



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM DESIGN

POWER AUTHORITY OF THE STATE OF NEW YORK

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50-333

1.0 INTRODUCTION

Main Steam Isolation Valve Leakage Control System (MSIVLCS) is required by General Design Criterion (GDC) 54, "Piping Systems Penetrating Containment," of Appendix A to 10 CFR Part 50 to detect and control leakage from main steam isolation valves (MSIV) within acceptable limits. MSIVLCS is also required to ensure that the total site radiological effects do not exceed the guidelines of 10 CFR Part 100.

In its letter dated September 22, 1976, the licensee submitted a proposed MSIVLCS design for our review. We evaluated the proposed design to determine whether it met the requirements specified in GDC 2, 4 and 54. Our evaluation included review of design calculations and drawings, installation procedures, and an independent verification of design inputs and as-built systems.

2.0 EVALUATION

The results of our evaluation of the MSIVLCS design are summarized as follows:

1. There is no system piping that connects to main steam system piping between inner and outer containment isolation valves. The redundant MSIVLCS piping systems are located out-board of the outer isolation valve. The system has no fluid sealing medium. The MSIVLCS is designed in accordance with Seismic Category I and Quality Group B requirements.

The MSIVLCS therefore meets the requirements of GDC 2 insofar as the design is in conformance with position C.1 of Regulatory Guide 1.29 and position C.1 of Regulatory Guide 1.96.

2. The licensee has designed the system to withstand the effects of a loss-of-coolant accident (LOCA) including (a) missiles, (b) dynamic effects from pipes and jet forces, and (c) normal operating and accident-caused local environmental conditions. The design also assures that a single failure of an active component would not affect the operation of main steam lines and main steam isolation valves.

These features adequately meet the requirements of GDC 4 insofar as the design is in conformance with positions C.2 and C.4 of Regulatory Guide 1.96.

3. The system is designed to function following a LOCA and an assumed single active failure including the failure of a main steam isolation valve. The electrical design permits the system to function following a LOCA coincident with loss of all offsite power. The motor-operated valves and instrumentation required for post-LOCA operation are powered from redundant emergency power supplies.

As indicated in Section 5.3.3.4 of the facility Final Safety Analysis Report (FSAR), the Standby Gas Treatment System is capable of collecting and processing the expected leakage from this system. A review of the system and the associated operating procedures indicate that the system is designed to be manually initiated within 20 minutes after a LOCA.

The instrumentation and circuits associated with this system are designed to conform with the applicable sections of Institute of Electrical and Electronics Engineers (IEEE) Standard 279, 344, 323, 308, 338 and 379. The system, as indicated in the licensee's letter dated September 22, 1976, has the necessary interlocks to prevent inadvertent operation. The location of the control panel permits operability tests during power operation and plant shutdown. The system interlocks would isolate the system if the system pressure was greater than 16 psig. The system has the capability to collect and process valve stem packing leakage. The valve stem packing leakage collection system is also designed to Seismic Category I and Quality Group B requirements.

The above features are adequate to meet the requirements of GDC 54 insofar as the design is in conformance with positions C.3 and C.5 through C.12 of Regulatory Guide 1.96.

### 3.0 CONCLUSION

Based on the above review of the licensee's design criteria, design bases, safety classification of systems and components, and the requirements for operation of the system during LOCA conditions, the staff concludes that the design of the MSIVLCS is in conformance with the Commission's regulations set forth in General Design Criteria 2, 4 and 54 and is, therefore, acceptable.

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Dated: September 26, 1985