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ACCESSION NBR: 9112110066 DOC. DATE: 91/12/02 NOTARIZED: NO DOCKET #
 FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
 AUTH. NAME AUTHOR AFFILIATION
 MEAD, S.C. Florida Power & Light Co.
 SAGER, D.A. Florida Power & Light Co.
 RECIPIENT NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-007-00: on 911104, diesel generators administratively declared out of SVC because of particulate contamination in diesel fuel oil. Caused by deficiency in plant Chemistry procedure. Procedures revised. W/911202

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December 2, 1991

L-91-326
10 CFR 50.73

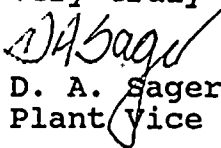
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Attn: Document Control Desk
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Gentlemen:

Re: St. Lucie Unit Nos. 1
Docket No. 50-335
Reportable Event: 91-007
Date of Event: November 4, 1991
Diesel Generators Out of Service because of Contamination in
the Diesel Fuel Oil

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,


D. A. Sager
Plant Vice President

DAS/JWH/kw

Attachment

cc: Stewart D. Ebnetter, Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #572-91

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LICENSEE EVENT REPORT (LER)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-630), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20545, AND TO THE PAPERWORK REDUCTION PROJECT 3150-0104, OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 1	DOCKET NUMBER (2) 0510101335	PAGE (3) 1 OF 5
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TITLE (4) **Diesel Generators Administratively Declared Out of Service Because of Particulate Contamination in the Diesel Fuel Oil Due to Procedure Deficiencies**

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES		DOCKET NUMBER(S)
1	1	04	9	1	007	0	0	12	St. Lucie, Unit 2		0151010131819
1	1	04	9	1	007	0	0	12	N/A		01510101

OPERATING MODE (9) 6	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR : (Check one or more of the following) (11)				
POWER LEVEL (10) 000	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)	OTHER (Specify in Abstract below and in Text NRC Form 366A)
	20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)	
	20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)		
	20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)		
	20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)		
	20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)	
NAME Sandra C. Mead, Shift Technical Advisor	TELEPHONE NUMBER AREA CODE 407 465 - 3550

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)									
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)	<input checked="" type="checkbox"/> NO					

ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)

On November 4, 1991 St. Lucie Nuclear Unit 1 was in Mode 6 (Refueling) and Unit 2 was in Mode 1 at 100% power when sample results telephoned from an off-site contract laboratory indicated out of specification particulate contamination in three of the four diesel fuel oil storage tanks (FOSTs) on site. Both the Unit 1 FOSTs and the 2B FOST contained greater than 10.0 milligrams per liter (mg/l) particulates. As a result of this, the 1A, 1B, and 2B Emergency Diesel Generators were administratively declared out of service. A mobile filtration system was brought in from a vendor to recirculate the fuel oil in the tanks and filter out the particulate contamination contained in the fuel oil. The FOSTs were cleaned and returned to service within the time limits of the applicable Technical Specification Action Statement on both units.

This event was caused by the use of a contaminated fuel oil tanker truck transfer pump and hose during the receipt of diesel fuel oil on October 10, 1991. The root cause of this event is procedural deficiencies in plant Chemistry procedures. The corrective actions undertaken as a result of this event are as follows: 1) The Chemistry procedures have been changed to eliminate the discrepancies discovered during this event, and make enhancements to ensure a similar event will not occur. 2) The first 100 gallons of all fuel oil shipments received will be flushed into drums. 3) A filtration unit is being purchased which will be installed on the fuel oil tanker discharge hose to trap any possible particulate contamination after flushing into the drums. 4) American Society of Testing and Materials (ASTM) Standard 2276-83 particulate testing will be performed on the fuel oil tanker for all shipments prior to transferring any fuel oil into the site FOSTs until the filtration unit is installed. 5) The Chemistry Department is having an outside vendor conduct a review of all other diesel fuel oil analytical techniques to ensure compliance with the ASTM Standard.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION
REQUEST: 50.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS
AND REPORTS MANAGEMENT BRANCH (P-335), U.S. NUCLEAR REGULATORY COMMISSION,
WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE
OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 5	LER NUMBER (6)			PAGE (3)	
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TEXT (If more space is required, use additional NRC Form 366A's) (17)

DESCRIPTION OF THE EVENT

On November 4, 1991 St. Lucie Unit 1 was in Mode 6 (Refueling) and Unit 2 was in Mode 1 operating at 100% power. At 1030 the St. Lucie Plant Chemistry Supervisor was contacted by the contract laboratory responsible for a portion of the Technical Specification diesel fuel oil testing. Analysis results on samples shipped to the contract laboratory on October 23, 1991 indicated three of the four site Emergency Diesel Generator Fuel Oil Storage Tanks (EIS:DC) were out of specification high on particulate contamination. The affected Emergency Diesel Generator Fuel Oil Storage Tanks (FOSTs) and the particulate concentrations of same were:

1A FOST	12.9 milligrams per liter
1B FOST	16.4 milligrams per liter
2B FOST	16.6 milligrams per liter

The 2A FOST was in specification with a particulate concentration of 3.75 milligrams per liter (mg/l). The particulate contamination is required to be less than 10.0 mg/l by the Unit 1 and Unit 2 Technical Specifications.

The 1A, 1B, and 2B Emergency Diesel Generators (EDGs) (EIS:EK) were declared administratively out of service at 1030 on November 4, 1991. Technical Specification Action Statements were entered on both units. The 1B EDG was declared back in service at 0730 on November 5 when the site Chemistry laboratory confirmed a particulate level of 9.6 mg/l due to dilution as a result of receipt of another shipment of diesel fuel oil. Unit 1 Technical Specification 3.8.1.2 was exited.

A special mobile filtration unit was secured to recirculate the diesel fuel oil contained in the storage tanks, thus filtering out the particulate contamination. The filtration unit was obtained from a vendor and arrived on site at 1500 on November 5, 1991. The filtration unit was first used to cleanup the 2B FOST, bringing the particulate contamination to a level of 1.0 mg/l. The 2B EDG was returned to service at 0110 on November 6. Unit 2 Technical Specification 3.8.1.1 was exited, within the time limit constraints of the Limiting Condition for Operation.

The 1B FOST was run through the filtration unit and brought to less than 1 mg/l particulates at 1830 on November 6. The particulate level in the 1A FOST was reduced to less than 1 mg/l after being recirculated through the filtration unit. The 1A EDG was out of service during this event for a mechanical overhaul and other outage related work.

CAUSE OF THE EVENT

The root cause of this event is a procedural deficiency in the plant Chemistry procedure C-05 Diesel Fuel Oil Inventory, Receiving Shipments and Periodic Sampling. During this event, all the required sampling and testing were performed in accordance with the Plant Technical Specifications.

**LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION**

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.8 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-330), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) St. Lucie Unit 1	DOCKET NUMBER (2) 0 5 0 0 0 3 3 5	LER NUMBER (6)			PAGE (3)		
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Although all the surveillances for fuel oil shipments were performed in accordance with applicable Technical Specification sampling requirements, the tainted fuel oil tanker pump and discharge hose were not detected prior to transfer to the site FOSTs. This event is being reported as a procedural deficiency although the particulate contamination analysis is not required by Technical Specifications to be performed for each diesel fuel oil shipment received on site.

It is believed this event occurred due to using a contaminated diesel fuel oil tanker truck transfer pump and discharge hose during the receipt of diesel fuel oil on October 10, 1991. Contaminants contained in the tanker pump and discharge hose were pumped into the 1A FOST and subsequently to the other tanks as a result of fuel oil movement to support various EDG surveillance requirements. This conclusion is supported by the visual clarity of the diesel fuel oil drawn from the tanker directly; there was no visual evidence of particulate contamination. Reconstructing the diesel fuel oil transfers over the days following October 10, the contaminated fuel oil was put in the 1A, 1B, and 2B FOSTs, but none was transferred to the 2A FOST. The 2A FOST remained in service throughout the entire event. The premise that the particulate contamination came from the tanker truck discharge pump and hose is further supported by the contract laboratory analyses performed on the solids found in the contaminated fuel oil samples from the FOSTs. The results indicated contaminants very similar in composition to the coal tar base found in used lubricating oil.

Based upon the analyses, the contract laboratory states that the results "strongly supports a conclusion that the observed particulate contamination is derived from an external source and is not the result of oxidation."

As a result of the detailed evaluation of this event, two inadequacies were discovered with the site analytical procedure for particulate contamination testing, Chemistry Procedure C-121, Determination of Particulate Contamination and Check for Clear and Bright Appearance with Proper Color Diesel #2 Fuel Oil. The incorrect solvent was being used for the flushing solution when rinsing the filter after the addition of the fuel oil sample to the filtration apparatus. This resulted in some of the particulate contamination being solubilized. It was also discovered that the speed of filtration affects the particulate sample results. If the speed of filtration is too slow, the control filter does not rinse properly. This testing has been performed on-site in accordance with Chemistry Procedure C-121, Determination of Particulate Contamination and Check for Clear and Bright Appearance with Proper Color Diesel #2 Fuel Oil since February 22, 1989. Both procedural inadequacies have been corrected and subsequent confirmation of the contract laboratory results was achieved by the plant Chemistry Department. Both of these situations resulted in lower than actual analysis results. As a result, the particulate contamination values reported since February 22, 1989 for Technical Specification surveillance requirement 4.8.1.1.2.d could have been lower than actual values.

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ANALYSIS OF THE EVENT

This event is reportable under 10 CFR 50.73(a)(2)(i)(B), any operation or condition prohibited by the plant's Technical Specifications. The particulates in the 2B Emergency Diesel Fuel Oil Storage Tanks were out of specification high for greater than the 72 hours allowed by Technical Specification 3.8.1.1. in Modes 1, 2, 3, and 4. The fuel oil shipment by which the FOSTs became tainted was received on October 10, 1991. The high particulate contamination was not discovered until November 4, 1991.

The 1A and 1B FOSTs had high particulate contamination since October 10, 1991. As soon as the high particulates were discovered in the Unit 1 FOSTs, actions of Technical Specification 3.8.1.2 were complied with; the plant immediately suspended all operations involving core alterations, positive reactivity changes, movement of irradiated fuel, or crane operation with loads over the fuel storage pool.

The inadequacies in the utility fuel oil sampling procedure probably resulted in the reporting of lower than actual particulate values since the procedure was developed on February 22, 1989. This situation is also reportable under 10 CFR 50.73(a)(2)(i)(B), any operation or condition prohibited by the plant's Technical Specifications.

Upon receipt of the diesel fuel oil shipment on October 10, 1991 all the Technical Specification required samples were drawn and analyzed, with satisfactory results for the sampling of new fuel oil prior to the addition to the FOSTs. There is no Technical Specification requirement for the particulate analysis to be performed upon receipt of each fuel oil shipment, only that the fuel oil have a clear and bright appearance with proper color. The Technical Specifications require testing specified in ASTM D975-81 be performed prior to addition to the storage tanks; this testing consists of API Gravity, Kinematic Viscosity, Flash Point, and a clear and bright appearance with proper color prior to addition, with the remainder of ASTM D975-81 results within 31 days. The particulate contamination analysis (ASTM D2276-83) is required to be performed once every 31 days, and is performed by the plant Chemistry Department at the beginning of each month.

The Emergency Diesel Generators affected by the contaminated FOSTs were declared out of service administratively. The Diesel Generators could have, and in fact did, perform in accordance with the design bases as required by Technical Specifications surveillances. Additionally, offsite power was always operable throughout this condition.

At no time during this event were the operable Emergency Diesel Generators unable to perform their intended safety function. Thus, the health and safety of the public were not at risk at any time during this event.

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CORRECTIVE ACTIONS

- 1) Chemistry procedure C-05, Diesel Fuel Oil Inventory, Receiving Shipments and Periodic Sampling, will be revised to require the first 100 gallons of all diesel fuel oil shipments received be flushed into drums to ensure cleanliness of the fuel oil tanker pump and discharge hose.
- 2) The Chemistry Department will obtain a filtration unit to be installed on the diesel fuel oil tanker discharge hose to catch possible particulate contamination after flushing the initial 100 gallons to drums. Use of this filtration unit will be incorporated into Chemistry procedure C-05, Diesel Fuel Oil Inventory, Receiving Shipments and Periodic Sampling.
- 3) Until the filtration system is installed, the Chemistry Department will perform ASTM 2276-83 particulate testing on all diesel fuel oil tankers received at the site. The sample will be drawn from the discharge of the tanker pump and hose and analyzed prior to any diesel fuel oil transfers to the plant FOSTs.
- 4) The Chemistry procedure C-121, Determination of Particulate Contamination: and Check for Clear and Bright Appearance with Proper Color Diesel #2 Fuel Oil, has been changed to eliminate the procedural deficiencies which resulted in reporting low particulate results on the monthly FOST oil analyses.
- 5) The Chemistry Department is having an outside vendor conduct a review of all other diesel fuel oil analytical techniques to ensure compliance with the ASTM Standard.
- 6) The Chemistry Department will establish 6 month full ASTM analysis on all FOSTs, which includes split samples for particulate contamination testing. Chemistry procedure C-01, Schedule for Periodic Tests, has been revised to reflect this additional testing. The contract laboratory will also perform this testing as a quality control self-assessment for the plant.
- 7) An INPO Nuclear Network entry will be made to notify the industry of this event.

ADDITIONAL INFORMATION

Component Failures:

None

Previous Similar Events:

This is the first LER at St. Lucie where high particulate contamination in the Diesel Fuel Oil Storage Tanks rendered the associated Emergency Diesel Generators administratively inoperable.