November 27, 2007

Mr. Michael A. Balduzzi
Sr. Vice President & COO
Regional Operations, NE
Entergy Nuclear Operations, Inc.
440 Hamilton Avenue
White Plains, NY 10601

SUBJECT: JAMES A. FITZPATRICK NUCLEAR POWER PLANT - RELIEF REQUESTS FOR THE FOURTH INTERVAL INSERVICE TESTING PROGRAM (TAC NOS. MD5396, MD5397, MD5398, MD5399, MD5400, MD5401, MD5402, MD5403, AND MD5404)

Dear Mr. Balduzzi:

By letter dated April 11, 2007, as supplemented by letters dated July 31, 2007, and August 29, 2007, Entergy Nuclear Operations, Inc. (Entergy), submitted relief requests for the James A. FitzPatrick Nuclear Power Plant, Fourth Interval Inservice Testing Program. Entergy submitted four relief requests associated with pump testing, requests PRR-01, PRR-02, PRR-03, and PRR-04, and five relief requests associated with valve testing, requests VRR-01, VRR-02, VRR-03, VRR-04, and VRR-05. Relief Requests PRR-01 through PRR-03 and VRR-01 through VRR-04 were previously approved for use in the Third Interval Inservice Testing Program. Relief Request VRR-01 (TAC No. MD5400) was withdrawn by letter dated July 31, 2007.

Relief Requests PRR-02, PRR-04, VRR-03, VRR-04, and VRR-05 are authorized pursuant to 10 CFR 50.55a(a)(3)(i), on the basis that the proposed alternative provides an acceptable level of quality and safety. Relief Request PRR-01 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii), based on the determination that compliance with the specified Code requirements results in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Relief Requests PRR-03 and VRR-02 are authorized pursuant to 10 CFR 50.55a(f)(6)(i), based on the determination that it is impractical to impose Code requirements due to the design of the systems.

If you have any questions regarding this approval, please contact the FitzPatrick Project Manager, John Boska, at (301) 415-2901.

Sincerely,

/RA/

Mark G. Kowal, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-333

Enclosure:
Safety Evaluation

cc w/encl: See next page

If you have any questions regarding this approval, please contact the FitzPatrick Project Manager, John Boska, at (301) 415-2901.

Sincerely,

/RA/

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Safety Evaluation

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE TESTING PROGRAM, FOURTH 10-YEAR INTERVAL

ENTERGY NUCLEAR OPERATIONS, INC.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

By letter dated April 11, 2007, Agencywide Documents Access and Management System (ADAMS) Accession No. ML071080254, Entergy Nuclear Operations, Inc. (the licensee) submitted relief requests for the fourth 10-year inservice testing (IST) program interval at its James A. FitzPatrick Nuclear Power Plant. The licensee requested relief from certain IST requirements of the 2001 Edition through 2003 Addenda of the American Society of Mechanical Engineers (ASME), Code for Operation and Maintenance of Nuclear Power Plants (OM Code). The fourth 10-year IST interval began on September 27, 2007. In response to the Nuclear Regulatory Commission (NRC) staff's request for additional information, the licensee submitted the additional information and also withdrew Relief Request VRR-01 in a letter dated July 31, 2007 (ADAMS Accession No. ML072190608). In a letter dated August 29, 2007 (ADAMS Accession No. ML072540621), the licensee revised Relief Request PRR-01.

The NRC evaluation of Relief Requests PRR-01, PRR-02, PRR-03, PRR-04, VRR-02, VRR-03, VRR-04, and VRR-05 are contained herein.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations*, Part 50, Section 55a, (10 CFR 50.55a), requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month intervals in accordance with the specified ASME Code incorporated by reference in the regulations, except where alternatives have been authorized or relief has been granted 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 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 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 pursuant to paragraphs (a)(3)(i) or (a)(3)(ii) of 10 CFR 50.55a, the licensee must demonstrate that: (1) the proposed alternatives would provide an acceptable level of quality and safety; or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Section 50.55a states that the Director of the Office of Nuclear Reactor Regulation may authorize alternatives to ASME Code requirements. The Director has delegated that authority to the branch chiefs in the Division of Operating Reactor Licensing. In proposing alternative requirements or requesting relief pursuant to (f)(5)(iii) of 10 CFR 50.55a, the licensee must notify the Commission and submit information to support the determination that conformance with those code requirements is impractical for the facility. The Commission will evaluate those determinations and may grant relief and impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, Revision 1, "Guidance for Inservice Testing at Nuclear Power Plants."

The James A. FitzPatrick Nuclear Power Plant fourth 10-year IST interval began on September 27, 2007. The program was developed in accordance with the 2001 Edition through 2003 Addenda of the ASME OM Code. By letter dated April 11, 2007, the licensee submitted relief requests for the fourth 10-year IST program interval at its FitzPatrick Nuclear Power Plant.

The NRC's findings with respect to authorizing alternatives to the IST program or granting relief requests are given below:

3.0 TECHNICAL EVALUATION

3.1 Pump Relief Request PRR-01

3.1.1 Code Requirements

The licensee requested relief from the ISTB-3500 requirement that the frequency response range of the vibration measuring transducers and their readout system be from one-third minimum shaft rotational speed to at least 1000 hertz (Hz). Relief was requested for the following pumps:

Standby Liquid Control (SLC) pump 11P-2A
Standby Liquid Control pump 11P-2B

3.1.2 Licensee's Proposed Alternative Testing

Vibration measurements will be taken using instrumentation accurate to ± 5% of full scale over a frequency response range of 6.5 Hz to 1000 Hz, instead of 2.89 Hz to 1000 Hz. The data will be evaluated in accordance with ISTB-6000.

3.1.3 Licensee's Basis for the Proposed Alternative

The nominal speed of the SLC pumps is 520 revolutions per minute (rpm), which correlates to a rotational frequency of 8.67 Hz. Table ISTB-3510-1 requires the frequency response range of the vibration measuring transducers and their readout system be accurate to ± 5% full scale over the range of 2.89 - 1000 Hz.

The FitzPatrick Nuclear Power Plant has instruments for use during surveillance testing with certified accuracies of ± 5% full scale over a range of 5 - 2000 Hz. Calibration is done using a system test methodology over a range of 10 - 1000 Hz in units of displacement (mils) and 6.5 - 1000 Hz in units of velocity (ips peak). The system test verification is limited by the capability of the calibration shaker system to accurately sustain vibration at meaningful amplitudes outside the tested frequencies. The certified calibration range is obtained by addition of individual transducer and meter inaccuracies over the stated frequency range.

The instrument lower frequency response limits are a result of high-pass filters installed to eliminate low frequency elements associated with the input signal from entering the process of single and double integration. These filters prevent low frequency electronic noise from distorting vibration readings. As a side effect, the measurement readings for any actual vibration occurring at low frequencies is filtered out. This is a necessary trade-off, as 1 millivolt (mv) of electronic noise at 2.5 Hz translates to approximately 62.6 mil peak to peak with the accelerometer used with these instruments, at a nominal sensitivity of 50 mv/g.

The licensee has extensively researched this issue concerning Code compliance and intent, and feels that, for these pumps, procurement of equipment capable of meeting the Code required accuracy is impractical with little or no benefit. Instrumentation capable of meeting the Code for these pumps is cumbersome, difficult to operate, prone to human error, costly to purchase, and expensive to calibrate. The number of vendors that supply instrumentation accurate to these frequencies is limited, and there are even fewer vendors capable of performing the required calibration services. Most standard qualified calibration laboratories provide calibration services only to a minimum of 10 Hz.

The licensee feels that the instruments presently used are adequate to assess the condition of these pumps. The manufacturer of these pumps, Union Pump Company, has stated that these pumps, being of a simplified reciprocating design, have no failure mechanism that would be revealed at frequencies less than shaft speed. The pump manufacturer has stated that all failure modes of the pump resulting in increasing vibration will be manifested at shaft speed frequency or harmonics thereof. In light of the information provided by the pump manufacturer, monitoring subsynchronous vibration for these pumps is not needed, but super-synchronous readings will provide meaningful information in the detection of imminent machinery faults.

The licensee's search of an industry database has revealed only one failure reported for pumps of this or similar design whose discovery mentioned increased vibration levels. The cited cause of the failure was improper endplay set leading to gearing failure. Failures of this type would normally be detected at running (shaft) speed frequency, harmonics thereof, or non-harmonic super-synchronous bearing defect frequencies. It should also be noted that these are standby pumps that are normally operated only during pump and valve testing. In the unlikely event this system is required to fulfill its design function, only one of the two redundant pumps needs to operate for a period of 23 to 125 minutes.

In addition to vibration monitoring performed for the IST Program during the quarterly pump test, these pumps are included in the FitzPatrick Nuclear Power Plant Rotating Equipment Monitoring Program. Vibration spectral data are periodically collected and analyzed for the pump and gear motors in addition to those required by the Code. The equipment used in the rotating equipment program is designed to be accurate to ± 5% over a frequency range of 5 - 2000 Hz and is also limited by high-pass integrating filters, but allows for discrete frequency analysis and trending using fast fourier transforms. Vendor specifications state that this equipment should provide fairly accurate data down to 2 Hz in units of acceleration (g peak) by using the raw transducer signal, negating the need for integration. Study of low frequency spectra taken in g peak with these instruments has revealed no distinct subsynchronous peaks above the noise floor acceleration signal.

The licensee stated that in light of their rigorous testing and limited design run time, it is not likely that a minor mechanical fault would prevent these pumps from fulfilling their design function and unlikely that development of a major fault would go unnoticed.

3.1.4 Evaluation

ISTB requires vibration instrumentation to have a frequency response range from one-third minimum shaft rotational speed to at least 1000 Hz. The Code requirements are general requirements in order to cover various types of pumps installed in safety-related applications in nuclear power plants. The Code vibration monitoring requirements apply mainly to pumps operating above 600 rpm. Moreover, the frequency spectrum generated by a pump is characteristic to that pump, constituting a unique pattern, referred to as the machine signature. Analysis of the signature allows identification of vibration sources, and monitoring of the change over time permits evaluation of the mechanical condition of the pump.

In order to identify sources of noise and vibration, the peaks of the measured frequency spectra are correlated with data pertaining to possible vibration source components in the pump. For reciprocating pumps, the source of vibration from unbalanced forces will generally give rise to vibrations at running speed or higher order multiples of the running speed. Vibrations at one half running speed or lower may indicate oil whip in journal bearings, or looseness in bearings.

The licensee has contacted the pump manufacturer who indicated that these pumps have no failure mechanisms that would be revealed at frequencies less than shaft speed. Therefore, the Code requirements for subsynchronous vibration data would provide no useful information about the condition of the SLC pumps.

These pumps are included in the Rotating Equipment Monitoring Program. Vibration spectral data are periodically collected and analyzed for the pump and gear motors in addition to those required by the Code and allows for discrete frequency analysis and trending using fast fourier transform analyzers. A spectral analysis provides the entire spectrum of vibration frequencies as compared to the vibration data required by the Code, and will allow for monitoring potential failure modes at different frequencies.

Because the pumps have no known failure modes that are only revealed at subsynchronous frequencies, imposition of the Code requirements for vibration instrumentation would be of little to no benefit for assuring operational readiness of the SLC pumps. The licensee proposed alternative provides reasonable assurance of the operational readiness of the SLC pumps.

Imposition of the Code requirements would create a hardship on the licensee by requiring that a different type of vibration monitoring instrumentation be procured, maintained, and operated, solely for the SLC pumps.

3.1.5 Conclusion

The NRC staff concludes that compliance with the specified requirements would result in hardship without a compensating increase in the level of quality and safety. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.2 Pump Relief Request PRR-02

3.2.1 Code Requirements

The licensee requested relief from ISTB-3510(b) which requires that the full scale range of each analog instrument not be greater than three times the reference value. Relief was requested for the following core spray pumps:

Core spray pump 14P-1A
Core spray pump 14P-1B

3.2.2 Licensee's Proposed Alternative Testing

The existing installed plant suction pressure gauges will be used to determine the pump differential pressure for quarterly testing of the core spray pumps.

3.2.3 Licensee's Basis for the Proposed Alternative

The differential pressure for each core spray pump is calculated using the installed suction and discharge pressure gauges. The suction pressure gauge is designed to provide adequate suction pressure indication during all expected operating conditions. The full scale range, 60 pounds per square inch (psi), is sufficient for a post-accident condition when the torus is at the maximum accident pressure. This range exceeds the range limit for suction pressure under the test condition (approximately 5 psi).

The installed suction pressure gauge and discharge pressure instrumentation loop are calibrated to within ± 2% of full scale. The full scale range of the pump discharge pressure instrumentation loop is 500 psi. Pump discharge pressure is typically 300 psi. The maximum variation due to inaccuracy in measured suction pressure is ± 1.2 psi. The maximum variation due to inaccuracy in measured discharge pressure is ± 10 psi. Thus, the differential pressure would be 295 ± 11.2 psi or an inaccuracy of 3.8%. If the full scale range of the suction pressure gauge was within the Code allowable value of 3 times the reference value (15 psi) the resulting differential pressure measurement would be 295 ± 10.3 psi or an inaccuracy of 3.5%. The increase in accuracy of 0.3% is insignificant and does not warrant the additional manpower and exposure to change the suction pressure gauge for test purposes. The Code would allow a full scale range for the discharge pressure measurement of 900 psi. This would translate into a

differential pressure measurement of 295 ± 18.3 psi. The existing measurement is significantly better than the maximum Code allowable inaccuracy.

3.2.4 Evaluation

The licensee requests relief from the instrument range requirements of ISTB-3510(b) for the core spray pump suction pressure gauges utilized during the quarterly pump test. The Code requires that the full-scale range of each analog instrument shall not be greater than three times the reference value. The licensee proposes to use the installed suction pressure gauges, which do not meet this Code requirement.

For Group A and Group B tests, the Code requires instrument accuracy to be within 2% of full-scale and the full-scale range of each instrument be no greater than three times the reference value. The combination of these two requirements results in an effective accuracy requirement of approximately 6% of the reference value.

Suction pressure measurements are recorded and used to derive the pump differential pressure through calculation. The maximum effect of suction pressure inaccuracies is 2% x 60 psi or 1.2 psi for the installed suction pressure gauges. The Code allowed instrument range for suction pressure would be 0 to 15 psi. The Code required accuracy requirement of 2% would cause a maximum inaccuracy of 2% x 15 psi or 0.3 psi.

Discharge pressure measurements are also recorded and used to derive the pump differential pressure through calculation. The maximum effect of the discharge pressure inaccuracies is 2% x 500 psi or 10 psi for the installed discharge pressure instruments. The Code allowed instrument range for discharge pressure would be 0 to 900 psi. The Code required accuracy requirement of 2% would cause a maximum inaccuracy of 2% x 900 psi or 18 psi.

The maximum inaccuracy of the installed suction and discharge pressure instruments combined is 11.2 psi. The accuracies of the installed core spray pump suction and discharge instruments yield differential pressure readings that are more accurate than the readings achieved from instruments that meet Code requirements and, thus, provide an acceptable level of quality and safety.

3.2.5 Conclusion

The NRC staff concludes that the licensee's alternative provides an acceptable level of quality and safety. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.3 Pump Relief Request PRR-03

3.3.1 Code Requirements

The licensee requested relief from ISTB-5222(b), ISTB-5222(c), and ISTB-5223(c) which require in part that system resistance be varied until the reference point is achieved.

The licensee also requested relief from ISTA-3130 which requires that code cases only be used with the edition and addenda specified in the test plan. Relief was requested for the following emergency service water (ESW) pumps:

Emergency service water pump 46P-2A
Emergency service water pump 46P-2B

3.3.2 Licensee's Proposed Alternative Testing

Flow rate and total developed pump head will be measured during IST in the as found condition and compared to an established reference curve developed in accordance with Code Case OMN-9 and the additional conditions as prescribed in Regulatory Guide (RG) 1.192.

3.3.3 Licensee's Basis for Requesting Relief

ESW systems are designed such that the total pump flow cannot be adjusted to one specific value for the purpose of testing without adversely affecting the system flow balance and Technical Specification (TS) operability requirements. These pumps must be tested in a manner that ensures the service water loop remains properly flow balanced during and after the testing and each supplied load remains fully operable per TSs to maintain the required level of plant safety during plant operation.

The ESW loops are not designed with a full flow test line and a single throttle valve. The flow cannot be throttled to a fixed reference value every time. Total pump flow rate can only be measured using total system flow indication installed on the common supply header. Only the flows of the serviced components can be individually throttled. Each load is throttled to a Final Safety Analysis Report required flow range which must be satisfied for the load to be operable. All loads are aligned in parallel, and all receive ESW flow when the associated ESW pump is running, regardless of whether the served component is in service or not.

During power operation, all loops of ESW are required to be operable per the TSs. A loop of ESW cannot be taken out of service for testing without entering a limiting condition for operation (LCO) action statement.

It is extremely difficult to return to a specific flow rate or differential pressure for testing of these pumps. Multiple reference points could be established according to the Code, but it would be impossible to obtain reference values at every possible point. An alternative to the testing requirements of ISTB is to base the acceptance criteria on a reference curve.

The licensee requests approval to use the guidelines set fourth in Code Case OMN-9, "Use of a Pump Curve for Testing," including the associated conditions prescribed in RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," in lieu of the ISTB-5222 and ISTB-5223 requirements for ESW pumps 46P-2A and 46P-2B.

Flow rate and total developed pump head (in accordance with NUREG-1482 Section 5.5.3) will be measured during IST in the as-found condition and compared to an established reference curve developed in accordance with Code Case OMN-9 and the additional conditions as prescribed in RG 1.192.

The licensee stated that Code Case OMN-9 should be considered acceptable for use with the 2001 Edition through 2003 Addenda of the Code.

3.3.4 Evaluation

ISTB-5222 and ISTB-5223 outline the IST criteria for vertical line shaft centrifugal pumps and require that Group B (ISTB-5222) and comprehensive (ISTB-5223) pump tests be conducted with the pump operating at a specified reference point. The licensee has requested relief from this requirement and proposed an alternative that would allow the use of pump reference curves established in accordance with Code Case OMN-9 and the additional conditions prescribed in RG 1.192.

NUREG-1482, Revision 1, Paragraph 5.2, provides guidance for utilizing pump curves when it is impractical to establish a fixed set of reference values and references Code Case OMN-9 along with RG 1.192. Code Case OMN-9 is only applicable to the 1990 Edition through 1992 Addenda of the Code and utilization of Code Case OMN-9 with the conditions established in RG 1.192 would not require relief if the 1990 Edition through 1992 Addenda was the licensee's Code of Record.

Pump curves represent a set of infinite reference points of flow and differential pressure. Establishing a reference curve for a pump when it is known to be operating acceptably, and basing the acceptance criteria on this curve, can permit evaluation of pump condition and detection of degradation. There is, however, a higher degree of uncertainty associated with using a curve to assess operational readiness. Code Case OMN-9 and NUREG-1482 discuss the use of pump curves. RG 1.192 placed two conditions on the use of Code Case OMN-9. The licensee stated that the pump curves will be established in accordance with the guidance contained in OMN-9 and the additional conditions as prescribed in RG 1.192. The NRC staff concludes that adherence to this guidance provides assurance that the use of the proposed reference curves will detect degradation in the pumps over the range of the reference curves. All other requirements for pump testing, other than use of a reference pump curve, will be in accordance with the 2001 Edition through 2003 Addenda of the Code.

The licensee states that it is extremely difficult or impossible to return to a specific flow rate or differential pressure for testing of these pumps. Imposition of the Code requirements would require that the system be modified to achieve a specific flow rate or differential pressure during pump testing activities. The NRC staff finds that the licensee's proposed alternative provides an acceptable means of assuring the operational readiness of the ESW pumps. The NRC staff has determined that granting the license's relief request will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the relief is authorized by law. The NRC staff has also determined that the use of the proposed reference curves will appropriately detect degradation in the pumps. Therefore, the consequences of postulated accidents are not increased and this relief will not endanger life or property. This relief has no impact on plant physical security, therefore the common defense and security is not endangered. This relief is otherwise in the public interest, as forcing compliance would necessitate an extended plant shutdown for modifications of the ESW system. An extended plant shutdown reduces the reliability of the electricity supply.

3.3.5 Conclusion

The NRC staff concludes that the Code test requirement is impractical based on the design of the ESW system. The ESW system flow throttle valves for each component are preset to provide the flow rates to each component as required by the system design. Changing the position of a throttle valve affects the flow rates to all components on the header, and could result in making those components inoperable. It is impractical to adjust ESW total pump flow to one specific value for the purpose of testing without adversely affecting the system flow balance and TS operability requirements if the Code requirements were imposed. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. The NRC grants relief and imposes the licensee's alternative pursuant to 10 CFR 50.55a(f)(6)(i). Granting relief pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.4 Pump Relief Request PRR-04

3.4.1 Code Requirements

The licensee requested relief from ISTB-3300(a), ISTB-3100(d), ISTB-3300(f), ISTB-5120, ISTB-5220, and ISTB-5320 which require in part that initial vibration reference values be determined from the results of testing meeting the requirements of ISTB-3100, preservice testing, or from the results of the first inservice test and that these values be used in establishing acceptance criteria. Relief was requested for the following smooth running residual heat removal (RHR) service water pumps and ESW pumps:

RHR service water pump 10P-1A
RHR service water pump 10P-1B
RHR service water pump 10P-1C
RHR service water pump 10P-1D
Emergency service water pump 46P-2A
Emergency service water pump 46P-2B

3.4.2 Licensee's Proposed Alternative Testing

Smooth running pumps with a measured reference value below 0.05 in/sec for a particular vibration measurement location will have subsequent test results for that location compared to an acceptable range limit of 0.125 in/sec and an alert range limit of 0.300 in/sec (based on a minimum reference value of 0.05 in/sec). These proposed ranges shall be applied to vibration test results during both Group A tests and Comprehensive tests.

In addition to the Code requirements, pumps in the FitzPatrick Nuclear Power Plant IST Program are included in and will remain in the FitzPatrick Nuclear Power Plant Predictive Maintenance Program regardless of their smooth running status.

3.4.3 Licensee's Basis for the Proposed Alternative

The smooth running pumps in the FitzPatrick Nuclear Power Plant IST Program have at least one vibration reference value (Vr) that is currently less than 0.05 in/sec. A small value for Vr produces a small acceptable range for pump operation. The Code acceptable range limit for pump vibrations for both the Group A test and Comprehensive test is less than or equal to 2.5 Vr. Based on a small acceptable range, a smooth running pump could be subject to unnecessary corrective action if it exceeds this limit.

ISTB-6200(a) requires that the test frequency be doubled until the cause of the deviation is determined and the condition is corrected if the measured test parameter falls in the alert range.

For very small reference values for vibration, flow variations, hydraulic noise and instrument error can be a significant portion of the reading and affect the repeatability of subsequent measurements. Also, experience gathered by the FitzPatrick Nuclear Power Plant Predictive Maintenance Group has shown that changes in vibration levels in the range of 0.05 in/sec do not normally indicate significant degradation in pump performance.

In order to avoid unnecessary corrective actions, a minimum value for Vr of 0.05 in/sec is proposed. This minimum value would be applied to individual vibration locations for those pumps with reference vibration values less than 0.05 in/sec.

Therefore, the smallest Code acceptable range limit for any IST pump vibration location would be no lower than 2.5 times Vr or 0.125 in/sec, which is within the "fair" range of the "General Machinery Vibration Severity Chart" provided by IRD Mechanalysis, Inc. Likewise, the smallest Code alert range limit for any IST pump vibration location for which the pump would be inoperable would be no lower than 6 times Vr, or 0.300 in/sec.

For comparison purposes, ASME Code, Section XI, Table IWP-3100-2, "Allowable Ranges of Test Quantities," specifies a vibration acceptable range limit of 1.0 mil for a displacement reference value less than or equal to 0.5 mils. A displacement reference value of 0.5 mils is equivalent to 0.047 in/sec for an 1800 rpm pump and 0.094 in/sec for a 3600 rpm pump. The effective minimum reference value proposed (0.05 in/sec) for smooth running pumps is roughly equal to the ASME Code, Section XI reference value for an 1800 rpm pump and more conservative than the reference value for a 3600 rpm pump.

This proposed alternative expands the Acceptable Range for some extremely smooth running pumps by as much as a factor of 10.

In addition to the requirements of ISTB, the pumps in the FitzPatrick Nuclear Power Plant IST Program are also included in the FitzPatrick Nuclear Power Plant Predictive Maintenance Program. The predictive maintenance program currently employs predictive monitoring techniques such as: vibration monitoring and analysis beyond that required by ISTB, bearing temperature trending, oil sampling and analysis, and/or thermography analysis as applicable.

If the measured parameters are outside the normal operating range or are determined by analysis to be trending toward an unacceptable degraded state, appropriate actions are taken that may include: a condition report initiated, increased monitoring to establish a rate of change,

review of component specific information to identify cause, and removal of the pump from service to perform maintenance.

It should be noted that the pumps in the IST Program will remain in the FitzPatrick Nuclear Power Plant Predictive Maintenance Program even if certain pumps have very low vibration readings and are considered to be smooth running pumps.

3.4.4 Evaluation

The Code requires that the vibration of all safety-related pumps be measured. For centrifugal pumps, the measurements of each pump are taken in a plane approximately perpendicular to the rotating shaft in two orthogonal directions on each accessible pump-bearing housing. For vertical line shaft pumps, the vibration measurements are taken on the upper motor-bearing housing in three orthogonal directions, including the axial direction. The measurement is also taken in the axial direction on each accessible pump thrust-bearing housing. These measurements are to be compared with the Code vibration acceptance criteria to determine if the measured values are acceptable.

ISTB requires that, if during an inservice test, a bearing vibration measurement exceeds 2.5 times Vr, the pump is considered in the alert range. The frequency of testing is then doubled until the condition is corrected and the vibration level returns below the alert range. Pumps whose vibration is recorded to be 6 times Vr, are considered in the required action range and must be declared inoperable until the cause of the deviation has been determined and the condition corrected. The vibration reference values are required to be determined when the pump is in good condition.

For pumps whose absolute magnitude of vibration is an order of magnitude below the absolute vibration limits established in ISTB, a relatively small increase in vibration magnitude may cause the pump to enter the alert or required action range. These instances may be attributed to variation in flow, instrument accuracy, or other noise sources that would not be associated with degradation of the pump. Pumps that operate in this region are typically referred to as smooth running. Based on a small acceptable range, a smooth running pump could be subjected to unnecessary corrective action.

The ASME OM Code Subgroup on pumps has tried numerous times to implement a Code change to establish test requirements for a class of pumps, defined as smooth running. These requirements focused on selecting a minimum vibration to be specified in the proposed Code change, that would assign the minimum reference values. The Code committees have not reached a consensus on the appropriate minimum reference value and on whether this approach would be sufficient to determine degradation in safety-related pumps during testing.

In addition, the Code committees had significant discussion on what other types of pump monitoring activities should be included as compensatory requirements for testing of smooth running pumps.

At least one plant has previously been authorized to use the smooth running pump methodology as described above. The minimum reference value was 0.1 ips. However, a pump bearing at this plant experienced significant degradation even though the vibration was below the minimum reference value in the proposed alternative. Had the current Code

requirements been in place, the bearing vibration level for this pump would have exceeded the alert range. The degradation was discovered during vibration monitoring for a predictive maintenance program. After this finding, it was clear to the NRC staff that a simple minimum reference value method alone would not be sufficient to determine pump degradation.

The licensee's proposal combines the minimum reference value method with a commitment to monitor all the IST pumps with a predictive maintenance program even if certain pumps have very low vibration readings and are considered to be smooth running pumps. The licensee will assign a vibration reference value of 0.05 ips to any pump bearing vibration direction where, in the course of determining its reference value, a measured value is below 0.05 ips. Therefore, the acceptable range will be less than or equal to 0.125 ips and the alert range will be 0.125 to 0.30 ips.

The licensee's proposal also describes the predictive monitoring program for all IST program pumps considered important to safe and reliable plant operation. The licensee states that the predictive maintenance program goes beyond the IST requirements for pumps. The program includes vibration monitoring and analysis beyond that required by ISTB, bearing temperature trending, oil sampling and analysis, and/or thermography analysis as applicable. The licensee states that if the measured parameters are outside the normal operating range or are determined by analysis to be trending towards an unacceptable degraded state, appropriate actions will be taken. These actions may include initiation of a condition report, increased monitoring to establish a rate of change, review of component specific information to identify cause, and removal of the pump from service to perform maintenance. The proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components.

As described above, the NRC staff finds that the alert and required action limits specified in the relief request sufficiently address the previously undetected acute pump problems. The NRC staff assumes that the objective of the licensee's predictive maintenance program is to detect problems involving the mechanical condition, even well in advance of when the pump reaches its overall vibration alert limit.

Based on the experience gathered by the FitzPatrick Nuclear Power Plant Predictive Maintenance Group, the licensee has proposed to establish a reference value of 0.05 ips. As described above, the use of the suggested reference value of 0.05 ips will provide an alert range of 0.125 to 0.30 ips, and the licensee's predictive maintenance program has shown that changes in vibration levels below 0.05 ips do not normally indicate significant degradation in pump performance. The reference value of 0.05 ips is consistent with previous NRC staff safety evaluations (SEs) of similar issues. This relief request is not for relief from the requirement to establish reference values, but from the method of determining the reference value. Therefore, the licensee's proposed alternative will provide an acceptable level of quality and safety.

3.4.5 Conclusion

The NRC staff concludes that the licensee's alternative provides an acceptable level of quality and safety. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of

operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.5 Valve Relief Request VRR-02

3.5.1 Code Requirements

The licensee requested relief from ISTC-5151(a) which requires that active solenoid-operated valves have their stroke times measured when exercised. Relief was requested for Traversing In-Core Probe (TIP) system solenoid-operated valves 07SV-104A, B, and C.

3.5.2 Licensee's Proposed Alternative Testing

The licensee will time the opening (10-second delay time included) and closing cycle for valves 07SV-104A, B, and C. The time from open initiation to receipt of the closed light for each valve will be monitored with a stop watch. The licensee will apply ISTC-5152(a) which requires that each valve exhibit no more than ± 25% change in stroke time when compared to the reference value except that the full stroke limiting time for each valve will be truncated at 12 seconds.

3.5.3 Licensee's Basis for Requesting Relief

Solenoid-operated valves 07SV-104A, B, and C are primary containment isolation valves that have a safety function to stroke to the closed position. The licensee stated that the TIP computer system controls the operation of valves 07SV-104A, B, and C. To operate valve 07SV-104A, B, or C, the solenoid for the subject valve is energized for 10 seconds. The valve opens (it should take less than 2 seconds for the valve to open) and remains open during the 10-second period. After 10 seconds, the solenoid for the valve is deenergized if the TIP probe has not been extracted from the shield and the valve then strokes to the closed position.

The design of the TIP control system does not allow for measurement of the closure stroke times of valves 07SV-104A, B, and C. Measuring the closure stroke times in accordance with the Code is impractical because it would require a costly computer control system modification. Closure of valves 07SV-104A, B, and C could also be accomplished by an alternative method but this method would require manual extraction and retraction of the TIP from the shield block. This method of testing would be contrary to the principles of keeping radiation exposure as low as reasonably achievable because it would result in radiation exposure to personnel performing the test.

3.5.4 Evaluation

ISTC-3500 requires that active Category A valves be periodically exercised. The licensee stated that valves 07SV-104A, B, and C are active Category A valves. ISTC-5151(a) requires that the stroke time be measured when exercising active solenoid-operated valves. Measuring the closure stroke times in accordance with the Code is impractical because it would require that the computer control system be modified. A calibrated stop watch will be used to time the full stroke from the open initiation to receipt of the closed light. This test was successfully utilized in the previous IST interval and the measured stroke time utilizing this method was consistently between 10 and 11.5 seconds. This method meets the desired outcome of monitoring valve stroke time for degradation since the 10-second delay is controlled by the

computer and the additional approximate 2 seconds for valve closure should indicate the actual stroke time. The licensee stated that the TIP computer system is maintained in accordance with its NRC approved quality assurance program. The NRC staff finds that proposed alternative to time the entire opening (10-second delay time included) and closing cycle for valves 07SV-104A, B, and C is acceptable. The proposed stoke-time acceptance criteria is essentially the same as that applied to valves that have a maximum limited stroke time of 2 seconds.

The NRC staff has determined that granting the license's relief request will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the relief is authorized by law. The NRC staff has also determined that the use of the proposed alternative test will appropriately detect degradation in the valves. Therefore, the consequences of postulated accidents are not increased and this relief will not endanger life or property. This relief has no impact on plant physical security, therefore the common defense and security is not endangered. This relief is otherwise in the public interest, as forcing compliance would necessitate a costly computer control system modification or a method of testing that increases the radiation exposures of the personnel performing the test.

3.5.5 Conclusion

The NRC staff concludes that the Code requirement is impractical based on the design of the TIP computer system. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. The NRC grants relief and imposes the licensee's alternative. Granting relief pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Accordingly, the proposed alternative is imposed for the fourth 10-year IST interval.

3.6 Valve Relief Request VRR-03

3.6.1 Code Requirements

The licensee requested relief from ISTC-3522(c) which requires that Category C check valves be exercised during refueling outages if it is not practicable to exercise the valves during operation at power and cold shutdowns. Relief was requested for the following excess flow check valves (EFCVs):

02-2EFV-PS-128A,B
02-2EFV-PT-24A,B
02-2EFV-PT-25A,B
02-2EFV1-DPT-111A,B
02-2EFV12-FT-110A,C,E,G
02-2EFV2-DPT-111A,B
02-2EFV2-FT-110A,C,E,G
02-3EFV-11
02-3EFV-13A,B
02-3EFV-15A,B,N

02-3EFV-17A,B
02-3EFV-19A,B
02-3EFV-21A,B,C,D
02-3EFV-23A,B,C,D
02-3EFV-23
02-3EFV-25
02-3EFV-31A,B,C,D
02-3EFV-31E,F,G,H
02-3EFV-31J,K,L,M
02-3EFV-31N,P,R,S
02-3EFV-33
13EFV-01A,B
13EFV-02A,B
14EFV-31A,B
23EFV-01A,B
23EFV-02A,B
29EFV-30A,B,C,D
29EFV-34A,B,C,D
29EFV-53A,B,C,D
29EFV-54A,B,C,D

3.6.2 Licensee's Proposed Alternative Testing

The license will exercise approximately 20% of the EFCVs every refueling outage (nominally once every 24 months) such that each EFCV is tested every 10 years as an alternative to the exercise frequency in ISTC-3522(c).

The representative sample of EFCVs exercised each refueling outage will consist of an approximately equal number of EFCVs and will be representative of the various plant configurations, models, sizes and operating environments.

EFCV failures will be documented in the licensee's corrective action program as a surveillance test failure. The failure will be evaluated and corrected. An equipment failure evaluation (EFE) will be required per the corrective action program. The EFE will encompass common failure mode identification, industry experience evaluation, and review of similar component failure history. A minimum acceptance criteria of less than or equal to 1 failure per year on a 3-year rolling average will be required. Upon exceeding the criteria, a root-cause evaluation will be required to determine cause, extent of condition, and evaluation of the testing interval to ensure reliability of the EFCVs, and a risk analysis of the effects of the failure on cumulative and instantaneous plant safety. Corrective actions and performance goals will be established based on the results of the root-cause analysis.

3.6.3 Licensee's Basis for the Proposed Alternative

The licensee is proposing an alternative exercise frequency for EFCVs. The NRC SE dated March 14, 2000, approving General Electric (GE) Nuclear Energy Topical Report B21-00658-01, "Excess Flow Check Valve Testing Relaxation," dated November 1998, is the licensee's basis that the proposed alternative exercise frequency provides an acceptable level of quality and safety. The topical report provides justification for the relaxation of the exercise frequency

for EFCVs. Also, this relief request was previously approved for FitzPatrick in the previous IST interval by an NRC safety evaluation dated October 10, 2000.

The topical report was written by GE for the Boiling Water Reactor Owners Group and provided: (1) an estimate of steam release frequency (into the reactor building) due to a break in an instrument line concurrent with an EFCV failure to close and (2) an assessment of the radiological consequences of such a release. The topical report concluded that the increase in risk associated with the relaxation of EFCV exercise frequency is sufficiently low and acceptable. In the NRC SE, dated March 14, 2000, the NRC staff also concluded that the increase in risk associated with the relaxation of EFCV testing is sufficiently low and acceptable.

3.6.4 Evaluation

EFCVs are installed in reactor instrument lines to limit the release of fluid in the event of an instrument line break. Examples of EFCV installations include reactor pressure vessel level and pressure instrumentation, main steam line flow instrumentation, recirculation pump suction pressure, and reactor core isolation cooling steam line flow instrumentation. EFCVs are not required to close in response to a containment isolation signal and are not required to operate under post loss-of-coolant accident conditions. The EFCVs are designed not to close accidentally during normal operation; they are designed to close if a rupture of the instrument line occurs downstream of the valve. The instrument lines at the FitzPatrick Nuclear Power Plant have a flow restricting orifice upstream of the EFCV to limit reactor water leakage in the event of an instrument line rupture. Instrument line rupture analysis in the Final Safety Analysis Report (FSAR) does not credit the EFCVs for isolating the rupture. Thus, a failure of an EFCV, though not expected, is bounded by the FSAR analysis.

The licensee stated that EFCVs at the FitzPatrick Nuclear Power Plant have demonstrated a high degree of reliability. Based on the acceptability of the methods applied to estimate the release frequency in conjunction with a relatively low release frequency estimate, an unlikely impact on core damage, and negligible consequence of a release in the reactor building, the NRC staff concludes that the licensee's request for relaxation of EFCV surveillance testing is acceptable.

The topical report established that each plant’s corrective action program must evaluate equipment failures and establish appropriate corrective actions. These programs ensure that meaningful feedback data is acquired so that appropriate corrective action may be taken with regard to EFCV performance. The licensee provided input on EFCV performance criteria and the EFCV corrective action program. These were found acceptable by the NRC staff.

Based on this evaluation, the NRC staff finds that the licensee’s proposed alternative to the requirements of ISTC-3522(c) is acceptable.

3.6.5 Conclusion

The NRC staff concludes that the licensee’s alternative provides an acceptable level of quality and safety. The licensee’s proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of

operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.7 Valve Relief Request VRR-04

3.7.1 Code Requirements

The licensee requested relief from ISTC-5221(c)(3) which requires that at least one check valve from each check valve group be disassembled and examined at each refueling outage and that all check valves in each group be disassembled and examined at least once every 8 years. Relief was requested for high-pressure core injection (HPCI) check valves 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62.

3.7.2 Licensee's Proposed Alternative Testing

The license is proposing that HPCI check valves 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62 be disassembled, visually examined, and manually full-stroked during operation at power instead of during a refueling outage.

3.7.3 Licensee's Basis for the Proposed Alternative

The licensee will disassemble and examine HPCI check valves 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62 during operation at power. The licensee performs HPCI maintenance that includes tasks such as pump and turbine inspection/overhaul, and inspection of the governor and valve linkage during operation at power. The system outage window for these basic inspections conducted on a 24-month frequency is approximately 72 hours; and for the major overhaul activities, which are currently on a 48-month frequency, the window will be larger. Maintenance history for check valves 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62 demonstrates that the valves can be adequately isolated to ensure the safety of maintenance personnel and adequate protection of operable plant equipment. Disassembly, examination, and reassembly of these check valves takes between 6 and 19 hours. This additional IST activity would be conducted in parallel with the other tasks in the maintenance window. Based on maintenance history, scheduling experience, and work execution in past maintenance windows on the HPCI system, this additional IST activity neither extends the maintenance window nor increases the overall maintenance unavailability. Therefore, performing these IST inspections during operation at power would not change the duration of the HPCI system maintenance activity.

3.7.4 Evaluation

The proposed relief would allow the addition of 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62 IST activities to HPCI system maintenance windows where these check valves can be worked along with other activities that have been risk assessed without affecting the total amount of system unavailability. This request seeks to allow the same alternative to testing currently conducted during refueling outages to be performed during maintenance windows for operation at power. The IST activities will be planned when adequate isolation boundaries are established to protect the maintenance personnel involved in the activities and to protect operable plant equipment.

The risk associated with maintenance activities during operation at power is controlled through the licensee's work control process. That process includes preventive measures for maintaining safety and minimizing risk while performing maintenance such as:

1. Assessment of work activities by multiple independent personnel to ensure work activities in one system do not affect the abilities of redundant systems or trains to perform their safety function.

2. Establishment of redundant systems or trains as "protected," so that these systems are less likely to be inadvertently made inoperable while they are being relied upon to operate during the period that another safety system is out of service for maintenance.

3. Providing additional management oversight for significant maintenance activities being conducted while in TS LCO actions.

4. Conducting shift briefing to ensure that personnel are aware of active TS LCO action statements.

5. Using human performance tools including pre-job briefings, self-checking and peer checking.

ISTC-5224 requires that the cause of failure be analyzed and the condition corrected for any check valve in a sample disassembly program that is not capable of being full-stroke exercised, has failed, or has unacceptably degraded valve internals. Other check valves in the sample group that may also be affected by this failure mechanism must also be examined or tested to determine the condition of internal components and their ability to function. The licensee stated in a request for additional information response dated July 31, 2007, that any sample expansion required due to unsatisfactory inspections will be performed, and the cause of failure will be analyzed and corrected during the maintenance window that the unsatisfactory inspection occurred.

The NRC staff finds that the licensee's proposed alternative to the requirements of ISTC-5221(c)(3) for check valves 23HPI-130, 23HPI-131, 23HPI-32, 23HPI-61, and 23HPI-62 is acceptable.

3.7.5 Conclusion

The NRC staff concludes that the licensee's alternative provides an acceptable level of quality and safety. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

3.8 Valve Relief Request VRR-05

3.8.1 Code Requirements

The licensee requested relief from ISTC-5131 which requires that (a) active valves shall have their stroke times measured when exercised in accordance with ISTC-3500, (b) the limiting

value(s) of full-stroke time of each valve shall be specified by the Owner, (c) the stroke time of all valves shall be measured to at least the nearest second, and (d) any abnormality or erratic action shall be recorded, and an evaluation shall be made regarding need for corrective action.

The licensee requested relief from ISTC-5132 which requires that (a) valves with reference stroke times of greater than 10 seconds shall exhibit no more than ± 25 percent change in stroke time when compared to the reference value, (b) valves with reference stroke times of less than or equal to 10 seconds shall exhibit no more than ± 50 percent change in stroke time when compared to the reference value, and (c) valves that stroke in less than 2 seconds may be exempted from ISTC-5132(b). In such cases, the maximum limiting stroke time shall be 2 seconds.

The licensee requested relief from ISTC-5133(b) which requires that valves with measured stroke times that do not meet the acceptance criteria of ISTC-5132 shall be immediately retested or declared inoperable.

Relief was requested for valves 67PCV-101, 70TCV-120A, B, and 70TCV-121A, B.

3.8.2 Licensee's Proposed Alternative Testing

The licensee proposes to test valves 67PCV-101, 70TCV-120A, B, and 70TCV-121A, B in accordance with Code Case OMN-8. The valves will be exercised in accordance with Subsection ISTC requirements and the fail-safe position on a loss of power signal will be verified. Any abnormality or erratic action experienced during the valve exercising will be evaluated per the corrective action program.

These valves are in the Electric Bay and Tunnel Ventilation System, and the Control Room Cooling and Ventilation System. The valves are power-operated valves that are used for system control with an associated fail-safe safety function.

3.8.3 Licensee's Basis for Requesting Relief

The licensee is proposing to apply Code Case OMN-8, "Alternative Rules for Preservice and Inservice Testing of Power-Operated Valves That Are Used for System Control and Have a Safety Function per OM-10." NUREG-1482, Revision 1, paragraph 4.2.9 states, in part, that control valves that perform a safety or fail-safe function must be tested in accordance with the Code provisions to monitor the valves for degrading conditions. In NUREG-1482 the NRC staff recommends that licensees apply ASME Code Case OMN-8, as accepted in RG 1.192, if concerns exist regarding IST of control valves with fail-safe conditions.

3.8.4 Evaluation

ISTC-1200(b) excludes "valves used only for system control, such as pressure regulating valves." It is not the intent of the Code to test the regulating function of control valves. However, if these valves have a safety function to fail in an open or closed position, then the testing requirements for the power-operated valves are imposed. Code Case OMN-8 provides alternative rules for IST of power-operated valves that are used for system control and have a fail-safe function. The code case states that for power-operated control valves that have only a fail-safe safety function, the requirements for valve stroke-time measurement testing, the

associated requirements for stroke test acceptance criteria, and the associated resulting requirements for stroke-time testing corrective actions need not be met. All other requirements applicable for these valves shall be met. If a valve fails to exhibit the required change of obturator position during the exercise test, the valve shall immediately be declared inoperable and corrective actions initiated. Any abnormality or erratic action observed during exercise testing of these power-operated control valves shall be recorded in the record of tests, and an evaluation shall be made regarding the need for corrective action.

Application of code cases is addressed in 10 CFR 50.55a(b)(6) through reference to RG 1.192, which lists acceptable and conditionally acceptable code cases for implementation in IST programs. RG 1.192, Table 1, approves the use of Code Case OMN-8 and states that the code case is applicable to the 2000 Addenda and earlier editions and addenda of the Code. Code Case OMN-8 provides an acceptable level of quality and safety for testing of power-operated control valves that have only a fail-safe safety function and is an acceptable alternative for use in the licensee's IST program. This conclusion is consistent with the NRC staff position in NUREG-1482, Revision 1, and RG 1.192.

3.8.5 Conclusion

The NRC staff concludes that the licensee's alternative provides an acceptable level of quality and safety. The licensee's proposed alternative is consistent with the objective of IST which is to determine degradation in safety-related components and provides reasonable assurance of operational readiness. Accordingly, the proposed alternative is authorized for the fourth 10-year IST interval.

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