

Stephen A. Byrne  
Senior Vice President, Nuclear Operations  
803 345 4622



March 28, 2003

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

Dear Sir:

Subject: VIRGIL C. SUMMER NUCLEAR STATION  
DOCKET NO. 50-395  
OPERATING LICENSE NO. NPF-12  
ANNUAL OPERATING REPORT

Enclosed is the 2002 Annual Operating Report for the South Carolina Electric & Gas Company Virgil C. Summer Nuclear Station Unit No. 1. This report is being submitted in accordance with Technical Specifications 6.9.1.4, 6.9.1.5, and Regulatory Guide 1.16.

If there are any questions, please call at your convenience.

Very truly yours,

A handwritten signature in black ink, appearing to read "S.A. Byrne".

Stephen A. Byrne

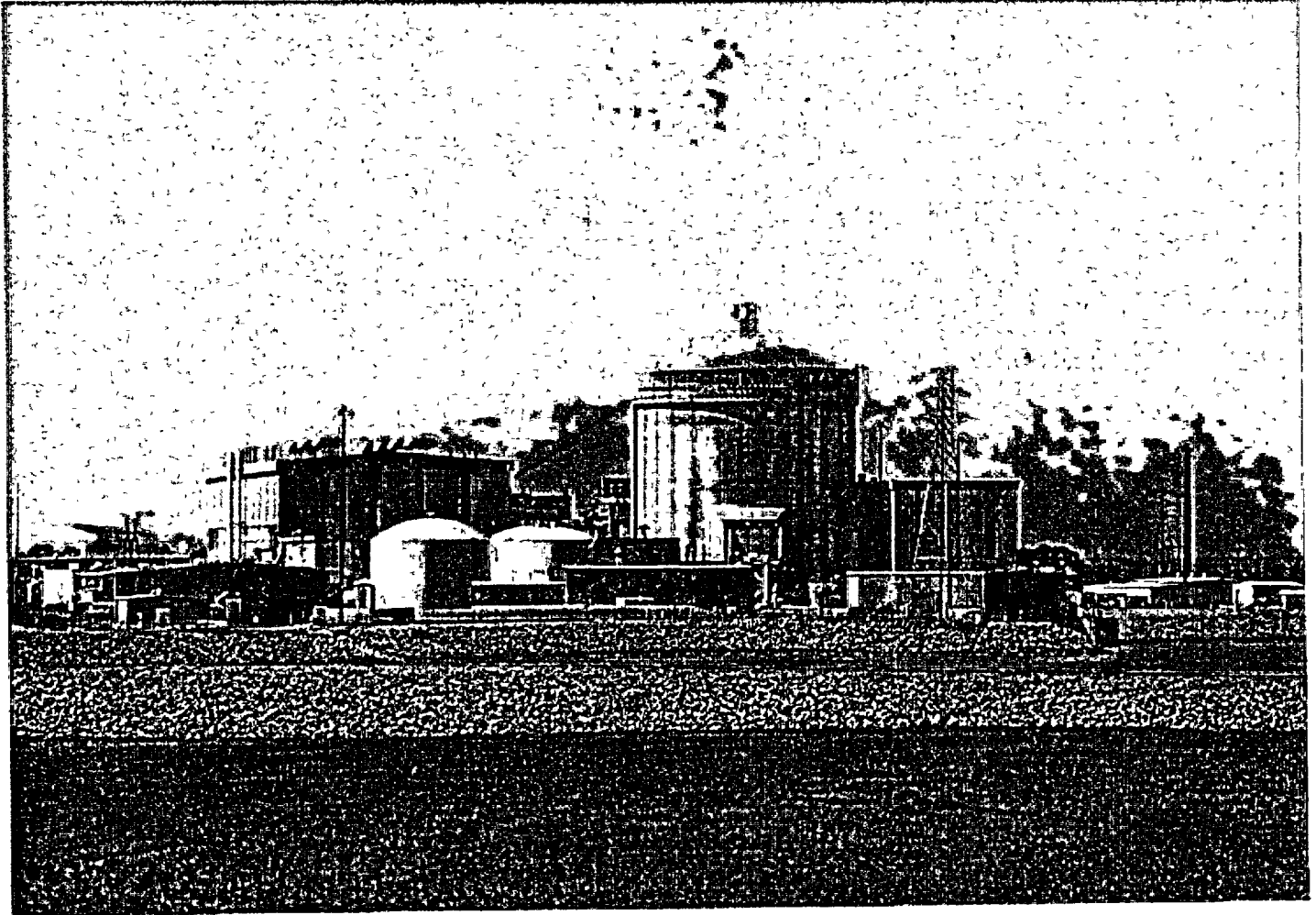
SBR/SAB/sr  
Attachment

c: N. O. Lorick  
T. G. Eppink (w/o attachment)  
R. J. White  
L. A. Reyes  
K. R. Cotton  
REIRS Project Manager  
K. M. Sutton  
D. L. Abstance

W. G. Wendland  
J&H Marsh & McLennan  
NRC Resident Inspector  
NSRC  
RTS (0-L-99-0107)  
File (818.02-10, RR 8225)  
DMS (RC-03-0062)

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# VIRGIL C. SUMMER NUCLEAR STATION



## 2002 ANNUAL OPERATING REPORT

## PREFACE

The 2002 Annual Operating Report for the Virgil C. Summer Nuclear Station is hereby submitted in accordance with Technical Specifications 6.9.1.4, 6.9.1.5, and Regulatory Guide 1.16 under Docket Number 50/395 and Facility Operating License NPF-12.

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- II. 2002 Man-Rem Report

# ANNUAL OPERATING REPORT

## 1.0 INTRODUCTION

The Virgil C. Summer Nuclear Station (VCSNS) utilizes a pressurized water reactor rated at 2900 MWT. The maximum dependable capacity is 966 Mwe.

The station is located approximately 26 miles northwest of Columbia, South Carolina.

## 2.0 OPERATIONAL DATA

For the reporting period of January 1 through December 31, 2002, the station operated at a capacity factor of 87.2 percent (using maximum dependable capacity) and a unit availability of 87.3 percent. The reactor was critical for a total of 7700 hours, the generator remained on line 7646 hours, and the total gross electrical energy generated for 2002 was 7677140 MWH.

The station successfully completed its thirteenth refueling outage in 44 days and 12 hours.

## 3.0 OPERATING SUMMARY

The Virgil C. Summer Nuclear Station (VCSNS) Unit No.1 operated at 100 percent power from January 1 through January 5<sup>th</sup>. On January 5<sup>th</sup>, power was reduced to 98% to support maintenance on the 2B feedwater heater level transmitter. Power was restored to 100% on January 6<sup>th</sup>.

VCSNS operated at 100 percent power from January 6<sup>th</sup> to February 2<sup>nd</sup>. On February 2<sup>nd</sup> power was reduced to 98% to support repairs of 1A feedwater level transmitter. Power was restored to 100% on February 2<sup>nd</sup>.

VCSNS operated at 100 percent power from February 2<sup>nd</sup> to February 18<sup>th</sup>. On February 18<sup>th</sup>, a turbine load reduction was initiated to support a reduction in power to 98% due to low air pressure on Main Steam Isolation Valves "A" and "C". Power was restored to 100% on February 19<sup>th</sup>.

VCSNS operated at 100% power from February 19<sup>th</sup> to April 17<sup>th</sup>. On April 17<sup>th</sup> power was reduced to 85% to support main steam safety valve testing. On April 20<sup>th</sup>, the thirteenth refueling outage began with the opening of the main generator breaker. The plant remained shutdown for the refueling outage until June 1<sup>st</sup>. On June 1<sup>st</sup> at 02:46, the reactor became critical. On June 1<sup>st</sup>, the reactor automatically tripped due to a spike in intermediate range nuclear instrumentation channel NI 36. A circuit card was replaced and the reactor was restarted. The main generator breaker was closed on June 3<sup>rd</sup>. On June 8<sup>th</sup>, the main generator breaker was opened to permit the performance of a main turbine overspeed test.

The test was completed and the breaker was closed on June 8<sup>th</sup>. On June 17<sup>th</sup>, the reactor tripped on lo-lo level in the "A" Steam Generator. The low level was caused by the trip of the "C" main feedwater pump in conjunction with a feedwater digital control system logic error that inadvertently caused the remaining feed pump recirculation valves to go full open. The feed pump and DCS logic were repaired. The main generator breaker was closed on June 19<sup>th</sup>. Power was restored to 100% on June 20<sup>th</sup>.

VCSNS operated at 100 percent power from June 20<sup>th</sup> to August 6<sup>th</sup>. On August 6<sup>th</sup> power was reduced to 99% due to high circulating water discharge temperature. The circulating water discharge temperature became stable and reactor power was restored to 100% on August 7<sup>th</sup>.

VCSNS operated at 100 percent power from August 7<sup>th</sup> to September 20<sup>th</sup>. On September 20<sup>th</sup>, the plant power was reduced to 92% to support turbine control valve and generator exciter testing. Power was restored to 100% on September 21<sup>st</sup>.

VCSNS operated at 100% from September 21<sup>st</sup> to December 13<sup>th</sup>. On December 13<sup>th</sup> power was reduced to 92% to support main turbine control valve testing. Power was restored to 100% on December 14<sup>th</sup> at 0240. At 0528 on December 14<sup>th</sup> reactor power was reduced to 98% to support electro-hydraulic control testing and troubleshooting. Testing was completed and power was restored to 100% on December 15<sup>th</sup>. The plant operated at 100% reactor power for the remainder of 2002.

## **Maintenance**

Attachment I, "Power Reductions Caused by Maintenance Activities," provide more detailed information on operating time lost as a result of maintenance activities.

## **Refuel 13 Summary**

The main generator was opened at 1112 on April 20<sup>th</sup>, for refueling outage 13.

Major work activities included:

- Reactor Building Spray System Flow Test (10 year ISI)
- "A" Reactor Coolant Pump Motor Change Over and Seal Refurbishment
- "B" Reactor Coolant Pump Seal Replacement
- "B" Pressurizer Safety Valve Test

- Reactor Vessel Disassembly, fuel Shuffle and Reassembly
- "A" Hot Leg Repair Follow-up Weld Inspection and Mechanical Stress Improvement Process (MSIP) on "B" and "C" Hot Legs
- Eighteen month Preventative Maintenance on "A" and "B" Diesel Generators
- ETBT-0290 Diesel Generator Relay Replacement
- "A" Component Cooling Heat Exchanger Repair and Plasticoat
- "B" Component Cooling Heat Exchanger Repair
- Service Water UT and Visual Inspections, Pipe Replacement and Drain Valve Installation

Refuel 13 duration in 2002 was 44 days and 12 hours. Outage planned duration was approximately 34 days. Personnel exposure in 2002 due to the outage was approximately 65 man-rem based on electronic dosimeters.

#### **4.0 EXPOSURES**

Attachment II consists of tables, which list the number of station, utility, and other personnel (including contract personnel) receiving exposures greater than 100 mrem/year and their associated man-rem exposure according to work and job function. The exposures reported are estimated doses based on electronic dosimeters.

#### **5.0 FAILED FUEL**

VCSNS did not have any indication of failed fuel in 2002.

The reactor coolant system specific activity did not exceed the 1.0 microcuries per gram dose equivalent iodine-131 specific activity or the 100/E microcuries per gram limits of Technical Specification 3.4.8, for this reporting period.

**ATTACHMENT I**

**TO**

**2002 ANNUAL REPORT**



# V. C. Summer Nuclear Station Events

## Outage or Power Reductions Caused by Maintenance Activities

<u>Date</u>	<u>Time Start</u>	<u>Cause of Event/NERCGADS* Code</u>	<u>Date</u>	<u>Time Finish</u>	<u>Duration</u>	<u>Net Capacity MWe</u>	<u>Type</u>
1/5/2002	2105 Hrs	FW Heater Level Transmitter / 3502	1/6/2002	0935 Hrs	12.5 Hrs	959	Unplanned
2/2/2002	0226 Hrs	FW Heater Level Transmitter / 3502	2/2/2002	2355 Hrs	21.5 Hrs	964	Unplanned
4/17/2002	2305 Hrs	Pre-Refuel 13/2070	4/20/2002	0014 Hrs	49.0 Hrs	833	Planned
4/20/2002	0014 Hrs	Refuel 13/2070	4/30/2002	2400 Hrs	264.0 Hrs	0	Planned
5/1/2002	0001 Hrs	Refuel 13/2070	5/22/2002	2100 Hrs	525.0 Hrs	0	Planned
5/22/2002	2100 Hrs	Refuel 13 Outage Extension/2070	5/31/2002	2400 Hrs	219.0 Hrs	0	Unplanned
6/1/2002	0001 Hrs	Refuel 13 Outage Extension/2070	6/3/2002	1311 Hrs	61.0 Hrs	0	Unplanned
06/11/2002	1800 Hrs	Leading Edge Feed Flowmeter Transducer/2390/3499	6/14/2002	2300 Hrs	77.0 Hrs	930	Unplanned
6/17/2002	1902 Hrs	'C' FW Pump Trip/3414	6/20/2002	1630 Hrs	69.0 Hrs	Min0/Avg246	Unplanned
6/27/2002	1600 Hrs	'A' FW Pump Trip/3414	6/29/2002	0625 Hrs	38.0 Hrs	Min865/Avg 871	Unplanned
6/29/2002	0830 Hrs	'C' MFP Lockout Reset/3414	6/29/2002	1230 Hrs	4.0 Hrs	Min840/Avg905	Unplanned
9/20/2002	2134 Hrs	Quarterly Main Turbine Valve Testing/4261	9/21/2002	0410 Hrs	6.6 Hrs	Min870/Avg895	Planned
11/6/2002	1040 Hrs	FW Venturi Fouling/2390/3499	11/6/2002	1500 Hrs	4.3 Hrs	979	Unplanned
12/13/2002	2220 Hrs	Quarterly Main Turbine Valve Testing/4261	12/14/2002	0300 Hrs	4.7 Hrs	Min892/Avg937.5	Planned
12/14/2002	0300 Hrs	EHC Troubleshooting/4301	12/16/2002	0100 Hrs	46.0 Hrs	66.4	Planned

**ATTACHMENT II**

**TO**

**2002 ANNUAL REPORT**

PERSONNEL AND MAN-REM BY WORK AND DUTY FUNCTION  
FINAL END OF YEAR REPORT FOR 2002

WORK AND JOB FUNCTION	NUMBER OF PERSONNEL OVER 100mREM			TOTAL MAN-REM		
	STATION WORKERS	UTILITY WORKERS	CONTRACT WORKERS	STATION WORKERS	UTILITY WORKERS	CONTRACT WORKERS
ROUTINE MAINTENANCE						
MAINTENANCE PERSONNEL	16	0	48	7.263	0.001	17.356
OPERATIONS PERSONNEL	1	0	1	0.695	0.000	0.477
HEALTH PHYSICS PERSONNEL	3	0	2	0.911	0.000	1.256
SUPERVISORY PERSONNEL	1	0	0	0.333	0.000	0.000
ENGINEERING PERSONNEL	1	0	1	0.419	0.000	0.358
SPECIAL MAINTENANCE						
MAINTENANCE PERSONNEL	13	0	35	5.146	0.000	13.461
OPERATIONS PERSONNEL	3	0	2	1.143	0.000	0.420
HEALTH PHYSICS PERSONNEL	2	0	5	0.634	0.000	1.268
SUPERVISORY PERSONNEL	1	0	0	0.336	0.000	0.005
ENGINEERING PERSONNEL	0	0	1	0.127	0.000	0.276
REACTOR OPERATIONS & SURVEILLANCE						
MAINTENANCE PERSONNEL	1	0	0	1.173	0.000	0.428
OPERATIONS PERSONNEL	2	0	0	1.686	0.000	0.217
HEALTH PHYSICS PERSONNEL	0	0	0	0.706	0.000	0.320
SUPERVISORY PERSONNEL	0	0	0	0.062	0.000	0.009
ENGINEERING PERSONNEL	0	0	0	0.152	0.000	0.012
WASTE PROCESSING						
MAINTENANCE PERSONNEL	0	0	0	0.023	0.000	0.017
OPERATIONS PERSONNEL	0	0	0	0.006	0.000	0.001
HEALTH PHYSICS PERSONNEL	3	0	1	0.679	0.000	0.207
SUPERVISORY PERSONNEL	0	0	0	0.043	0.000	0.000
ENGINEERING PERSONNEL	0	0	0	0.000	0.000	0.000
IN-SERVICE INSPECTION						
MAINTENANCE PERSONNEL	0	0	6	0.445	0.000	2.367
OPERATIONS PERSONNEL	0	0	1	0.133	0.000	0.147
HEALTH PHYSICS PERSONNEL	0	0	1	0.010	0.000	0.184
SUPERVISORY PERSONNEL	0	0	0	0.000	0.000	0.000
ENGINEERING PERSONNEL	0	0	0	0.000	0.000	0.000
REFUELING						
MAINTENANCE PERSONNEL	5	0	19	2.018	0.000	6.497
OPERATIONS PERSONNEL	0	0	1	0.298	0.000	0.207
HEALTH PHYSICS PERSONNEL	0	0	1	0.025	0.000	0.360
SUPERVISORY PERSONNEL	0	0	0	0.004	0.000	0.000
ENGINEERING PERSONNEL	0	0	2	0.004	0.000	0.336
TOTALS						
MAINTENANCE PERSONNEL	35	0	108	16.068	0.001	40.126
OPERATIONS PERSONNEL	6	0	5	3.961	0.000	1.469
HEALTH PHYSICS PERSONNEL	8	0	10	2.965	0.000	3.595
SUPERVISORY PERSONNEL	2	0	0	0.778	0.000	0.014
ENGINEERING PERSONNEL	1	0	4	0.702	0.000	0.982
GRAND TOTAL	52	0	127	24.474	0.001	46.186

\*\*\*\*\* END OF REPORT \*\*\*\*\*