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C. Randy Hutchinson  
Vice President  
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October 7, 1996

OCAN109601

Mr. James Lieberman  
Director, Office of Enforcement  
U. S. Nuclear Regulatory Commission  
One White Flint North  
11555 Rockville Pike  
Rockville, MD 20852-2738

Subject: Arkansas Nuclear One - Units 1 and 2  
Docket Nos. 50-313 and 50-368  
License Nos. DPR-51 and NPF-6  
Response To NRC Inspection Report  
50-313/96-21; 50-368/96-21  
EA 96-274

Dear Mr. Lieberman:

Pursuant to the provisions of 10CFR2.201, attached is the response to the Notice of Violation and proposed civil penalty identified during the inspection of activities associated with the May 19, 1996 event at Arkansas Nuclear One (ANO) Unit 1, during which a main steam safety valve (MSSV) failed to reseal following a reactor trip. Additional information is contained in Licensee Event Report 50-313/96-005-00 dated June 18, 1996.

Upon careful review of the Notice and the facts (cited therein) regarding the violation, ANO elects to pay the proposed civil penalty. Accordingly, payment of the civil penalty is attached.

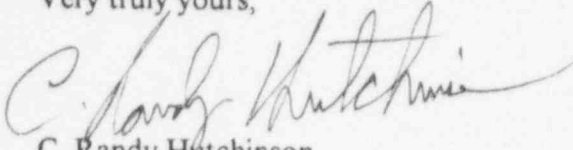
Should you have any comments or questions, please call Mr. Dwight Mims at 501-858-4601.

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U. S. NRC  
October 7, 1996  
OCAN109601

Very truly yours,

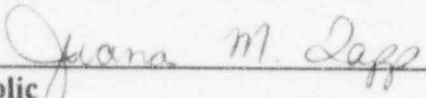


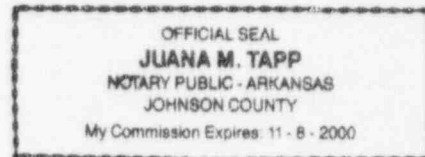
C. Randy Hutchinson  
Vice President, Operations

CRH/slp  
Attachments

To the best of my knowledge and belief, the statements contained in this submittal are true.

SUBSCRIBED AND SWORN TO before me, a Notary Public in and for Johnson County and the State of Arkansas, this 7th day of October, 1996.

  
\_\_\_\_\_  
Notary Public  
My Commission Expires 11-8-2000



U. S. NRC  
October 7, 1996  
OCAN109601

cc: Mr. Leonard J. Callan  
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Washington, DC 20555

## NOTICE OF VIOLATION

Entergy Operations, Inc.  
Arkansas Nuclear One, Units 1 and 2

Dockets: 50-313; 50-368  
Licensee: DPR-51; NPF-6  
EA 96-274

During an NRC Inspection conducted July 12 to August 2, 1996, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions", NUREG-1600, the Nuclear Regulatory Commission proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and 10 CFR 2.205. The particular violations and associated civil penalty are set forth below:

- A. Unit 1 Technical Specification 6.8.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November 1972.

Paragraph I.1 of Regulatory Guide 1.33 states, in part, that maintenance which can affect the performance of safety-related equipment should be performed in accordance with written procedures appropriate to the circumstances.

Procedure 1306.017, "Unit 1 Main Steam Safety Valve Test", revision 11 for the testing and restoration of the Unit 1 Main Steam Safety Valves step 8.2.22 requires, in part, that the bottom of the release nut should clear the top of the lever by 1/16 to 1/8 inches and that a new stainless steel cotter pin be inserted through the release nut slots and spindle.

Contrary to the above, as of May 19, 1996, Procedure 1306.017 was not appropriate to the circumstances for valves PSV-2684, 2685, and 2695, in that the cotter pin could not be installed through the release nut slots and spindle if the bottom of the release nut cleared the top of the lever by 1/16 to 1/8 inches.

- B. Unit 1 Technical Specification 6.8.1.a states, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, November 1972.

Paragraph I.1 of Regulatory Guide 1.33 states, in part, that maintenance which can affect the performance of safety-related equipment should be performed in accordance with written procedures appropriate to the circumstances.

Procedure 1000.006, "Procedure Control", Step 6.5.1 requires, in part, that procedures shall be performed exactly as written. Step 6.5.4 requires, in part, that if problems occur during procedure performance due to unexpected results, the user shall stop work.

Procedure 1306.017, "Unit 1 Main Steam Safety Valve Test", revision 11 for the testing and restoration of the Unit 1 Main Steam Safety Valves step 8.2.22 requires, in part, to insert a new stainless steel cotter pin through the release nut slots and that a second person verifier shall verify that the cotter pin has been installed properly.

Contrary to the above, as of May 19, 1996, for valves PSV-2684, 2685, and 2695, Procedure 1306.017 had not been performed exactly as written in that the cotter pins were found not inserted through the release nut slots and the second person verifier had not verified that the cotter pins were properly installed. In addition, Procedure 1000 006 had been performed on valves PSV-2684, 2685, and 2695 with unexpected results and the users did not stop work.

These violations represent a Severity Level III problem (Supplement I), Civil Penalty - \$50, 000.

Response to violation 50-313/9621-01

(1) Admission or denial of the alleged violations:

Entergy Operations, Inc. admits to failing to properly install the cotter pin in the release nut for valve PSV-2685 at ANO-1.

(2) Reason for the violations:

An automatic reactor trip on high Reactor Coolant System (RCS) pressure occurred at ~0312 hours on May 19, 1996, due to a reduction of Main Feed Water flow.

Steam pressure in the "B" Once Through Steam Generator (OTSG) was sufficient to cause six of the eight MSSVs to open. MSSVs lifting following a reactor trip is an expected response for ANO-1. One of these valves, PSV-2685, failed to reseal. This caused a cooldown of the RCS.

At ~0328, after trying unsuccessfully to reseal the MSSV, Operators manually initiated Main Steam Line Isolation (MSLI) of the "B" OTSG to stop the cooldown transient. Both actions, attempting to reseal the MSSV and isolation of the OTSG, were performed using Emergency Operating Procedure guidance. The secondary side of the "B" OTSG began to boil dry via the open MSSV. During the blowdown, the RCS cooldown rate remained within analysis and Technical Specification limits. RCS average temperature remained above 520 degrees.

A gagging device was installed on the open MSSV at ~0853. Restoration of water level in the "B" OTSG began at ~0916. The MSLI was cleared, normal feed water established to both OTSGs, and the plant restored to normal hot shutdown conditions at ~1304.

The ANO-1 MSSVs, manufactured by Dresser-Consolidated, are designed to prevent the steam generators from exceeding their design pressure. There are a total of sixteen MSSVs, eight on each steam generator header. The spindle is a threaded extension of the valve stem that is located above the valve body. At the upper part of the spindle, a release nut is threaded on to the spindle. The release nut is prevented from rotating on the spindle by a cotter pin which is installed through a slot in the release nut and a hole in the spindle. The release nut slot is open at the upper end and serves as a leverage point for the top lever which is part of the manual lift mechanism.

Prior to refueling outage 1R12 (February 1995), surveillance testing was performed on the ANO-1 MSSVs. The release nuts and cotter pins were removed at the beginning of the testing sequence to allow installation of test equipment. Once the setpoint verification and adjustment sequence were complete, the release

nut and cotter pin were reinstalled. The reinstallation of the cotter pin and release nut was performed using procedure 1306.17, *Unit 1 Main Steam Safety Valve Test*, which required, in part, that the bottom of the release nut should clear the top of the lever by 1/16 to 1/8 inches and that a new stainless steel cotter pin be inserted through the release nut slots and spindle. The procedure also required a second verification to ensure that the cotter pin had been properly installed.

Because of inadequate engagement of the cotter pin through the release nut during this most recent installation activity, the nut vibrated and rotated down the spindle while PSV-2685 was open following the reactor trip. Contact between the release nut and the top lever prevented the valve from reseating.

The root cause of incomplete cotter pin engagement was determined to be "personnel work practices." The procedure for release nut installation was not followed correctly by ANO-1 mechanical maintenance personnel following the last surveillance testing of the MSSVs. The MSSV test procedure contained specific assembly instructions including release nut to top lever clearance and installation of the cotter pin through the release nut slots. During the performance of the MSSV test procedure, manufacturing dimensional variables resulted in competing procedure requirements. The performers did not stop when these procedure requirements could not be met. ANO requirements for procedure adherence are to stop work if a procedure step is unclear or if unexpected results occur.

A contributing cause was determined in that a number of manufacturing dimensional variables existed on the valves in the spindle and cap area which resulted in the procedure instructions not being appropriate for every valve, specifically PSV-2684, 2685, and 2695. These manufacturing variables included the height of the spindle, the height of the top lever, the location/angle of the spindle hole, and the variance in fit of manufactured parts.

(3) Corrective steps taken and results achieved:

PSV-2685 was closed and gagged.

The remaining 15 ANO-1 MSSVs were inspected for adequate release nut engagement. The release nuts on the remaining 15 valves were restrained in the as-found condition; however, two of the valves had partial cotter pin engagement at one end.

An inspection of the installed ANO-1 pressurizer code safety valves, ANO-2 MSSVs, and the spare ANO-2 pressurizer code safety valves identified no concerns similar to those associated with the failure of PSV-2685.

The root cause, contributing cause, sequence of events, and human performance aspects of this event were discussed with ANO-1 and ANO-2 maintenance



personnel, ANO-1 and ANO-2 system engineering personnel and the modifications organization.

Mechanical maintenance personnel involved in the 1995 MSSV testing voluntarily discussed the event with peers at the other Entergy nuclear sites.

An assessment of the transient analysis and problem resolution was performed by an independent team led by Entergy Corporate staff. Enhancements identified by the team have been incorporated into the MSSV corrective action plan.

An Operating Experience Report concerning the May 19, 1996 ANO-1 event was issued to the industry.

The manual lift levers and release nuts were removed from the ANO-1 MSSVs. The manual lift levers are not required by the ASME code and are not utilized by Emergency Operating Procedures or Abnormal Operating Procedures.

(4) Corrective steps that will be taken to prevent further violations:

There has been substantial improvement in the areas of human performance and procedural adherence since the procedure violation which initiated this event and, as described above, training on the specifics of this event and lessons learned has taken place. To further enhance existing guidance on proper use of procedures and second party verification, a training module will be developed. This training module will emphasize human performance affecting procedure usage and utilize current ANO and industry experience. This module is expected to be completed by February 28, 1997.

A general sampling for similar mode failure of other ANO-1 and ANO-2 pressure relief valves which use a release nut, retaining device, and manual top lever will be conducted by December 15, 1996.

PSV-2685 will be repaired or replaced during the ANO-1 refueling outage 1R13 which is currently ongoing.

(5) Date when full compliance will be achieved:

Full compliance was achieved on May 20, 1996, when the release nuts on the remaining 15 ANO-1 MSSVs were found to be adequately restrained in the as-found condition.