



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

August 5, 2009

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

SUBJECT: ARKANSAS NUCLEAR ONE, UNIT 2 – REQUEST FOR ALTERNATIVE  
VRR-ANO2-2008-1 FOR THE THIRD 10-YEAR INSERVICE TESTING  
INTERVAL (TAC NO. MD9503)

Dear Sir or Madam:

By letter dated August 21, 2008, as supplemented by letter dated April 30, 2009, Entergy Operations, Inc. (Entergy, the licensee), proposed an alternative to the inservice testing (IST) requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, pertaining to the frequency of the leak rate test for two service water boundary isolation valves at Arkansas Nuclear One, Unit 2 (ANO-2) for the remainder of the third 10-year IST program interval. At ANO-2, the Code of record governing IST for valves is the ASME Code, Section XI, 1989 Edition with no Addenda, and American Society of Mechanical Engineers/American National Standards Institute (ASME/ANSI) OMa-1988 Addenda to the OM-1987 Edition, Operation and Maintenance of Nuclear Power Plants, Part 10 (OM-10).

OM-10, Section 4.2.2.3(a) requires that Category A valves, which perform a function other than containment isolation, shall be seat leakage tested to verify their leak-tight integrity and that the tests shall be conducted at least once every 2 years. The proposed test frequency is to perform the test at least once every 3 years for these valves. This request impacts only these two valves and would allow ANO-2 to test one valve per refueling outage instead of both valves in the same outage.

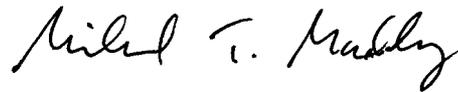
By the request for alternative VRR-ANO2-2008-1, Entergy has, pursuant to paragraph 50.55a(a)(3)(ii) of Title 10 of the *Code of Federal Regulations* (10 CFR), requested an alternative to the requirements OM-10 for the remainder of the current (third) 10-year inservice testing (IST) interval for ANO-2 which began on March 26, 2000.

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review and determined that the licensee's proposed alternative would provide reasonable assurance of valve operability. The NRC staff has determined that compliance with the specified requirements of OM-10, Section 4.2.2.3(a) would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the use of request for alternative VRR-ANO2-2008-1 for the remainder of the third 10-year IST interval.

All other ASME Code, Section XI requirements for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

The NRC staff's safety evaluation is enclosed.

Sincerely,

A handwritten signature in black ink that reads "Michael T. Markley". The signature is written in a cursive style with a large initial "M".

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosure:  
Safety Evaluation

cc w/encl.: Distribution via Listserv



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR ALTERNATIVE VRR-ANO2-2008-1 FOR

THE THIRD 10-YEAR INSERVICE TESTING INTERVAL

ARKANSAS NUCLEAR ONE, UNIT 2

ENTERGY OPERATIONS, INC.

DOCKET NO. 50-368

1.0 INTRODUCTION

By letter dated August 21, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082380146), as supplemented by letter dated April 30, 2009 (ADAMS Accession No. ML081210325), Entergy Operations, Inc. (Entergy), the licensee, submitted a relief request, VRR-ANO2-2008-1, for the remainder of the third 10-year inservice testing (IST) program interval at Arkansas Nuclear One, Unit 2 (ANO-2). The licensee requested relief from certain IST requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI.

At ANO-2, the Code of record governing IST for valves is the ASME Code, Section XI, 1989 Edition with no Addenda, and Part 10 of ASME/American National Standards Institute (ANSI) OMa-1988 Addenda to the OM-1987 Edition, Operation and Maintenance of Nuclear Power Plants, (OM-10) for testing valves. The third 10-year IST interval for ANO-2 began on March 26, 2000.

2.0 REGULATORY EVALUATION

Section 50.55a, "Codes and standards," of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code and applicable addenda incorporated by reference in the regulations, except where alternatives have been authorized or relief has been requested by the licensee and granted by the U.S. Nuclear Regulatory Commission (NRC) pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In accordance with 10 CFR 50.55a(f)(4)(ii), licensees are required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. In accordance with 10 CFR 50.55a(f)(4)(iv), IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in

Enclosure

10 CFR 50.55a(b), subject to NRC approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions and addenda are met. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance with Code requirements is impractical for the facility. Section 50.55a authorizes the NRC to approve alternatives and to grant relief from ASME Code requirements upon making necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 3, 1989, provides alternatives to ASME Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, dated April 4, 1995, and NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants," January 2005.

The NRC's finding with respect to authorizing or denying the IST program relief request is given below:

### 3.0 TECHNICAL EVALUATION

#### 3.1 Valve Relief Request VRR-ANO2-2008-1

##### 3.1.1 Code Requirements

The licensee requested relief from the requirements of Section 4.2.2.3(a) of OM-10 for testing valves 2CV-1541-1 and 2CV-1560-2. These valves are Category A valves and have an active closed safety function to isolate a ruptured service water (SW) header to ensure the long-term cooling capability is maintained. Section 4.2.2.3(a) requires that Category A valves shall be seat leakage tested at least once every 2 years.

##### 3.1.2 Licensee's Basis for Requesting Relief

Valves 2CV-1451-1 and 2CV-1560-2 are normally closed motor-operated 18" Tricentric stainless steel butterfly stop valves. They have an active open safety function to direct the SW return flow to the emergency cooling pond (ECP), an active closed safety function to isolate a ruptured SW header to ensure the long-term cooling capability and also serve as SW boundary isolation valves. Section 4.2.2.3(a) of OM-10 requires that these valves be leakage tested every 2 years.

In its submittal dated August 21, 2008, the licensee states,

These valves can only be leakage tested when the unit is shutdown in Modes 5 or 6 and with the associated SW loop out of service one at a time. Normally these valves are tested during refueling outages. The entire loop of service water is required to be removed from service and drained empty to perform this test. In doing this, all the loads on that particular service water loop are declared inoperable including the associated emergency control room chiller, the associated emergency diesel generator, the backup SW train for cooling the spent fuel pool, and the standby shutdown cooling train. In declaring the emergency control room chillers inoperable requires ANO-1 [Arkansas Nuclear

One, Unit 1] to enter into Technical Specification action statements since this equipment is used for cooling both ANO control rooms.

Most importantly, the removal of a SW loop from operations reduces the defense in depth for loss of decay heat removal events by removing its cooling water from service and its emergency diesel generator. The emergency diesel generator also supplies a backup power to the standby shutdown cooling train.

In its letter dated August 21, 2008, the licensee states,

This unnecessarily increases the risk and vulnerability of ANO-2 during a refueling outage.

In its letter dated April 30, 2009, the licensee also states,

In addition to the hardships discussed above, it is estimated that it will take approximately 125 man-hours and 2 days per valve to perform the Code-required test. The cost associated with the test is approximately \$4400 per valve, and there is a dose consequence of less than 10 mrem [millirem].

The performance history of these valves from 2003 to 2008 has been reviewed and they have a good history of being leak-tight. Therefore, Entergy believes that testing both valves every refueling outage would unnecessarily increase the risk and vulnerability of ANO-2 during the refueling outage, and also results in a hardship without a compensating increase in the level of quality or safety. As such, Entergy proposes to test one valve each refueling outage. Since there are two valves in the group, the proposed test will extend the test interval to 3 years from 2 years as required by the Code.

This request for relief is from the frequency of the leak rate test only. The full stroke test of these valves will continue to occur every 3 months. Neither the acceptance criterion of the full stroke and the leak rate tests, nor the required corrective actions if the acceptance criterion is violated, are not changed. The test methods for the full stroke test and the leak rate test are not being changed due to this request.

### 3.1.3 Licensee's Proposed Alternative Testing

In its letter dated April 30, 2009, the licensee states that ANO-2 will perform a sample test plan similar to the plan described in NUREG-1482, Revision 1, Section 4.1 for disassembly and inspection of check valves. One of these valves will be leak tested each refueling outage on a rotating basis. If the problems are found with the sample valve that result in leakage in excess of the limiting value for operability described in the test procedure, both valves will be tested during the same outage to verify operability.

### 3.1.4 NRC Staff Evaluation

The valves identified in this alternative are normally closed motor-operated 18" Tricentric stainless steel butterfly stop valves. They have an active open safety function to direct the SW return flow to the ECP, an active closed safety function to isolate a ruptured SW header to

ensure the long-term cooling capability, and also serve as SW boundary isolation valves. The total allowed leakage limit for each valve is based on the inventory analysis for the ECP assuming a total loss of 30 gallons per minute (gpm) from the boundary valves of both units combined. Administrative leakage limits have been calculated for each of the subject valves. These calculations and administrative limits were not reviewed as part of this safety evaluation.

Seat leakage testing of these valves requires the entire service water loop to be drained and removed from service. In doing this, all the loads on that particular service water loop are declared inoperable including the associated emergency control room chiller, the associated emergency diesel generator, the backup SW train for cooling the spent fuel pool, and the standby shutdown cooling train. Declaring these systems inoperable would increase the risk and vulnerability of ANO-2 during a refueling outage. Declaring the emergency control room chillers inoperable requires ANO-1 to enter into Technical Specification action statements because this equipment is used for cooling both ANO control rooms. Furthermore, it is estimated that it will take approximately 125 man-hours and 2 days per valve to perform the Code-required test, the cost associated with the test is approximately \$4400 per valve, and there is a dose consequence of approximately 10 mrem. Therefore, the NRC staff concludes that performance of the seat leakage tests for the affected valves would be a hardship to the licensee.

Section 4.2.2.3(a) of OM-10 requires that the valves identified in the relief request be leakage tested every 2 years. Because of the hardship of testing the affected valves, the licensee is requesting that, in lieu of testing both valves, the test will be performed on a rotating basis with one valve being tested each refueling outage. The licensee's proposal will result in the testing of each valve every 3 years. In the event that a valve selected for testing during a refueling outage is not capable of meeting the leakage limit, the other valve will be leakage tested during the same refueling outage. A review of historical leak-test results over a period of 5 years (2003 through 2008) for each of these valves indicated that measured leakages are in most cases non-existent or less than the administrative limits. The NRC staff concludes that the licensee's proposal of testing the affected valves on a rotating basis combined with good history of previous test results would provide reasonable assurance of valve operability, and support that an extension of the time period from 2 to 3 years between tests is reasonable and is, therefore, acceptable. Since these valves are of the same size/type and experience identical service conditions, the licensee's proposal and regulatory commitment to test one of the two valves on a rotating basis is also consistent with the philosophy of the sample test as described in NUREG-1482, Revision 1, Section 4.1 for check valves and, therefore, is acceptable.

### 3.1.5 COMMITMENTS

In its letter dated April 30, 2009, the licensee made the following commitment:

ANO-2 will perform a sample test plan similar to the plan described in NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," Revision 1 for disassembly and inspection of check valves as an alternative to the test frequency required by the OM Code (Section 4.1.4). One of the two valves will be leak tested each refueling outage on a rotating basis. If problems are found with the sample valve that results in leakage in excess of the limiting value for operability described in the test procedure, both valves will be tested during the same outage to verify operability.

The NRC staff concluded that the proposed commitment satisfies the need for continuing compliance and is, therefore, acceptable.

#### 4.0 CONCLUSION

Based on the above evaluation, the NRC staff has determined the licensee's proposed alternative to the Code testing requirements of valves 2CV-1541-1 and 2CV-1560-2 is acceptable and provides reasonable assurance of valve operability. In addition, the NRC staff has determined that compliance with the current Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the NRC staff authorizes the use of request for alternative VRR-ANO2-2008-1 for the remainder of the third 10-year IST interval.

All other ASME Code, Section XI requirements for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Y. Huang

Date: August 5, 2009

All other ASME Code, Section XI requirements for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

The NRC staff's safety evaluation is enclosed.

Sincerely,

/RA/

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-368

Enclosure:  
Safety Evaluation

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