CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9711120154 DOC.DATE: 97/11/07 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
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STALL,J.A. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-007-00:on 971008,inoperable containment cooling fan resulted in operation of facility outside design basis. Caused by non-cognitive personnel error.CCS operation was revised & issued on 971013.W/971107 ltr.

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TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

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FPL

Florida Power & Light Company, 6351 S. Ocean Drive, Jensen Beach, FL 34957

November 7, 1997

L-97-275
10 CFR 50.73

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

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 97-007
Date of Event: October 8, 1997
Inoperable Containment Cooling Fan Results in Operation of Facility Outside Design Basis

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,

J. Scarola for

J. A. Stall
Vice President
St. Lucie Plant

JAS/KWF

Attachment

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

NRC FORM 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 04/30/98
ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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TITLE (4)

Inoperable Containment Cooling Fan Results in Operation of Facility Outside Design Basis

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 NAME	DOCKET NUMBER
10	8	97	97	-- 007 --	0	11	7	97	N/A	05000
									FACILITY NAME	DOCKET NUMBER
										05000

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)					
OPERATING MODE (9)	1	20.2201(b)		20.2203(a)(2)(v)	X	50.73(a)(2)(i)	50.73(a)(2)(viii)
POWER LEVEL (10)	100	20.2203(a)(1)		20.2203(a)(3)(i)	X	50.73(a)(2)(ii)	50.73(a)(2)(x)
		20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)	73.71
		20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)	OTHER
		20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
		20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
K. W. Frehafer, Licensing Engineer	(561) 468-4284

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
D	BK	FCU	J127	NO						
A	BK	FCU:MO	R165	NO						

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE).	X	NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 4, 1997, Unit 2 was in Mode 1 at 100 percent power. Utility licensed operators questioned the 31 day surveillance method used to test the containment cooler fans and satisfy Technical Specification 4.6.2.1.1.a.1 requirements. Each fan cooler is equipped with a two-speed motor (with separate windings) to satisfy both the normal (fast speed) and post-accident (slow speed) functions. The apparent cause for the inadequate surveillance was non-cognitive personnel error that occurred at the time of plant licensing when the inadequate surveillance procedure was developed. FPL started and operated the containment cooling fans in fast speed during the surveillance, which does not demonstrate that the fan coolers can perform their post-accident function.

On October 6, 1997, FPL discovered an additional issue with the containment cooling system when the fans were started and run in slow speed. Containment cooler fan 2-HVS-1D generated a low flow alarm during slow speed testing. The fan cooler was declared out of service and Unit 2 entered ACTION statement 1.b of Technical Specification 3.6.2.1. On October 8, 1997, FPL determined that the 2-HVS-1D containment cooling fan was rotating in reverse when run in slow speed. The apparent cause for the reverse rotation of containment cooling fan 2-HVS-1D was human error that occurred during the execution of post maintenance testing performed on May 16, 1997.

Corrective actions include: correcting the slow speed rotation of containment cooler fan 2-HVS-1D; revising the 31 day containment cooler fan surveillance procedure to ensure the fans are tested in slow speed; investigating whether similar problems may exist with other surveillance procedures; training on the event; and the enhancement of several Maintenance procedures.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

DESCRIPTION OF THE EVENT

On October 4, 1997, Unit 2 was in Mode 1 at 100 percent power. Utility licensed operators questioned the 31 day surveillance method used to test the containment cooler fans [EIIS:BK:FCU] and satisfy Technical Specification requirements. Technical Specification surveillance 4.6.2.1.1.a.1 requires starting each containment cooling fan unit from the Control Room, and verifying fan operation for at least 15 minutes. Procedure NOP 2-2000020, "Containment Cooling System Operation," performs the 31 day surveillance test of the containment fan coolers. The procedure and Technical Specification surveillance 4.6.2.1.1.a.1 did not specify what speed to operate the fans in during the surveillance. FPL started and operated the containment cooling fan in fast speed during the surveillance, which does not demonstrate that the fan cooler can perform its post-accident function.

The containment cooling system has two modes of system operation. In the normal operating mode three fan coolers operate in fast speed to maintain containment temperature. In the post-accident Safety Related mode of operation, all four fan coolers operate in slow speed after receiving Safety Injection Actuation Signal (SIAS) start signals. On October 8, 1997, FPL determined that the intent of Technical Specification surveillance requirement 4.6.2.1.1.a.1 is to start each containment cooling fan unit in slow speed from the Control Room, and verify operation in slow speed for at least 15 minutes.

On October 6, 1997, FPL discovered an additional issue with the containment cooling system when the fans were started and run in slow speed. Containment cooler fan 2-HVS-1D generated a low flow alarm during the slow speed testing. This fan cooler was declared out of service (OOS) and Unit 2 entered the 7 day ACTION statement 1.b of Technical Specification 3.6.2.1.

On October 7, 1997, in response to the observed low flow alarm on 2-HVS-1D, FPL performed a series of fan run tests to determine system performance and record motor currents in various slow and fast speed configurations. During this testing, the low flow alarm condition was again observed for 2-HVS-1D, and another low flow alarm was received for 2-HVS-1A. Operations declared 2-HVS-1A OOS, and Unit 2 entered the 72 hour ACTION statement 1.d of Technical Specification 3.6.2.1 for two inoperable containment cooling trains.

On October 8, 1997, FPL determined that the 2-HVS-1D containment cooling fan was rotating in reverse in slow speed. The reverse rotation of the fan was corrected on October 9, 1997, by implementing a Temporary System Alteration that rolled two of the three power leads to the low speed winding of the fan motor [EIIS:BK:FCU:MO] at the motor control center. FPL verified fast and slow speed air flows for 2-HVS-1D as part of the post maintenance testing.

The investigation into the cause of the low flow alarm on 2-HVS-1A determined that the problem resided in the low flow instrumentation and was not due to improper operation of the cooling fan. On October 9, 1997, Maintenance replaced the low flow alarm switch for 2-HVS-1A. The low flow alarm cleared after the new switch was placed in service and remained clear during all subsequent testing, which included both slow and fast speed starts.

On October 9, 1997, Operations declared all containment fan coolers back in service, and exited the ACTION statement for Technical Specification 3/4.6.2.1.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

DESCRIPTION OF THE EVENT (cont'd)

FPL reviewed the maintenance history of containment cooling fan 2-HVS-1D and determined that containment cooling fan 2-HVS-1D was replaced during the 1997 Unit 2 refueling outage as part of its normal Equipment Qualification (EQ) replacement schedule. Every outage, one containment cooling fan motor is replaced in accordance with MP-2-0950173, "The Overhaul of Containment Fan Cooler Motors 2-HVS-1A, 1B, 1C, 1D (EQ Motors)."

The time line for the 1997 Unit 2 refueling outage maintenance activities performed on containment cooling fan 2-HVS-1D was as follows:

April 14, 1997 - Operations removed 2-HVS-1D from service.

May 1, 1997 - I&C Maintenance removed the flow switch for 2-HVS-1D to assist in the motor replacement in accordance with Work Order (WO) 97002696-01. The specified Post Maintenance Test (PMT) requires that the fan be run to verify that the low flow alarm annunciator clears.

May 10, 1997 - I&C Maintenance replaced flow switch for 2-HVS-1D. The PMT was deferred because the fan could not be operated at this time.

May 16, 1997 - Maintenance performed the 2-HVS-1D motor rotation check per procedure MP-2-0950173. Reverse slow speed motor rotation was missed during performance of rotation check.

May 19, 1997 - The portion of the Integrated Safeguards Test that verifies post-accident actuation of 2-HVS-1D was performed. 2-HVS-1D started in slow speed as expected.

May 21, 1997 - PMT for WO 97002696-01 performed by running 2-HVS-1D in fast speed in accordance with the 31 day Technical Specification surveillance test (NOP 2-2000020) in order to return the fan cooler back to service. WO 97012388-01 initiated to troubleshoot the observed low flow alarm. I&C Maintenance discovered that the flow sensing pitot tube was installed incorrectly, which was promptly corrected. Subsequent PMT results were satisfactory, and Operations returned containment fan cooler 2-HVS-1D to service.

CAUSE OF THE EVENT

The apparent cause for the containment cooler fan surveillance procedure deficiency was non-cognitive personnel error that occurred at the time of plant licensing during the development of surveillance procedure NOP 2-2000020, "Containment Cooling System Operation." The procedure as written did not meet the intent of the Technical Specification surveillance requirements because the containment cooler fans were tested in fast speed, when the post-accident safety related function for the fans is to operate in slow speed. A contributing factor for this error was that the surveillance requirement for Technical

CAUSE OF THE EVENT (cont'd)

Specification 4.6.2.1.1.a.1 is the same for both St. Lucie Unit 1 and 2, and only requires starting and operating the fans for 15 minutes. Unlike St. Lucie Unit 1, St. Lucie Unit 2 has dual speed containment cooler fans, and the Technical Specification surveillance does not specify an operating speed (i.e., slow) for the fans during the surveillance.

FPL investigated the generic implications of this event to determine what other equipment types may be subject to inadequate surveillances. FPL developed a list of equipment types governed by Technical Specification surveillances. Next, the equipment types were reviewed to determine if other industry or regulatory programmatic guidance existed that would assist in development of surveillance procedures. For instance, safety related pump surveillances are based not only on the Technical Specification requirements but also the ASME Section XI Pump and Valve test program. This review revealed that, with the exception of HVAC equipment, additional requirements exist which enhance the development of surveillance procedures. Therefore, FPL concluded that HVAC equipment surveillance procedures were most susceptible to not meeting the intent of the Technical Specifications, and all HVAC procedures used to perform Technical Specification surveillances are being reviewed.

The apparent cause for the low flow alarm on 2-HVS-1A was a leak in the process sensing line. FPL determined that the containment cooling fan was operating correctly because correct direction of fan rotation was verified in both fast and slow speeds and there was strong qualitative evidence that the 2-HVS-1A fan air flow rates were correct. Subsequent inspection and setpoint verification of the removed switch did not reveal any abnormalities that would have caused a spurious low flow alarm. Due to the small magnitude of the process signal (approximately 0.8 inches water column differential pressure), a leak in the process sensing line is considered a credible failure mechanism. All connections were inspected and tightened when the new switch was installed.

The apparent cause for the reverse rotation of containment cooling fan 2-HVS-1D was personnel error that occurred during the execution of post maintenance testing performed during the last Unit 2 refueling outage. The 2-HVS-1D containment cooling fan motor was replaced in accordance with procedure MP-2-0950173, which requires performing both slow and fast speed motor rotation checks during post maintenance testing. The containment cooler fan motors are three phase AC motors. The direction of motor rotation is established by the way the three power conductors are connected to the motor windings. If motor rotation is found to be in the wrong direction, the condition is corrected in the field by swapping any two power conductors. On October 17, 1997, FPL reviewed the completed documentation for the May 16, 1997 post maintenance test and compared it against the May 16, 1997 Unit 2 control room Sequence of Event Recorder (SER). The SER showed that 2-HVS-1D was started twice during the post maintenance testing, however, both the slow and fast speed rotational checks were performed with the motor operating in fast speed. The fact that two motor starts were done implies that maintenance personnel were correctly following the test procedure steps. FPL concludes that the most probable human error that caused the improper test execution on May 16, 1997, was faulty communications between the maintenance personnel assessing fan rotation inside containment and the control room operator who started the fan.

TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

CAUSE OF THE EVENT (cont'd)

Contributing causes for the faulty communications include:

I) The Electrical Maintenance personnel inside containment have no local indication of which motor windings are energized during the rotation checks. The motor rotation check is performed by momentarily energizing the motor from the control room and checking the direction of fan rotation during the motor coast-down.

II) The Control Room operators apparently did not have a copy of procedure MP-2-0950173, "The Overhaul of Containment Fan Cooler Motors 2-HVS-1A, 1B, 1C, 1D (EQ Motors)," in hand to follow the post maintenance testing.

III) Procedure MP-2-0950173, "The Overhaul of Containment Fan Cooler Motors 2-HVS-1A, 1B, 1C, 1D (EQ Motors)," does not specifically identify that the containment fan cooler fan motors are dual winding motors, which may have alerted the Electrical Maintenance personnel to the potential effects a dual winding motor may have on the post maintenance testing. Additionally, the procedure did not require signatures for verification of fan rotation in both speeds, but only required the verification signature for the slow speed fan rotation check.

Procedure AP 0010020, "Conduct of Infrequently Performed Tests or Evolutions at St. Lucie Plant," requires the operators to consider all annunciators received during the Integrated Safeguards Test as valid. The reason the 2-HVS-1D low flow alarm was not noted as a test anomaly during the May 19, 1997 Integrated Safeguards Test was that 2-HVS-1D was known to be OOS, therefore the annunciator was not valid. 2-HVS-1D was OOS because the PMT for the flow switch had not been completed.

The apparent cause for the May 21, 1997 PMT that missed the reverse slow speed rotation of 2-HVS-1D was that the retest was done in accordance with the inadequate 31 day Technical Specification surveillance procedure NOP 2-2000020. As discussed earlier, this procedure was inadequate because it only tested the containment fan coolers in fast speed. Although the PMT that was performed on May 21, 1997 revealed that the flow sensing pitot tube was installed incorrectly, the test could not prove that the safety related slow speed function was satisfactory.

ANALYSIS OF THE EVENT

This event is reportable in accordance with both 10 CFR 50.73(a)(2)(i)(C) and 10 CFR 50.73(a)(2)(ii)(B) for the following reasons:

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ANALYSIS OF THE EVENT (cont'd)

I) 10 CFR 50.73(a)(2)(i)(C) which requires submitting a Licensee Event Report (LER) for "any operation or condition prohibited by the plant's Technical Specifications," for the following conditions:

a) the operation of the containment cooling system with a 31 day surveillance that did not demonstrate operability of the system, and;
b) the operation of the containment cooling system with 2-HVS-1D inoperable (including mode changes prohibited by Technical Specification 3.0.4).

II) 10 CFR 50.73(a)(2)(ii)(B) which requires submitting an LER for "any event or condition that resulted in the nuclear power plant being in a condition that was outside the design basis of the plant," for the time when 2-HVS-1D could not perform its accident mitigation function because of reverse slow speed rotation. A single failure of the opposite electrical train would have resulted in one containment spray header and only one of the required two containment fan coolers operating post-accident, a condition outside the plant's design basis.

The containment cooling system has two modes of system operation. During normal operation, three containment coolers operate in fast speed to maintain containment temperatures within Technical Specification limits. Each fan cooler is equipped with a two-speed motor (with separate windings) to accommodate both the normal and post-accident functions. In the post-accident safety related mode, all four fan coolers operate in slow speed after receiving SIAS start signals. The increased containment atmosphere density post-accident requires that the fans run in slow speed. Separate contactors are used in the motor control circuit for fast and slow speeds. Each fan has a four-position control switch in the Control Room, and the TEST position of each switch is used for testing the fan cooler in slow speed.

The system design assumes that all operating fans are running at the same speed (i.e., fast speed for normal containment cooling, and slow speed during an accident). All four fan coolers discharge into the common containment ring header via a gravity operated damper. With the common discharge header arrangement, the hydraulics of one fan can affect the operation of another fan. For example, if one or more fans are operating in fast speed, the increased pressure in the ring header opposes full opening of the gravity damper for a fan running in slow speed. While concurrent operation of some fans in fast speed and some fans in slow speed is not detrimental to the fans or motors, operation in this configuration may result in low flow alarms.

Reverse slow speed operation of the 2-HVS-1D fan cooler did not affect the normal operation of the containment cooling system. There is no evidence to suggest that reverse operation of the fan cooler in slow speed caused any damage or degradation of 2-HVS-1D. FPL conducted visual inspections of the motor and fan blades and no damage was observed. The bolts used to set the fan blade pitch were inspected along with the associated lock wiring with no noted deficiencies. The fan logged very little run time in slow speed after the motor wiring error occurred. Most of this slow speed run time occurred during the integrated safeguards test. Since that test, the fan logged a significant number of satisfactory fast speed run time hours, thus providing further support that no damage occurred due to reverse rotation.

ASSESSMENT OF SAFETY SIGNIFICANCE

The containment cooling system consists of two trains of containment spray, two trains of containment fan coolers (each train consists of two coolers) and two shutdown cooling heat exchangers. The containment cooler fans utilize a separate fast and slow speed set of windings. During normal operation, three containment coolers operate in fast speed to maintain containment temperature. Upon receipt of a SIAS, all four fans start in slow speed to remove accident heat loads. Full post-accident containment heat removal is met by one spray and two containment coolers.

With the as-found condition of 2-HVS-1D, only three fan coolers would be operable post-accident because reverse slow speed operation of fan cooler 2-HVS-1D results in the closing of its gravity operated damper. A postulated single failure on the electrical train Emergency Diesel Generator (EDG) opposite from 2-HVS-1D results in one spray train and one operable containment cooler. This configuration is not bounded by the accident analysis which assumes that the most limiting single failure results in one containment spray header and two containment fan coolers in operation.

The containment coolers play a more significant role in mitigating the pressure and temperature effects for the Loss of Coolant Accident (LOCA) event than they do for the Main Steam Line Break (MSLB) event because the MSLB post-accident containment temperature spike duration is much shorter. Therefore, this safety assessment is focused on the LOCA event. A qualitative assessment of the impact of 2-HVS-1D being out of service, coincident with an EDG failure, on the post-LOCA containment analysis was performed. This assessment was performed relative to the criteria of containment peak pressure and the EQ temperature envelope. To support this assessment, a comparison was performed on the differences in the containment pressure and temperature results between the analysis of record and the subject configuration.

A review of the containment analysis of record shows that the peak containment pressure case produced a peak containment pressure of 36.2 psig. This pressure is below both the Integrated Leak Rate Test (ILRT) pressure of 41.8 psig and the containment design pressure of 44 psig. Approximately 5.6 psig of margin exists to the ILRT limit and 7.8 psig of margin exists to the containment design pressure limit.

Based on engineering knowledge and experience with containment performance analysis, the impact of a loss of one containment fan cooler would not cause peak containment pressure to increase by greater than 5 psi. This was confirmed by a CONTRANS computer code run which started with the limiting minimum safety injection case. One containment fan cooler was eliminated, which left one containment spray and one containment fan cooler in operation. Due to the peak pressure occurring within three to four minutes of the postulated primary side break, the impact of losing one containment fan cooler was calculated to be less than 0.5 psi. This case provided a "delta" pressure result of the specific impact of losing one containment fan cooler. In terms of peak containment pressure, this clearly shows that ample margin is preserved to both the ILRT and containment design pressure limits. As expected, since the peak pressure occurs relatively soon after the postulated break, the impact of losing one containment cooling fan is not significant.

TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

ASSESSMENT OF SAFETY SIGNIFICANCE (cont'd)

In terms of the overall post-accident 30 day EQ temperature profile, the loss of one containment fan cooler results in a several degree temperature increase during this time period. To support this assessment, the limiting EQ case was rerun similar to the peak pressure case, with one containment spray train and one containment fan cooler in operation. The resulting temperature profile was compared to the current EQ profile. Although the profile exceeds the EQ profile for a short duration at approximately 1000 seconds, an Arrhenius comparison of the two curves demonstrates that the single containment fan cooler case is well bounded by the current EQ temperature profile.

Based on the comparison of existing margins from preliminary computer runs, FPL concludes that the inoperability of one containment fan cooler did not pose a safety concern. The existing containment pressure margins, although slightly reduced, are still sizable and the reduction in containment heat removal would not challenge the containment integrity. Additionally, the postulated temperature profile would not challenge the capability of the inside containment Class 1E equipment to perform its intended safety functions.

FPL performed a risk assessment scoping evaluation of the impact of 2-HVS-1D not being able to start. With 2-HVS-1D assumed OOS (i.e., the fail to start event is set to "true"), the change in Core Damage Frequency (CDF) is approximately 1E-7/yr, and the estimated change in Large Early Release Fraction (LERF) is less than 1E-10/yr.

The 18 month Integrated Safeguards Test tests the operation of the containment cooler fans in slow speed. FPL also performed a risk assessment scoping evaluation to estimate the impact of 18 month testing for the containment coolers in lieu of monthly testing. For this comparison it was assumed that the baseline failure rate is a representative failure rate for monthly testing and that the failure probability for 18 month testing would be estimated at 18 times the monthly failure probability (or 18 x 2.39E-3 = 4.3E-2). Changing the failure probability for all four containment cooling fans to 4.3E-2 results in a 2E-8/yr change in CDF.

In summary, the impact of 2-HVS-1D reverse slow speed rotation is not significant from either containment failure, EQ, or core damage viewpoints. Based on the above, FPL concludes that this event did not represent a significant impact to the protection of the health and safety of the public.

CORRECTIVE ACTIONS

Corrective actions to ensure that surveillance procedures meet the intent of Technical Specifications include:

1. Procedure NOP 2-2000020, "Containment Cooling System Operation," was revised and issued on October 13, 1997. The revision clearly indicates that all fans must be started and run in slow speed because the proper system configuration is to have all four fans running in slow speed. Once all four fans have been shifted to slow speed, the absence of any low flow alarms throughout the 15 minute run time constitutes satisfactory completion of the surveillance test.

   This issue is not applicable to St. Lucie Unit 1 because the containment cooling fans do not have dual winding motors (i.e., they are single speed fan units).

2. FPL is reviewing all HVAC procedures that implement Technical Specification surveillance requirements.

Corrective actions implemented for post maintenance testing include:

3. Procedure ADM-08.02, "Conduct of Maintenance," underwent a major revision in early 1997 to require the use of accurate communications during maintenance activities. Although this procedure change pre-dates this event, all aspects of the continuing Maintenance department training program emphasize the use of three way communications.

4. This specific event, including the importance of accurate communications and the use of three way communications, will be included in a Maintenance training bulletin to be issued by November 30, 1997.

5. Procedure MP-2-0950173, "The Overhaul of Containment Fan Cooler Motors 2-HVS-1A, 1B, 1C, 1D (EQ Motors)," was issued on October 27, 1997 to provide specific details about the dual winding motors, to require signatures for rotation testing for both speeds, and to add a caution statement that both windings must be exercised when the motor is electrically disconnected. An additional procedure revision will be issued by December 1, 1997, to include an addendum sheet that will be used by the control room operators to follow the performance of the motor rotation checks and to require a functional test of the containment fan cooler in both fast and slow speed prior to returning the unit to service.

6. Procedure ADM-78.01, "Post Maintenance Testing," will be revised to add a caution note about testing multiple speed or multiple winding motors by January 31, 1998.

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ADDITIONAL INFORMATION

Failed Component Identification:

Manufacturer: Reliance Electric Co.
Model Number: 1XF882438A4-NE
Device: Motor for Containment Fan Cooler HVS-1D

Manufacturer: Joy Manufacturing Co.
Model Number: 45-26-1770/1170
Device: Containment Fan Cooler HVS-1D

Previous Similar Events:

Recent LERs on related inadequate human performance Post Maintenance Test issues:

LER 389/97-005, "Past Inoperability of FI-3306 Resulted in Operation of Facility in a Manner Prohibited by Technical Specifications."

Recent LERs on Technical Specification surveillance issues:

LER 389/97-006, "Operation Prohibited by Technical Specifications due to Inadequate Surveillance Testing of ESF Subgroup Relays."

LER 335/96-016, "Insufficient Testing and Maintenance on 125V DC Cross-Tie Breakers."