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

ENCLOSURE

SAFETY EVALUATION REPORT

MAINE YANKEE STATION

OVERRIDE OF CONTAINMENT PURGE ISOLATION

Introduction

Instances have been reported at nuclear power plants where the intended automatic closure of the containment purge/ventilation valves during a postulated accident would not have occurred because the safety actuation signals were inadvertently overridden and/or blocked, due to design deficiencies. These instances were determined to constitute an Abnormal Occurrence (#78-5). As a follow-up action, NRR issued a generic letter requesting each licensee to take certain actions.

Evaluation

The attached report "Override and Reset of Control Circuitry in the Ventilation/Purge Isolation and Other Engineered Safety Feature Systems," was prepared for us by Franklin Research Center as part of our technical assistance contract program. The report provides their technical evaluation of the design compliance with NRC provided criteria. The following discussion addresses the concerns in the conclusion section of the contractor's report. We have no additional concerns.

The containment isolation circuit design satisfies our criteria for containment ventilation and purge with the exception of the radiation monitors, which are not safety grade as required by Criterion 5. This item is presently being reviewed under NUREG-0737 Action Plan Item II.E.4.2.7 concerning the automatic isolation of the containment ventilation and purge systems on high containment radiation. Therefore, for the purposes of this report, our review of this item is complete.

The Safety Injection Actuation System (SIAS) initiation circuitry does not satisfy Criterion 1 in that the blocking of the SIAS initiation circuitry causes the blocking of both the pressurizer low-low pressure signal and the containment high pressure signal. We recommend the circuit design be modified such that only one initiation parameter is blocked when the SIAS initiation circuitry is blocked. Accomplishment of the above will satisfy Criterion 1 for the SIAS.

In the case of the CSAS actuation logic, the blocking of the SIAS will cause a block of the CSAS. This is acceptable because the SIAS is considered a permissive signal for the CSAS. However, the blocking of the SIAS will also disable the manual capability of the CSAS. This situation is inconsistent with satisfying review criterion number 1 and with the criteria of IEEE Standard 279-1971 with regard to manual initiation at the system level. We recommend that the design be modified to provide a manual initiation capability for the CSAS which is independent of the blocking signals.

Conclusion

Based on our review of the contractor's technical report, we conclude that the electrical, instrumentation and control design aspects of the override of containment purge valve isolation are acceptable pending satisfactory resolution of NUREG-0737 Action Plan Item II.E.4.2.7 and with the following exceptions:

1. The SIAS initiation circuitry blocks all initiation parameters when overriding one actuation signal. We recommend that only one initiation parameter is blocked when the SIAS initiation circuitry is blocked as required by review criterion number 1.

2. The CSAS does not have manual initiation capability at the system level when the SIAS has been blocked. We recommend that the design be modified to provide manual capability for the CSAS which is independent of the block signals as required by review criterion number 1 and IEEE Standard 279-1971.

This safety evaluation was performed by T. Alexion and J. Calvo of the Operating Reactors Assessment Branch, Division of Licensing.

Attachment: FRC Technical
Evaluation Report