

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9407070132 DOC. DATE: 94/06/28 NOTARIZED: NO DOCKET #
 FACIL: 50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
 AUTH. NAME AUTHOR AFFILIATION
 HURCHALLA, J.A. Florida Power & Light Co.
 SAGER, D.A. Florida Power & Light Co.
 RECIP. NAME RECIPIENT AFFILIATION

SUBJECT: LER 93-009-01: on 931117, containment isolation sys subgroup actuation module trip occurred due to spurious signal on one containment isolation sys channel. Module replaced, tested & reset. W/940628 ltr.

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June 28, 1994

L-94-168

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

Re: St. Lucie Unit 1
Docket No. 50-389
Reportable Event: 93-009-01
Date of Event: November 17, 1993
Engineered Safety Features Actuation due to
Spurious Subgroup Actuation Module Trip

The attached Licensee Event Report is being submitted voluntarily,
as a revision to the original Licensee Event Report.

Very truly yours,

A handwritten signature in black ink, appearing to read 'D. A. Sager'.

D. A. Sager
Vice President
St. Lucie Plant

DAS/LLM/kw

Attachment

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

DAS/PSL #1151-94

000128

9407070132 940628
PDR ADDCK 05000389
S PDR

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Handwritten initials 'IFE' and the number '11' in black ink.

LICENSEE EVENT REPORT (LER)

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

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (MNBB 7714), 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.

FACILITY NAME (1) St. Lucie Unit 1	DOCKET NUMBER (2) 05000335	PAGE (3) 1 OF 5
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TITLE (4) **Engineered Safety Features Actuation due to Spurious Subgroup Actuation Module Trip**

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
11	17	93	93	--009--	1	6	28	94	N/A	
									N/A	

OPERATING MODE (9) 1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)									
POWER LEVEL (10) 98	<input type="checkbox"/> 20.402(b)	<input type="checkbox"/> 20.405(c)	<input checked="" type="checkbox"/> 50.73(a)(2)(iv)	<input type="checkbox"/> 73.71(b)						
	<input type="checkbox"/> 20.405(a)(1)(i)	<input type="checkbox"/> 50.36(c)(1)	<input type="checkbox"/> 50.73(a)(2)(v)	<input type="checkbox"/> 73.71(c)						
	<input type="checkbox"/> 20.405(a)(1)(ii)	<input type="checkbox"/> 50.36(c)(2)	<input type="checkbox"/> 50.73(a)(2)(vii)	OTHER						
	<input type="checkbox"/> 20.405(a)(1)(iii)	<input type="checkbox"/> 50.73(a)(2)(i)	<input type="checkbox"/> 50.73(a)(2)(viii)(A)	(Specify in Abstract below and in Text, NRC Form 366A)						
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	<input type="checkbox"/> 20.405(a)(1)(v)	<input type="checkbox"/> 50.73(a)(2)(iii)	<input type="checkbox"/> 50.73(a)(2)(x)							

LICENSEE CONTACT FOR THIS LER (12)	
NAME James A. Hurchalla, Shift Technical Advisor	TELEPHONE NUMBER (Include Area Code) (407) 465-3550

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	R	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	JE	DET	V115	Y						

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

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

On November 17, 1993, Unit 1 was in mode 1 and operating at 98% steady state power. One of four Engineered Safety Features Actuation System containment radiation measurement bistables was in trip due to maintenance. At 1336 Unit 1 experienced a trip of a single subgroup actuation module on one of two containment isolation system actuation channels. Utility licensed operators and the Instrument and Control system supervisor confirmed proper component actuation of this subgroup module. The subgroup actuation module trip was determined to be spurious and the actuation module signal reset. The subgroup actuation module was replaced as a precaution and the new module was tested satisfactorily. The actuated components were then returned to their normal position.

The root cause of the containment isolation system subgroup actuation module trip was due to a spurious signal on one containment isolation system radiation monitoring channel while another channel was out of service and in the trip condition.

Corrective actions were: The subgroup actuation module was replaced and tested and the actuated components were reset. Repairs were completed on the previously out of service containment radiation channel and the radiation detector was replaced. The subgroup actuation module was tested by the vendor and found to be functioning correctly.



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LICENSEE EVENT REPORT (LER)
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				93	--009--	1	

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

DESCRIPTION OF THE EVENT

On November 17, 1993, St. Lucie Unit 1 was in mode 1 at 98% steady state power. The Engineered Safety Features Actuation System (ESFAS) (EIIS:JE), which normally requires two of four channels in trip for actuation, was in one out of three logic for the containment isolation system (CIS) (EIIS:JM). The MA containment radiation loop was out of service for repair and had been placed in trip per Technical Specification 3.3.2.1. The CIS as actuated by containment radiation consists of four independent measurement channels (MA,MB,MC,MD), each utilizing an independent bistable which passes a trip signal upon the measured parameter reaching its setpoint (See Figure 1). These four bistables are fed to two redundant actuation channels (SA,SB) where the subgroup actuation modules are located. The subgroup actuation modules pass a signal to their respective component actuation relays upon coincident signals from any two of four measurement bistables.

At 1336, utility licensed operators in the control room received an alarm for containment isolation system channel actuation concurrent with indication from the Reactor Turbine Generator Board (RTGB) (EIIS:JL) that a CIS actuation had occurred on the SB actuation channel. The licensed operators proceeded to check the ESFAS cabinet and observed that a single actuation module, the 4B CIS subgroup actuation module, on the SB ESFAS actuation cabinet was in trip. There were no abnormal indications on measurement parameters and none of the measurement bistables aside from the MA containment radiation bistable were in trip. The licensed operators performed a check of CIS actuated components per EOP-99 Table 2 "Containment Isolation Actuation Signal" and found that Reactor Cavity Sump (EIIS:BD) isolation valve LCV-07-11B and Reactor Drain Tank (EIIS:BD) isolation valve V6302 were closed in their CIS position. Additionally, the Unit 2 control room ventilation system had gone into the recirculation mode. Licensed operators and the Instrument and Control (I&C) system supervisor determined that this was the proper actuation for the 4B CIS actuation module. Since plant parameters were normal with no indication of reaching their ESFAS setpoint, the actuation was determined to be spurious and was reset at 1416. As a precautionary measure, the I&C department replaced the 4B CIS actuation module. At 1705 the replacement 4B CIS actuation module was tested satisfactorily and returned to service. All actuated components were then returned to their normal condition.

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

CAUSE OF THE EVENT

The root cause of the 4B CIS subgroup actuation module trip is attributed to a spurious voltage spike on one channel of the containment isolation system (CIS) radiation monitoring. This provided a momentary two out of four actuation logic since the MA radiation measurement channel was already in the tripped condition. No maintenance or surveillances were being performed at the time of the event. The 4B CIS subgroup actuation module which was replaced was sent to the vendor, Consolidated Controls Corp. (C560) for testing. Results of the vendor acceptance testing were satisfactory and show no failure of the module. Observation of the Engineered Safety Features automatic testing device indicated that there were no system malfunctions.

In the containment isolation system the measurement bistables pass a signal to the subgroup actuation modules upon reaching their setpoint and then lock in indication that a signal was present after a specified duration referred to as latch-in time. There are six subgroup actuation modules on both the SA and SB actuation channels (see figure 1). Each subgroup actuation module contains its own individual logic circuit for determining receipt of a signal from two of the four measurement bistables. Upon receipt of this signal the subgroup actuation modules pass a signal to the output relays and then latch in the output signal at a specified duration. The 4B subgroup actuation module was a new type designated to replace the original subgroup actuation modules and was the only one of its type installed in the CIS at the time. This newer module is designed with a 12 millisecond latch-in time. This provides enhanced symmetry with the measurement bistables which lock in indication that a signal was output to the actuation modules if it continues for 15 milliseconds. The original type subgroup actuation module was designed with a 30 millisecond latch-in time. Both the new and original type subgroup actuation modules provide acceptable component actuation times within the design criteria of the ESFAS. With the CIS MA containment radiation bistable in trip, a momentary spurious signal of between 12 and 15 milliseconds did not provide sufficient duration to latch-in indication on one of the other three bistables but was of sufficient duration to cause the 4B actuation module to latch-in. No other subgroup actuation modules actuated since they were of the original design which required 30 milliseconds to latch-in. Therefore, the system response to the spurious signal was in accordance with the design.

ANALYSIS OF THE EVENT

This event is reportable as an actuation of the Engineered Safety Features (ESFAS) under 10CFR50.73(a)(2)(iv). The actuation of both the "B" side reactor drain tank and reactor cavity sump containment isolation valves and the Unit 2 control room ventilation system going into recirculation are the only component actuations from the 4B CIS subgroup actuation module. Since the components actuated to their CIS position there was no effect on the operability of the containment isolation system. The actuations from the 4B CIS subgroup did not affect normal plant operations. Therefore the health and safety of the public were not affected by this event.

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CORRECTIVE ACTIONS

- 1) Utility licensed operators verified that no other Engineered Safety Features Actuation System components changed state by performing Table 2 of EOP-99, which is the component actuation list for the containment isolation system (CIS) function.
- 2) Utility Instrument and Control (I&C) maintenance personnel replaced the 4B CIS subgroup actuation module as a precautionary measure and to facilitate root cause analysis.
- 3) Operations reset the affected components to their normal state.
- 4) Upon receipt of the replacement containment radiation measurement channel parts, Utility I&C maintenance personnel expeditiously repaired the CIS MA containment radiation channel restoring the two of four logic to the CIS.
- 5) Utility I&C maintenance personnel performed a preliminary examination of the 4B-CIS subgroup actuation module that was removed and found no indications of faulted subcomponents.
- 6) The equipment vendor performed failure analysis testing of the suspect 4B CIS subgroup actuation module and determined that it performed satisfactorily.
- 7) Utility I&C maintenance monitored the CIS MB, MC, and MD radiation monitoring channels and detected no indication of inadequate performance.
- 8) The CIS MA channel radiation detector and indicator were replaced. Since that time no further CIS MA channel equipment problems have been noted.

ADDITIONAL INFORMATION

Component Failures

Containment Isolation System MA channel radiation detector
 Model Number: 857-3
 Type: GM Tube (Gamma Sensor)
 Manufacturer: Victoreen Instrumentation (V115)

Previous Similar Events

LER 335-90-003 "Spurious Containment Isolation Signal Actuation Resulting from Radiation Monitor Noise Spike due to External Grid Disturbance"

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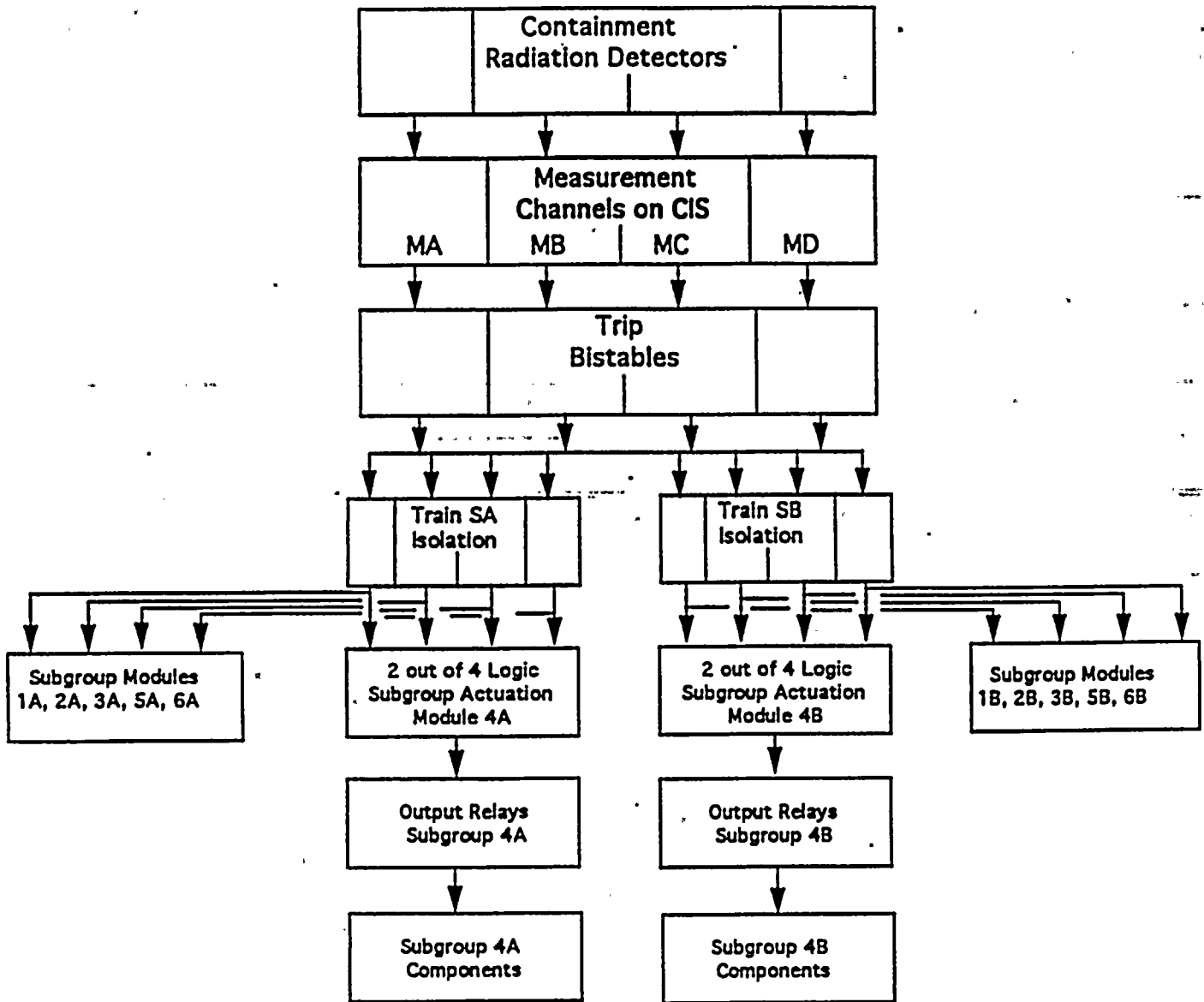


FIGURE ONE - CONTAINMENT ISOLATION SYSTEM