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W. R. McCollum, Jr.
Vice President

March 11, 2002

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

Subject: Duke Energy Corporation
Oconee Nuclear Station, Unit 3
Docket Nos. 50-270
Third Ten Year Inservice Test Program
Pump Specific Relief Request No. ON-SRP-HPI-02

Pursuant to 10 CFR 50.55a(a)(3)(ii), attached is a pump specific Request for Relief from specific requirements for vibration monitoring instrumentation specified by the ASME Boiler and Pressure Vessel Code, Section XI, 1986 Edition. This request is to allow Duke Energy Corporation (Duke) to take temporary credit for an alternate instrument due to malfunction of the primary instrument. The alternate instrument is in full conformance with IWP paragraph 4510 except that it is aligned parallel to the line of travel of the positive displacement pump plunger. Due to radiation levels at the location of the pump inside containment, access for repair or replacement of the primary instrument requires Unit power reduction to approximately 20% rated power or less. Such a power reduction would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, Duke requests that the NRC grant relief as authorized under 10 CFR 50.55a(a)(3)(ii). Duke requests verbal concurrence with this request on or before March 13, 2002 in order to promptly resolve the status of this non-conforming item.


Repair will be planned for the next power reduction that would accommodate access to the pump.

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

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U. S. Nuclear Regulatory Commission
March 11, 2002
Page 2

Very truly yours,


W. R. McCollum, Jr.
Site Vice President

Attachment

xc w/att: L. A. Reyes, Regional Administrator
U.S. Nuclear Regulatory Commission, Region II
Atlanta Federal Center
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L. N. Olshan, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation
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xc(w/o attch):

Scott Freeman
Acting NRC Senior Resident Inspector
Ocone Nuclear Station

Mr. Virgil Autrey
Division of Radioactive Waste Management
Bureau of Land and Waste Management
SC Dept. of Health & Environmental Control
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Columbia, SC 29201

Pump Specific Relief Request

Item Number: ON-SRP-HPI-02

Pump(s): SSF RC Makeup Pump (positive displacement)
3HPIPU0005

Flow Diagram: OFD-101A-03-05

ISI Class / Duke Class: B/B

Function: The SSF RC Makeup pump shall be capable of delivering sufficient flow to the RC pump seal injection lines during an SSF Event in order to prevent seal failures (seal LOCA).

Test Requirement: Per the 1986 edition of IWP paragraph 4510, at least one displacement vibration amplitude (peak to peak composite) shall be read during each inservice test. On reciprocating pumps, the location shall be on the bearing housing of the main pump drive shaft, approximately perpendicular to both the shaft and the line of plunger travel.

Basis for Relief: During an accident, the SSF RC Makeup pump takes suction from the spent fuel pool and injects into the reactor coolant pump (RCP) seals. During accident conditions, the SSF RC Makeup pump would be required to inject flow into the RCP seals at 2350 psig. The SSF RC Makeup pump is tested during power operation through a recirculation test flow path that takes suction from the spent fuel pool and returns to the spent fuel pool.

The SSF RC Makeup pump is a positive displacement pump located within the containment building. Quarterly vibration parameters are monitored via permanently installed vibration sensors that are routed through a containment penetration. Two vibration sensors (accelerometers) are mounted on the pump bearing housings. The pump outboard bearing probe is in the vertical direction (perpendicular to the crankshaft and perpendicular to the line of plunger travel) and the pump inboard probe is in the horizontal direction (perpendicular to the crankshaft and parallel to the line of plunger travel).

Currently, the pump outboard vibration probe is not functioning properly such that valid data is unobtainable from this instrument. During an extended pump run on 3/8/02, the pump outboard bearing vertical vibration was observed to be responding erratically. After a detailed engineering analysis of the vibration data, it was concluded that there is no known machinery defect that would cause the erratic vibration signature. In addition, other pump parameters (the inboard bearing horizontal vibration value, discharge pressure, flow) remained steady and consistent with past pump performance. Furthermore, such significant changes in the pump outboard bearing vertical vibration instrument readings would also be observed to some degree in the pump inboard bearing horizontal vibration instrument readings if the pump were degrading.

Due to the location of the malfunctioning vibration sensor (inside the containment building biological shield wall), a unit power reduction from 100% to approximately 20% would be required to enter containment and correct the problem. The power reduction is necessary to reduce the radiation field that makes the equipment inaccessible at full power.

Monitoring of the pump vibration with only one probe functioning will ensure the health of the pump is sufficiently examined. For this component, degradation of the pump would be characterized by specific frequencies of vibration corresponding to the shaft speed and plunger cycling. In addition to reviewing acceptability of the overall vibration level at the horizontal sensor, Engineering will evaluate the frequency spectrum for each test. Review of pump failure modes with the manufacturer has determined that increases in vibration amplitude at shaft speed and plunger cycling frequency will give early indication of a degrading condition. Furthermore, the manufacturer has concluded that there is no credible failure mechanism for the pump that would manifest itself in such a way that this level of monitoring would not detect failure.

Compliance with IWP vibration measurement requirements would be a hardship without a compensating increase in the level of quality and safety pursuant to 10CFR50.55a(a)3(ii), with the hardship being the unit power reduction that would be required in order to correct the malfunctioning vibration sensor.

Test Alternative:

The SSF RC Makeup Pump will be tested in accordance with IWP requirements except for the stated location of the vibration measurement point. Rather, vibration will be monitored on the pump inboard bearing in the horizontal direction that is perpendicular to the crankshaft and parallel to the line of plunger travel. This alternative will only be utilized until the next power reduction that would accommodate repair to the pump outboard bearing probe in the vertical direction.