

The purpose of this letter is to notify the Nuclear Regulatory Commission (NRC) of the cancellation of Wolf Creek Generating Station (WCGS) Licensee Event Report (LER) 2011-001-00, "Potential for a CVCS Through-Weld Leak to Affect Reactor Coolant System Inventory After a Loss of Coolant Accident." The cancellation of this LER is consistent with the guidance in NUREG-1022, Revision 2, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," Sections 2.8 and 5.1.2.

The Reference reported the potential for a through-weld leak in the Chemical Volume and Control System (CVCS) to affect Reactor Coolant System (RCS) inventory under 10 CFR 50.73(a)(2)(v)(D) as a condition that could have prevented fulfillment of a safety function needed to mitigate the consequences of an accident. This condition was also reported under 10 CFR 50.73(a)(2)(ix)(A) as a single cause that could have prevented fulfillment of the safety functions of trains or channels in different systems.

To ensure that the reactor core would have been protected following a Loss of Coolant Accident (LOCA), Wolf Creek Nuclear Operating Corporation (WCNOC) reviewed current documentation and performed an additional evaluation to determine whether the Emergency Core Cooling System (ECCS) would have been capable of performing its core cooling function with the identified CVCS through-weld leak. This evaluation was documented in the Basic Engineering Disposition (BED) for sub-work order (SWO) 11-336634-006.

The evaluation determined that the uncracked portion of the socket weld had sufficient remaining strength to withstand design loadings for faulted conditions and pressure boundary structural integrity was maintained in the degraded condition. Because the weld would have remained intact through a 12-hour mission time, the integrated leakage over 12 hours would have been a small fraction (approximately two percent) of the margin on RWST/containment recirculation sump inventory. Therefore, the through-weld leak in the CVCS would not have prevented the ECCS from performing its specified safety function after a LOCA.

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Calculation AN-95-021, "Determination of the ECCS Flow Rates During the Recirculation Phases," determined that a single Residual Heat Removal (RHR) pump is capable of delivering more than 1,200 gallons-per-minute (gpm) directly to one of the two RCS cold legs when the RCS is depressurized and one of the RHR cross-tie valves (EJ-HV8716A/B) is isolated. For a postulated small break LOCA, the RCS pressures are expected to remain greater than the RHR pump output pressure for a longer period of time than for a large-break LOCA. At the time the Refueling Water Storage Tank (RWST) inventory is depleted and the RHR pump is required to switch to take suction from the containment sump, the RCS pressure may still exceed the RHR pump cut-in pressure of approximately 150 pounds-per-square-inch-gauge (psig).

Under these conditions, the RHR pump would have to be operated in a piggy-back mode with a centrifugal charging pump (CCP) and/or a safety injection pump (SIP) to deliver ECCS flow to the core. However, procedure EMG ES-11, "Post LOCA Cooldown and Depressurization," directs plant operators to initiate the post-LOCA cooldown and depressurization process in a timely fashion. The BED for SWO 11-336634-006 documented the conclusion from Performance Improvement Request 2002-1967 that, during the recirculation phase of ECCS operations, the RHR pumps are sufficient to maintain the plant in a safe condition after the initial 12 hours of injection and that the CCPs and SIPs are not required after the RCS is depressurized to the RHR pump cut-in conditions.

With the RCS pressures being decreased to the RHR pump cut-in conditions, a single RHR pump can provide more than 250 gpm flow directly to one of the RCS cold legs as determined in calculation SA-90-003, "Determination of Safety Injection Flowrates for Mode 4 Shutdown LOCA." Thus, operating with a single RHR pump can provide more than sufficient ECCS flow for long-term core cooling 12 hours after initiation of a small break LOCA event. Based on the above discussion, the 12-hour mission time established for the CCP or SIP is adequate for either a design basis large break LOCA or a small break LOCA.

WCNOC used this 12-hour mission time to determine the potential impact of the CVCS through-weld leak after a small break LOCA. From the rate of 0.02 gpm, the total loss over the 12-hour period is approximately 14.4 gallons. To have a high confidence that the total leakage in 12 hours is bounded by this evaluation, an estimate of the amount that the leak rate could increase was made. The as-found crack had a length on the outer diameter (OD) surface of the weld of approximately 0.25 inches with an approximate ID length of 1.1 inches. The evaluation assumes that in the 12 hours following the LOCA the length of the crack at the OD surface will grow in length to match the crack length at the ID surface of approximately 1.1 inches. The increased crack length is also assumed to increase the width of the crack opening thus increasing the leak rate.

Increasing the length of the OD crack to equal the length of the ID crack would increase the crack opening area by approximately a factor of 20 times the initial crack opening area. This evaluation also assumed that flow erosion would increase the flow area by an additional factor of 10. Assuming a linear rate of increase, the average leak rate would be approximately 100 times the initial leak rate. This gives an estimated total leakage from the cracked weld during the 12-hour post LOCA operation of 1,440 gallons.

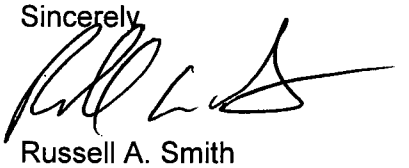
When the RWST volume level reaches the first low-level indication (LOLO-1), the RHR pumps automatically switch to draw suction from the containment sumps. At this point, the minimum transfer allowance is available in the containment sumps and this volume is used to calculate the Net Positive Suction Head (NPSH) for the RHR pumps. When the RWST volume reaches

the second low-level indication (LOLO-2), the containment spray pumps are also manually switched to draw suction from the containment sumps.

The volume of water from the RWST that is transferred to the containment sumps between LOLO-1 and LOLO-2 is at least 72,492 gallons and this amount is not required to maintain NPSH for the RHR pumps during the recirculation phase. At the time of discovering the through-wall leak, there was approximately 16,048 gallons additional volume in the RWST. Therefore, the 72,492 and the 16,048 (total of 88,540) gallons of inventory represents a margin in the capacity of the RWST and the assumed maximum loss of 1,440 gallons represents a two percent decrease in this margin. The two percent decrease in this margin would not affect the suction capability of the RHR pumps. In addition, assuming this leak rate is continuous (not isolated or repaired) for the 30-day required long term cooling, the excess volume in the recirculation sump inventory would not be exhausted.

Based on this evaluation, WCNOC determined that this condition does not meet the criteria for reporting under 10 CFR 50.73 and LER 2011-001-00 is being cancelled. This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Mr. Gautam Sen at (620) 364-4175.

Sincerely,



Russell A. Smith

RAS/rlt

cc: E. E. Collins (NRC)
J. R. Hall (NRC)
G. B. Miller (NRC)
Senior Resident Inspector (NRC)