

WOLF CREEK

NUCLEAR OPERATING CORPORATION

John A. Bailey
Vice President
Operations

February 26, 1992
NO 92-0068

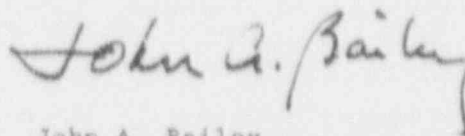
U. S. Nuclear Regulatory Commission
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Subject: Docket No. 50-482: 1991 Annual Operating Report for Wolf
Creek Nuclear Generating Station

Gentlemen:

The attached Annual Operating Report is being submitted pursuant to Wolf
Creek Generating Station, Unit No. 1, Technical Specifications 6.9.1.4 and
6.9.1.5. Also included in this report is information required by 10 CFR
20.407. This report covers operations for the period of January 1, 1991 to
December 31, 1991.

Very truly yours,



John A. Bailey
Vice President
Operations

JAB/jra

Attachment

cc: A. T. Howell (NRC), w/a
R. D. Martin (NRC), w/a
G. A. Pick (NRC), w/a
W. D. Reckley (NRC), w/a

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WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO: 50-482
FACILITY OPERATING LICENSE: NPF-42

ANNUAL OPERATING REPORT

REPORT NO. 7

Reporting Period: January 01, 1991 through December 31, 1991

Prepared by: S. G. Wideman

Approved by:



O. L. Maynard
Director Plant Operations

EXECUTIVE SUMMARY

The purpose of the Annual Operating Report is to provide a comprehensive summary of the operating experience at Wolf Creek Generating Station. The Annual Operating Report also provides a summary of the major safety related maintenance activities completed during the year. This report covers the period beginning on January 1, 1991 and ending on December 31, 1991.

The Annual Operating Report is submitted in accordance with the requirements of Technical Specification 6.9.1.4 and contains the information required by Technical Specification 6.9.1.5. The format of this report is similar to that provided in Regulatory Position C.1.b of Regulatory Guide 1.16, Revision 4, August, 1975.

Also included in this report is the information on personnel monitoring as required by 10 CFR 20.407.

In 1991, Wolf Creek Generating Station's availability factor was 71.8 percent and capacity factor (using maximum dependable capacity) was 58.9 percent.

Wolf Creek Generating Station experienced no Reactor trips in 1991 and started the fifth refueling outage after completing a record 487 days of continuous on-line operation on September 20, 1991.

1. SUMMARY OF OPERATING EXPERIENCE

A summary of Wolf Creek Generating Station's operating experience and major safety-related maintenance activities completed during 1991 is provided by month below. This information has been previously submitted in accordance with the requirements of Technical Specification 6.9.1.8 in the Monthly Operating Reports for January through December, 1991.

January

The unit operated at or near 100% power throughout the first ten days of January, 1991. On January 11, the unit commenced power reduction at 2252 hours to 90% power for fuel conservation purposes. Power remained at or near 90% for the remainder of the month.

No major safety-related maintenance activities were performed during the month of January.

February

The unit began the month at 90% power with power being further reduced to 80% on February 5 for fuel conservation purposes. Power remained at 80% for the remainder of February with the exception of a sixteen hour period beginning late February 14, when power was reduced to 75% as a result of a main generator stator cooling instrumentation problem. The instrumentation problem was corrected and the unit returned to 80% power on February 15, 1991.

Major safety-related maintenance activities for February:

- a. Replacement of hydraulic pump on Main Steam Isolation Valve ABHV11.
- b. Replacement of compressor heads on Control Room Air Conditioning Unit SGK04A in support of Plant Modification Request (PMR) 2062.

March

The unit operated continuously in March at 80% power for fuel conservation purposes with the exception of a reduction to 60% power on March 20 for the replacement of the "B" main feedwater pump inboard bearing. Power was returned to 80% on March 22 and remained at 80% for the remainder of the month.

Major safety-related maintenance activities for March:

- a. Repair of speed sensing circuitry on "A" emergency diesel generator.
- b. Ongoing repair of Fuel Pool Cooling Pump Room Cooler SGG04A.
- c. Replacement of compressor heads on Control Room Air Conditioning Unit SGK05A in support of PMR 2061.

April

The unit began the month at 80% power with power being reduced to 60% on April 6, and to 50% on April 13, for fuel conservation purposes. Power was further reduced to 46% on April 15 to allow the repair of Main Turbine Control Valve AC FCV047. Following repair of the valve, power was restored to 60% on April 16 and remained at or near this level for the remainder of the month.

Major safety-related maintenance activities for April:

- a. Replacement of the mechanical overspeed trip mechanism on Turbine Driven Auxiliary Feedwater Pump PAL02.

May

The unit began the month at 60% power for fuel conservation purposes. Power remained at or near 60% for the remainder of the month with the exception of one Technical Specification required power reduction and two System Operations requested increases to full power.

A Notification of Unusual Event (NUE) was declared and a plant shutdown commenced May 12 at 2115 hours as a result of the failure of a 15V power supply in Engineered Safety Features Actuation System Cabinet SA036D. The power supply was replaced and the NUE was terminated before a total plant shutdown was achieved. Reactor power was reduced to a low of 50% during this event. (This event was reported as Licensee Event Report 482/91-006-00).

Power was increased from 60% to 100% on May 13 at the request of System Operations to meet grid demand. The unit remained at 100% until May 17 when a power reduction to 60% was commenced for fuel conservation. Power was again increased to 100% on May 30 at the request of System Operations and remained at this level for the remainder of the month.

Major safety-related maintenance activities for May:

- a. Replacement of Instrument and Service Air Compressor CKA01A in support of PMR 2495.
- b. Ongoing replacement of Balance of Plant and Nuclear Steam Supply System computers in support of PMR 1479.

June

The operating experience for Wolf Creek Generating Station in June was highlighted by surpassing 400 days of continuous operation at 0025 hours on June 25. The unit operated at or near 100% for the entire month of June. This was the first full month of operation at 100% power since fuel conservation efforts began.

No major safety-related maintenance activities were performed during the month of June.

July

The unit operated at or near 100% power throughout the month of July 1991. At month's end, the unit had operated continuously for 436 days.

No major safety-related maintenance activities were performed during the month of July.

August

The unit operated at or near 100% power through August 17. Power began ramping down as the coastdown to the fifth refueling outage was commenced at 1700 hours on August 18. At month's end, power had been reduced to 89% and the unit had operated continuously for 467 days.

No major safety-related maintenance activities were performed during the month of August.

September

The unit began the month at 89% power and continued coastdown to the fifth refueling outage. The power decrease continued until a 7% per hour power decrease was initiated at 1400 hours on September 19 to remove the unit from service for refueling. The main generator output breakers were opened at 0125 hours on September 20 to officially commence the fifth refueling outage. The unit had operated continuously for 487 days.

Major safety-related maintenance activities for September:

- a. Commenced Reactor Coolant System resistance temperature detector bypass manifold removal.
- b. Commenced maintenance activities on "A" emergency diesel generator.
- c. Commenced replacement of "B" reactor coolant pump motor.
- d. Commenced modification of containment penetrations P36 and P68.
- e. Commenced reactor vessel head disassembly in preparation for lifting.

October

The unit remained shutdown the entire month as activities associated with the fifth refueling outage continued. The unit began the month in Mode 5, Cold Shutdown, entered Mode 6, Refueling, on October 3, and continued in Mode 6 until October 13 when all fuel was removed from the core. The unit then re-entered Mode 6 on October 30 when fuel loading for Cycle 6 commenced.

Major safety-related maintenance activities for October:

- a. Replaced "B" reactor coolant pump motor.
- b. Performed maintenance on "A" and "B" emergency diesel generators.
- c. Completed Reactor Coolant System resistance temperature detector bypass manifold removal modification.
- d. Performed maintenance on 4160 Volt Bus NB01.
- e. Performed maintenance on "A" and "B" trains Emergency Core Cooling System.
- f. Installed permanent reactor cavity seal.
- g. Performed eddy current testing on "A" and "C" steam generators.

November

The unit remained shutdown for the entire month for refueling activities with November 30 representing day 72 of the continuing refueling outage. The unit began the month in Mode 6 as fuel loading continued in preparation for Cycle 6. Fuel loading and stud tensioning were completed November 14 and the unit entered mode 5 with the unit remaining in this mode for the remainder of the month.

Major safety-related maintenance activities for November:

- a. Completed maintenance on "B" emergency diesel generator, "B" train Essential Service Water System, and "B" train Emergency Core Cooling System.
- b. Completed repair of "B" residual heat removal pump motor, including rotor balancing.
- c. Completed fuel loading and reassembly of reactor vessel head and internals.
- d. Completed procedure STS KJ-001A and B, integrated safeguards tests.
- e. Completed sludge lancing on all steam generators.
- f. Completed filling and venting of Reactor Coolant System.
- g. Continued inspection, testing, and evaluation of motor operated valves.

December

The unit remained shutdown the entire month for refueling activities with December 31 representing day 103 of the continuing refueling outage. The unit remained in Mode 5 for the entire month. Unit restart was delayed pending resolution of motor operated valve testing issues.

Major safety-related maintenance activities for December:

- a. Ongoing inspection, testing, evaluation, and resolution of motor operated valves.

2. SUMMARY OF OUTAGES AND FORCED POWER REDUCTIONS

Provided below is a summary of the 1991 outages and forced power reductions of over 20 percent of design power level where the reduction extended for more than four hours. References to reports of reportable occurrences directly related to each outage or load reduction are included in parenthesis where applicable.

1. Start Date: 04/06/91 Completion Date: 05/13/91

Type: Scheduled Duration: 912.0 hours

Reason: Reduced power for fuel conservation purposes. Further reduced power to 50% for 53.2 hours on April 13. On April 15, reduced to 46% for 28.8 hours to repair main turbine control valve. Upon completion of valve repair, returned to 60% power. Operated at 50% for .3 hours as a result of commencing a unit shutdown for declaration of a Notice of Unusual Event.

2. Start Date: 05/18/91 Completion Date: 05/31/91

Type: Scheduled Duration: 278.7 hours

Reason: Reduced power to 60% for fuel conservation purposes.

3. Start Date: 09/20/91 Completion Date: 12/31/91

Type: Scheduled Duration: 2470.6 hours

Reason: Manual shutdown on September 20 for fifth refueling outage.

3. EXPOSURE INFORMATION

a. NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION REPORT - 1991

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 MREM) ¹			TOTAL MAN-REM ²		
	STATION	UTILITY	CONTRACT	STATION	UTILITY	CONTRACT
Reactor Operations & Surveillance						
Maintenance & Construction	2	0	3	1.071	0.000	1.758
Operations	16	0	3	6.112	0.286	0.922
Health Physics & Lab	17	1	26	5.925	0.363	9.197
Supervisory & Office Staff	8	0	2	2.923	0.051	1.389
Engineering Staff	4	0	0	2.245	0.174	0.303
Routine Plant Maintenance						
Maintenance & Construction	18	0	9	6.518	0.032	6.445
Operations	0	0	0	0.307	0.006	0.005
Health Physics & Lab	0	0	0	0.478	0.042	0.354
Supervisory & Office Staff	2	0	2	1.145	0.000	0.960
Engineering Staff	1	0	0	0.594	0.018	0.074
Inservice Inspection						
Maintenance & Construction	8	0	14	1.928	0.005	5.313
Operations	0	1	1	0.107	0.260	0.288
Health Physics & Lab	2	0	14	0.497	0.000	3.631
Supervisory & Office Staff	4	0	5	0.738	0.000	1.666
Engineering Staff	0	0	46	0.529	0.000	20.838
Special Plant Maintenance						
Maintenance & Construction	45	1	223	13.715	0.906	90.571
Operations	1	0	1	0.301	0.037	0.228
Health Physics & Lab	7	0	16	3.556	0.018	6.597
Supervisory & Office Staff	10	0	9	2.740	0.000	4.637
Engineering Staff	5	1	121	3.484	0.283	49.128
Waste Processing						
Maintenance & Construction	2	0	0	1.011	0.000	0.292
Operations	0	0	0	0.389	0.018	0.125
Health Physics & Lab	14	0	26	4.546	0.018	7.862
Supervisory & Office Staff	2	0	0	0.580	0.000	0.046
Engineering Staff	0	0	0	0.037	0.000	0.023
Refueling						
Maintenance & Construction	28	0	56	7.349	0.000	14.665
Operations	7	1	1	2.016	0.292	0.195
Health Physics & Lab	0	0	6	0.046	0.033	1.909
Supervisory & Office Staff	4	0	2	1.364	0.000	0.840
Engineering Staff	4	0	2	1.331	0.121	0.859
Totals						
Maintenance & Construction	103	1	305	31.591	0.943	119.043
Operations	24	2	6	9.232	0.900	1.763
Health Physics & Lab	40	1	88	15.048	0.475	29.550
Supervisory & Office Staff	30	0	20	9.490	0.051	9.539
Engineering Staff	14	1	169	8.219	0.595	71.225
Grand Totals	211	5	588	73.581	2.964	231.119

¹Number of personnel > 100 mrem based on PIC data

²Total man-rem based on ratio of PIC data applied to TLD data

b. PERSONNEL MONITORING REPORT

1. In 1991, 1797 individuals were provided personnel monitoring devices. This information is provided in accordance with 10 CFR 20.407(a)(2). This total includes the number of individuals required to be reported under 10 CFR 20.407(a)(1).
2. Below is a statistical summary report of the personnel monitoring information recorded for individuals for whom personnel monitoring was provided in 1991 in accordance with the requirements of 10 CFR 20.407(b).

Estimated whole body exposure range (rems)	Number of individuals in each range
No measurable exposure.....	788
Measurable exposure less than 0.1.....	327
0.1 to 0.25.....	226
0.25 to 0.5.....	235
0.5 to 0.75.....	133
0.75 to 1.0.....	46
1.0 to 2.0.....	42
2.0 to 3.0.....	0
3.0 to 4.0.....	0
4.0 to 5.0.....	0
5.0 to 6.0.....	0
6.0 to 7.0.....	0
7.0 to 8.0.....	0
8.0 to 9.0.....	0
9.0 to 10.0.....	0
10.0 to 11.0.....	0
11.0 to 12.0.....	0
12.0+.....	0

4. SINGLE RELEASE OF RADIOACTIVITY OR RADIATION EXPOSURE GREATER THAN 10 PERCENT OF ALLOWABLE ANNUAL VALUES

During 1991, there were no single releases of radioactivity or single radiation exposures greater than ten percent of allowable annual values.

5. CHALLENGES TO THE PORVS AND SAFETY VALVES

During 1991, there were no challenges to the Pressurizer power operated relief valves (PORVs) or safety valves.

6. INDICATIONS OF FAILED FUEL

During the fifth refueling outage, all 193 fuel assemblies that were loaded during Cycle 5 were removed and were visually and ultrasonically inspected. Of the 193 assemblies inspected, three were determined to have defective fuel pins with one of the assemblies having a fuel pin that was broken. It was determined that all the fuel pellets were accounted for. The core design for Cycle 6 was completed without use of the three defective assemblies or any others from the same manufacturing lot. (This condition was reported as Licensee Event Report 482/91-019-00).

7. REACTOR COOLANT SYSTEM SPECIFIC ACTIVITY IN EXCESS OF TECHNICAL SPECIFICATION 3.4.8 LIMITATION

On September 20, 1991, it was determined through analysis that the specific activity of the Reactor Coolant System (RCS) had exceeded the Technical Specification (T/S) 3.4.8.a limit of 1 microcurie per ml Dose Equivalent I-131 (DEI). The analysis results of the sample taken at 0218 CDT, indicated 3.04 microcuries per ml DEI. The peak DEI of 6.39 uCi/ml was reached on 9/20/91 at 0607 CDT. Maximum cleanup flow through the CVCS mixed bed demineralizer was maintained during this entire period of time. By 9/21/91 at 0439 CDT, the DEI was back within the limits of T/S 3.4.8.a.

The following information is provided in accordance with T/S 6.9.1.5.c:

- a. Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded:

From 9/18/91 at 0218 CDT to 0218 CDT 9/20/91, Reactor power was approximately 80 percent.

b. Results of the isotopic analyses for radioiodine:

SAMPLE DATE & TIME	I-131 UCI/ML	I-132 UCI/ML	I-133 UCI/ML	I-134 UCI/ML	I-135 UCI/ML	DEI UCI/ML
9/19/91 22:04	8.56E-02	0.11	0.12	4.79E-02	8.61E-02	0.13
9/20/91 02:18	2.34	1.35	2.06	0.19	1.07	3.04
9/20/91 04:05	3.85	1.609	3.26	0.11	1.57	4.92
9/20/91 06:07	5.10	1.55	4.04	3.25E-02	1.62	6.39
9/20/91 08:13	5.14	1.29	3.87	0.00	1.38	6.35
9/20/91 10:30	4.02	0.87	2.86	0.00	0.88	4.90
9/20/91 12:30	3.40	0.74	2.24	0.00	0.60	4.09
9/20/91 14:15	2.72	0.62	1.74	0.00	0.39	3.25
9/20/91 16:30	2.33	0.58	1.36	0.00	0.28	2.74
9/20/91 18:40	1.86	0.49	1.04	0.00	0.20	2.18
9/20/91 20:53	1.53	0.46	0.79	0.00	0.13	1.77
9/20/91 22:43	1.35	0.45	0.66	0.00	7.60E-02	1.54
9/21/91 00:42	1.15	0.42	0.52	0.00	6.52E-02	1.31
9/21/91 02:46	0.97	0.40	0.42	0.00	4.54E-02	1.10
9/21/91 04:39	0.81	0.34	0.34	0.00	2.46E-02	0.92

- c. Cleanup system flow history starting 48 hours prior to the first sample in which the limit was exceeded:

The cleanup flow through the CVCS mixed bed demineralizer was approximately 112 gpm for the 48 hours prior to exceeding the limit of 1 microcurie per gram. This cleanup flow was maintained while the DEI I-131 limit was exceeded.

- d. Time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

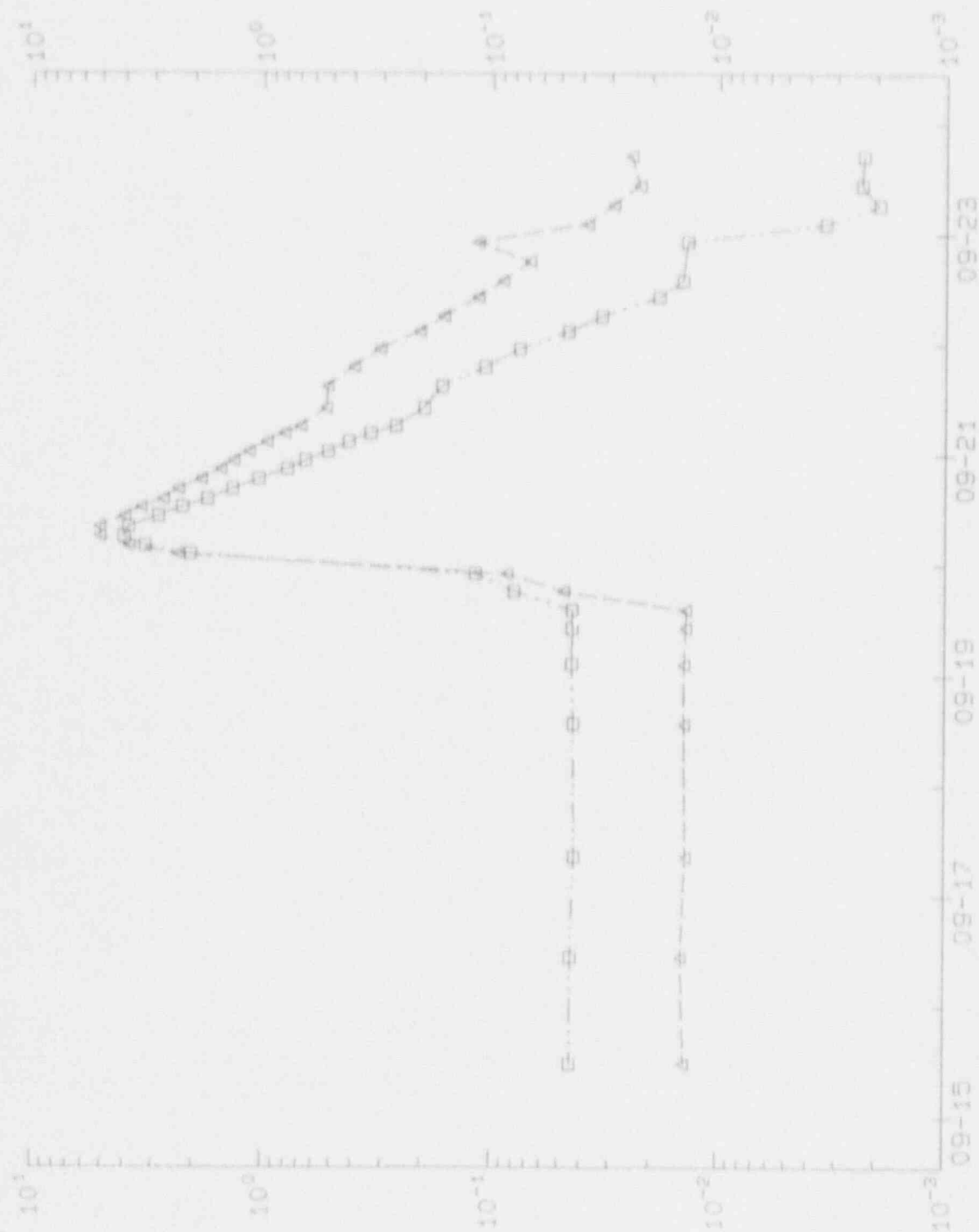
The specific activity of the RCS exceeded the T/S 3.4.8 limit of 1 microcurie per gram Dose Equivalent I-131 for 26.5 hours, from 0218 CDT, 9/20/91 to 0439 CDT on 9/21/91.

- e. Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration that the specific activity was above the steady-state level.

See Graph 1: "RCS Iodines"

WOLF CREEK NUCLEAR OPERATING COR
 WOLF CREEK GENERATING STATION

UCI/ML



1991

1991

RCS IODINES

1-133
 RCS

1-133
 RCS