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# EVENT DESCRIPTION

- 1. On March 20, 1989, while in Mode 5 (Cold Shutdown), with Reactor Coolant System (RCS) (EIIS-AB) temperature at 130°F and pressure at 240 PSIA, a Calvert Cliffs Licensed Reactor Operator, supervised by a Licensed Senior Reactor Operator, was returning the Engineered Safety Features (ESF) (EIIS-JE) "B" actuation logic cabinet to operation using Section IX of Calvert Cliffs Operating Instruction No. 34, Engineered Safety Features Actuation System. The steps basically involve recording sensor potentiometer readings, zeroing those potentiometers, turning on 15 VDC power supplies, turning on 28 VDC power supplies, then resetting the potentiometers. This procedure must be performed in the exact written sequence. The 15 VDC power supplies must be energized before the 28 VDC power supplies, and the sequence within each of those sections must be followed. The state of the logic bistables cannot be predicted if the sequence is not followed.
- 2. Page 13 of OI 34, containing steps 23-34, is shown on page 6 of this LER.

At 1320, the Licensed Operator had completed Step 25, which was to actuate a Steam Generator Isolation Signal (SGIS) Block after having energized the associated 28 VDC power supply. The Senior Licensed Operator had called the Control Room to verify that SGIS was blocked. After the call, the Licensed Operator mistakenly performed Steps 28 and 29 instead of 26 and 27. A partial actuation of Engineered Safety Features resulted when Step 29 was completed. As this was not part of the preplanned sequence of the procedure, it is a reportable event per 10 CFR 50.73(2)(ii)(c)(iv).

# DESCRIPTION OF STEPS INVOLVED

Step 26 energizes a 28 VDC power supply for more Engineered Safety Features, including the Safety Injection Actuation Signal (SIAS). Step 27 then actuates a SIAS Block, which prevents an unwarranted SIAS when pressurizer (EIIS-AB-PZR) pressure is below the 1740 PSIA SIAS setpoint (pressurizer pressure was 240 PSIA). These steps had not been performed.

Step 28 energizes a 28 VDC undervoltage signal power supply. Step 29 energizes a 28 VDC power supply for the Loss of Coolant Incident Sequencer (LOCIS) and the Shutdown Sequencer Signal (SDS). These two signals are fed by SIAS circuitry and their basic function is as follows: If a loss of power occurs when a SIAS is present, the LOCIS signal works to block, then unblock in programmed steps (at 5-second intervals) some of the actuation subchannels of some Engineered Safety Features. If a loss of power occurs without a SIAS, the SDS automatically energizes selected essential equipment at 5-second intervals. Basically, these actions selectively and sequentially energize essential equipment to prevent diesel generator (EIIS-EK-DG) overload.

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- 3. The partial ESF actuation involved the SIAS "B" logic. Number 12 Boric Acid Pump (EIIS-CB-P) and Number 12 Component Cooling Pump (EIIS-CC-P) started, and High Pressure Safety Injection System header valves (EIIS-BQ-ISV) 616, 626, 636, and 646 opened. Operators consulted Emergency Operating Procedure 8 (Functional Recovery Procedure) Attachment 2 (SIAS Verification Checklist).
- 4. Next, Steps 28 and 29 were undone, then Steps 26 through 29 were done in order.
- After six minutes, Number 12 Boric Acid Pump was secured. After ten minutes, Number 12 Component Cooling Pump was secured and the HPSI header valves were shut. No water was injected into the RCS.
- Systems Engineering performed an analysis of Unit 1 ESFAS to ensure that the system response was appropriate during the event. No discrepancies were noted.

### ROOT CAUSE

The root cause of this event was personnel error in that the Licensed Operator did not exercise appropriate attention to detail and inadvertently skipped Steps 26 and 27 in OI-34.

A contributing cause was the procedure. OI-34 has several steps, many of which are similar. OI-34 has no sign-offs or other "place-keeping" mechanism.

There were no unusual characteristics of the work location. The operator involved holds a Reactor Operator license. He was being supervised by a Senior Licensed Operator.

#### PREVENTIVE ACTION

- o Appropriate personnel actions were taken.
- The seriousness of this event was emphasized in the General Supervisor-Nuclear Operations (GS-NO) Notes and Instructions.
- o The seriousness of this event was reviewed with each Operations crew. Crews were asked for suggestions for preventive actions.
- A formal Human Performance Evaluation System evaluation of this, and two other recent events was performed, concentrating on appropriate preventive actions. INPO assisted in the evaluation.

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- GS-NO talks with all Operations personnel will be completed, emphasizing strict procedural compliance.
- GS-NO Standing Instruction 89-2, "Supervision of Operations Activities" will be re-evaluated and revised as necessary to ensure that Senior Licensed Operators are fully knowledgeable of their responsibilities when supervising plant evolutions.
- An Operations Observation Program that formerly utilized a Senior Reactor Operator licensed individual to monitor certain evolutions will be resumed when an SRO becomes available, estimated to occur by June 30, 1989.
- o Increased use of Quality Control in Operations will be evaluated.
- o Operators will be trained on the details of this event.
- o Human factors enhancements to improve procedures are being evaluated.

### ASSESSMENT OF THE SAFETY CONSEQUENCES

The safety consequences of this event are not considered significant. The HPSI pumps were not operational during the event, so the opening of the four HPSI header isolation valves had no effect on the plant. The boric acid pumps recirculated back into the Boric Acid Storage Tank. The component cooling pump increased cooling in the shutdown cooling heat exchanger, but the pump only ran for a short period of time.

## RELATED EVENTS

Seven similar events have occurred.

- LER 317/84-007 reported an ESF actuation due to an operator pushing an incorrect test button and mistakenly deenergizing a 4160 volt emergency bus.
- LER 317/85-004 reported an inadvertent SIAS due to an inadequate procedure that occurred during steps to remove the SIAS pressurizer pressure block signal.
- LER 317/85-005 reported an inadvertent actuation of ESF due to not having the handswitch keys in the handswitches for blocking an ESF signal prior to reaching the setpoint during a plant cooldown.

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# CONTACT

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Calvert Cliffs contact for this report is Don Shaw, 301-260-4028.

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# - CAUTION -

Verify all trips are reset prior to proceeding.

23. Place the 28 VDC ON-OFF switch of the CIS/AUTO TEST power supply assembly to ON.

24. Place the 28 VDC ON-OFF switch of the CSAS/RAS/CRS/SGIS power supply assembly to ON.

## - NOTE -

At this point the SGIS Permission To Block

light should be energized.

25. Actuate SGIS Block by pressing the block button.

26. Place the 28 VDC ON-OFF switch of the SIAS/CVCS/DSS (AFAS) power supply assembly in the on position.

# - NOTE -

At this point the SIAS Permission to Block

light should be energized.

27. Actuate SIAS Block by pressing the block button.

28. Place the 28 VDC ON-OFF switch of the UV power supply assembly to ON.

29. Place the 28 VDC ON-OFF switch of the LOCIS/SDS power supply . assembly to ON.

30. Close and lock the ZA (ZB) Actuation Logic Cabinet front door.

31. If necessary repeat Steps 13 through 30 for ZB Actuation Logic Cabinet.

32. Unlock and open Sensor Cabinet ZD front door.

33. Reset Pressurizer Pressure (SIAS) setpoint potentiometer to the value recorded in Step 2.

34. Reset Steam Generator Pressure 11 (21) (SGIS) setpoint potentiometer to the value recorded in Step 5.



### CHARLES CENTER . P.O. BOX 1475 . BALTIMORE, MARYLAND 21203

CALVERT CLIFFS NUCLEAR POWER PLANT DEPARTMENT CALVERT CLIFFS NUCLEAR POWER PLANT LUSBY, MARYLAND 20667

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April 10, 1989

U.S. Nuclear Regulatory Commission Document Control Desk Washington, DC 20555 Docket No. 50-317 License No. DPR 53

TEA

Dear Sirs:

The attached LER 89-004 is being sent to you as required by 10 CFR 50.73.

Should you have any questions regarding this report, we would be pleased to discuss them with you.

Very truly yours,

Kurrell

L. B. Russell Manager-Calvert Cliffs Nuclear Power Plant Department

LBR:DLS:tls

cc: William T. Russell Director, Office of Management Information and Program Control Messrs: G. C. Creel L. B. Russell C. H. Cruse