APPENDIX B

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-482/89-09 Operating License: NPF-42

Docket: 50-482

Licensee: Wolf Creek Nuclear Operating Corporation (WCNOC)
P.O. Box 411
Burlington, Kansas 66839

Facility Name: Wolf Creek Generating Station (WCGS)

Inspection At: WCGS Site, Burlington, Kansas

Inspection Conducted: March 13-17, 1989

Inspector: J. Blair Nicholas 4/12/89
J. B. Nicholas, Senior Radiation Specialist Date
Facilities Radiological Protection Section

Approved: R E Baer 4/13/89
R. E. Baer, Chief, Facilities Radiological Date
Protection Section

Inspection Summary

Inspection Conducted March 13-17, 1989 (Report 50-482/89-09)

Areas Inspected: Routine, unannounced inspection of the licensee's liquid and gaseous radioactive waste management programs and occupational radiation exposure control program.

Results: The NRC inspector determined that the licensee was implementing the radioactive waste effluent program (RWEP) in accordance with the Radiological Effluent Technical Specifications (RETS) and Offsite Dose Calculation Manual (ODCM). The quantities of radionuclides released in the radioactive waste effluents were within the limits specified in the RETS. Offsite doses had been calculated using methods specified in the ODCM and were within Technical Specification (TS) limits. The licensee's ventilation systems had been tested in accordance with TS requirements. Quality Assurance (QA) surveillances and audits had been performed as required and were technically comprehensive. The licensee had submitted their Semiannual Effluent Release Reports as per TS requirements.

Within the areas inspected, three violations were identified: (1) failure to perform exit whole body counts, (2) overexposure to the skin of the whole body, and (3) failure to complete TS surveillance test (see paragraphs 4, 5, and 6, respectively). No deviations were identified. One licensee Event Report (LER) was closed. One new open item in discussed in paragraph 6.

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DETAILS

1. Persons Contacted

WCNOC

*R. M. Grant, Vice President Quality
*G. D. Boyer, Plant Manager
*L. F. Breshears, Supervisor, Health Physics (HP)/Dosimetry
M. D. Charlton, Supervisor, Supplier and Material Support
*D. L. Dees, Surveillance Coordinator-Operations
*R. D. Flannigan, Manager, Nuclear Support Engineering
*S. F. Hatch, Supervisor, Quality Systems
*C. J. Hoch, QA Technologist
*J. L. Houghton, Supervisor, Operations
B. O. McKinney, Manager, Operations
*R. K. Lewis, Supervising Results Engineer
*W. M. Lindsay, Manager, QA
*R. L. Logsdon, Chemist
*V. J. MacTaggart, Supervisor, Results Engineering
*T. S. Morrill, Manager, Radiation Protection
*W. B. Norton, Manager, Technical Support
*C. L. Palmer, Radwaste Chemistry Supervisor
*C. E. Parry, Manager, Site Quality
*G. J. Pendergrass, Licensing Engineer
*K. R. Peterson, Supervisor, Licensing
*R. J. Potter, Manager, Supplier and Material Quality
*M. G. Williams, Manager, Plant Support
R. T. Wright, Supervisor, QA Audits

NRC

J. E. Bess, Senior Resident Inspector, South Texas Project Unit-1

*Denotes those individuals present during the exit interview conducted on March 17, 1989.

2. Open Items Identified During This Inspection

An open item is a matter that requires further review and evaluation by the NRC inspector or licensee. Open items are used to document, track, and ensure adequate followup on matters of concern to the NRC inspector. The following open item was identified:

Open Item	Title	Paragraph
482/8909-04	Monitoring of Ventilation System Operating Hours	6

3. Followup on LER (92700)

(Closed) LER (482/88-028): Personnel Overexposure Due to Hot Particle Contamination - The event the LER described involved an individual receiving a radiation overexposure to the skin of the whole body in excess of 10 CFR Part 20.101 dose limits. This overexposure is discussed in paragraph 5 of this report and is the subject of a Notice of Violation issued with this report. (482/8909-02)

4. Occupational Exposure Control (83750)

The NRC inspector reviewed the licensee's implementation of the health physics dosimetry program dealing with personnel whole body counting. The NRC inspector reviewed selected personnel exposure history files of individuals who had been issued a thermoluminscent dosimeter (TLD) at WCGS and had been terminated from employment at WCGS during the period July 1, 1988, through February 28, 1989.

Technical Specification (TS) 6.11 requires, "Procedures for personnel radiation protection shall be prepared consistent with the requirements of 10 CFR Part 20 and shall be approved, maintained, and adhered to for all operations involving personnel radiation exposure." The licensee's health physics dosimetry program is implemented by Administrative Procedure ADM-03-100, "Health Physics Dosimetry Program," Revision 6, dated October 27, 1987. Paragraph 4.1.3.1 requires that, individuals who have been issued a TLD at WCGS will receive a termination whole body count. It further requires that, if an individual terminates without obtaining an exit whole body count, an attempt will be made to contact the individual to request they return to WCGS or another mutually acceptable facility for a whole body count. A record indicating the attempted contact will be placed in the individual's exposure history file. The NRC inspector reviewed 20 personnel exposure history files of individuals who had been terminated from employment at WCGS and had not received an exit whole body count upon termination. It was determined on March 14, 1989, that 7 individuals of the 20 reviewed had left the WCGS site without receiving an exit whole body count and no record was included in their individual exposure history file indicating that an attempt had been made to contact the individual to request they return to WCGS or another mutually acceptable facility for a whole body count. The failure to attempt to contact an individual to request an exit whole body count upon termination from WCGS is a violation of TS 6.11 and the licensee's implementing procedure, ADM-03-100. (482/8909-01)

No deviations were identified.

5. Control of Radioactive Materials and Contamination, Surveys, and Monitoring (83750)

The NRC inspector reviewed selected portions of the licensee's radioactive materials and contamination control program including the hot particle contamination control program.

10 CFR Part 20.101(a) requires, in part, that ". . . no licensee shall possess, use, or transfer licensed material in such a manner as to cause any individual in a restricted area to receive in any period of one calendar quarter from radioactive material and other sources of radiation a total occupational dose in excess of . . . (7.5 rems per calendar quarter to the skin of the whole body)."

In LER 482/88-028, dated January 6, 1989, the licensee identified to the NRC the facts surrounding and the subsequent evaluation of the overexposure to the skin of the whole body of an employee on December 9, 1988. The employee received an occupational dose of approximately 12.5 rems to the skin of the whole body. The employee came in contact with the hot particle while working in the area of the polar crane inside the containment building. The licensee suspended work in the area and conducted hot particle surveys in the area. These surveys identified one additional hot particle. A review of previous radiological surveys conducted in this area indicated that this incident was an isolated case and that there had not been previously identified hot particles in the area. No unusual radiation levels or evidence of abnormal contamination had been previously detected in the polar crane area.

The licensee has had previous cases of contamination incidents involving hot particles; however, there had not been any previous incidents which resulted in an overexposure. The licensee has, for the most part, maintained personnel exposures ALARA as a result of their hot particle control program, which is implemented by Administrative Procedure ADM-03-204.

The NRC inspector reviewed the licensee's analysis and root cause of the incident. Based on the analysis and nuclide composition of the two hot particles detected in the area, the licensee has concluded that the two particles had originated several years ago and probably as a result of a pressurizer spray valve leak in April 1986, which caused high contamination in the containment building and high radiation levels in the polar crane area at that time. The licensee reviewed their hot particle contamination control program and did not identify any necessary programmatic changes.

The exposure to the skin of the whole body of an individual of 12.5 rems is a violation of 10 CFR 20.101(a). (482/8909-02)

No deviations were identified.

6. Radioactive Liquids and Gaseous Waste Systems (84750, 84524)

The NRC inspector reviewed the licensee's liquid and gaseous radioactive waste effluent programs including: waste system construction and installation, waste sampling, process and effluent monitors, procedures

for waste and effluent systems, air cleaning systems, and audits and surveillances to determine adherence to commitments in Chapters 9, 11, and 17 in the Final Safety Analysis Report (FSAR) and the requirements in Sections 3/4.3.3.10, 3/4.3.3.11, 3/4.7.6, 3/4.7.7, 3/4.11.1, 3/4.11.2, 6.5, 6.8, and 6.15 in the TS.

The NRC inspector reviewed the licensee's implementation of the RETS and ODCM to ensure agreement with analysis sensitivities, reporting limits, analytical results, sampling requirements, surveillance tests, RWEP operating procedures, offsite dose results from effluents, and functional checks and calibrations of equipment associated with the RWEP. Selected documents and records listed in Attachment 1 to this report were reviewed.

The NRC inspector reviewed current approved revisions of WCGS procedures governing the release of liquid and gaseous radioactive waste. These effluent release procedures provide for the following: sampling of radioactive waste; radionuclide analysis prior to release; calculation of effluent release rate, projected offsite radionuclide concentrations, and offsite doses prior to release; verification of effluent radiation monitor setpoints and testing of effluent isolation valves prior to release; and verifying discharge flow rates and effluent volume discharged.

The NRC inspector reviewed selected liquid and gaseous release permits for the period January 1988 through December 1988. It was determined that quantities of radioactive nuclides released in the liquid and gaseous effluents were within the limits specified in the RETS. Offsite doses had been calculated according to the ODCM and were within the TS limits. The NRC inspector determined that processing, sampling and analysis, and approval and performance of the radioactive effluent releases were conducted in accordance with WCGS procedures, except for the performance and documentation of the respective process radiation monitoring system source checks and valve strokes associated with the various radioactive effluent release types.

TS 3/4.3.3.10, Table 4.3-8 and TS 3/4.3.3.11, Table 4.3-9 require that process effluent radioactivity monitors, which provide an alarm and automatic termination of release, be source checked prior to each release. The licensee's System Operating Procedure SYS HB-125, "Waste Monitor Tanks Operation," Revision 4, dated July 26, 1988, paragraph 4.6.2 states, "Ensure all applicable sections of STS SP-001, Process Radiation Monitoring System Source Check and Valve Stroke, have been completed." In addition, similar references to the performance of Surveillance Procedure STS SP-001 prior to each batch release are made in SYS HF-200, "Secondary Liquid Waste System Operations," Revision 5, dated May 20, 1988, paragraphs 4.4.3.3, 4.5.2.12, and 4.9.5; SYS GT-120, "Containment Mini Purge System Operations," Revision 8, dated November 8,1988, paragraph 3.5; and SYS HA-204, "Gaseous Radwaste System Decay Tank Release Procedure," Revision 4, dated August 30, 1988, paragraph 3.8.

Contrary to the above, the NRC inspector determined on March 15, 1989, that only 25 out of 203 liquid effluent batch releases, one containment purge out of 51 containment releases, and none of the seven gas decay tank releases conducted in 1988 had completed STS SP-001 surveillance test results in the WCGS records vault documenting the performance of the process radiation monitoring system source check and valve stroke surveillance test prior to each radioactive effluent batch release. The failure to complete Surveillance Procedure STS SP-001 and document such performance prior to each radioactive effluent batch release is considered a violation of TS 3/4.3.3.10, Table 4.3-8 and TS 3/4.3.3.11, Table 4.3-9. (482/8909-03)

The NRC inspector determined that no design changes had been made to the liquid and gaseous radioactive waste systems since the previous NRC inspection conducted in January 1988.

The NRC inspector reviewed functional checks, calibrations, and setpoint procedures and records for radioactive waste effluent monitors which showed that the frequency of functional channel checks and calibrations met TS requirements. The monitor calibrations and setpoint determinations were verified to have been performed according to approved procedures.

The NRC inspector reviewed the licensee's procedures, surveillance tests, and selected records and test results for maintenance and testing of air cleaning systems which contain high efficiency particulate air (HEPA) filters and activated charcoal adsorbers. The NRC inspector verified that the licensee's procedures and surveillance tests provided for the required periodic functional checking of ventilation system components, evaluation of HEPA and activated charcoal adsorbers, and replacement and in-place filter testing of filter systems. The NRC inpsector reviewed selected records and test results for the period May 1986 through March 1989 for the control room emergency ventilation and the auxilary building emergency exhaust air cleaning systems. The in-place filter testing and activated charcoal laboratory tests had been performed in accordance with approved procedures by a contract laboratory and all test results were verified to be within TS limits. The NRC inspector noted that the TS requirement for testing the various ventilation systems' activated charcoal adsorber material after every 720 hours of operation was being tracked by the licensee's results engineering section. However, the tracking of ventilation system operating hours between sampling and laboratory testing of the activated charcoal adsorber material was being performed informally using data collected weekly from the control room major equipment monitoring log. The licensee had not developed a procedure or surveillance test to periodically monitor and control the various ventilation systems' operation hours so as not to exceed the 720 hour operation criteria between testings of the activated charcoal adsorber material as specified by TS. This item was discussed with the licensee during the inspection and at the exit interview on March 17, 1989. The licensee agreed to evaluate the NRC inspector's concern and take the necessary action to establish a procedure to formally monitor the operating hours of the various ventilation systems requiring TS testing. This is considered to be an open item (482/8909-04) pending completion of the licensee's evaluation.

The NRC inspector determined that the licensee was performing their own in-place filter testing program on the various station ventilation systems and that a contract laboratory was performing the activated charcoal adsorber analyses as required by TS. The licensee had performed a QA program audit on the contractor performing the laboratory analyses on the station ventilation systems and had placed the contractor on the WCGS qualified supplier's list.

The NRC inspector reviewed audit and surveillance schedules for 1988 and the first and second quarters of 1989 and the qualifications of QA auditors. Surveillances and audit reports of QA activities performed during 1988 in the area of RWEP were reviewed for scope, thoroughness of program evaluation, and timely followup of identified deficiencies. The NRC inspector also reviewed the audit report of the contractor laboratory used to perform tests on the station ventilation systems. The NRC inspector determined that the QA surveillances and audits had been performed in accordance with WCGS QA procedures and schedules and had not identified any significant problems. The documents which were reviewed are listed in Attachment 1 to this report.

No deviations were identified.

7. Reports of Radioactive Effluents (84750)

The NRC inspector reviewed the licensee's reports concerning radwaste systems and effluent releases to determine compliance with the requirements of 10 CFR Part 50.36(a)(2) and Sections 6.9.1.7, 6.14, and 6.15 in the TS.

The NRC inspector reviewed the licensee's semiannual effluent release reports for the periods July 1 through December 31, 1987; January 1 through June 30, 1988; and July 1 through December 31, 1988. These reports were written in the format described in NRC Regulatory Guide 1.21 and contained the information required by TS.

No violations or deviations were identified.

8. Exit Interview (30703)

The NRC inspector met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection on March 17, 1989. The NRC inspector summarized the scope and findings of the inspection and discussed the details of the violations and open item. The licensee representatives stated at the exit interview that they would evaluate the NRC inspector's concern expressed as an open item.

ATTACHMENT 1

Wolf Creek Generating Station

NRC Inspection Report: 50-482/89-09

Documents Reviewed

	Title	Revision	Date
1.	Administrative Procedures		
	ADM-04-006, Preparation of the Monthly "Preliminary Report on Radioactive Releases" and the "Radioactive Effluent Releases" Portion of the Semiannual Operating Report	3	01/31/89
	ADM-04-019, ODCM Control	0	02/04/85
	ADM-04-020, Chemistry Surveillance Program	15	01/24/89
	ADM-04-020, Appendix 1, WCGS Technical Specifications Surveillance Report	(g)	
	ADM-04-020, Appendix 2, WCGS Technical Specification Surveillance Report (Cumulative Doses and Projected Doses)	(c)	
	ADM-04-020, Appendix 4, Table 4.11-2 Surveillance Report	(b)	
	ADM-04-020, Appendix 5, Table 4.11-1 Surveillance Report	(b)	
	ADM-04-023, Radioactive Releases	10	06/28/88
	ADM-04-023, Appendix I, Radioactive Liquid Release Permit	10	06/28/88
	ADM-04-023, Appendix II, Radioactive Gas Release Permit	10	06/28/88
	ADM-04-023, Appendix III, Shift Chemist Liquid Release Checklist	10	06/28/88
	ADM-04-023, Appendix IV, Shift Chemist Gaseous Release Checklist	10	06/28/88
2.	Chemistry Manual Procedures		
	CHM-01-002, Sampling of the Liquid Release Batch Tanks	4	05/02/88

CHM-01-003,	Sampling of the Waste Gas Decay Tanks	3	08/03/88
CHM-01-004,	Sampling Containment Atmosphere for Radioactive Gases and Tritium	7	07/06/88
CHM-01-005,	Exchange of Unit and Radwaste Vent Particulate and Iodine Filter Cartridges	7	09/22/87
CHM-01-006,	Sampling of Containment Atmosphere for Particulate and Iodine Concentration	3	09/02/87
CHM-01-007,	Sampling of the Unit and Radwaste Vent for Radioactive Gas and Tritium	4	07/14/87
CHM-01-009,	Sampling of the Spent Fuel Building Vent for Radioactive Gases and Tritium	5	07/06/88
CHM-03-011,	Liquid Scintillation Counter Operations	4	01/09/89
CHM-03-021,	Gamma Isotopic Analysis	10	11/14/88
CHM-03-040,	Tritium Analysis (Liquid Sample)	9	12/28/88
CHM-03-042,	Gross Alpha Measurement	0	04/06/84
CHM-03-043,	Airborne Tritium Analysis	4	01/18/89
CHM-03-050,	Determination of Strontium 89-90	2	03/02/88
CHM-03-054,	Waste Gas Analyzer	0	01/03/89
CHM-03-140,	Preparation of Radioactive Release Permit	6	11/08/88
CHM-03-145,	Composite Preparation of Liquid Releases	4	01/16/89
CHM-03-150,	Use of the ND6700 LRW/GRW System for Liquid Radioactive Releases	7	11/08/88
CHM-03-151,	ND6700 Midrelease Update	2	11/05/87
CHM-03-152,	Use of the ND6700 LRW/GRW System for Containment Purges	10	07/06/88
CHM-03-153,	Use of the ND6700 LRW/GRW System for Gas Decay Tank Releases	8	08/01/88
CHM-03-154,	Use of the ND6700 LRW/GRW System for Unit Vent and Radwaste Building Continuous Releases	7	05/29/87

CHM-03-155, Instructions for Use of the ND6700 for Generating Radiological Reports	0	11/09/84
CHM-03-156, Updating the ND6700 System with Isotopic Composite Results	2	03/07/88
CHM-03-160, Preparation of Waste Gas Release Permit	4	09/09/88
CHM-03-161, Preparation of Radioactive Gas Release Permit for Containment Purges	5	07/06/88
CHM-03-162, Preparation of Vent Release Permit	2	06/16/87

3. Surveillance Tests

STS-CR-001, Control Room Daily Logs	6	06/02/87
STS-CH-010, Calibration of Liquid Process and Effluent Monitors	1	11/25/86
STS-CH-011, Calibration of the Particulate Detector for Gaseous Monitors	2	04/26/88
STS-CH-012, Calibration of the Iodine Detector for Gaseous Monitors	2	04/26/88
STS-CH-013, Calibration of the Gaseous Detector for Gaseous Monitors	1	12/02/86
STS-CH-014, Calibration of Monitors GT RE-21A and GT RE-21B	2	04/26/88
STS-GG-001A, Emergency Exhaust Filtration System Train A 10 Hour Operability Test	6	08/09/88
STS-GG-001B, Emergency Exhaust Filtration System Train B 10 Hour Operability Test	6	08/09/88
STS-GK-001A, Control Room Emergency Vent System Train A Operability Test	7	02/16/88
STS-GK-001B, Control Room Emergency Vent System Train B Operability Test	7	02/16/88
STS-IC-256, Analog Channel Operational Test Liquid Radwaste Discharge Radiation Monitor HB RE-18	5	09/20/88
STS-IC-257, Analog Channel Operational Test Steam Generator Blowdown Discharge Radiation Monitor BM RE-52	5	09/20/88

STS-IC-258, Analog Channel Operational Test Turbine Building Drain Radiation Monitor LE RE-59	5	09/27/88
STS-IC-259, Analog Channel Operational Test Secondary Liquid Waste System Radiation Monitor HF RE-45	5	09/27/88
STS-IC-270A, Analog Channel Operational Test-Inlet and Outlet Gaseous Radwaste Hydrogen/ Oxygen Analyzers, Train A	3	02/20/86
STS-IC-270B, Analog Channel Operational Test-Inlet and Outlet Gaseous Radwaste Hydrogen/ Oxygen Analyzers, Train B	2	04/01/86
STS-IC-274A, Analog Channel Operational Test Unit Vent Radiation Monitor GT RE-21A	2	03/07/86
STS-IC-274B, Analog Channel Operational Test Unit Ventilation System Radiation Monitor GT RE-21B	3	03/07/86
STS-IC-275A, Analog Channel Operational Test Containment Purge System Radiation Monitor GT RE-22	6	08/09/88
STS-IC-275B, Analog Channel Operational Test Containment Purge System Radiation Monitor GT RE-33	6	08/16/88
STS-IC-276B, Analog Channel Operational Test Radwaste Bldg. Vent System Radiation Monitor GH RE-10B	3	03/07/86
STS-IC-456, Channel Calibration Liquid Radwaste System Discharge Radiation Monitor HB RE-18	2	12/13/84
STS-IC-457, Channel Calibration Steam Generator Blowdown Effluent Radiation Monitor BM RE-52	2	12/15/84
STS-IC-458, Channel Calibration Turbine Building Effluent Radiation Monitor LE RE-59	4	07/02/85
STS-IC-459, Channel Calibration Secondary Liquid Waste Radiation Monitor HF RE-45	2	12/15/84
STS-IC-474A, Channel Calibration Unit Vent Radiation Monitor GT RE-21A	3	03/04/86
STS-IC-474B, Channel Calibration Unit Ventilation System Radiation Monitor GT RE-21B	3	03/07/86

STS-IC-475A, Channel Calibration Containment Purge System Radiation Monitor GT RE-22	4	02/04/86
STS-IC-475B, Channel Calibration Containment Purge System Radiation Monitor GT RE-33	3	02/11/86
STS-IC-476A, Channel Calibration Radwaste Building Vent Radiation Monitor GH RE-10A	4	03/07/86
STS-IC-476B, Channel Calibration Radwaste Building Vent Radiation Monitor GH RE-10B	3	03/07/86
STS-MT-006, Hydrogen Recombiner Visual Inspection	2	05/23/85
STS-PE-001, Filter/Adsorber Unit Vent Inspection Safety Related Units	0	01/14/86
STS-PE-002, Filter/Adsorber Unit Charcoal Adsorbent Bed Sampling Safety Related Units	1	03/01/88
STS-PE-003, Emergency Exhaust System Flow Rate and Combined Pressure Drop Test	4	10/20/88
STS-PE-004, Auxiliary Building and Control Room Pressure Test	6	10/20/88
STS-PE-005, HEPA Filter In-Place Leak Test Safety Related Units	1	06/28/88
STS-PE-006, Charcoal Adsorbers In-Place Leak Test Safety Related Units	1	06/28/88
STS-PE-009, Control Room Filtration and Pressurization Systems Flow Rate and Combined Pressure Drop Test	2	10/20/88

4. Quality Assurance Surveillances and Audits

1987 Revised Third and Fourth Quarter Audit and Surveillance Schedule	1	10/12/88
1989 First and Second Quarter Audit and Surveillance Schedule	1	10/24/89

QA Surveillance Report TE:53359 S-1687, Duratek Operation of the EVR System, dated November 11, 1988

QA Surveillance Report TE:53359 S-1715, Liquid/Gaseous Effluents, dated, February 9, 1989

QA Surveillance Report TE:53359 S-1717, Technical Specifications Chemistry Surveillance Testing, dated February 9, 1989

QA Surveillance Report TE:53359 S-1723, Processing of Liquid Radwaste, dated March 10, 1989

QA Audit Report TE:50140-K206, Technical Specification and License Condition Adherence, dated May 5, 1988

QA Audit Report TE:50140-K218, Offsite Dose Calculation Manual, dated August 24, 1988

QA Audit Report TE:50140-K219, Surveillance Testing and Inspection, dated August 16, 1988

QA Vendor Audit Report TE:58367-K001, NCS Corporation, dated September 11, 1987

5. Wolf Creek Generating Station Semiannual Effluent Release Reports

July 1 through December 31, 1987
January 1 through June 30, 1988
July 1 through December 31, 1988