



NUREG-0800

## U.S. NUCLEAR REGULATORY COMMISSION

# STANDARD REVIEW PLAN

### BRANCH TECHNICAL POSITION 7-2

### GUIDANCE ON REQUIREMENTS OF MOTOR-OPERATED VALVES IN THE EMERGENCY CORE COOLING SYSTEM ACCUMULATOR LINES

### REVIEW RESPONSIBILITIES

**Primary** - Organization responsible for the review of instrumentation and controls

**Secondary** - None

**Review Note:** The revision numbers of Regulatory Guides (RG) and the years of endorsed industry standards referenced in this branch technical position (BTP) are centrally maintained in Standard Review Plan (SRP) Section 7.1-T, "Regulatory Requirements, Acceptance Criteria, and Guidelines for Instrumentation and Control Systems Important to Safety," (Table 7-1). Therefore, the individual revision numbers of RGs (except RG 1.97) and years of endorsed industry standards are not shown in this BTP. References to industry standards incorporated by reference into regulation (IEEE Std 279-1971 and IEEE Std 603-1991) and industry standards that are not endorsed by the agency do include the associated year in this BTP. See Table 7-1 to ensure that the appropriate RGs and endorsed industry standards are used for the review.

Revision 6 - August 2016

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#### USNRC STANDARD REVIEW PLAN

This Standard Review Plan (SRP), NUREG-0800, has been prepared to establish criteria that the U.S. Nuclear Regulatory Commission (NRC) staff responsible for the review of applications to construct and operate nuclear power plants intends to use in evaluating whether an applicant or licensee meets the NRC regulations. The SRP is not a substitute for the NRC regulations, and compliance with it is not required. However, an applicant is required to identify differences between the design features, analytical techniques, and procedural measures proposed for its facility and the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP acceptance criteria provide an acceptable method of complying with the NRC regulations.

The SRP sections are numbered in accordance with corresponding sections in Regulatory Guide (RG) 1.70, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)." Not all sections of RG 1.70 have a corresponding review plan section. The SRP sections applicable to a combined license application for a new light-water reactor (LWR) are based on RG 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)."

These documents are made available to the public as part of the NRC policy to inform the nuclear industry and the general public of regulatory procedures and policies. Individual sections of NUREG-0800 will be revised periodically, as appropriate, to accommodate comments and to reflect new information and experience. Comments may be submitted electronically by email to [NRO\\_SRP@nrc.gov](mailto:NRO_SRP@nrc.gov).

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## **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. The Institute of Electrical and Electronics Engineers (IEEE) Standard (Std) 279-1971, “Criteria for Protection Systems for Nuclear Power Generating Stations,” 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. IEEE Std 603-1991, “IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations,” contains a similar requirement. This branch technical position (BTP) provides specific guidance in meeting the intent of IEEE Std 279-1971 or IEEE Std 603-1991 for safety injection tank MOIVs.

It should be noted that SRP BTP 8-4, “Application of the Single Failure Criterion to Manually Controlled Electrically Operated Valves,” also applies to these isolation valves and should be used in conjunction with this position.

## **B. Branch Technical Position**

The following features should be incorporated into the design of MOIV systems for safety injection tanks to meet the intent of IEEE Std 279-1971 or IEEE Std 603-1991:

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. Bypassed and inoperable status indication in accordance to RG 1.47, “Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety System.”
4. Utilization 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).

## **C. References**

1. Institute of Electrical and Electronics Engineers, IEEE Std 279-1971, “Criteria for Protection Systems for Nuclear Power Generating Stations,” Piscataway, NJ.
2. Institute of Electrical and Electronics Engineers, IEEE Std 603-1991, “IEEE Standard

Criteria for Safety Systems for Nuclear Power Generating Stations,” Piscataway, NJ.

3. U.S. Nuclear Regulatory Commission, “Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems,” Regulatory Guide 1.47.

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**PAPERWORK REDUCTION ACT STATEMENT**

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

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**BTP Section 7-2  
Description of Changes**

**BTP 7-2, “Guidance on Requirements of Motor-Operated Valves in the  
Emergency Core Cooling System Accumulator Lines”**

This BTP Section affirms the technical accuracy and adequacy of the guidance previously provided in BTP Section 7-2, Revision 5, dated March 2007. See ADAMS Accession No. ML070550090.

The main purpose of this update is to incorporate the revised software Regulatory Guides and the associated endorsed standards. For organizational purposes, the revision number of each Regulatory Guide and year of each endorsed standard is now listed in one place, Table 7-1. As a result, revisions of Regulatory Guides and years of endorsed standards were removed from this section, if applicable. For standards that are incorporated by reference into regulation (IEEE Std 279-1971 and IEEE Std 603-1991) and standards that have not been endorsed by the agency, the associated revision number or year is still listed in the discussion.

Additional changes were editorial.