

# WOLF CREEK

NUCLEAR OPERATING CORPORATION

Otto L. Maynard  
Vice President Plant Operations

February 22, 1993

WO 93-0025

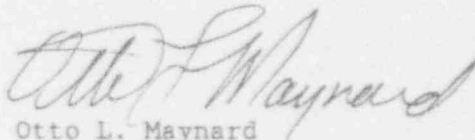
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Subject: Docket No. 50-482: 1992 Annual Operating Report for  
Wolf Creek Nuclear Generating Station

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, 1992 to December 31, 1992.

Very truly yours,

  
Otto L. Maynard  
Vice President  
Plant Operations

OLM/jad

Attachment

cc: J. L. Milhoan (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. 8

Reporting Period: January 1, 1992 through December 31, 1992

Prepared by: Merlin G. Williams

#### 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, 1992 and ending on December 31, 1992.

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 1992, Wolf Creek Generating Station's availability factor was 85.8 percent and capacity factor (using maximum dependable capacity) was 85.5 percent. Wolf Creek Generating Station experienced two unplanned reactor trips in 1992 after the unit was returned to service on January 20, 1992, following the completion of the fifth refueling outage.

1. **SUMMARY OF OPERATING EXPERIENCE**

A summary of Wolf Creek Generating Station's operating experience and major safety related maintenance activities completed during 1992 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, 1992.

January

The unit completed its fifth refueling outage and the generator output breaker was closed on January 15, 1992 at 0004 hours. Power ascension activities then took place, with the unit reaching full power at 1840 hours on January 20, 1992. The unit operated at or near 100 percent power throughout the remainder of the month.

Major safety related maintenance activities for January:

- a. Inspection, testing, and evaluation of motor operated valves.
- b. Replacement of Residual Heat Removal discharge relief valve EJ8856B.

February

The unit operated at 100 percent power throughout the month of February until an unplanned reactor trip occurred February 19, 1992 at 2110 hours as a result of the failure of an electronic component in inverter NN11 and the subsequent loss of control power to both main feedwater pumps. (This event was reported as Licensee Event Report 492/92-002-00). While the unit was down, an inspection of the reactor vessel revealed that some minor leakage existed on three reactor vessel penetrations. The unit remained down for the duration of the month as these items are repaired.

Major safety related maintenance activities for February:

- a. Replacement of circuit board in inverter NN11.
- b. Replacement of main steam safety valve ABV057.
- c. Repair of minor leakage on in-core thermocouple conduit.
- d. At month's end, investigation into repair of reactor vessel canopy seal weld leakage was ongoing.

March

After an unplanned reactor trip on February 19, 1992, the unit remained shutdown until March 27, 1992. While the unit was shutdown, repair of the reactor vessel canopy seal weld and the reactor cavity seal ring was performed. An investigation of an unexplained noise that occurred on February 28, 1992 identified that the Reactor Coolant System crossover leg saddles were coming in contact with the thrust block shims. The investigation also identified the need to rework the Loop A and C vertical drop restraints. (This event was reported as Licensee Event Report 482/92-096-00 and was further discussed in NRC Information Notice 92-86, dated 12/24/92). The unit

reached full power at 2234 hours on March 28, 1992 and remained at full power for the remainder of the month.

Major safety related maintenance activities for March:

- a. Repair of the reactor canopy seal weld leakage.
- b. Repair of reactor cavity seal ring.
- c. Adjustments to the Loop A and C Reactor Coolant Pump vertical drop restraints and the thrust block shims.

#### April

The unit operated at or near 100 percent power throughout the month of April.

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

#### May

The unit operated at or near 100 percent power throughout the month of May.

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

#### June

The unit operated at or near 100 percent power throughout the month of June.

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

#### July

The unit operated at or near 100 percent power throughout the month of July.

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

#### August

The unit operated at or near 100 percent power throughout the month of August with the exception of a power reduction following the loss of a 345 kilovolt (kV) line.

The power reduction occurred on August 11, 1992, following the loss of the 345 kV LaCygre line to ensure that grid stability would be maintained if a second line was lost. Power was reduced to 80 percent for approximately 6 hours. Power was returned to 100 percent after the 345 kV line was returned to service.

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

#### September

The unit operated at or near 100 percent power throughout the month of September.

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

#### October

The unit operated at or near 100 percent power throughout the month of October.

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

#### November

The unit operated at or near 100 percent power until November 10, 1992, at 1105 hours, when a reactor trip occurred due to a ground fault at an off-site substation. The fault was caused by contact between an overhead ground and the energized portion of a 138 kV ring bus during clearance procedures for a 345/138 kV transformer at the substation. Non-nuclear utility personnel were performing the work at the substation. The unit was in Mode 3, Hot Standby, following the trip. (This event was reported as Licensee Event Report 482/92-016-00).

On November 11, 1992, at 0330 hours, the unit entered Mode 2, Startup. Mode 3, Hot Standby, was reentered at 0436 hours due to Digital Rod Position Indication problems. At 1244 hours, the unit entered Mode 2 following repairs to the Digital Rod Position Indication system. Mode 1, Power Operation, was entered at 1608 hours. On November 13, 1992, at 1310 hours, the unit was returned to 100 percent reactor power. The unit operated at or near 100 percent power throughout the remainder of the month.

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

#### December

The unit operated at or near 100 percent power throughout the month of December.

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

## 2. SUMMARY OF OUTAGES AND FORCED POWER REDUCTIONS

Provided below is a summary of the 1992 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. <u>Start Date:</u> 01/01/92 | <u>Completion Date:</u> 01/15/92   |
| <u>Type:</u> Forced            | <u>Duration:</u> 336.1 hours   |
| <u>Reason:</u>                 | Continued forced outage for resolution of motor operated valve issues which were discovered during the fifth refueling outage. |

2. Start Date: 02/19/92

Completion Date: 03/27/92

Type: Forced

Duration: 877.4 hours

Reason:

Unplanned reactor trip at 2110 hours February 19, 1992, on steam generator 10-10 level as a result of an electronic component failure in inverter NN11 and the subsequent loss of control power for both main feedwater pumps. (Reported as Licensee Event Report 482/92-002-00). While the unit was shutdown, the reactor vessel canopy seal welds and the reactor cavity seal ring were repaired. Also, adjustments to the Loop A and C Reactor Coolant Pump vertical drop restraints and the thrust block shims were performed. (Reported as Licensee Event Report 482/92-006-00).

3. Start Date: 11/10/92

Completion Date: 11/13/92

Type: Forced

Duration: 30.9 hours

Reason:

Unplanned reactor trip at 1105 hours on November 10, 1992, when a ground fault was inadvertently initiated by contact between an overhead ground and the energized portion of a 138 kV ring bus at an off-site substation by non-nuclear utility technicians. (Reported as Licensee Event Report 482/92-016-00).

### 3. EXPOSURE INFORMATION

#### a. NUMBER OF PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION REPORT - 1992

WORK & JOB FUNCTION	NUMBER OF PERSONNEL (>100 MREM) <sup>1</sup>			TOTAL MAN-REM <sup>2</sup>		
	STATION	UTILITY	CONTRACT	STATION	UTILITY	CONTRACT
Reactor Operations & Surveillance						
Maintenance & Construction	1	0	4	1.261	0.015	1.268
Operations	0	0	0	1.093	0.006	0.073
Health Physics & Lab	20	0	0	5.653	0.264	0.233
Supervisory & Office Staff	1	0	2	1.447	0.024	0.798
Engineering Staff	4	0	2	1.459	0.288	0.935
Routine Plant Maintenance						
Maintenance & Construction	0	0	0	1.398	0.015	1.152
Operations	0	0	0	0.135	0.000	0.000
Health Physics & Lab	0	0	0	0.418	0.043	0.049
Supervisory & Office Staff	0	0	0	0.409	0.000	0.063
Engineering Staff	0	0	0	0.416	0.019	0.010
Inservice Inspection						
Maintenance & Construction	1	0	16	0.469	0.019	3.734
Operations	0	0	0	0.268	0.000	0.000
Health Physics & Lab	3	1	0	0.869	0.121	0.000
Supervisory & Office Staff	9	0	1	2.368	0.000	0.333
Engineering Staff	6	3	4	1.442	0.389	1.184
Special Plant Maintenance						
Maintenance & Construction	10	2	80	3.583	0.343	26.018
Operations	1	0	0	0.328	0.024	0.123
Health Physics & Lab	4	0	1	1.422	0.067	0.295
Supervisory & Office Staff	4	0	4	1.428	0.000	0.836
Engineering Staff	1	0	1	0.581	0.039	0.256
Waste Processing						
Maintenance & Construction	0	0	0	0.029	0.000	0.121
Operations	0	0	0	0.051	0.000	0.019
Health Physics & Lab	5	0	0	3.802	0.000	0.000
Supervisory & Office Staff	2	0	0	0.275	0.000	0.000
Engineering Staff	0	0	0	0.010	0.000	0.000
Refueling						
Maintenance & Construction	0	0	0	0.000	0.000	0.000
Operations	0	0	0	0.005	0.000	0.000
Health Physics & Lab	0	0	0	0.005	0.000	0.000
Supervisory & Office Staff	0	0	0	0.000	0.000	0.000
Engineering Staff	0	0	0	0.000	0.000	0.000
Totals						
Maintenance & Construction	12	2	100	6.730	0.391	32.294
Operations	1	0	0	1.881	0.030	0.215
Health Physics & Lab	32	1	1	12.169	0.495	0.577
Supervisory & Office Staff	16	0	7	5.927	0.024	2.030
Engineering Staff	11	3	7	3.908	0.735	2.385
Grand Totals	72	6	115	30.615	1.675	37.500

<sup>1</sup>Number of personnel > 100 mrem based on Pocket Ion Chamber (PIC) data

<sup>2</sup>Total man-rem based on ratio of PIC data applied to TLD data



b. PERSONNEL MONITORING REPORT

1. In 1992, 1103 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 1992 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.....	657
Measurable exposure less than 0.1.....	304
0.1 to 0.25.....	61
0.25 to 0.5.....	45
0.5 to 0.75.....	17
0.75 to 1.0.....	7
1.0 to 2.0.....	12
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
Greater than 12.0.....	0

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

During 1992, there was no single release of radioactivity greater than ten percent of the allowable annual value.

On March 26, 1992, while the unit was shutdown, an engineer in the Radiologically Controlled Area was discovered to have a localized area of contamination on the left cheek. The contamination was determined to be a hot particle which probably originated from work previously performed which required breaching the Reactor Coolant System. It was subsequently determined that the particle was made of stellite and, given its strength and geometry, the exposure was calculated to be 15.9 Rem to the skin of the whole body. This exposure exceeded the 10 CFR 20.101 quarterly dose limit and represented 53 percent of the annual allowable exposure limit to the skin of the whole body for an individual. (This event was reported as Licensee Event Report 482/92-007-00 and supplement 482/92-007-01).

5. CHALLENGES TO THE PORVS AND SAFETY VALVES

During 1992, there were no challenges to the Pressurizer Power Operated Relief Valves (PORVs) or safety valves.

However, PORV BBPCV456A has been isolated, per Technical Specification 3.4.4.a, due to excessive seat leakage, since May 5, 1992.

6. INDICATIONS OF FAILED FUEL

During August/September 1992, detailed inspections were performed of the failed fuel assemblies that were discovered during the fifth refueling outage. (Reference Licensee Event Report 482/91-019-00). The intent of the inspections was to confirm the grid-to-rod fretting as the failure mechanism and to ascertain the root cause of the failure mechanism. From these additional inspections it was confirmed that grid-to-rod fretting was the principle failure mechanism. It was determined that fuel handling or fuel fabrication issues are unlikely root causes and that the fuel assemblies were fabricated to current design specifications. Investigation into the possibility that the root cause of the failure of the fuel assemblies was related to flow characteristics in the core is ongoing.

The current iodine activity in the Reactor Coolant System (RCS) indicates that there are 2 defective fuel rods in the core. However, noble gas activity in the RCS indicates that there are 6 - 10 defective fuel rods. This activity level meets the requirements of Action Level 1 per procedure ADM 01-221, "Failed Fuel Action Plan." Action Level 1 is defined as a moderate increase in RCS Activity level beyond that defined for normal operation and sustained at Steady-State Operation for more than seven days. This action level requires, in part, an assessment of plant operating data to develop an initial estimate of the number and type of fuel failure, a review of fabrication and other design records, and the initiation of plans for end-of-cycle fuel inspections, assembly reconstitution or replacement, and root cause evaluation.

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

On November 10, 1992, following a reactor trip, it was determined through analysis that the specific activity of the 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 1316 CST, indicated 1.011 microcuries per ml DEI. Maximum cleanup flow through the Chemical and Volume Control System (CVCS) mixed bed demineralizer was maintained during the time that the specific activity exceeded the T/S limit. The DEI was back within the limits of T/S 3.4.8.a by 1412 CST.

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 November 8, 1992, at 1316 CST, until 1103 CST on November 10, 1992, Reactor power was approximately 100 percent. Following a reactor trip at 1103 CST, until 1316 CST, Reactor power was 0 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
11/09/92 1106	2.799E-03	3.185E-02	1.595E-02	5.293E-02	2.923E-02	1.160E-02
11/10/92 0831	2.785E-03	3.172E-02	1.616E-02	5.342E-02	2.983E-02	1.170E-02
11/10/92 1316	7.310E-01	5.125E-01	6.753E-01	1.280E-01	4.425E-01	1.011
11/10/92 1412	7.425E-01	4.675E-01	6.351E-01	6.330E-02	4.048E-01	9.661E-01
11/10/92 1520	6.755E-01	4.013E-01	5.609E-01	3.255E-02	3.097E-01	8.680E-01
11/10/92 1533	6.632E-01	4.027E-01	5.426E-01	2.459E-02	2.950E-01	8.496E-01

- 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 110 gallons per minute 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.

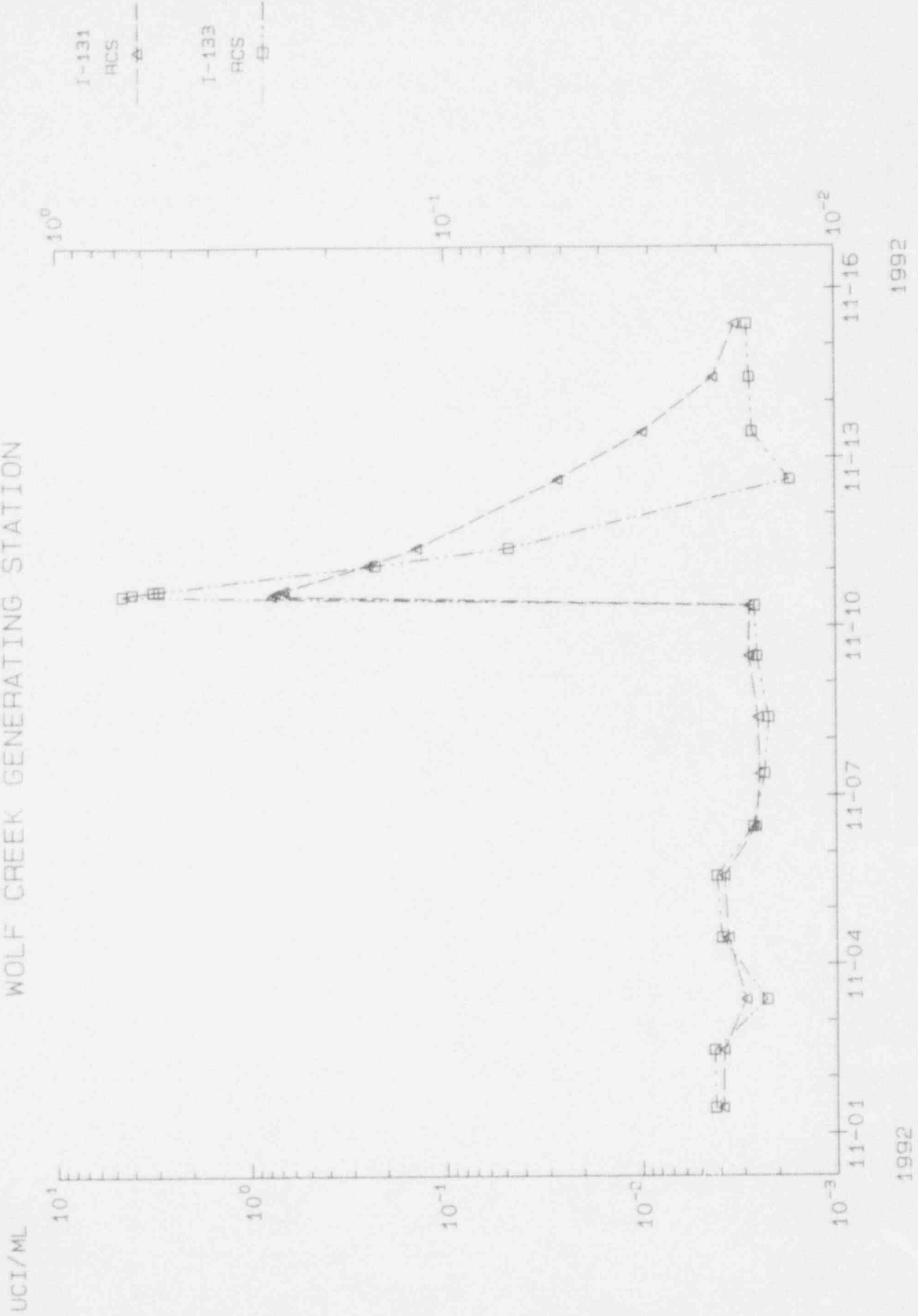
- d. Time duration when the specific activity of the primary coolant exceeded the radioiodine limit:

The specific activity of the RCS exceeded the T/S 3.4.8.a limit of 1 microcurie per gram Dose Equivalent I-131 for 56 minutes. This occurred from 1316 CST until 1412 CST, on November 10, 1992.

- 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"

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RCS IODINES