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

ENCLOSURE

SAFETY EVALUATION OF

ALTERNATE SHUTDOWN CAPABILITY - ST. LUCIE, UNIT 1

DOCKET NO. 50-335

1.0 INTRODUCTION

The staff's safety evaluation of July 17, 1984 for St. Lucie, Unit 1, described aspects of the post-fire, safe shutdown capability for the control room. The staff subsequently reviewed previous licensee correspondence, including letters dated April 12 and October 7, 1983, to assess the adequacy of the alternate shutdown capability for the cable spreading room. By letter dated November 24, 1986, the staff requested additional information from the licensee so as to be able to confirm that the post-fire safe shutdown capability conforms with the criteria delineated in Section III.L. of Appendix R to 10 CFR 50 and Generic Letters 81-12 and 86-10. The licensee responded to this request by letter dated January 23, 1987. The staff's evaluation of this information is as follows.

2.0 EVALUATION

In the April 12, 1983 letter, the licensee indicated that their evaluation of the effects of spurious signals caused by a fire on the ability to achieve safe shutdown was incomplete. The staff was concerned that this effort was not complete and that the protection provided to mitigate the consequences of spurious signals was not in accordance with the guidance issued in Generic Letters 81-12 and 86-10. The licensee responded by letter dated January 23, 1987 that previously identified pending evaluations were completed as part of the Engineered Safety Features Actuation System (ESFAS) spurious signal study. The results of this study have been incorporated in the current alternate shutdown procedure. Certain required modifications were implemented to bring the plant into conformance with Appendix R. On the basis that the licensee has comprehensively assessed the consequences of fire-induced spurious signals and that mitigating features conform with the above-referenced staff guidance, this issue is considered closed.

In Generic Letter (GL) 81-12, the staff identified reactor coolant hot leg temperature or exit core thermocouples as instrumentation needed for safe shutdown. The licensee has not provided either of these indications as part of the alternate shutdown capability. The staff considered this an unjustified deviation. The licensee responded to this concern by stating that this issue had been resolved on the basis of meetings with the staff in 1982 and had been reviewed and found acceptable for both units during a February 1985 audit. However, this issue was closed during the audit on the basis of previous staff acceptance. But the staff safety evaluation does not specifically address the lack of fire protection for this instrumentation. Nor does it reference the

meetings held or correspondence issued concerning this issue. The staff concludes that this issue should remain open pending receipt of sufficient technical justification by the licensee or a commitment to conform with the guidance in GL 81-12.

The staff was concerned that a fire in the area which contains the hot shutdown panel could, because of the absence of electrical isolation, adversely affect the ability to safely shutdown the plant from the control room. The licensee responded in the January 23, 1987 letter that for this area (Fire Area C), "Train A" equipment is relied upon for safe shutdown. Required "Train A" cables have been protected against fire damage and "Train A" instrumentation at the hot shutdown panel has been provided with electrical isolation. On the basis that this protection scheme will assure that one train of shutdown systems will be free of damage for a fire in Area C, this issue is considered resolved.

The staff was concerned that the shutdown procedures were not comprehensive as pertaining to the need to take tank level indications and diagnostic instrumentation readings in order to achieve safe shutdown. The licensee responded that level indication for the boric acid makeup tank and refueling water storage tank are not required for post-fire safe shutdown. For the condensate storage tank, a local mechanical level indicator is provided which requires the implementation of the alternate shutdown capability and which would not be affected by a fire. All other readings are encompassed by the current revision of the safe shutdown procedure. On this basis, the staff considers this issue closed.

For a fire in the cable spreading room (CSR), the safe shutdown procedure calls for isolating panel 1AB, which is located in the CSR. The staff was concerned that operators would have to enter the fire area in order to achieve safe shutdown. The licensee responded that isolation switches located in the CSR will be positioned only if these switches are accessible. The purpose of these switches, according to the licensee, is to make available additional equipment to assist in the unit shutdown. The equipment affected by these switches is not required for shutdown with a fire in the control room and/or CSR. On the basis that the plant can be safely shutdown after a fire without operators having to take actions within the fire area, this issue is considered closed.

The staff requested information as to whether the licensee had conducted an analysis to judge whether multiple high impedance faults could adversely affect the adequacy of circuit isolation devices. The licensee responded that a distinct analysis of multiple high impedance faults of associated safety cables is not required by Section III.G. of Appendix R. In addition, the licensee concluded that due to the relatively low occurrence of multiple non-essential circuits from the same power supply routed in a fire area of the opposite train and the low probability of such a fault condition occurring, an analysis was not deemed necessary. The staff considers this response unacceptable. In GL 86-10 the staff delineated its position on this issue as follows:

> "To meet the separation criteria of Section III.G.2 and III.G.3 of Appendix R, high impedance faults should be considered for all associated circuits located in the fire area of concern. Thus, simultaneous high

impedance faults (below the trip point for the breaker on each individual circuit) for all associated circuits located in the fire area should be considered in the evaluation of the safe shutdown capability. Clearing such faults on associated circuits which may affect safe shutdown may be accomplished by manual breaker trips governed by written procedures. Circuit coordination studies need not be performed if it is assumed that shutdown capability will be disabled by such high impedance faults and appropriate written procedures for clearing them are provided."

The staff considers this issue open pending receipt of a satisfactory response from the licensee.

In the licensee's description of the alternate shutdown capability for the control room and CSR, it was stated that certain safe shutdown systems would be protected within these areas. The staff was concerned that these systems would not be protected per the criteria of Section III.G.2 of Appendix R. The licensee responded that those systems requiring protection would be completely enclosed in a 3 hour fire-rated barrier. On this basis, the staff considers this issue closed.

3.0 CONCLUSION

Based on its evaluation, the staff concludes that, except for two open issues, the licensee's methodology for assuring safe shutdown for a fire in the control room and CSR conforms with the criteria delineated in Sections III.G.3 and III.L of Appendix R to 10 CFR 50 and in Generic Letters 81-12 and 86-10. The two open items are:

1. the absence of T-Hot indication on the alternate shutdown panel, and

2. the lack of analysis of multiple high impedance faults.

Dated:

Principal Contributor:
D. Kubicki