

July 9, 2008

Vice President, Operations  
Arkansas Nuclear One  
Entergy Operations, Inc.  
1448 S.R. 333  
Russellville, AR 72802

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT NO. 1 - ISSUANCE OF AMENDMENT RE:  
CONTAINMENT SPRAY NOZZLE TECHNICAL SPECIFICATIONS TEST  
REQUIREMENTS (TAC NO. MD8310)

Dear Sir or Madam:

The Commission has issued the enclosed Amendment No. 233 to Renewed Facility Operating License No. DPR-51 for Arkansas Nuclear One, Unit No. 1. The amendment consists of changes to the Technical Specifications in response to your application dated March 13, 2008.

The amendment revises the Surveillance Requirement (SR) 3.6.5.8 to require verification that containment spray nozzles are unobstructed following maintenance that could result in nozzle blockage, in lieu of the current SR of performing the test every 10 years.

A copy of our related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Alan B. Wang, Project Manager  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-313

Enclosures: 1. Amendment No. 233 to DPR-51  
2. Safety Evaluation

cc w/encls: See next page

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DATE	6/2/08	6/2/08	6/2/08	6/16/08	7/9/08	7/9/08

**OFFICIAL RECORD COPY**

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ENTERGY OPERATIONS, INC.

DOCKET NO. 50-313

ARKANSAS NUCLEAR ONE, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 233  
Renewed License No. DPR-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Entergy Operations, Inc. (the licensee), dated March 13, 2008, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this license amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and Paragraph 2.C.(2) of Renewed Facility Operating License No. DPR-51 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 233 , are hereby incorporated in the renewed license. EOI shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 90 days from the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Balwant K. Singal, Acting Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment: Changes to the Renewed Facility  
Operating License No. DPR-51  
and Technical Specifications

Date of Issuance: July 9, 2008

ATTACHMENT TO LICENSE AMENDMENT NO. 233

RENEWED FACILITY OPERATING LICENSE NO. DPR-51

DOCKET NO. 50-313

Replace the following pages of the Renewed Facility Operating License No. DPR-51 and Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Operating License

REMOVE

Page 3

INSERT

Page 3

Technical Specifications

REMOVE

3.6.5-3

INSERT

3.6.5-3

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 233 TO  
RENEWED FACILITY OPERATING LICENSE NO. DPR-51  
ENTERGY OPERATIONS, INC.  
ARKANSAS NUCLEAR ONE, UNIT NO. 1  
DOCKET NO. 50-313

1.0 INTRODUCTION

By application dated March 13, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML080850905), Entergy Operations, Inc. (Entergy, the licensee), requested changes to the Technical Specifications (TSs) for Arkansas Nuclear One, Unit No. 1 (ANO-1).

The proposed changes would revise Surveillance Requirement (SR) 3.6.5.8 to require verification that containment spray nozzles are unobstructed following maintenance that could result in nozzle blockage in lieu of the current SR of performing the test every 10 years. Specifically, the proposed change would change SR 3.6.5.8 from verifying each required train spray nozzle is unobstructed every 10 years to verifying each spray nozzle is unobstructed, following maintenance which could result in nozzle blockage. This SR is required by TS 3.6.5, "Reactor Building Spray and Cooling Systems."

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A contains General Design Criteria (GDC) for nuclear power reactors. In particular, GDC 40 requires that the containment heat-removal system be designed to permit periodic testing. The containment spray system is a containment heat-removal system. The Babcock and Wilcox Standard Technical Specifications, NUREG-1430, Volume 1, Revision 3, dated June 2004, specifies in SR 3.6.6 a testing frequency of 10 years for the nozzle blockage test. While this is not a requirement, it had been the U.S. Nuclear Regulatory Commission's (NRC's) and industry's judgment of an acceptable frequency for this test. The current TSs require ANO-1 to test the containment spray nozzles every 10 years.

### 3.0 TECHNICAL EVALUATION

The Reactor Building Spray system is an Engineered Safety Feature used to provide cooling to the reactor building atmosphere in response to a postulated Loss-of-Coolant Accident (LOCA) or main steam line break (MSLB). The reactor building spray system has three major functions:

- maintain reactor building temperature and pressure within design limits by reducing post accident temperature and pressure to nearly atmospheric,
- remove airborne iodine from the reactor building atmosphere, and
- establish the sump pH to help retain elemental iodine.

These functions are performed by subcooled water solution sprayed into the reactor building atmosphere through nozzles from the spray headers located in the reactor building.

The licensee requested a change to revise TS SR 3.6.5.8, from requiring verifying each required train spray nozzle is unobstructed every 10 years to verifying each spray nozzle is free from obstruction following maintenance that could result in nozzle blockage (loss-of-foreign-material exclusion (FME) control).

Until 1998, the reactor building sprays were tested every 5 years since original plant construction and the tests have confirmed that the nozzles are free of obstructions that could have occurred following startup, operation, and maintenance of the system. In 2002, as part of the STS conversion ANO-1 went to a 10 year inspection cycle. The licensee stated that the containment spray nozzles are Sprayco model 1713A nozzles which features a ramp bottom design and have no moving parts in the nozzle to plug. The licensee also stated that the spray ring header is maintained dry even though the water level in the spray pipe headers are maintained at an elevation of ~ 394 feet. The piping, ring headers, and nozzles are constructed of Schedule 10, type 304 stainless steel. Therefore, the formation of corrosion products or loose parts that could cause nozzle plugging is unlikely.

The licensee maintains an FME program which is implemented by Procedure EN-MA-118, "Foreign Material Exclusion." The procedure describes measures to be taken to ensure foreign material is not introduced into a system or component and describes measures to be taken if material or tool accountability is lost. The procedure applies to all station activities having the potential to introduce foreign material into systems or components which could impact plant safety. The requirements of the procedure apply when maintenance, modifications, repairs, inspections and operating activities are being conducted on open piping and equipment. The procedure establishes various levels for preventing the generation of debris when breaching a system and the removal of debris from the system if materials have entered a system. Pre-job briefs for FME are conducted prior to opening systems where foreign materials can be introduced. The procedure also requires personnel who are working on open components/systems receive FME training as part of their job qualifications. The procedure requires that when closing a system or component, an inspection be performed to ensure that all foreign material is removed. If FME is not maintained, a Condition Report is initiated requiring an assessment of the circumstances and implementation of the corrective actions to prevent reoccurrence.



Due to its location at the top of the reactor building, introduction of foreign material into the spray header via the open nozzles is unlikely. Foreign material introduced as a result of maintenance is the most likely cause for obstruction; therefore, verification that no foreign material has entered the system following such maintenance is sufficient to confirm that the nozzles are free from blockage. Therefore, the potential for unidentified nozzle obstruction is very low.

The NRC staff reviewed the NRC Inspection Reports for Arkansas Nuclear One, Units 1 and 2 for the years 2000 through 2006. There are no significant findings identified in the reports that would indicate lapses in the FME program. Based on the NRC's review of the reports, the FME program appears to be effective.

The NRC staff previously approved, on a plant-specific basis, similar revisions to this requirement. The revisions require verification that each spray nozzle is unobstructed only following maintenance that could potentially result in nozzle blockage. This is based on the judgment that once the reactor building nozzles are determined to be unobstructed, the only mechanisms that can cause nozzle blockage is foreign material introduced following maintenance and corrosion deposits. The first concern is addressed by the licensee's FME program. The second concern is addressed by the piping system being constructed out of corrosion-resistant materials.

NUREG-1366, "Improvements to Technical Specifications Surveillance Requirements," (May 1992) reported in an NRC staff review of industry experience which indicated that containment spray systems of similar design are highly reliable and are not subject to plugging after testing following construction. The NRC staff reviewed industry experience and found that, in general, once tested after construction, containment spray systems have not been subject to blockage. There have been several exceptions. In the case of one pressurized-water reactor (PWR), a chemical added to the inner surface of a spray system pipe to eliminate corrosion detached and the loose material blocked some spray nozzles. The piping at ANO-1 is corrosion resistant; therefore, this failure mechanism is unlikely. The licensee for another PWR found debris, identified as construction debris, in the spray nozzle headers (Licensee Event Report 315/98-027). The fraction of blockage was not significant and the sprays remained functional. The debris was found by visual observation, not by an air flow test. The licensee states that the reactor building spray nozzles have been tested 6 times in addition to pre-operational tests. Pre-operational testing identified 2 nozzles that had blocked flow. After removal of the blockage, air flow was verified through all containment spray nozzles. Subsequent in-place air flow tests have demonstrated unobstructed flow through each nozzle. Tests have confirmed that the system was free from construction debris and that no debris that could cause obstructions had entered the systems following startup and operation of ANO-1.

Based on the NRC staff's review and assessment of the applicable information provided by the licensee in its amendment request, the past history of these spray systems, and the licensee's FME controls, the NRC staff concludes that the design of the ANO-1 reactor building spray system provides reasonable assurance that the potential for nozzle obstruction is acceptably low. The FME controls provide reasonable protection from the introduction of foreign materials into open piping during maintenance or testing and require post-maintenance verification of system cleanliness and freedom from foreign materials. In addition, the NRC staff review of

industry-wide experience has indicated that the licensee's proposed change is acceptable. Therefore, the NRC staff finds the amendment request acceptable.

#### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arkansas State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published on May 6, 2008 (73 FR 25038). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: A. Wang

Date: July 9, 2008