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JAFP-09-0088  
July 31, 2009

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, D. C. 20555

SUBJECT: Proposed Relief Request VRR-06 for the James A. FitzPatrick Nuclear Power Plant Fourth Interval In-Service Testing Program  
Entergy Nuclear Operations, Inc.  
James A. FitzPatrick Nuclear Power Plant  
Docket No. 50-333  
License No. DPR-59

Dear Sir or Madam:

In accordance with 10 CFR 50.55a(a)(3)(ii) this letter requests relief from the testing requirements of ASME OM Code-2001, Appendix I, paragraphs I-1320(a) and I-3410(d).

ASME OM Code, Appendix I, paragraph I-1320(a), "Test Frequencies, Class 1 Pressure Relief Valves" requires that Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years.

ASME OM Code, Appendix I, paragraph I-3410(d), requires remote manual actuation of safety/relief valves (SRVs) to verify open and close capability of the valve before resumption of electric power generation. This applies to valves that have been either maintained or refurbished in place, or removed for maintenance and testing and reinstalled. This remote manual actuation has been shown to be a contributor to SRV and SRV pilot valve leakage.

James A. FitzPatrick Nuclear Power Plant (JAF) Fourth Inservice Testing (IST) Interval Relief Request VRR-06, contained in Enclosure 1, proposes using the "Alternate Rules for Testing ASME Class 1 Pressure Relief / Safety Valves" of Code Case OMN-17 in lieu of the test frequency of OM Code Paragraph I-1320(a) and a series of overlapping tests that are performed in situ and at a vendor test facility to provide assurance that the SRVs will open and close on demand in lieu of the in situ manual actuation required by OM Code paragraph I-3410(d). The proposed testing frequency and overlapping tests of the SRVs and associated components provide reasonable assurance of adequate valve operation and readiness. On the basis that compliance with OM Code testing requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, this proposed alternative is consistent with 10 CFR 50.55a(a)(3)(ii).

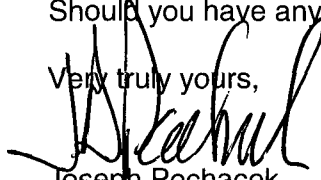
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The fourth interval began October 1, 2007 and this relief will be applicable for the duration of the fourth interval. JAF requests approval of the enclosed relief request by July 31, 2010.

There are no commitments made in this letter.

Should you have any questions, please contact Mr. Joseph Pechacek at (315) 349-6766.

Very truly yours,



Joseph Pechacek  
Licensing manager

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Enclosure 1: James A. FitzPatrick Nuclear Power Plant Fourth Interval  
In-Service Testing Program Relief Request VRR-06

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**JAFP-09-0088**

**Enclosure 1**

**James A. FitzPatrick Nuclear Power Plant  
Fourth Interval In-Service Testing Program  
Relief Request VRR-06**

# **JAMES A. FITZPATRICK NUCLEAR POWER PLANT**

## **10 CFR 50.55a Request VRR-06**

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii), on the basis that compliance with OM Code testing requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

### **System:**

NUCLEAR BOILER AUTOMATIC DEPRESSURIZATION SYSTEM

### **ASME Code Components Affected:**

02RV-71A, B, C, D, E, F, G, H, J, K, L

### **Component /System Function:**

Eleven Safety/Relief Valves (SRVs) are installed on the main steam lines between the reactor vessel and the inboard main steam isolation valves. Each SRV discharges via a separate tailpipe to a point below the water level in the suppression pool. SRVs open:

- In the safety mode on high reactor pressure, to provide primary overpressure protection to the reactor coolant pressure boundary.
- In the relief mode when actuated by the SRV Electric Lift logic on high reactor pressure, as a backup to the safety mode actuation.
- In the relief mode when manually actuated by individual control switches in the Control Room, or by individual control switches in the Remote Shutdown system.
- For seven of the eleven SRVs, in the relief mode when actuated by the Automatic Depressurization System (ADS) logic of the Emergency Core Cooling Systems (ECCS). The ADS function is to rapidly reduce reactor pressure to within the capacity of low pressure ECCS pumps in the event of a small or intermediate break Loss of Coolant Accident with the High Pressure Coolant Injection System (HPCI) unable to maintain level due to equipment failure or break size.

### **Applicable Code Edition and Addenda:**

ASME OM CODE 2001 Edition to 2003 Addenda

### **Applicable Code Requirements:**

Appendix I, paragraph I-1320(a), "Test Frequencies, Class 1 Pressure Relief Valves" requires that Class 1 pressure relief valves shall be tested at least once every 5 years, starting with initial electric power generation. No maximum limit is specified for the number of valves to be tested within each interval; however, a minimum of 20% of the valves from each valve group shall be tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 5-year interval, if they exist. The test interval for any individual valve shall not exceed 5 years.

Appendix I, paragraph I-3410(d) of the OM Code requires that valves that have been maintained or refurbished in place, removed for maintenance and testing, or both, and reinstalled shall be remotely actuated at reduced or normal system pressure to verify open and close capability of the valve before resumption of electric power generation.

# **JAMES A. FITZPATRICK NUCLEAR POWER PLANT**

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### **Reason For Request:**

This 4th Interval request for relief is based on Appendix I of the ASME OM Code-2001 Edition to 2003 Addenda. Exercising of the SRV after reinstallation can only be performed during reactor startup when there is sufficient steam pressure to actuate the main disk. Past history indicates that the main disks may not re-seat properly after being exercised during reactor startup resulting in steam leakage into the suppression pool. This leakage results in a decrease in plant performance and the potential for increased suppression pool temperatures which could force a plant shutdown to repair a leaking SRV. Past operating history indicates that the exercising performed during reactor startup is of no significant benefit in ensuring the proper operation of the individual SRV subassemblies.

This relief request also proposes to implement Code Case OMN-17 "Alternate Rules for Testing ASME Class 1 Pressure Relief/Safety Valves." OMN-17 states in Section (a) that safety valves shall be tested at least once every 72 months (6 years) with a minimum of 20% of the SRV group being tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 72-month interval, if they exist. The test interval for any individual valve that is in service shall not exceed 72 months except that a 6-month grace period is allowed to coincide with refueling outages to accommodate extended shutdown periods.

### **System Description:**

The SRVs are Target Rock Two-Stage, Model 7567F design. The SRVs are dual-function valves capable of being independently opened in either the safety or relief mode of operation. A total of 11 SRVs are installed at the James A. FitzPatrick Nuclear Power Plant (JAF). In the safety mode (or spring mode of operation) the spring loaded pilot valve opens when steam pressure at the valve inlet overcomes the spring force holding the pilot valve closed. Opening the pilot valve allows a pressure differential to develop across the main valve piston and opens the main valve. Each of the 11 SRVs can be opened manually in the relief mode from the control room by its associated two position switch. If one of these switches is placed in the open position the logic output will energize the associated SRV solenoid control valve directing the pneumatic supply to open the valve. Seven of these SRVs solenoid control valves can also be energized by the relay logic associated with the automatic depressurization system (ADS). In addition each SRV can be manually operated from another control switch located at the ADS auxiliary panel located outside the control room.

### **Current Testing at JAF:**

Testing of JAF SRVs is performed to satisfy Technical Specifications Surveillance Requirements (TSSRs) and the ASME OM Code-2001, "Code for Operation and Maintenance of Nuclear Power Plants with addenda." Certain tests are performed with the SRVs installed (in situ), while others are performed as "bench tests" after the valve is removed and transported to a maintenance and testing facility. Current requirements are as follows:

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### **Current Testing at JAF (continued):**

1. TS B 3.4.3-2 the safety function of the SRVs are required to be operable to satisfy the assumptions of the safety analysis. The requirements of this LCO are applicable only to the capability of the SRVs to mechanically open to relieve excess pressure when the lift setpoint is exceeded (Safety Function). This test is performed during the bench test at the vendor's facility.
2. TSSRs 3.4.3.2 and 3.5.1.13 verify each SRV opens when manually actuated.
3. Remote manual actuation is also required by ASME OM Code, Appendix I, paragraph I-3410(d), to verify open and close capability of the valve before resumption of electric power generation. This applies to valves that have been either maintained or refurbished in place, or removed for maintenance and testing and reinstalled.

### **Current Testing at Outside Facilities:**

During each refueling outage, the 11 SRV pilot assemblies and at least one main stage are removed and shipped to an offsite vendor for "as-found" testing, which includes visual inspection, leakage testing, and as-found set pressure testing. The tests are performed on a valve prior to maintenance on the valve. The pre-test leakage is measured at 1050 psig meeting the requirements of ASME OM Code-2001, I-3310 (a), (b), and (c). Following the "as-found" testing, the SRVs are given a dimensional inspection followed by refurbishment, if required. This work is performed by the valve supplier. Post maintenance testing includes initial valve leakage testing, safety mode valve actuation to satisfy requirements for set pressure, reseal pressure, main disc stroke time, and final leakage testing. Final seat leakage tests are performed at approximately 1070 psig. Upon successful test completion, each valve receives written certification from the vendor and is returned to JAF for reinstallation. To receive certification, the valve must have zero seat leakage and meet the acceptance criteria of +/- 1% for set pressure. These tests meet the requirements of ASME OM Code-2001, I-3310 and Technical Specifications SR 3.4.3.1.

### **General Change Justification:**

Leaking SRVs create operational problems associated with the suppression pool. SRV leakage increases both pool temperature and level, requiring more frequent use of the suppression pool cooling mode of the Residual Heat Removal (RHR) system.

As described previously, each SRV pilot assembly and at least one main stage removed during the refuel outage is tested at an offsite facility. The as found testing is performed within 12 months of removal, meeting the OM code requirements. The valves are refurbished the following year just prior to the refuel outage as necessary to meet the acceptance criteria of zero leakage, and are certified in writing as being leak free. The valves are then reinstalled in the plant and proper pilot operation is confirmed through leak rate testing of the pilot air operators and associated accumulator piping followed by manual lift at reactor power.

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### **General Change Justification (continued):**

Several aspects of SRV design and operation can contribute to valve leakage. As mentioned earlier, these include test pressure, pilot valve disc and rod configuration, and system and valve cleanliness. Actuation of the SRVs after laboratory testing by any means allows these contributors to impact the ability of the valve to re-close completely. JAF has made significant efforts to minimize the effects of these contributors.

JAF currently uses ASME OM Code 2001 section I-1320 "Test Frequencies, Class I Pressure Relief Valves." This establishes the five year frequency for SRV testing. JAF proposes to use Code Case OMN-17 "Alternate Rules for Testing ASME Class 1 Pressure Relief/Safety Valves." This Code Case changes the frequency to six years to coincide with the 24-month refueling cycle at JAF.

Additionally, reducing challenges to the SRVs is a recommendation of NUREG-0737; "TMI Action Plan Requirements" item II.K.3. (16). This recommendation is based on a stuck open SRV being a possible cause of a Loss of Coolant Accident (LOCA). This relief request is consistent with that NRC recommendation.

### **Proposed Alternative In Accordance With 10 CFR 50.55a(a)(3)(ii):**

As an alternate to the testing required by ASME OM Code-2001, Appendix I, paragraph I-3410(d), JAF proposes to actuate the SRVs in the relief mode at the test facility (i.e., Wyle Laboratory). A test solenoid valve will be energized, the actuator will stroke, and the pilot rod lift will be verified. This test will verify that, given a signal to energize the solenoid, the pilot disc rod will lift. The pilot function will be recorded in the test documentation package for future reference, as needed. Alternate testing is justified since the remaining segments of the SRV relief mode of operation are proven by other tests. The ability of the pilot disc to open is shown in the safety mode actuation bench test. The integrity of the pneumatic and solenoid system for the SRVs is verified by performance of post maintenance leak rate testing, continuity testing, and a functional test of the solenoids while detached from the SRV. The joint between the pilot and solenoid / manifold assembly are visually inspected under the maintenance procedure with a second verification to ensure that the "O" ring is in place during reassembly. Automatic valve actuation is proven operable by logic system functional tests which include verification that the solenoid is energized by the automatic signal. The actuator to main body joint is inspected during ISI VT-2 exam performed prior to startup. The above proposed surveillance and testing of the SRVs and associated components provides reasonable assurance of adequate valve operation and readiness.

JAF proposes to implement Code Case OMN-17 that requires in section (a) 72-month test interval for Class 1 pressure relief valves with a minimum of 20% of the SRV group being tested within any 24-month interval. This 20% shall consist of valves that have not been tested during the current 72-month interval, if they exist. The test interval for any individual valve that is in service shall not exceed 72 months except that a six month grace period is allowed to coincide with refueling outages to accommodate extended shutdown periods.

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Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii), on the basis that compliance with OM Code testing requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

### **Proposed Alternative In Accordance With 10 CFR 50.55a(a)(3)(ii) (continued):**

ASME Code Case OMN-17 section (d) "maintenance", requires the owner to disassemble and inspect each valve after as found set pressure testing to verify that parts are free of defects resulting from time related degradation or service induced wear. Section (e) requires that each valve shall have been disassembled and inspected in accordance with section (d) prior to the start of the 72-month (6 year) test interval.

Each refueling outage, 100% of the pilot assemblies and approximately one third of the main disc assemblies (4, 4, and 3 main assemblies over a three cycle period) will be sent to an offsite vendor and tested with steam pressure. As a result, even though actual valve movement is not performed after the SRV is re-installed in the plant, all pilot assemblies are tested with steam pressure once per cycle and all the main discs are tested with steam pressure at least once every three cycles. This proposed testing meets the testing requirements of Code Case OMN-17. On the basis that compliance with ASME OM Code 2001 Edition 2003 Addenda testing requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, this proposed alternative should be granted pursuant to 10 CFR 50.55a(a)(3)(ii).

### **Duration:**

The proposed alternative identified in this 10 CFR 50.55a Request shall be utilized during the Fourth Ten year IST Interval that began on October 1, 2007.

### **Precedents:**

NUREG-1482 Paragraph 4.3.2.1 states, "In recent years, the NRC staff has received numerous requests for relief and/or TS changes related to the stroke testing requirements for BWR dual-function main steam SRVs. Both Appendix I to the ASME OM Code and the plant-specific TS require stroke testing of SRVs after they are reinstalled following maintenance activities. Several licensees have determined that in situ testing of the SRVs can contribute to undesirable seat leakage of the valves during subsequent plant operation and have received approval to perform testing at a laboratory facility coupled with in situ tests and other verifications of actuation systems as an alternative to the testing required by the ASME OM Code and TS."

The NRC has approved similar testing methods at Nine Mile Point Station: reference MSS-VR-01 (Unit 2).

Similar testing has also been approved for Dresden, Quad Cities, and Peach Bottom, which use three-stage Target Rock SRVs rather than two-stage SRVs. Testing approved for these plants included an in situ actuator test without steam (dry lift test). The dry lift test is not suitable for two-stage SRVs because it has a high probability of causing unseating or leakage of the pilot stage, which can lead to spurious actuation or failure to reclose of the SRV.



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### **References:**

1. ASME OM Code, 2001 Edition through 2003 Addenda
2. Code Case OMN-17, "Alternative Rules for Testing ASME Class 1 Pressure Relief / Safety Valves
3. NUREG-1482, "Guidelines for Inservice Testing at Nuclear power Plants", April 1995