

**Millstone Power Station Unit 2
Safety Analysis Report**

Chapter 12: Conduct of Operations

CHAPTER 12—CONDUCT OF OPERATIONS

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CHAPTER 12 – CONDUCT OF OPERATIONS

12.1 ORGANIZATIONAL STRUCTURE

Information regarding the organizational structure is presented in Section 1.0, Organization, of the Quality Assurance Program Description (QAPD) Topical Report (Reference 12.1-1). With the exception given below, that information is incorporated herein by reference.

The owner, holding 100 percent of the Millstone 2 nuclear plant, is Dominion Nuclear Connecticut, Inc.

12.1.1 MANAGEMENT AND TECHNICAL SUPPORT ORGANIZATION

Information regarding the management and technical support organization is presented in Section 1.0, Organization, of the QAPD Topical Report (Reference 12.1-1). That information is incorporated herein by reference.

12.1.1.1 Technical Support for Operations

The organization providing technical support for operations is described in Section 1.0 of the QAPD Topical Report (Reference 12.1-1). That information is incorporated herein by reference.

12.1.1.2 Organizational Arrangement

The organizational arrangement is as described in Section 1.0 of the QAPD Topical Report (Reference 12.1-1). That information is incorporated herein by reference.

12.1.2 OPERATING ORGANIZATION

12.1.2.1 Plant Organization

The plant organization is as shown in Reference 12.1-1.

12.1.2.2 Operating Shift Crews

The minimum shift crew composition and license requirements during all modes of operation are contained in Section 6.2 of the Technical Specifications.

12.1.3 QUALIFICATION OF NUCLEAR PLANT PERSONNEL

Education and experience requirements are established by Section 6.3 of the Technical Specifications.

12.1.4 REFERENCES

12.1-1 Quality Assurance Program Description Topical Report.

12.2 TRAINING PROGRAM

Formal training programs have been established to train and qualify the personnel who operate and maintain the Millstone nuclear units. These programs are structured to fulfill the requirements for training set forth in ACAD 91-015 (Reference 12.2-1). The programs are based on a Systems Approach to Training and are accredited by the National Academy for Nuclear Training. Initial accreditation of these programs was awarded on August 21, 1986, for operator training and on December 15, 1987, for Maintenance and Technical training. These programs are implemented for the following categories of nuclear power plant personnel:

- Nonlicensed Operator
- Reactor Operator
- Senior Reactor Operator
- Shift Manager
- Continuing (Requalification) Training for Licensed Personnel
- Shift Technical Advisor
- Instrument and Control Technician
- Electrical Maintenance Personnel
- Mechanical Maintenance Personnel
- Chemistry Technician
- Radiological Protection Technician
- Engineering Support Personnel

12.2.1 REFERENCES

- 12.2-1 ACAD 91-015, National Academy for Nuclear Training, “The Objectives and Criteria for Accreditation of Training in the Nuclear Power Industry.”

12.3 EMERGENCY PLANNING

The Staff approved Millstone Nuclear Power Station Emergency Plan (Reference 12.3-1) addresses the criteria set forth in NUREG-0654, FEMA-REP-1, Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Revision 1, November 1980 and NUREG-0737, Supplement 1. As such, the NRC approved Emergency Plan provides for an acceptable state of emergency preparedness and meets the requirements of 10 CFR Part 50 and Appendix E thereto.

12.3.1 REFERENCES

- 12.3-1 J. F. Opeka letter to U. S. Nuclear Regulatory Commission Document Control Desk, transmitting Revision 6 to the Millstone Nuclear Power Station, Unit Numbers 1, 2, and 3 Emergency Plan, dated 11/4/91, and subsequent revisions thereto submitted on an annual basis.

12.4 REVIEW AND AUDIT

A program describing the review and audit of activities important to and affecting station safety during the operational phase has been established and complies with Regulatory Guide 1.33, “Quality Assurance Program Requirements (Operation).” The program provides a system to ensure that these activities are performed in accordance with company policy, rules, and approved procedures.

12.4.1 ONSITE REVIEW

On site review is conducted by committee(s) as described in the Quality Assurance Program Description (QAPD) Topical Report (Reference 12.4-1).

12.4.2 INDEPENDENT REVIEW

Independent review of activities affecting the unit's safety is performed by the Management Safety Review Committee as described in the QAPD Topical Report.

12.4.3 AUDITS

The Audit Program for activities affecting safety related systems, structures, or components is as described in the QAPD Topical Report.

12.4.4 OTHER REVIEW GROUPS

Other review groups evaluate, on a periodic basis, the effectiveness of the units. These groups are: independent consultants, task forces, nuclear industry management assessments, insurance inspections, etc.

12.4.5 REFERENCES

12.4-1 Quality Assurance Program Description Topical Report.

12.5 PLANT PROCEDURES

Station procedures are written on a unit and station services level controlling the specifics of station operations, including specifications; maintenance and modification; periodic test, inspection, calibration, and special processes, and plant and equipment.

12.5.1 ADMINISTRATIVE PROCEDURES

12.5.1.1 Conformance with Regulatory Guide 1.33

Regulatory Guide 1.33, issued February 1978, Quality Assurance Program Requirements, is used as guidance for the preparation of administrative and station procedures.

12.5.1.2 Preparation of Procedures

Preparation, review and approval of procedures is as described in the Quality Assurance Program Description (QAPD) Topical Report.

12.5.1.3 Procedures

Administrative control and station procedures cover a wide range of topics. Major areas are described as follows.

Standing Orders to Operating Personnel

Administrative control procedures define the authorities and responsibilities of operating personnel. The procedures specify the number of personnel with reactor operator and senior reactor operator licenses required to be on site or at the controls in all plant conditions. The administrative procedures direct the proper maintenance, review, and disposition of operating records, establish requirements for shift turnover, and establish the authority and responsibilities of the person in charge of the control room to limit access. Procedures also direct the assignment of shift personnel to duty stations, establish limits for scheduled working hours, provide methods of timely and concise feedback of operating experience to applicable plant staff, and describe methods used to verify operational activities are performed correctly. Plant procedures also provide for shift turnover such that all necessary information is properly transmitted to the oncoming shifts.

Special Orders of a Transient or Self-Cancelling Character

Night orders are issued as necessary to provide guidance to operating shifts and are of a temporary nature but will be incorporated into an administrative control if the need becomes permanent.

Equipment Control Procedures

Instructions are written to specify proper methods of obtaining clearances on plant equipment for maintenance or construction and to specify procedures for control of jumpers, inhibits, and wire removal. The clearance procedure assigns responsibility for clearance issue to the shift supervisor. A licensed operator, after ensuring he is aware of the effect of the activity on the system, is required to authorize all maintenance, tests, and surveillances performed on plant systems. Upon completion of the item, the document is returned to the operator for acceptance or for the purpose of returning the system to service. The administrative procedures which control these evolutions provide the required explicit notification of operational personnel whenever a safety related system is removed from and returned to service. The clearance procedure also contains certain restrictions on the issuance of a clearance. The instructions for control of jumpers, inhibits, and wire removal allow temporary alterations to critical structures, systems, or components to facilitate tests, maintenance, or operations. They specify administrative procedures to be followed in performing such alterations.

Control of Maintenance and Modifications

Administrative control procedures implement the review and approval requirements for maintenance and modifications. These procedures include the control of plant modifications and maintenance on safety-related equipment. These procedures establish a framework of special process and maintenance procedures.

Master Surveillance Testing Schedule

An administrative control procedure establishes a master test control list, implements the surveillance test program, and assigns responsibility for review and approval of surveillance procedures in accordance with Technical Specifications. Written surveillance procedures are controlled as station or unit procedures.

Procedures for Logbook Usage and Control

An administrative control procedure establishes the requirements for logbook usage and control.

Maintenance and Testing of Safety-Related Systems

Procedures for maintenance and testing of safety-related systems specify that prior to the removal of a safety-related system from service, the redundant system is verified operable. For equipment that requires specific surveillance in accordance with Technical Specifications, the surveillance testing is completed prior to removing the system from service.

These procedures are reviewed and improved, if necessary, to ensure operability of safety systems prior to taking credit for the system(s) to satisfy Technical Specification requirements.

Special Procedures

Special procedures are prepared as necessary to support infrequently performed activities which are not to be included in the permanent list of station procedures. A special procedure can be written for any type of station procedure (i.e., maintenance, operating). The form of a special procedure is the same as the applicable type of station procedure. All requirements for review, approval, revisions, and changes are the same as for permanent station procedures.

12.5.2 OPERATING AND MAINTENANCE PROCEDURES

Operating and maintenance procedures are divided into several categories which are described in the following subsections. The list of these procedures is contained in the Master Document Index.

Operating and maintenance procedures preparation is the responsibility of the appropriate department head. When a procedure is written, the applicable Department Head/Manager is responsible to forward the procedure for review and approval in accordance with the QAPD Topical Report.

Plant operations are performed in accordance with written and approved Station and Department procedures.

Independent position verification of safety-related components/systems (valves, breakers, and control switches) with no indication in the control room are performed prior to the return-to-service of the component/system.

12.5.2.1 Control Room Operating Procedures

12.5.2.1.1 General Operating Procedures

These procedures cover major plant evolutions. Step-by-step instructions are provided for the function or task with the appropriate cross reference to system operating procedures for details of specific system operation. Appropriate precautions and limitations are included.

12.5.2.1.2 System Operating Procedures

These procedures provide step-by-step details for systems operations with appropriate prerequisites, precautions, limitations, and alarm responses. Each procedure covers the expected modes of operation of the system as well as startup, shutdown, filling and venting, and standby operation as applicable.

12.5.2.1.3 Abnormal Operating Procedures

Operating procedures are prepared for abnormal operation of the unit. Abnormal operation is a condition that could degrade into an emergency or could violate Technical Specifications if proper

action were not taken. These procedures identify the symptoms of the abnormal condition, automatic actions that may occur, and the appropriate immediate and subsequent operator actions.

12.5.2.1.4 Emergency Operating Procedures

Emergency operating procedures are prepared for conditions which might possibly lead to injury of plant personnel or the public if the release of radioactivity in excess of established limits occurs. These procedures include symptoms of the emergency conditions, automatic actions that may or should occur, and immediate and subsequent operator actions. All immediate actions are required to be memorized by the operator since the primary responsibility for detection of an emergency and initiation of corrective action rests upon the operator.

12.5.2.2 Station Procedures

Station procedures are written by the chemistry, health physics, security, generation test, building services, stores, nuclear records, computer operations, station services engineering and any other station group. These procedures control the specific activities of these departments in support of unit or station operation (may be common site or unit specific). Station calibration procedures written by the maintenance or instrument departments are also station procedures.

12.5.2.2.1 Radiation Protection Procedures

Radiation Protection procedures support Section 13.5 and 10 CFR 20 requirements.

12.5.2.2.2 Instrument Maintenance Instructions

Instrument maintenance instructions are prepared for the performance of periodic calibration, testing, and channel checking of safety-related plant instrumentation and all instruments used to satisfy Technical Specification requirements. These instructions ensure measurement accuracies adequate to maintain plant safety parameters within operational and safety limits. In addition, instrument maintenance instructions outline the periodic calibration and accuracy requirements of test equipment necessary to support the calibration of safety-related instrumentation.

12.5.2.2.3 Chemistry Procedures

Chemistry procedures are prepared covering the routine analysis and sampling methods to ensure compliance with plant chemistry and discharge limits.

12.5.2.2.4 Radioactive Waste System Procedures

Procedures for operation of radwaste systems are included in system operating procedures.

12.5.2.2.5 Material Control Procedures

This topic is covered by administrative procedures in Section 12.5.1.3.

12.5.2.2.6 Maintenance and Modification Procedures

Maintenance procedures are prepared to cover safety-related work which requires a specific technique or sequence not normally part of an individual's routine skill.

The procedures support the requirements and programs of Section 12.5.1.33 which covers administrative control of maintenance and modification.

12.5.2.2.7 Fire Protection Procedures

The Fire Protection Program is described in Section 9.10.

12.5.2.2.8 Special Procedures

This topic is covered by administrative procedures.

12.6 RECORDS

Records are kept and maintained in accordance with the applicable federal, state, and operating license requirements. The records and retention program is as described in the Quality Assurance Program Description Topical Report. These controls include all quality related records including plant and as-built drawings.

12.7 PHYSICAL SECURITY PLANS

The security plan (Reference 12.7-1) states the security measures to be employed by the licensee for the protection of Millstone Units 1, 2, and 3 at the Millstone Nuclear Power Station, Waterford, Connecticut, against radiological sabotage. The plans have been submitted in accordance with 10 CFR Part 73, Section 73.55, “Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage.”

These plans include measures to deter or prevent malicious actions that could result in the release of radioactive materials into the environment through sabotage. This protection is provided through the use of armed guards, physical barriers, monitors, personnel access controls, alarms, communications, response to security contingencies, and liaison with appropriate law enforcement agencies.

12.7.1 REFERENCES

- 12.7-1 J. F. Opeka letter to the Nuclear Regulatory Commission, “Millstone Nuclear Power Station Unit Numbers 1, 2, and 3 Physical Security Plan, Revision 15,” dated December 16, 1991, and subsequent revisions thereto.

12.8 QUALITY ASSURANCE PROGRAM

12.8.1 QUALITY ASSURANCE PROGRAM DESCRIPTION (QAPD) TOPICAL REPORT

A comprehensive Quality Assurance Program (QAP) has been developed and implemented to assure conformance with established regulatory requirements, set forth by the Nuclear Regulatory Commission, and accepted industry standards. The participants in the QAP assure that the design, procurement, construction, testing, operation, maintenance, repair, and modification of nuclear power plants are performed in a safe and effective manner.

The QAPD Topical Report complies with the requirements set forth in Appendix B of 10 CFR Part 50, along with applicable sections of the Safety Analysis Report (SAR) for each license application, and is responsive to NUREG-0800, which describes the information presented in the Quality Assurance Section of the SARs for nuclear power plants. The QAPD Topical Report is incorporated herein by reference.

The QAP is also established, maintained, and executed with regard to Radioactive Material Transport Packages as allowed by 10 CFR 71.101(f).

The QAPD Topical Report is submitted periodically to the NRC in accordance with 10 CFR 50.54(a).

12.9 DELETED BY PKG FSC MP2-UCR-2011-014

12.10 RISK INFORMED CATEGORIZATION AND TREATMENT

12.10.1 INTRODUCTION

Millstone has implemented 10 CFR 50.69 using the processes for categorization of Risk-Informed Safety Class (RISC)-1, RISC-3, and RISC-4 structures, systems, and components (SSCs) using:

- Probabilistic Risk Assessment (PRA) model to evaluate risk associated with internal events, including internal flooding; the Appendix R program to evaluate fire risk; and the shutdown safety assessment process to assess shutdown risk;
- The Arkansas Nuclear One, Unit 2 (AN0-2) passive categorization method to assess passive component risk for Class 2 and Class 3 SSCs and their associated supports;
- The results of non-PRA evaluations that are based on the IPEEE [Individual Plant Examination of External Events] Screening Assessment for External Hazards, i.e., seismic margin analysis (SMA) to evaluate seismic risk, and a screening of other external hazards updated using the external hazard screening significance process identified in ASME/ANS PRA Standard RA-Sa-2009.

12.10.2 SSC CATEGORIZATION

As outlined in the Safety Evaluation Report (SER) for License Amendment 337 to Renewed Facility Operating License No. DPR-65 (Reference 12.10-3), Millstone 2 will use the methodology described in Section 12.10.

It should be noted that 10 CFR 50.69 does not replace the existing “safety-related” and “nonsafety-related” classification. Instead 10 CFR 50.69 divides these classifications into two subcategories based on high or low safety significance, such that there are four categories of risk-informed safety class (RISC), as shown below:

RISC-1: safety-related SSCs that perform (high) safety significant functions.

RISC-2: nonsafety-related SSCs that perform (high) safety significant functions.

RISC-3: safety-related SSCs that perform low safety-significant functions.

RISC-4: nonsafety-related SSCs that perform low safety-significant functions

10 CRF 50.69(f)(2) requires updating the UFSAR to reflect which systems have been categorized. The list below is revised as part of the periodic UFSAR update to reflect systems that have been categorized.

System Name

Radiation Monitoring (2404)

12.10.3 SSC TREATMENT

12.10.3.1 Treatment of Component Categories

The programs or processes that implement the special treatment requirements are revised to recognize that the special treatments no longer apply to RISC-3 and RISC-4 SSCs. The programs or processes either allow continued application of the special treatments or acceptable alternative treatments, as applicable, to provide reasonable confidence that these SSCs would perform their safety-related function under design basis conditions.

For those components that are categorized as Low Safety Significant, 10 CFR_50.69(b)(1) allows compliance with alternative requirements in lieu of the following special treatment requirements:

1. 10 CFR Part 21
2. The portion of the 10 CFR 50.46a(b) that imposes requirements to conform to Appendix B to 10 CFR Part 50
3. 10 CFR 50.49
4. 10 CFR 50.55(e)
5. The in-service testing requirements in 10 CFR 50.55a(f): the in-service inspection and repair, and replacement (with the exception of fracture toughness), requirements for ASME Class 2 and Class 3 SSCs in 10 CFR 50.55a(g); and the electrical component quality and qualification requirements in Section 4.3 and 4.4 of IEEE 279 and Sections 5.3 and 5.4 of IEEE 603-1991, as incorporated by reference in 10 CFR 50.55a(h)
6. 10 CFR 50.65, except for paragraph (a)(4)
7. 10 CFR 50.72
8. 10 CFR 50.73
9. Appendix B to 10 CFR Part 50
10. The Type B and Type C leakage testing requirements in both Options A and B of Appendix J to 10 CFR Part 50, for penetrations and valves meeting the following criteria:
 - a. Containment penetrations that are either 1-in. nominal size or less, or continuously pressurized.
 - b. Containment isolation valves that meet one or more of the following criteria:

1. The valve is required to be open under accident conditions to prevent or mitigate core damage events;
 2. The valve is normally closed and in a physically closed, water-filled system;
 3. The valves is in a physically closed system whose piping pressure rating exceeds the containment design pressure rating and is not connected to the reactor coolant pressure boundary; or
 4. The valve is 1-in. nominal size or less.
11. Appendix A to Part 100, Sections VI(a)(1) and VI(a)(2), to the extent that these regulations require qualification testing and specific engineering methods to demonstrate that SSCs are designed to withstand the Safe Shutdown Earthquake and Operating Basis Earthquake.

When applying alternative treatment, 10 CFR 59.69 requires that the licensee “shall ensure, with reasonable confidence, that RISC-3 SSCs remain capable of performing their safety-related functions under design basis conditions, including seismic conditions and environmental conditions and effects throughout their service life.”

Performance monitoring is being performed on all RISC-1, RISC-2, RISC-3, and RISC-4 SSCs and the station adjusts, as necessary, to either the categorization or treatment process so that the categorization process and results are maintained valid.

12.10.3.2 Enhanced Treatment of RISC-2 SSCs

The 10 CFR 50.69 procedures and 10 CFR 50.69(d)(1) require that RISC-2 SSCs perform their functions consistent with the categorization process assumptions by evaluating treatment being applied to these SSCs to ensure that it supports the key assumptions in the categorization process that relate to their assumed performance.

12.10.4 REFERENCES

- 12.10-1 NEI 98-03, “Guidelines for Updating Final Safety Analysis Reports,” Revision 1, dated June 1999.
- 12.10-2 Regulatory Guide 1.181, “Content of the Updated Final Safety Analysis Report in Accordance with 10 CFR 50.71(e),” dated September 1999.
- 12.10-3 Safety Evaluation by the Office of Nuclear Reactor Regulation related to Amendment No. 337 to Renewed Facility Operating License No. DPR-65 Dominion Energy Nuclear Connecticut, Inc. Millstone Power Station, Unit No. 2, Docket No. 50-336.