WOLF CREEK
NUCLEAR OPERATING CORPORATION

C. C. Warren
Vice President Operations Support

MAR 1 3 2000

CO 00-0003

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Subject: Docket No. 50-482: Licensee Event Report 2000-001-00

Gentlemen:

The enclosed Licensee Event Report (LER) 2000-001-00 is being submitted, pursuant to 10 CFR 50.73(a)(2)(i)(B), regarding Wolf Creek Nuclear Operating Corporation's identification of a condition that resulted in the level of Sodium Hydroxide in the spray additive tank being lower than limits allowed by Technical Specifications.

The attachment to this letter identifies the action committed to by Wolf Creek Nuclear Operating Corporation in the enclosed LER.

If you should have any questions regarding this submittal, please contact me at (316) 364-4048, or Mr. Michael J. Angus at (316) 364-4077.

Very truly yours,

Clay C. Warren

Clay C. Warren

CCW/rlr

Enclosure
Attachment

cc: J. N. Donohew (NRC), w/e, w/a
W. D. Johnson (NRC), w/e, w/a
E. W. Merschoff (NRC), w/e, w/a
Senior Resident Inspector (NRC), w/e, w/a

IE22

NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSION
(6-1998)

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001
Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Forward comments regarding burden estimate to the Records Management Branch (T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
WOLF CREEK GENERATING STATION	05000482	1 OF 5

TITLE (4)
Surveillance Method Results in Low NaOH Level in the Spray Additive Tank

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV. NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	10	2000	2000	001	00	03	13	2000	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	MODE 1
POWER LEVEL (10)	100%

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.402(b)		20.405(c)		50.73(a)(2)(iv)		73.71(b)
	20.405(a)(1)(i)		50.36(c)(1)		50.73(a)(2)(v)		73.71(c)
	20.405(a)(1)(ii)		50.36(c)(2)		50.73(a)(2)(vii)		OTHER
	20.405(a)(1)(iii)	X	50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		
	20.405(a)(1)(iv)		50.73(a)(2)(ii)		50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)		50.73(a)(2)(iii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Michael J. Angus Manager Licensing and Corrective Action	(316) 364-4077

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)				EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES	X	NO				

ABSTRACT (16):

On February 9, 2000, while reviewing an NRC inspector's concern associated with a calibration calculation, Wolf Creek Nuclear Operating Corporation (WCNOC) personnel determined that the method used to measure Sodium Hydroxide (NaOH) level in the spray additive tank could result in the level in the tank being lower than that allowed by Technical Specifications. On February 10, 2000, WCNOC personnel checked the tank level and determined that the level was approximately 100 gallons lower than required by Technical Specification Surveillance 3.6.7.2. The condition had existed for longer than the allowed out of service time, and thus is reportable in accordance with 10 CFR 50.73 (a)(2)(i)(B) and NUREG-1022, Revision 1. WCNOC personnel subsequently determined that a 1985 engineering recommendation providing guidance for proper instrumentation to be used to determine level indication was not incorporated into operating procedures. The root cause of not incorporating the guidance is indeterminate due to the historical nature. The surveillance procedure has been corrected to ensure the proper instrumentation (sight glass) is used to determine tank level, and other engineering documents providing recommendations during the time period in question were reviewed to ensure that no similar conditions existed. Although the level was low, the tank volume was sufficient to ensure design bases functions were met. Therefore, the event was not considered a safety system functional failure and the safety significance is minimal.

Plant Conditions Prior to the Event:

Mode -- 1
Power -- 100 percent
Temperature -- 586.2 degrees Fahrenheit
Pressure - 2238.2 pounds per square inch gauge

Basis for Reportability:

Wolf Creek Generating Station (WCGS) Technical Specification Limiting Condition for Operation (LCO) 3.6.7 requires the spray additive system be operable. On February 10, 2000, WCNOC personnel identified that the spray additive tank level did not meet the minimum surveillance requirements. There is reason to believe this condition existed longer than the allowed completion time of 72 hours due to the design of the tank and the fact that no additions to the tank had been made since 1985.

As discussed in NUREG-1022, Revision 1, if the required actions and associated completion times of an LCO are not met, the condition is reportable in accordance with 10 CFR 50.73(a)(2)(i)(b).

WCNOC had originally reported this event as a one hour report on February 10, 2000, in accordance with 10 CFR 50.72(b)(1)(ii)(B) as a condition outside the design basis of the plant. The design basis of the spray additive system is to provide a volume of NaOH that would ensure the design basis functions of iodine retention and corrosion mitigation are met. Further evaluation determined that, even with the lower volume, these functions would have been met and accident condition radiological consequences were not impacted. Therefore, the condition did not result in the plant being outside its design basis.

Event Description:

During the NRC Safety System Engineering Inspection conducted at Wolf Creek Generating Station from January 10, 2000, through February 4, 2000, an NRC inspector questioned the calculation for calibration of control room indication for the spray additive tank. During the review of the inspector's concern, WCNOC personnel determined that the actual level of the tank may be lower than that measured by the level instrument. Performance Improvement Request (PIR) 2000-0405 was initiated to investigate the issue. WCNOC Technical Specifications require a spray additive tank volume of between 4340 and 4540 gallons be verified every 184 days (Surveillance Requirement 3.6.7.2). WCNOC personnel determined that the calculation for calibrating the wide range level transmitters (ENLT0017 and ENLT0019)were calibrated according to engineering calculation J-L-EN01, which assumes extreme environmental conditions and the full range of NaOH concentration. Therefore, the indication could read five to six inches higher than actual level at normal plant conditions.

The spray additive tank has a local sight glass that eliminates this concern. On February 10, 2000, WCNOC personnel placed the local sight glass in service to verify the actual tank level. The tank level was determined to be approximately 100 gallons lower than the minimum required Technical Specification volume.

Root Cause:

PIR 2000-0405 was generated to evaluate the root cause of this event and determine appropriate corrective actions. Procedure STS ML-001, "Monthly Surveillance Log," relied on the use of Control Room indication rather than the local sight glass. Documentation from 1985 and 1986 indicate that engineering recommended to operations the use of the sight glass rather than the control room instrumentation due to the non-conservative effects of temperature and density on transmitter span adjustments. However, these recommendations were not incorporated into the surveillance. Due to the historical nature of this issue, WCNOC could not identify why the recommendations were not incorporated. Therefore, it has been concluded that the root cause is indeterminate.

Corrective Actions Taken:

A planned out of service condition for the spray additive system was entered at 0500 on February 10, 2000 for scheduled maintenance and Technical Specification 3.6.7, Condition a, was entered. On February 10, 2000, at 1414, the tank level was determined not to meet its surveillance requirements. Therefore, the spray additive tank was maintained inoperable.

A revision to procedure STS ML-001, "Monthly Surveillance Log," was made using a temporary change on February 11, 2000, to incorporate the sight glass elevation requirements. Using the sight glass, the level in the spray additive tank was verified and then restored to above the minimum Technical Specification Surveillance value. The system was declared operable at 2358 on February 11, 2000.

A review of a sample of similar engineering dispositions was performed. The sample included documentation from the same time period. No additional issues or similar occurrences were found.

Actions to Prevent Recurrence:

Procedure STS ML-001 was revised to eliminate the reference to the surveillance on March 9, 2000. A new procedure will be developed to specify use of the sight glass for level verification, until more accurate calibration methods are developed to allow use of the level indicators. The new procedure will be issued by July 14, 2000, which is prior to the next required surveillance.

Safety Significance:

The Technical Specification Bases for the Spray Additive System states the system assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a design basis accident (DBA). To enhance the iodine absorption capacity of the spray, the spray solution is adjusted to an alkaline pH (8.5 - 11). This maximizes the retention of iodine as well as preventing occurrence of chloride and caustic stress corrosion on mechanical systems and components. The percent solution and volume of solution sprayed into containment ensures a long term containment sump pH of $\geq$ 8.5 and $\leq$ 11.0. This ensures the continued iodine retention effectiveness of the sump water during the recirculation phase, while minimizing corrosion of system piping. Iodine retention impacts the radiation exposure during a DBA.

The impact of the inadequate volume of NaOH was evaluated. The reduction in NaOH volume with the assumed Technical Specification minimum NaOH concentration (28%) results in a minimum containment sump pH of 8.4 at the onset of Emergency Core Cooling System (ECCS) recirculation. The NaOH concentration at the time of discovery of the low tank level was 29%. Calculations for the time of discovery conditions indicated the resulting containment sump pH would have been above the minimum 8.5 pH. However, a historical review of the NaOH concentration in the spray additive tank did identify that during the 1990-1991 time frame the NaOH concentration was less than 29%. Therefore, the sump pH could have been as low as 8.4, assuming that the level was low during that time frame. Therefore, this lower pH was reviewed for impact.

USAR Section 6.5.2.3 SAFETY EVALUATION TWO states:

It has been assumed in these evaluations (spray iodine removal analysis) of the spray removal effectiveness that organic iodine forms are not removed by the NaOH spray. A limited credit for the removal of airborne particulates containing iodine has been taken, assuming that the spray removal rate is 0.45 hr^{-1} until a DF (decontamination factor = final concentration/initial concentration) of 100 is attained. Credit for removal of elemental iodine is based on a spray removal rate of 10 hr^{-1} until a DF of 100 is attained. These assumptions underestimate the actual amounts of iodine removed and the result is the calculated accident doses are higher than those realistically expected. The iodine removal analysis calculates removal rates of 0.73 hr^{-1} for particulates and 25.7 hr^{-1} for elemental iodine.

As stated above, credit for removal of elemental iodine is based on a spray removal rate of 10 hr^{-1} until a DF of 100 is attained, even though the spray removal rate and DF are calculated to be 25.7 and 128, respectively. Therefore, the slight reduction in pH will have no effect on the DBA radiological consequences.

The pH in the containment sump also affects iodine retention. Long term iodine retention depends on the long term partition coefficient. The long term partition coefficient is dependent on pH. Current iodine retention models, dictated by Standard Review Plan Section 6.5.2 Rev. 2, support the retention of iodine with a sump solution as low as 7.0. Therefore, a sump pH of 8.4 has no impact on the iodine retention capability.

Two variables in the rate of Chloride Stress Corrosion Cracking of stainless steel are the pH and the time of exposure. Test results show no crack initiation in stainless steel at a pH of 8.0 even after sixteen months of exposure. Therefore, the calculated pH of 8.4 will not represent an impact to the integrity of the recirculation piping. In the accident recovery phase, there will be sufficient time to make any sump chemistry adjustments.

Hydrogen generation from corrosion of galvanized surfaces and surfaces coated with zinc based paint is strongly dependent on temperature and is relatively insensitive to differences in pH. Therefore, hydrogen generation from zinc corrosion will not be significantly affected by the slight reduction in sump pH.

It was also verified that there was no impact to the bistables controlling the operation of the Spray Additive Tank Outlet Valves.

PRA Radiological Consequences:

The WCGS IPE Containment Performance Analysis contains a source term analysis to quantitatively describe the magnitude and composition of fission product releases. Fission products, volatile and non-volatile alike, which accumulate in the containment gas space are sensitive to a number of fission product removal mechanisms. These mechanisms are important to the fission product retention capability of the containment barrier. If active or natural removal mechanisms such as inertial impaction, gravitational settling or water scrubbing take effect along the pathway from the containment to the outside environment, then a significant reduction in source term release may occur.

For sequences with non-bypassed or non-impaired containment, only a small portion of the volatile fission products will be released to the environment regardless of whether or not containment failure due to overpressurization occurs. The ability of containment to retain fission products for such sequences depends primarily on the time lapse between volatile fission product release to containment and containment failure. With a time lapse of about six hours, aerosol deposition mechanisms will remove nearly all airborne products. Typical results for the Wolf Creek dominant accident sequences indicate that overpressurization failure would not occur within the first 40 hours following accident initiation. This late containment failure mode results in a relatively small fission product release since sufficient time has elapsed for natural deposition mechanisms to remove nearly all airborne fission products from the containment atmosphere.

Based on the above evaluations, the safety functions of the spray additive system would not have been affected; therefore, there was minimal impact on safety from this condition.

Other Previous Occurrences:

Review of past LERs for Wolf Creek Generating Station resulted in no additional occurrences of conditions of a technical specification that were not met due to engineering information not being adhered to.

LIST OF COMMITMENTS

The following table identifies those actions committed to by Wolf Creek Nuclear Operating Corporation (WCNOC) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments. Please direct questions regarding these commitments to Mr. Michael J. Angus, Manager Licensing and Corrective Action at Wolf Creek Generating Station, (316) 364-4077.

COMMITMENT	Due Date/Event
A new procedure will be developed to specify use of the sight glass for level verification, until more accurate calibration methods are developed to allow use of the level indicators. The new procedure will be issued prior to the next required surveillance.	July 14, 2000