

**DG-1145, CONTENT of APPLICATIONS  
for COMBINED OPERATING LICENSES under  
SUBPART C of 10 CFR PART 52**



**SECTION C.I.17.6, DESCRIPTION OF APPLICANT'S  
PROGRAM for IMPLEMENTATION of 10 CFR 50.65,  
the MAINTENANCE RULE**

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# **MR PROGRAM DESCRIPTION**

- **Description of Program Procedures and Documentation for Maintenance Rule Implementation per NUMARC 93-01 as Endorsed by Regulatory Guide 1.160**
- **Deviations from the guidance in NUMARC 93-01 and RG 1.160 should be explained and justified.**
- **Maintenance Rule does not require procedures or documentation.**
- **NRC needs information for reasonable assurance of consistent compliance.**
- **Things that are new will be identified with asterisks.**

# REFERENCES FOR DEVELOPING YOUR NEW PLANT'S MR PROGRAM:

- The rule itself - 10 CFR 50.65
- Statements of Considerations for the Maintenance Rule
- Industry guidance - NUMARC 93-01 as endorsed by RG 1.160
- Industry guidance for 50.65(a)(4) - 2000 Revision of Section 11 of NUMARC 93-01 as endorsed by RG 1.182
- Lessons Learned from MR baseline inspections - NUREG 1648
- NRC Inspection Procedures for the MR - IP 71111.12, IP 71111.13, IP 62709
- NRC Enforcement Manual Section 8.1.11
- NRC Inspection Manual Chapter 0612, Appendix E, Section 7 - minor examples
- NRC IMC 0612, Appendix B, Section 3, Items (5)(a) through (5)(l), minor questions
- NRC Inspection Manual Chapter 0609, Appendix K, the SDP for (a)(4) findings
- **OF PARTICULAR INTEREST** - Part 52 COL Application Standard Review Plan, Section 17.6 and NRC Inspection Procedure 62706

# PROCEDURE AND DOCUMENTATION DESCRIPTION

- Computer Software and Data\*
- Status in Procedural Hierarchy\*
- Treatment as Safety-related or Non-safety-related\*
- Level of Compliance Expected\*
- Responsibility for Preparation, Review, Approval, Use, Compliance Oversight, Retention and Disposition.\*

# SCOPING per 10 CFR 50.65(b)

- Scoping and Safety Significance Classification Procedures and Documents
- Preferred Format for Scoping Data\*
  - Full-Relational Database
  - Template to be developed and provided by NRC
- Fields for Each Scoped SSC or Function
  - Scoping Paragraph
  - Function(s) Requiring SSC in Scope
  - Failure Modes and Effects Requiring SSC in Scope
  - Functional Performance Requirements/Success Criteria and/or Functional Failure Definitions and Implications

# SCOPING per 10 CFR 50.65(b)

- Safety Significance Classification (HSS or LSS)
  - Basis
  - Risk Metrics and Values
  - IOE, NRC, INPO and Vendor Information
  - Other Factors Considered by Expert Panel, *e.g.* ORAP
- For Each SSC Explicitly Mentioned in EOPs (or in Referenced Procedures), but not in MR Scope\*
  - Basis for Exclusion from MR Scope
  - Basis for Inclusion in EOPs
  - Portion of Any and All Mitigating Functions Provided
  - Expectation of Reliability
  - Means by Which Operators Alerted to Reduced Assurance of Reliability

# MONITORING per 10 CFR 50.65(a)(1)

- Monitoring Procedures and Documents
  - Goal Setting and Monitoring
  - Disposition of SSCs that do not meet goals
  - Corrective Action
- Monitoring Policies - Involving (a)(1) status of MR SSCs, e.g., for MR staff performance evaluation, etc.\*

# MONITORING per 10 CFR 50.65(a)(1)

- Monitoring Data - For each SSC initially in (a)(1) status
  - Operating status: standby or continuously operating
  - Monitoring type: performance (availability or reliability) and/or condition
  - Monitoring level: component, special component class\* (pseudo-system), system, train, or plant
    - \*applications in multiple systems, IOE, common failure modes, etc), how treated in program
  - Goals (reliability - demand failures, availability/unavailability, condition monitoring parameters and values)
  - Bases for goals - expert panel considerations (PRA insights, vendor information, IOE, Users Group Guidance, EPRI PRA Applications Guide, etc.)
  - Evaluated for consistency with safety and IOE consideration



# **MONITORING per 10 CFR 50.65(a)(1)**

- **Non-DBE Radiological Safety/Offsite Release Control Evaluation\***
  - Not currently required by the MR
  - Collateral radioactivity control function(s), active or passive, if any
  - Sensitivity of goals to radiological control effectiveness

# DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)

- (a)(2) Tracking Procedures and Documentation, including, but not limited to:
  - Establishing performance or condition criteria
  - Disposition of SSCs for which effective control of performance or condition is not being demonstrated (including not meeting performance criteria or condition monitoring criteria)
  - Conditions under which expert panel may choose not to place SSC in (a)(1) status

## DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)

- (a)(2) tracking Data - For each SSC initially in (a)(2) status
  - Operating status - standby or continuously operating
  - Tracking type: performance and/or condition
  - Tracking level: component, special component class\*(pseudo-system), system, train, or plant \*applications in multiple systems, IOE, common failure modes, etc), how treated in program
  - Performance criteria (availability and/or reliability) and/or condition monitoring criteria (reliability - demand failures, availability/unavailability when required, condition monitoring parameters and values)
  - Bases for performance criteria or condition monitoring criteria – expert panel considerations (PRA insights, vendor information, IOE, Users Groups Guidance, EPRI PRA Applications Guide, etc.)

# DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)

- Performance/Condition Criteria Evaluation
  - Consistency with industry guidance (as endorsed by NRC)
  - Commensurate with safety (including PRA insights) and good engineering and industry practice
  - Reasonable and sensible, etc., i.e., achievable and sufficiently sensitive to degraded performance or condition
- For each reliability performance criterion
  - Functional failures
  - MR functional failures (MRFFs)
  - Maintenance-preventable functional failures (MPFFs)
  - Repetitive MPFFs.

## **DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)**

- For each availability performance criterion
  - Availability or unavailability (planned and unplanned)
  - Exceptions, credits, basis
- For each condition monitoring criterion
  - Sensing, surveillance, tracking & trending, action levels (predictive maintenance), etc.

## DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)

- For each SSC categorized in a "run-to-failure" status, if any\*
  - SSC function(s) and success/failure criteria
  - Ability to detect degradation in performance or condition prior to failure
  - Ability to predict failure based on IOE (e.g., average failure rates, application vulnerabilities, MTBFs, etc.) and vendor information
  - Consequences of failure (modes, effects, safety significance), both with and without prompt detection and correction/repair or replacement
  - Ability promptly to detect failure (e.g., self revealing?)
  - Means to ensure prompt identification and resolution
  - Procedures for identification and disposition of excessive failure rates (including vendor interaction).

## **DEMONSTRATING EFFECTIVE CONTROL OF PERFORMANCE OR CONDITION - 10 CFR 50.65(a)(2)**

- Non-DBE Radiological Safety/Offsite Release Control Evaluation\*
  - Not currently required by the MR
  - Collateral radioactivity control function(s), active or passive, if any
  - Sensitivity of performance or condition criteria to radiological control effectiveness

# **PERIODIC EVALUATION**

## **per 10 CFR 50.65(a)(3)**

- Program procedures and documentation
- Scheduling and timely performance of (a)(3) evaluations
- Documenting, reviewing and approving evaluations, providing and implementing results
- Making adjustments to achieve or restore balance between reliability and availability
- Industry Operating Experience (IOE)



# INDUSTRY OPERATING EXPERIENCE (IOE)\*

- Obtaining IOE Information
  - NRC, INPO, EPRI
  - EPRI-sponsored organizations (e.g., the MRUG, CRMF, CBUGs, etc.)
  - NSSS owners groups
  - Other owners and users groups
  - Vendors (e.g., VETIP, or other programs established pursuant to NRC GL 83-28, Section 2.2)
- Reviewing IOE Information
  - Admin controls
  - Routing/distribution
  - Applicability screening
  - Engineering/technical staff involvement

# INDUSTRY OPERATING EXPERIENCE (IOE)\*

- Implementing/using IOE Information
  - Corrective action
  - Maintenance, testing and inspection changes
  - Modifications, improvements
  - Procedures, practices
  - Training, qualification
  - IOE Feedback
    - Safety Significance Classification
    - Monitoring or Tracking Type and Level
    - Goals and Performance/Condition Criteria
    - Procurement Engineering (e.g., receipt criteria, commercial-grade dedication)
    - Material handling, storage, issue
    - *PRA updating (including in-plant Operating Experience)*

# **RISK ASSESSMENT AND MANAGEMENT per 50.65(a)(4)\***

- Program procedures and documentation
- Determination of the scope (or limited scope) of SSCs to be included in (a)(4) risk assessments
- Risk assessment and management during work planning
- Risk assessment and management of emergent conditions and updating risk assessments as maintenance situations and plant conditions and configurations are changed

# **RISK ASSESSMENT AND MANAGEMENT per 50.65(a)(4)\***

- Assessment and management of risk of external events or conditions
  - Qualitative and/or quantitative capabilities
  - Fire (internal, external and fire-risk-sensitive maintenance activities)\*
  - Severe weather
  - External flooding, landslides, seismic activity and other natural phenomena
  - Grid/offsite power reliability for grid-risk-sensitive maintenance\* activities (respond to MR-related questions in NRC GL 2006-02)
  - Internal flooding

# **RISK ASSESSMENT AND MANAGEMENT per 50.65(a)(4)\***

- Assessment and management of risk of maintenance activities affecting containment integrity
- Assessment and management of risk of maintenance activities when at low power or when shut down (including implementation of NUMARC 91-06)
- Assessment and management of risk associated with the installation of plant modifications and assessment and management of risk associated with temporary modifications in support of maintenance activities (in lieu of screening in accordance with 10 CFR 50.59), in accordance with NEI 96-07 as endorsed by RG 1.187\*
- Risk assessment and management associated with risk-informed technical specifications\*

# MAINTENANCE RULE TRAINING AND QUALIFICATION

- Program procedures and documentation
- Maintenance Rule does not require training and qualification
- NRC needs information for reasonable assurance of consistent compliance
- Selection, Training and Qualification of Maintenance Rule Personnel

# MAINTENANCE RULE TRAINING AND QUALIFICATION

- Selection, Training and Qualification of Maintenance Rule Personnel
  - The Maintenance Rule Coordinator
  - The Maintenance Rule Expert Panel
- Training and Qualification of Engineering Personnel
  - System/Component Engineers
  - Procurement Engineers
  - Maintenance Engineers
  - Probabilistic Risk Analysts/Safety Assessors
- Training and Qualification of Maintenance Personnel
  - Work Planners
  - Maintenance Foremen and Shop Supervisors
  - Technicians and Craftsmen

# MAINTENANCE RULE TRAINING AND QUALIFICATION

- Training and Qualification of Operations Personnel
  - Shift Supervisors
  - Shift Technical Advisors
  - Senior Reactor Operators
  - Reactor Operators
  - Plant Operators
- Training and Qualification of Licensing Personnel
- Basic Indoctrination of New Personnel
- Management Training



# **Maintenance Rule and Operational Reliability Assurance Program (ORAP) Interface**

- Program Relationship/Interface
- Coordination/Integration of Functions
- Procedure Coordination & Cross Referencing
- See Section C.I.17.4

# Maintenance Rule Program Implementation

- Plan or process for implementing described MR program
- Sequence and milestones for establishing program elements
- Monitoring/tracking performance and/or condition of SSCs as they become operational.

# KEY POINTS TO REMEMBER ("TAKEAWAYS")

- The MR is different than it was in 1996.
- The Part 52 process is different from Part 50
- The new plants will be different.
- The ROP is a different way of regulating than 1996.
- Use DG-1145 (Section C.I.17.6), SRP 17.6 and IP 62706
  - We will!
- Don't hesitate to ask questions; saves RAIs.

Questions on  
DG-1145  
Section 17.6?

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