



Entergy

Entergy Operations, Inc.

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C. Randy Hutchinson

Vice President
Operations ANO

May 9, 1997

OCAN059702

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
50-313/96-27; 50-368/96-27
EA 96-512

Dear Mr. Lieberman:

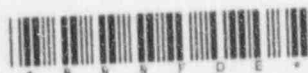
Pursuant to the provisions of 10CFR2.201, attached is the response to the Notice of Violation and proposed civil penalty identified during the inspection of activities associated with the October 17, 1996 event at Arkansas Nuclear One (ANO) Unit 1, during which a fire occurred in the Unit 1 reactor building while heating-up from a refueling outage. Additional information is contained in Licensee Event Report 50-313/96-009-00 dated November 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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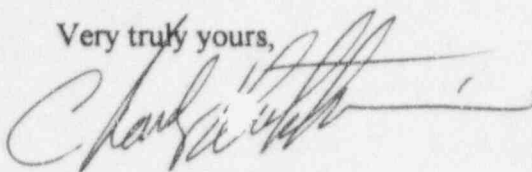
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U. S. NRC
May 9, 1997
OCAN059702

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 Logan
County and the State of Arkansas, this 9th day of May, 1997.

Sandy Siebenmorgen
Notary Public

My Commission Expires May 11, 2000

U. S. NRC
May 9, 1997
OCAN059702

cc: Mr. Ellis W. Merschoff
Regional Administrator
U. S. Nuclear Regulatory Commission
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U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station P1-137
Washington, DC 20555

NOTICE OF VIOLATION

Entergy Operations, Inc.
Arkansas Nuclear One, Unit 1

Dockets: 50-313; 50-368
Licensee: DPR-51; NPF-6
EA 96-5124

During an NRC inspection completed December 11, 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. 10 CFR Part 50, Appendix R, Section III.O states in part:

"The reactor coolant pump shall be equipped with an oil collection system if the containment is not inerted during normal operation."

"Such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil system."

"Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on reactor coolant pumps."

Contrary to the above, as of October 17, 1996, the licensee failed to protect lift piping and fill connection on the Unit 1 "B" Reactor Coolant Pump; the lift piping on four Unit 2 Reactor Coolant Pumps; the flange connections on lower reservoir transmitters on the Unit 1 "A", "C", "D" and all four Unit 2 Reactor Coolant Pumps; and the oil fill lines on all four Unit 1 and Unit 2 Reactor Coolant Pumps. (01013)

B. 10 CFR Part 50, Appendix B Criteria XVI states:

"Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to the appropriate levels of management."

1. Contrary to the above, on October 9, 1996, licensee personnel identified a crack in a weld on the Unit 1 "B" Reactor Coolant Pump lift oil piping, but did not identify and correct the fact that this oil leakage from this crack had resulted in oil accumulation in the fibrous insulation of Steam Generator "B", a fire hazard. On October 17, 1996, during plant heat-up, this oil-soaked insulation ignited, causing a fire. (01023)
2. Contrary to the above, on October 17, 1996, licensee personnel identified oil-soaked insulation which was smoking excessively during plant heat-up, but did not take prompt action to correct this condition. Later on the same day, this oil-soaked insulation ignited, causing a fire. (01033)

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

Response to violation 50-313/9627-01

(1) Admission or denial of the alleged violations:

Entergy Operations, Inc. admits that inadequacies existed in the Unit 1 and Unit 2 Reactor Coolant Pump (RCP) oil collection systems and that there were potential prior opportunities to identify that a fire hazard existed.

(2) Reason for the violations:

During the Spring 1995 Unit 1 refueling outage, 1R12, the "B" RCP motor was replaced with a new motor designed by Jeumont Industries. During shutdown for the Fall 1996 refueling outage, 1R13, the lift oil pump for this new RCP motor ran for ~17 hours on September 15, 1996, due to a failed interlock.

Subsequently, on October 9, 1996, a crack in the high pressure lift oil piping of the "B" RCP was discovered during a ~15-30 second post maintenance test run. The maintenance personnel conducting the post maintenance test were unaware of the previous ~17 hour run; therefore, the minimum amount of oil which was spilled was cleaned up immediately and no further investigation was felt to be warranted. This cracked weld was repaired and leak tested on October 13, 1996.

Heat-up from the refueling outage began at ~0010 on October 17, 1997. Between the hours of 0930 and 1030, with reactor coolant system (RCS) temperature at ~360°F, electricians reported oil-soaked insulation and excessive smoke in the reactor building to the electrical maintenance supervisor. However, the supervisor reported only smoke to the outage desk.

The Fire Prevention Coordinator (FPC) was contacted by the outage desk to review the Material Safety Data Sheet (MSDS) for the RCP motor oil. It was determined from the MSDS that the oil flashpoint was 400°F and the auto-ignition point of the motor oil, based on the training and experience of the FPC, was believed to be well above the flashpoint. The outage desk was also informed, in error, that the insulation in the smoking area was mirror insulation. This was consistent with observations of the affected insulation which had an exterior metallic surface. Based on the auto-ignition point information, the erroneously reported mirror insulation, and the fact that some level of smoke is not unexpected during heat-up, the potential fire hazard was not realized. The interaction of fibrous insulation and oil from the RCP motor which resulted in reduction of the oil auto-ignition temperature was not understood by ANO personnel.

Later in the day, to investigate the reported smoke in the reactor building, the outage desk requested the FPC to sample for air quality in the reactor building. The FPC began sampling as requested at ~1545 and at ~1607, the fire was reported to the control room by the FPC. At this time, RCS temperature was

~450°F. Two operators, who were qualified fire brigade members, were in the reactor building and responded immediately to the fire. A notification of unusual event (NUE) was declared at ~1617. The fire was extinguished at ~1623 using CO₂ and a light water spray, cooldown was initiated at ~1635. At ~1735, the NUE was terminated based on the fact that the fire had been extinguished, a reflash watch was established, and the RCS temperature was below the oil flashpoint.

Through the review of a multi-discipline team, the root cause of the fire was determined to be a fabrication defect in the weld in the discharge piping of the "B" RCP motor high pressure lift oil pump. This fabrication defect was responsible for the weld crack which likely occurred during the ~17 hour run of "B" RCP lift oil pump during plant shutdown. Additionally, the unknown potential for auto-ignition temperature reduction, communication issues, and inappropriate insensitivity to smoke during heat-up were determined to be contributing causes to the fire event.

As a result of this event, the Unit 1 and Unit 2 RCP motor oil collection systems were reviewed. It was determined that the Unit 2 RCP lower level transmitters and the Unit 1 "B" RCP fill connections could have leaks that were uncollected. One of eight Unit 1 transmitters, and three of the eight Unit 1 oil level sight glasses were oriented such that portions of these instruments were not over the drip collection system. The above discrepancies are in the low pressure portion of the RCP motor oil system. The Unit 1 "B" RCP contained high pressure flanged connections with no spray protection and there was also high pressure piping on the Unit 1 "B" RCP and all four Unit 2 RCPs with no spray protection. Additionally, there was no collection system for the Unit 1 and Unit 2 remote oil addition systems.

In general, there were two root causes for not identifying the fire hazard potential earlier and for the RCP motor oil collection system deficiencies. The lack of awareness of the impact of plant activities on compliance with the requirements of 10 CFR 50, Appendix R and the misinterpretation of the intention of the Appendix R regulations. Additionally, the reduction of the auto-ignition point of RCP motor oil as a result of fibrous insulation and oil interaction was not understood.

(3) Corrective steps taken and results achieved:

Plant cooldown was initiated after the fire and immediate actions were in place prior to heat-up from 1R13:

- The near-term effects of the fire and fire suppression activities were evaluated by ANO personnel and an independent fire protection engineer.
- Oil-fouled and damaged fibrous insulation was replaced.
- The RCP motor oil collection system was enhanced on all four Unit 1 RCPs to be consistent with the current understanding of Appendix R requirements.

- An interim strategy for heat-up which included specifically monitoring for smoke and oil leakage was developed.

An Operating Experience report was issued to notify the industry of the phenomenon of auto-ignition temperature reduction of oil in fibrous insulation.

A trending program was developed for RCP oil usage utilizing new remote oil level instrumentation.

Enhancements were made to the condition reporting procedure to specifically identify RCP oil collection capability, to identify equipment oil leaks or spills, and to designate specific personnel to evaluate questionable conditions.

The Abnormal Operating Procedures (AOPs) for Fire and Explosion have been modified to provide a warning concerning the potential reduction of auto-ignition temperatures of oil in fibrous insulation and to provide guidance to operators on how to respond to reports of smoke.

The procedure for the inspections of the Unit 1 and Unit 2 RCP oil collection systems was revised to add a functionality inspection at the beginning and end of each refueling outage. Also, the Unit 1 and Unit 2 Containment Closeout procedure was revised to provide specific instructions for inspection for excessive oil drips, excessive smoke, or oil vapors.

The Plant Startup and Shutdown procedures have been modified to emphasize monitoring for smoke, oil vapor, and oil leaks.

Electrical maintenance personnel were trained on the importance of 10 CFR 50, Appendix R requirements for the RCP lube oil collection systems.

ANO personnel were given training on lagging fires caused by auto-ignition point reduction, limitations of MSDS information, lessons learned on response to smoke or oil spills, and lessons learned on communications.

During an unrelated shutdown in December, 1996, modifications were made to the Unit 2 RCP lube oil collection systems to correct deficiencies. A justification for continued safe operation was developed and an exemption request to Appendix R requirements was submitted for the Unit 2 remote oil addition system.

The high pressure lift oil pump on the Unit 1 "B" RCP and the Unit 1 remote oil addition system are currently hold carded to provide administrative controls which prevent inadvertent operation.

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

A complete evaluation of the remaining Unit 1 "B" RCP high pressure lift oil pump piping welds by Jeumont Industries will be completed and a plan will be developed to ensure no additional questionable welds remain on the high pressure piping system. These actions are scheduled to be completed prior to heat-up from the next Unit 1 refueling outage currently scheduled for the Spring of 1998.

Evaluations of Jeumont Industries piping design, manufacturing process, and welding procedures are also scheduled to be completed by the next Unit 1 refueling outage.

The Unit 1 fibrous insulation will be evaluated for removal or marking to increase the sensitivity to the reduction of auto-ignition temperature prior to the next Unit 1 refueling outage.

Unit 2 fibrous insulation will also be evaluated prior to the upcoming 2R12 refueling outage. Insulation that is susceptible to oil accumulation will be removed or marked during the refueling outage.

Modifications to the Unit 1 remote oil addition system will be completed during the next Unit 1 refueling outage. Any exemption necessary to support the Unit 1 modifications will be submitted prior to the Unit 1 outage. An exemption request has been submitted for the Unit 2 remote oil addition system.

(5) Date when full compliance will be achieved:

Full compliance will be achieved on Unit 1 when modifications to the remote oil addition system are completed and any necessary exemption is received prior to restart from the next Unit 1 refueling outage, currently scheduled for the Spring of 1998. On Unit 2, full compliance will be achieved when the exemption request to the requirements of Appendix R for the remote oil addition system is received. For both units, until full compliance is achieved, administrative controls have been established to ensure continued safe operation of the oil addition system.