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U.S. Nuclear Regulatory Commission
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Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Proposed Relief Request No. VRR-09 to the
JAFNPP In-Service Testing Program

References: JAFP-03-0107, Proposed Relief Request No. VRR-09 to the JAFNPP In-Service Testing Program, dated July 28, 2003

Dear Sir:

This submittal revises and supercedes JAFNPP In-Service Testing (IST) Program Valve Relief Request VRR-09 previously submitted on July 28, 2003 (see referenced letter). This relief request proposes the use of acceptance criteria from the 1998 revision of the testing code in place of acceptance criteria from the 1988 revisions of the testing code. The 1998 code acceptance criteria is more appropriate for the FitzPatrick testing methodology.

Specifically, VRR-09 requests relief from the requirements of OMa-1988 Part 10 (OM-10), Paragraph 4.3.2.4(b) for vacuum breaker (check) valves in the Main Steam Safety Relief Valve (SRV) discharge lines, permitting alternate acceptance criteria for the required mechanical exercising of these valves. The licensee proposes to use the acceptance criteria of OM-10-1998, Subsection ISTC-5221 (b) for these valves in lieu of the current criteria.

The valves for which relief is requested are the following:

02RV-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 (3" Vacuum Breaker)
02VB-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 (10" Vacuum Breaker)

The piping arrangement is such that the steam discharge of each of 11 Main Steam Safety Relief Valves (SRVs) is individually piped to a quenching medium in the plant suppression chamber via an independent SRV discharge line. Each SRV discharge line is equipped with two vacuum breakers, one a nominal 3" check valve (02RV-nn), the other a nominal 10" check valve) 02VB-nn). Following an SRV actuation, these valves open to relieve differential pressure (vacuum) in the discharge line caused by condensing steam. This action prevents formation of a water column within the discharge line that could cause excessive stress to the suppression chamber structure during a subsequent lifting of the same SRV. The

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valves are required to close to prevent backflow of steam from an open safety/relief valve (SRV) from entering the drywell.

ASME/ANSI OM-10, Paragraph 4.3.2 requires check valves to be exercised to their safety position(s) quarterly, if practical, otherwise at cold shutdowns. If this, too, is impracticable, the Code allows testing to be deferred to refueling outages. Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outage." Paragraph 4.3.2.4 addresses methods that may be used to perform these IST activities. Paragraph 4.3.2.4(b) states:

> "If a manual mechanical exerciser is used to move the obturator, the force or torque required to initiate movement (breakaway) shall be measured and recorded. The breakaway force shall not vary by more than 50% from the established reference value. The reference value used shall be the value obtained when the valve is known to be operating properly and shall be taken under conditions as close as practicable to the conditions under which the valve will be tested, e.g., wet vs. dry, equivalent static head, etc."

Within the scope of the approved JAFNPP Third Interval IST Program, testing of the subject valves exercises the OM-10, Paragraph 4.3.2.2(e) refueling outage option. A manual mechanical exerciser is used to move the obturator as specified in Paragraph 4.3.2.4(b). Difficulty, however, has been experienced in trying to establish reference values for breakaway force for these valves. Data scatter is such that establishment of meaningful reference values has not proven possible. Over half the test results for the 3" valves have exhibited breakaway force values outside of the +/- 50% acceptance band with no discernable pattern to the results. The 10" valves have exhibited similar random data scatter, although with fewer test failures due to a higher range of absolute values for the acceptance band. This observed data scatter is attributable to three factors taken in aggregate.

1. The method of testing gives results which include a degree of subjectivity; breakaway force is manually determined by feel. This is complicated by the working environment in which the testing is conducted, including difficult valve locations and the need to work in protective clothing. Both affect test personnel ability to measure low breakaway force within a narrow band of repeatability.

2. The measurements for these valves involve low absolute values for breakaway force (between 0.40 and 2.34 lbf for the 3" valves, and 1.5 and 8 lbf for the 10" valves) with corresponding average reference values of approximately 1.08 lbf and 3.91 lbf respectively. When combined with the subjective aspects of the test, these low absolute values make obtaining repeatability within a narrow band difficult.

3. The low absolute values of breakaway force, combined with the relatively tight (+/- 50%) acceptance band required by OM-10, leads to a narrow absolute acceptance band (a nominal +/- .54 lbf for the 3" valves and a nominal +/- 1.96 lbf for the 10" valves.)

Based upon the foregoing, it has been concluded that the acceptance criteria mandated by OM-10 for evaluating manually exercised check valves does not provide meaningful acceptance criteria for the valves in question.

During the Second In-Service Testing Interval (1988 – 1997), these valves were tested using guidance from ASME XI, 1983 Edition, Summer 1983 Addenda. Test methodology involved comparing

breakaway force against a calculated breakaway force value determined from a design differential pressure across the valve disc. The maximum force required to unseat the valves, based upon a design differential pressure of 0.5 psig, was calculated to be 3.53 lbf for the 3" valves and 39.2 lbf for the 10" valves. During the surveillance test, plant personnel measured valve breakaway force as at present, but compared it to this maximum force required to open the valve to assess valve operability. There were no test failures during this period; all test data taken during the period met code acceptance criteria. The valves were operable during the period and would have performed the valve design basis function during a hypothetical plant transient. Third Interval test data, when evaluated against these criteria, shows consistency with Second Interval data, with all data meeting previous code acceptance criteria. Aggregate testing over two test program intervals has shown consistent performance for these valves, with the valves capable of meeting design performance requirements, but with test results showing considerable data scatter.

The cited problems have been recognized in subsequent code revisions, where more flexible acceptance criteria are established for check valve testing using mechanical exercisers. OM-10-1998, Subsection ISTC-5221(b) states:

> (b) If a mechanical exerciser is used to exercise the valve, the force(s) or torque(s) required to move the obdurator and fulfill its safety function(s) shall meet the acceptance criteria specified by the Owner.

This section is qualified by additional criteria, including provisions that acceptance criteria shall consider the specific design, application, and historical performance of the valves.

Imposing the OMa-1988 Part 10 requirements for the 3" valves will continue to result in a majority of the test results outside of the acceptance range. This will require application of the corrective action criteria of OM-10, not because of inadequate valve performance, but rather due to the application of inappropriate test acceptance criteria. This will result in undue licensee hardship and inaccurate characterization of valve performance, with no commensurate benefit and without a resulting improvement in public health and safety.

Imposing the OMa-1988 Part 10 requirements for the 10" valves will continue to result in data scatter of such a magnitude as to render the +/-50% criteria (which has as its basis the expectation of predictable, repeatable test results) ineffective in determining operability for these valves. Although fewer test failures are expected than for the 3" valves, these criteria remain inappropriate for the valves in question.

The Licensee proposes to continue the current test methodology, substituting the acceptance criteria of OM-10-1998, Subsection ISTC-5221(b) and associated subsections for the current criteria. Acceptance criteria shall be based upon design differential pressure requirements previously described, but shall take into account historical performance and other criteria described in the cited section, so as to provide early detection of possible valve performance degradation. The alternate acceptance criteria will provide a meaningful basis for assessing valve operability, a basis not provided by the current +/- 50% acceptance criteria for the reasons described.

Similar relief has been granted for Union Electric's Callaway Plant, Unit 1 (TAC NO. MB2547 dated November 28, 2001.)

Attachment 1 contains the relief request. Approval of this request is desired by August 10, 2004. If you have any questions, please contact Mr. John Hoddy at (315) 349-6538.

Very truly yours,

T.A. Sullivan

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APPENDIX B

Valve Relief Requests

VRR-09

SYSTEM:	REACTOR COOLANT
COMPONENTS:	02RV-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 (3" Vacuum Breaker) 02VB-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 (10" Vacuum Breaker)
CATEGORY:	C
CLASS:	2
FUNCTION:	These valves open to relieve differential pressure (vacuum) in the Main Steam Safety Relief Valve discharge line caused by condensing steam. This action prevents formation of a water column within the discharge line that could cause excessive stress to the suppression chamber structure during any subsequent lifting of the same SRV. The valves are required to close to prevent backflow of steam from an open safety/relief valve (SRV) from entering the drywell.
TEST REQUIREMENT:	Check valve exercise test to the open and closed positions per OM-10 Para. 4.3.2.2. and 4.3.2.4.(b).
BASIS FOR RELIEF:	It is not possible to establish meaningful baseline breakaway force values for these valves. Reference values were calculated from three separate tests. For the 3" valves, the data points used for establishing the break away force reference values resulted in a majority of these breakaway force values outside of the acceptance criteria of +/- 50% of the reference value with no discernable pattern to the results. Similar data scatter was observed for the 10" valves, although with fewer test failures. Based on this, it has been concluded, that due to the data scatter, the methodology mandated by OM-10 for manually exercising a check valve is ineffective for these valves. This is related to the subjective nature of the test method (measuring breakaway force by feel), the low absolute value (between 0.402 and 2.34 lbf for 3" valves, and 1.5 and 8 lbf for 10" valves) of the reference value breakaway forces, and the small acceptance criteria band mandated by the test method.

The Licensee tested these valves during the Second In-Service Testing Interval (1988 – 1997), using the guidance from ASME XI, 1983 Edition, Summer 1983 Addenda. All test data taken during this period met code acceptance criteria. These valves were operable during this period, and would have performed the valve design basis function during a hypothetical plant transient. There were no test failures found during this period.

Imposing the OMa-1988 Part 10 requirements for the 3" valves will continue to result in a majority of the test results outside of the acceptance range. This will require application of the corrective action criteria of OM-10, not because of inadequate valve performance, but rather due to the application of inappropriate test acceptance criteria. This will result in undue licensee hardship and inaccurate characterization of valve performance, with no commensurate benefit and without a resulting improvement in public health and safety.

Imposing the OMa-1988 Part 10 requirements for the 10" valves would result in similar data scatter due for the reasons cited, although with fewer test failures due to a higher range of absolute values associated with the +/- 50% acceptance band.

ALTERNATIVE TESTING: The Licensee proposes to use the current test methodology, exercising the valves as per OM-10a-1988 Para. 4.3.2.2 and 4.3.2.4.(b), but applying the acceptance criteria specified in OM-10-1998, Subsection ISTC-5221(b) and associated subsections. In establishing these criteria, the maximum acceptable force required to unseat the valves shall be based upon a design differential pressure of 0.5 psig, calculated to be 3.53 lbf for the 3" valves and 39.2 lbf for the 10" valves. Acceptance criteria shall also take into account historical performance and other criteria described in Subsection ISTC-5221(b), so as to provide early detection of possible valve performance degradation. This approach establishes meaningful acceptance criteria for the valves, and establishes consistent testing methodology for both sets of valves.