UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION REPORT

RELATED TO AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NPF-9

AND TO AMENDMENT NO. 14 TO FACILITY OPERATING LICENSE NPF-17

MCGUIRE NUCLEAR STATION, UNITS 1 AND 2

DUKE POWER COMPANY

Introduction

By letter dated November 18, 1983, Duke Power Company proposed changes to the surveillance requirements for diesel fuel oil in Technical Specification 4.8.1.1.2 for McGuire Nuclear Station Units 1 and 2. Additional information was contained in a letter dated March 20, 1984.

In general, the proposed changes involve replacing fuel oil tests presently required by the Technical Specifications with different tests which the licensee states (1) are more effective in detecting unsatisfactory fuel oil, (2) can be performed onsite, and (3) are simpler and less expensive to perform.

Evaluation

The most significant change is the deletion of requirements for testing stored fuel oil in accordance with American Society for Testing Materials (ASTM) D2274-70 every 92 days. In lieu of the test, the licensee proposes to test stored fuel oil for particulate concentrations every 31 days in accordance with ASTM D2276-78. The rationale for this change is that the proposed test addresses the actual condition of the fuel oil that will be pumped to the diesel generators in terms of particulate (solid) matter which could impair diesel generator operation or result in diesel generator unavailability. The current surveillance requirements (ASTM D2274-70) are oriented to predicting the tendency of fuel oil to oxidize and form particulates during long term storage, but do not address particulates that may already exist. In addition, ASTM D2274-70 test results may not accurately correlate with actual fuel condition because test results tend to vary depending on factors such as storage conditions. Also, the proposed ASTM D2276-78 tests would be performed every 31 days as opposed to every 92 days for ASTM D2274-70. The more frequent testing for actual particulates in the stored fuel oil would provide better data on fuel condition at the time of test as well as the tendency for formation of particulates under site storage conditions. The proposed tests would, therefore, be more conservative in establishing adequacy of stored fuel than the present requirements. In its review of the licensee's justification, the staff discussed the comparability of ASTM D2274-70 and ASTM D2276-78 with the licensee and his consultant, with representatives of the U.S. Naval Research Laboratory and with the U.S. Navy Petroleum Office. Based on the discussions, the staff agrees with the licensee that the proposal for testing per ASTM D2276-78 every 31 days in lieu of ASTM D2274-70 every 92 days is more conservative and is, therefore, acceptable.

Other proposed changes include (a) replacing the Water Sediment test by centrifuge on new fuel per ASTM D1796 with the Clear and Bright test per ASTM D4176-82, (b) use of optional methods of verifying fuel gravity by testing and comparing with the supplier's certification, (c) allowing sulfur analysis to be performed in accordance with ASTM D1552 or ASTM D2262, and (d) extending the time limit for obtaining ASTM D975 test results on new fuel from 14 days to 31 days. The staff has reviewed the Clear and Bright test (ASTM 4176-82) including a demonstration of the test principles at the Naval Fuel Laboratory, Norfolk, Virginia. Based on our review and the demonstration, the staff concurs with the licensee and concludes that the Clear and Bright test is more sensitive in determining the presence of water and sediment in fuel oil than the Water and Sediment test by centrifuge (ASTM D1796), and the proposed change is, therefore, acceptable.

The use of optional methods of verifying new fuel gravity prior to storing by testing and comparing with the supplier's certification is proposed by the licensee as a means of simplifying new fuel acceptance procedures. The justification for this change is that any contamination of fuel oil during transportation would be indicated by changes in flash point, gravity or viscosity, or appearance. Incorrect flash point will be detected by testing as discussed later in this report. Any contamination which will alter the fuel oil appearance will be detected by the Clear and Bright test discussed previously in this report. With tests for flash point and appearance as additional indicators, a verification of fuel oil gravity by testing and comparing to the supplier's certification will provide the necessary assurance that the new fuel is within specification limits. The staff concurs with the licensee's proposal and concludes that the verification of fuel oil gravity by optional methods is acceptable.

ASTM D975 requirements are such that testing new fuel oil for sulfur content may only be performed in accordance with ASTM D129. Federal diesel specification VV-F-800C and ASTM D396, Specification for Fuel Oil, however, allow the use of ASTM D1552 and ASTM D2262 tests for sulfur determination in No. 2 grade fuel oil. The staff recognizes both of the above fuel oil specifications and believes that obtaining test results by their use will be equivalent to results obtained by use of ASTM D129 and, therefore, concludes that the proposed alternate methods of determining sulfur are acceptable.

At present, the Technical Specifications require new fuel oil to be tested for conformance to the limits of the respective fuel oil properties listed in Table 1 of ASTM D975, and the test results to be available within 14 days following fuel oil delivery. Under the licensee's proposed surveillance program, the fuel oil properties which, if not in conformance with requirements, would have the most detrimental and immediate impact on diesel generator operation (flash point, viscosity or gravity, water and sediment) are checked for conformance to ASTM D975 limits immediately prior to accepting the new fuel. The remaining fuel oil properties are those which might impact diesel

generator performance only on a long term basis. Therefore, the licensee's proposal to extend the time for obtaining test results for the remaining fuel oil properties from 14 days to 31 days would not adversely affect diesel generator reliability. The staff concurs with the licensee and concludes that this time extension is acceptable.

The proposed changes to the Technical Specifications include deleting the requirement for testing of fuel oil in accordance with ASTM D975 requirements on a 92 day basis. The licensee's rationale for this deletion is that the fuel oil properties which can affect diesel generator performance (flash point, cetane number, viscosity, cloud point) do not change during storage. If these properties are within specification when the fuel oil is placed in storage, they will remain within specification unless other non-specification petroleum products are added to the storage tanks. The addition of non-specification petroleum products is precluded by the licensee's proposed new fuel surveillance program as detailed above. Over prolonged periods stored fuel can oxidize and form particulates which, in significant concentrations, could impair diesel generator performance. Particulate concentrations and bacteria concentrations are the only things that will change in stored fuel oil. Particulate concentrations will be monitored every 31 days as discussed previously in this report. Bacteria growth will be prevented by periodic removal of water from the storage tanks as discussed later in this report. Considering that the fuel oil properties will not change in storage, and that fuel oil conditions which could affect diesel generator operation will be closely monitored (on a 31 day basis), further testing of stored fuel in accordance with ASTM D975 every 92 days will not provide any additional data nor improve diesel generator reliability and, therefore, can be deleted. The staff concurs with the licensee's justification and concludes that the proposed deletion is acceptable.

The licensee has also proposed two additions to the fuel oil surveillance Technical Specifications. These include (a) testing new fuel for flash point before acceptance, and (b) testing for and draining water from the fuel oil storage tanks every 31 days. The flash point test provides an additional indication that new fuel oil is within specification limits, thereby reducing the possibility of adding "bad fuel" to the fuel oil already in storage. The requirement to drain accumulated water from the storage tanks every 31 days will be of considerable value in reducing the possibility of bacteria contamination of the stored fuel, in minimizing the formation of corrosion products on the bottom of the storage tank, and in preventing water from contaminating the fuel oil transfer system and the diesel generator fuel systems. Both of the above additions represent a more conservative approach to maintaining quality diesel fuel and diesel generator reliability. The staff concurs with the licensee and, therefore, concludes the above additions are acceptable.

Conclusion

The Commission made a proposed determination that the amendments involve no significant hazards consideration which was published in the Federal Register (49 FR 3347) on January 26, 1984, and consulted with the state of North Carolina. No public comments were received, and the state of North Carolina did not have any comments.

The staff finds that the changes to the present surveillance requirements for diesel fuel oil in Technical Specification 4.8.1.1.2 as proposed by the licensee for McGuire Nuclear Station Units 1 and 2 will result in a more conservative approach to fuel oil surveillance. The added conservatism coupled with the simplified testing of fuel oil will provide immediate assurance in acceptance of quality fuel oil on delivery and maintenance of high quality stored fuel; this should increase diesel generator availability. Therefore, the licensee's proposed Technical Specification changes to the diesel fuel oil surveillance requirements are acceptable.

Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

Safety Conclusion

In conclusion the staff finds the proposed changes to the plant technical specifications to be acceptable and based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Dated: June 5, 1984

June 5, 1984

AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NPF-9 - McGUIRE NUCLEAR STATION, UNIT 1
AMENDMENT NO. 14 TO FACILITY OPERATING LICENSE NPF-17 - McGUIRE NUCLEAR STATION, UNIT 2

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