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U.S. Nuclear Regulatory Commission
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Subject: Duke Energy Corporation
Oconee Nuclear Station, Unit 1, 2, and 3
Docket Nos. 50-269, 50-270, and 50-287
Fourth Ten Year Inservice Test Program
Pump Relief Request No.ON-GRP-01, Revision 26

On June 10, 2002, Duke Energy Corporation (Duke) submitted revision 26 to the Inservice Testing (IST) Program for Pumps and Valves at Oconee Nuclear Station. Pursuant to 10 CFR 50.55a(f), program revision 26 reflected the Oconee IST Program for the Fourth Inservice Inspection Interval beginning July 1, 2002. Included in this submittal were several relief requests.

On October 23, 2002, two additional Requests for Relief from specific pump testing requirements were submitted separately.

During review of these submittals a number of questions were generated by the NRC Staff and communicated to Oconee Site personnel. On April 29, 2002, Duke submitted a revision to the June 10, 2002 submittal providing revised information and essentially combining the two submittals.

Subsequently the NRC Staff provided additional comments regarding one of the requests for relief initially included in the October 23, 2002, as revised by the April 29, 2003 submittal. Attached is a revision to ON-GRP-01 that addresses the Staff's comments.

If there are any questions or further information is needed you may contact R. P. Todd at (864) 885-3418.

Very truly yours,

R. A. Jones,
Site Vice-President
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Attachment: ON-GRP-01, Revision 26

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Pump Generic Relief Request

Item Number ON-GRP-01

Category Type Smooth Running Pumps

Function Various

Test Requirement OMa-1996 ISTB paragraph 6.2 states that if deviations fall within the alert range of Table ISTB 5.2.1-1, the frequency of testing specified in paragraph ISTB 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected. Likewise, if deviations fall within the required action range of Table ISTB 5.2.1-1, the pump shall be declared inoperable until either the cause of the deviation has been determined and the condition corrected, or an analysis of the pump is performed and new reference values are established.

Basis for Relief This is a request for authorization of a proposed test alternative which provides an acceptable level of quality and safety pursuant to 10CFR50.55a(a)3(i).

The repeatability of pump vibration readings at ONS is in the range of 0.05 ips due to hydraulic flow noise in this amplitude range and the repeatability of the vibration instruments. When vibration velocities are less than 0.05 ips, changes have been shown to be non-significant.

At vibration velocities less than 0.05 ips, flow noise and instrument repeatability can significantly affect reference values. Candidates for "smooth-running" status will be analyzed per ISTB paragraph 4.3 to verify that use of this relief request will not prevent the detection of significant pump degradation.

For displacement reference values less than 0.5 mils, it is noted that the Section XI code in effect for the third interval IST Program sets the Alert Range at >1.0 mil and the Required Action Range at >1.5 mil. This implies a minimum reference value of 0.5 mils, which is equivalent to 0.047 ips for 1800 rpm pumps and 0.094 ips for 3600 rpm pumps. The effective reference values proposed for smooth-running pumps are roughly equal to the implied Section XI reference values for 1800 rpm pumps and more conservative than the implied reference values for 3600 rpm pumps. Without this relief request, the Alert Ranges for some smooth running pumps will be reduced by a factor of 10.

The ONS Predictive Maintenance (PdM) Program is part of the Preventive Maintenance (PM) Program. The PM Program was developed using RCM, NPRDS, EPRI, and INPO guidelines as well as factoring in ONS site-specific experience and regulatory requirements. The PM Program and PdM activities are controlled by plant procedures. Each of these pumps has regularly scheduled PM and PdM activities

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performed on that pump as described in the model work orders. The performance of the system associated with each of these pumps is monitored and compared to performance criteria under the ONS Maintenance Rule Program. This ensures the continued effectiveness of the PM program to minimize component failures and maintain or improve system performance (balance availability and reliability).

The ONS Predictive Maintenance Program uses vibration analysis, lubricant analysis, and, as appropriate, infrared thermographic analysis, to predict the need for maintenance so that equipment can be reworked prior to failure. The components included in this program include those considered important to safe and reliable plant operation, including all the pumps in the IST Program. The intervals for monitoring are based on manufacturer's recommendations, maintenance history, cost effectiveness, and experience. Although the monitoring, analyses, database, and software used in the Predictive Maintenance Program do not fall under the ONS Quality Program, the Predictive Maintenance Program still provides valuable information for assuring the operational readiness of smooth-running pumps.

The vibration analysis program monitors the vibration of rotating machinery. In addition to the vibration at pump bearings, the vibration of the driver (turbine or motor) bearings are also collected and trended. Analyzed parameters and methods include vibration velocity, bearing acceleration, bearing high frequency detection, and spectral analysis.

The lubricant analysis program samples lubricants and analyzes them to identify degradation or negative trends. Capabilities include wear debris, lubrication cleanliness, and limited chemical composition analysis.

In both the vibration monitoring and lubricant analysis programs, recently acquired data is compared with previous data to detect any indicated degradation of equipment condition. If degradation indicates the reliability of operating equipment may be negatively affected, or if acceptance criteria is no longer being met, appropriate corrective action is taken. Corrective action may include: continuing trending of the degraded condition, if the condition is not considered to be immediately threatening to the equipment and can be corrected during a time window convenient to plant operation; additional testing or monitoring to confirm the suspected degraded condition; inspection and repair of the equipment as necessary; changes to preventive maintenance procedures or schedules; or design changes.

ONS expends considerable resources on preventive and predictive maintenance. One result of these efforts is pumps that run very smoothly. To continue to impose Code-mandated Alert and Required Action values on smooth-running pumps unnecessarily penalizes ONS for achieving this high level of performance.

Test Alternative

Vibration parameters that have reference values ≤ 0.05 ips may be considered "smooth-running". The Alert and Required Action values for these parameters will be determined as if their reference value is 0.05 ips; that is, the Alert Range will be > 0.125 ips to 0.3 ips, and the Required Action Range will be > 0.3 ips.

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In addition to the Code-mandated parameter monitoring (developed head, flow, overall vibration, etc.), additional pump performance parameters are monitored under the Predictive Maintenance Program. This program includes the following:

- Spectrum band monitoring
- Bearing acceleration monitoring (on ball and roller bearings only)
- Bearing oil analysis (for oil lubricated bearings)

If any parameters are outside normally expected ranges, an evaluation will be performed and appropriate corrective actions will be taken.

Before being treated as "smooth-running" under this relief request, each candidate pump parameter will be reviewed to verify that testing performed under the provisions of this relief request will not prevent the detection of significant pump degradation.

This alternative will be utilized for the remainder of the current 120 month interval.