



**PUBLIC SERVICE COMPANY OF COLORADO**

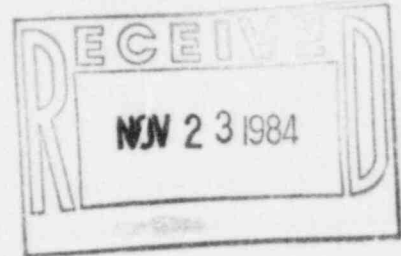
P. O. BOX 940 · DENVER, COLORADO 80201

OSCAR R. LEE  
VICE PRESIDENT

November 21, 1984  
Fort St. Vrain  
Unit #1  
P-84501

Regional Administrator  
Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 1000  
Arlington, Texas 76011

Attn: Mr. E. H. Johnson



Docket No. 50-267

SUBJECT: Generic Letter 84-15

REFERENCES: 1) Generic Letter 84-15,  
Dated July 2, 1984  
(G-84308)  
2) PSC Letter, Gahm to  
Eisenhut, Dated  
August 28, 1984  
(P-84319)  
3) PSC Letter, Lee to  
Collins, Dated  
December 30, 1983  
(P-83415)

Dear Mr. Johnson:

This letter responds to Generic letter 84-15, Proposed Staff Actions To Improve And Maintain Diesel Generator Reliability.

Public Service Company has considered each item covered by the letter and our detailed response is provided in Enclosure 1. In summary, our current Diesel Generator surveillance program avoids cold fast start testing and recent reliability data indicate acceptable performance under the recommended failure based testing interval guidance. However, in maintaining this acceptable level, Public

8411280266 841121  
PDR ADOCK 05000267  
P PDR

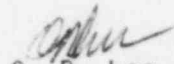
H00511  
RETURN ORIGINAL  
TO RIV

Service Company concurs that surveillance intervals based on reliability data would efficiently and effectively identify the need for remedial action and thus enhance overall reliability. The proposed actions listed under item III of Enclosure 1 outlines our goals for developing and implementing a reliability based surveillance program.

Public Service Company previously considered a reliability based surveillance program and submitted a proposal for Technical Specification changes using the Standard Technical Specifications and Regulatory Guide 1.108 as guidance (Reference 3). However, due to numerous discussions and comments on other contents of that proposal, we plan to resubmit the entire proposal. In the new submittal we plan to incorporate revised diesel generator reliability requirements, responsive to the guidance of Generic Letter 84-15 as modified by the PSC comment in Item III of Enclosure 1.

If you have any questions or wish to discuss any details of this response, please contact Mr. M. H. Holmes at (303) 571-8409.

Very truly yours,



O. R. Lee, Vice President  
Electric Production

Enclosures

ORL:djm

cc: E. H. Johnson

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter

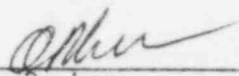
Public Service Company of Colorado  
Fort St. Vrain Unit No. 1

)  
)  
)  
)

Docket No. 50-267


AFFIDAVIT

O. R. Lee, being duly sworn, hereby deposes and says that he is Vice President of Public Service Company of Colorado; that he is duly authorized to sign and file with the Nuclear Regulatory Commission the attached response to Generic Letter 84-15; that he is familiar with the content thereof; and that the matters set forth therein are true and correct to the best of his knowledge, information and belief.

  
\_\_\_\_\_  
O. R. Lee  
Vice President

STATE OF COLORADO )  
COUNTY OF DENVER )

Subscribed and sworn to before me, a Notary Public on this 21st  
day of November, 1984.

  
\_\_\_\_\_  
Notary Public

550 15th ST.  
DENVER, CO 80202

My commission expires April 3, 1988.

DETAILED RESPONSE TO ITEMS COVERED IN GENERIC LETTER 84-15

I. Reduction in Number of Cold Fast Start Surveillance Tests For Diesel Generators

Current Surveillance Program:

During normal plant operation the standby Diesel Generator sets are tested weekly to verify operable status in compliance with Technical Specification requirements (LCO 4.6.1 and SR 5.6.1). This test includes manual and automatic starting of the four units, accelerating to 60 Hertz synchronous speed, applying excitation, synchronizing with the plant 480V AC essential buses, and assuming at least half load for a minimum of two hours. A loss of outside power is simulated twice annually to demonstrate that the standby generators, automatic controls, and load sequencers are operable. The diesel protective functions are calibrated annually, and the exhaust temperature "shutdown" and "declutch" functions are functionally tested monthly and calibrated annually.

Prior to each scheduled surveillance test requiring manual or automatic diesel engine starting, the testing procedure requires that a list of preoperational checks be verified. These checks include verification of proper levels of lubricating oil, fuel oil, and cooling water in addition to normal operation of the continuous engine heating system. The continuous engine heating system is comprised of individual engine heaters powered by an essential electrical power source. Power supply cables for each engine heater will be upgraded to an essential electrical classification. The system maintains the engine cooling water at approximately 110 degrees F. The diesel generator sets are located in separate rooms inside the turbine building which is maintained at a minimum of about 60 degrees F. Therefore, our current procedures and equipment already address the expressed concerns for avoiding cold fast start testing.

Proposed Actions:

As a result of the concerns expressed in Enclosure 1 to Generic Letter 84-15, Public Service Company plans to review other manufacturer recommended preparatory actions and industry practices to identify any further precautions that would reduce engine wear, extend life, and improve availability.

Public Service Company will also review the overall frequency of our testing requirements for purposes of identifying unnecessary excessive testing which would warrant Technical Specification changes in order to reduce diesel engine degradation and increase availability.

## II. Diesel Generator Reliability Data

### Current Data:

The attached table provides the reliability of each standby diesel engine based on the successful starts, and failures experienced over the last 20 and 100 demands, during performance of the normal weekly and semi-annual surveillance tests. The demands and failures reported were determined using the data available and the guidance outlined in Regulatory Guide 1.108 position C.2.e.

### Proposed Actions:

Although Public Service Company presently logs diesel generator set unavailability during testing and inoperability during system repairs, no specific record of itemized demands and failures has been maintained. Therefore, in conjunction with the development of proposed Technical Specification changes, a log will be developed along with surveillance testing procedure changes identifying and providing for reliability data collection based on the recommendations of Regulatory Guide 1.108 position C.3.a.

## III. Diesel Generator Reliability

### Current Reliability Basis:

The reliability of the Fort St. Vrain Diesel Generator sets was originally established as described in FSAR Section 8.2.3.3.2. The alternate onsite electric power supply system consists of two standby diesel generator sets, each set consisting of two independent diesel engines independently connected to a common generator and separate 480 VAC essential bus. Any two of the four diesel engines can be utilized to provide the necessary electric power for the minimum essential equipment required for safe reactor shutdown. This allows for six possible combinations of engines and generators that could produce the required power.

In addition to the high degree of equipment reliability, the HTGR plant can withstand varying degrees of short-time loss of core cooling without damage, allowing time for operator action to compensate for system failures.

The surveillance testing requirements as described in part I were considered adequate in maintaining the established high degree of reliability. In April of 1980, the test performance records for the period of 1974 through 1979 were reviewed and evaluated with no actual failures-to-start identified.

In comparing our present program with the proposed performance specification of Enclosure 3 to the Generic Letter, we determined that the concept of basing surveillance intervals on reliability goals and data would be an efficient and effective method of maintaining reliability and identifying the need for remedial action.

Proposed Actions:

It is anticipated that the major task necessary in developing and implementing a reliability program, which monitors and evaluates individual unit reliability in accordance with a specified surveillance interval, will be the identification of an appropriate reliability goal per unit. This effort would involve a detailed comparison between the original FSAR design reliability basis and the basis for the unit reliability guidance contained in Generic Letter 84-15, Regulatory Guide 1.108, NUREG/CR-0660 and the Standard Technical Specifications.

Once the unit reliability goal for Fort St. Vrain has been defined, Technical Specification changes could be developed and proposed in conjunction with development of procedure changes and failure/start logs.

Comments:

Although Public Service Company agrees with the general objectives and methods outlined by Nuclear Regulatory Commission guidance and recommendations, because of the configuration of the Fort St. Vrain diesel generators we plan to approach the issue on the basis of an equivalent overall diesel generator reliability goal. The NRC guidance relates to a single unit diesel generator set reliability whereas the two Fort St. Vrain standby emergency generators are each powered by two diesel engines. Each generator can be operated at full capacity powered by its two diesel engines or operated at half capacity powered by either one of its two diesel engines. For safe shutdown loads, either generator operating at full capacity can supply the required loads, or the two generators both operating at half capacity can supply the required loads. The Fort St. Vrain diesel generator reliability goal will be established to produce the same overall reliability as two stand alone single unit diesel generator sets.



# DIESEL GENERATOR RELIABILITY DATA

Last 20 Starts	Eng. 1A Reliability	Eng. 1B Reliability	Eng. 1C Reliability	Eng. 1D Reliability
Last 100 Starts	1.00	1.00	.95	.95
Recommended Test Interval	.99	.98	.97	.98
	Monthly	Monthly	Monthly	Monthly

START NO.	SURVEILLANCE DATE	FAILURES	START NO.	SURVEILLANCE DATE	FAILURES	START NO.	SURVEILLANCE DATE	FAILURES	START NO.	SURVEILLANCE DATE	FAILURES
1	6-28-84		26	11-02-83		51	5-20-83		76	12-10-82	
2	6-21-84		27	10-25-83		52	5-19-83		77	11-29-82	
3	6-13-84		28	10-19-83		53	5-11-83		78	11-24-82	
4	6-06-84		29	10-11-83		54	5-04-83		79	11-17-82	
5	5-30-84		30	10-05-83		55	4-26-83		80	11-03-82	
6	5-23-84		31	9-30-83		56	4-20-83		81	10-27-82	
7	5-17-84		32	9-22-83	A & B	57	4-13-83		82	10-25-82	SA
8	5-10-84		33	9-14-83		58	4-06-83		83	10-20-82	
9	5-04-84	C & D	34	9-08-83		59	3-31-83		84	10-13-82	
10	4-23-84		35	8-31-83		60	3-24-83		85	10-06-82	
11	4-20-84		36	8-24-83		61	3-16-83		86	9-27-82	
12	4-19-84		37	8-17-83		62	3-09-83		87	9-22-82	
13	4-13-84		38	8-11-83		63	3-02-83		88	9-16-82	
14	1-18-84		39	8-03-83		64	2-28-83	SA	89	9-09-82	
15	1-12-84		40	7-27-83		65	2-24-83		90	8-30-82	
16	1-03-84		41	7-20-83		66	2-16-83		91	8-23-82	
17	12-27-83		42	7-13-83		67	2-09-83		92	8-16-82	
18	12-21-83		43	7-06-83		68	2-02-83		93	8-11-82	
19	12-14-83		44	6-29-83	C	69	1-26-83		94	8-02-82	
20	12-09-83		45	6-22-83		70	1-20-83		95	7-26-82	
21	11-30-83		46	6-16-83	C & D	71	1-12-83		96	7-19-82	
22	11-23-83		47	6-08-83		72	1-05-83		97	7-12-82	
23	11-18-83		48	6-07-83		73	12-29-82		98	7-06-82	
24	11-09-83		49	5-30-83		74	12-22-82		99	6-28-82	
25	11-03-83		50	5-27-83	B	75	12-15-82		100	6-21-82	

\* SA - Semi-Annual Loss of Offsite Power Test