U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

BRANCH TECHNICAL POSITION (BTP) 8-1

REQUIREMENTS ON MOTOR-OPERATED VALVES IN THE ECCS ACCUMULATOR LINES

REVIEW RESPONSIBILITIES

Primary - Organization responsible for electrical engineering

Secondary - None

A. BACKGROUND

For many postulated loss-of-coolant accidents, the performance of the emergency core cooling system (ECCS) in pressurized-water reactor plants depends upon proper functioning of the safety injection tanks (also referred to as “accumulators” or “flooding tanks” in some applications). In these plants, a motor-operated isolation valve (MOIV) and two check valves are provided in series between each safety injection tank and the reactor coolant (primary) system.

The MOIVs must be considered to be “operating bypasses” because, when closed, they prevent the safety injection tanks from performing the intended protective function. IEEE Std. 279 has a requirement for “operating bypasses” which states that the bypasses of a protective function will be removed automatically whenever permissive conditions are not met. This Branch Technical Position provides specific guidance in meeting the intent of IEEE Std. 279 for safety injection tank MOIVs. See Reference 3 for further background information regarding this issue.

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B. BRANCH TECHNICAL POSITION

To meet the intent of IEEE Std. 279, the design of the MOIV system should incorporate the following features for safety injection tanks:

1. Automatic opening of the valves when either primary coolant system pressure exceeds a preselected value (to be specified in the technical specifications) or a safety injection signal is present. Both primary coolant system pressure and safety injection signals should be provided to the valve operator.

2. Visual indication in the control room of the open or closed status of the valve.

3. An audible and visual alarm, independent of item 2, above, that is actuated by a sensor on the valve when the valve is not in the fully open position.

4. Use of a safety injection signal to remove automatically (override) any bypass feature that may be provided to allow an isolation valve to be closed for short periods of time when the reactor coolant system is at pressure (in accordance with provisions of the technical specifications).

Conformance with the relevant criteria for operating bypasses described in IEEE Std. 603, as endorsed in RG 1.153, constitutes an acceptable alternative approach.

It should be noted that BTP 8-4 may also be applied to these isolation valves and should be used, when applicable, in conjunction with this Branch Technical Position.

It should also be noted that IEEE Std. 1290 provides information on motor-operated valve protection, control, and testing.

C. REFERENCES

1. Regulatory Guide 1.153, “Criteria for Power, Instrumentation, and Control Portions of Safety Systems.”

2. BTP 8-4, “Application of the Single Failure Criterion to Manually Controlled Electrically Operated Valves.”

3. Arkansas 1, Unit 1, Safety Evaluation Report, January 23, 1973.

4. IEEE Std. 603-1991, “Criteria for Safety Systems for Nuclear Power Generating Stations.”

5. IEEE Std. 279-1971, “Criteria for Protection Systems for Nuclear Power Generating Stations.”

6. IEEE Std. 1290-1996, “IEEE Guide for Motor Operated Valve (MOV) Motor Application, Protection, Control, and Testing in Nuclear Power Generating Stations,” 1996.

PAPERWORK REDUCTION ACT STATEMENT

The information collections contained in the Standard Review Plan are covered by the requirements of 10 CFR Part 50 and 10 CFR Part 52, and were approved by the Office of Management and Budget, approval number 3150-0011 and 3150-0151.

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