

8.1.11 Actions Involving the Maintenance Rule

This section provides enforcement guidance concerning enforcement of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," (the Maintenance Rule) including a joint NRR/OE/OGC/region review panel that has been established to help ensure that the Maintenance Rule is enforced in a consistent manner.

Because of the non-prescriptive nature of the rule language, enforcement of the maintenance rule represents a continuing challenge to inspectors. Since implementation of the maintenance rule in July 1996, enforcement of the rule has evolved as lessons were learned. However, this guidance cannot possibly address every conceivable maintenance rule compliance issue, but it does address issues typical of those which are most frequently raised by inspectors. This guidance reviews the requirements of 10 CFR 50.65 and provides examples of violations in which the requirements of the maintenance rule were not met.

Maintenance Rule Enforcement Panel

The maintenance rule enforcement panel includes appropriate personnel from NRR, OE, OGC, and the region. (Personnel are normally designated by their office.) The regional panel member should normally be the projects branch chief responsible for the site for which the violation was written, the Division of Reactor Safety (DRS) branch chief responsible for the inspection, or another person designated by regional management. In addition, Senior Executive Service (SES) managers from NRR and the region, and the Deputy Director, OE, should attend. Others, including the regional inspector, resident inspector, project manager, etc., may be asked to attend the meeting or provide input to the discussions.

General Procedure:

1. The panel will meet to discuss all proposed maintenance rule enforcement actions before they are issued. The panel shall usually meet in conjunction with the weekly regional enforcement SDP panel. Minor violations need not be paneled unless the region intends to document the violation in an inspection report.
2. The region will provide sufficient background information, e.g., the draft inspection report section describing the issue and a draft Notice of Violation (NOV). A draft NOV is requested even for proposed Non-cited Violations (NCVs) to ensure that a legally defensible violation exists. If sufficient parallel language to support a legal violation is present in the draft inspection report section, a draft NOV need not be provided. Consult the regional enforcement staff if guidance for this is needed.
3. It is expected that all decisions regarding the enforcement action will be made by consensus, all members agreeing. If there is no consensus, the matter will be referred to the appropriate NRR Division Director and the director of the Office of Enforcement for resolution. If needed, they may refer the matter to the Office of General Counsel.

4. Each case with a confirmed violation, regardless of significance, will be assigned an enforcement action (EA) number and will be documented on a Strategy Form.
5. The panel shall continue to review maintenance rule violations until the Nuclear Regulatory Commission (NRC) management agrees that such reviews are no longer needed.

General Enforcement Guidance for Potential Violations of the Maintenance Rule

A maintenance rule violation can only be cited against the specific language of 10 CFR 50.65. Regulatory Guide (RG) 1.160, Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, endorses NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants. NUMARC 93-01 provides methods that are acceptable to the NRC for complying with the provisions of 10 CFR 50.65. However, this guidance is non-binding and thus, does not represent requirements and can neither be the basis for nor cited in a maintenance rule violation. However, RG 1.160 and NUMARC 93-01 can be useful to inspectors in understanding how licensees typically implement their maintenance rule programs and in defining terms as they are commonly used with respect to the implementing guidance.

The maintenance rule does not require licensees to establish program procedures. Thus, there cannot be a procedure violation of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, for failing to establish, implement or to maintain Maintenance Rule process implementing procedures. Further, there cannot be a violation of the administrative section of technical specifications which invokes RG 1.33, Quality Assurance Program Requirements. This is because RG 1.33 does not cover the maintenance rule process. Therefore, the failure to follow a licensee's maintenance rule implementing procedure(s) cannot be cited as part of a maintenance rule violation, although the implementing procedure may be useful in providing insights when evaluating whether a direct violation of 10 CFR 50.65 may have occurred. As a reminder, the Maintenance Rule covers many non-safety-related systems, structures and components (SSCs).

Additionally, a violation of Appendix B, Criterion XVI for failure to identify or correct conditions adverse to quality cannot be cited for failure to identify or correct deficiencies with a licensee's maintenance rule implementation. This is because the maintenance rule process is not safety-related. This reasoning also applies to violations of Criterion V.¹

Throughout this guidance, acronyms and terms have been used which are consistent with those used by licensees to describe maintenance rule-related activities. Acronyms and terms associated with the maintenance rule are described in RG 1.160 and NUMARC 93-01 and are not further explained in this guidance. When used in this guidance, those acronyms and terms are *italicized*.

Section 8.1.11.1 of this guidance lists some maintenance rule-related activities which are and are not violations of the rule. Section 8.1.11.2 gives examples of maintenance rule violations

¹However, as in the past, a maintenance procedure used for the performance of a maintenance activity on an SSC can be referenced in a technical specification (TS)/RG 1.33 or Appendix B, Criterion V violation, when that maintenance procedure is not adequate, is not maintained, or is not followed and, for use of Appendix B, Criterion V, when the activity was on a safety-related SSC.

for each section of the rule. Section 8.1.11.3 is the text of 10 CFR 50.65 with excerpts from the Statements of Consideration (SOC). This is provided as a reference and provides the regulatory history of the rule and insight as to the Commission's intentions with respect to the rule.

Significance of Maintenance Rule Violations

This guidance will not address the significance of more than minor maintenance rule violations. The SDP will be used to determine the significance of a violation or maintenance rule finding. If a conflict exists between this guidance and the SDP for minor violations, the SDP takes precedence.

Examples of minor Maintenance Rule violations are included in section 8.1.11.2.

8.1.11.1 ISSUES THAT ARE VIOLATIONS OF 10 CFR 50.65 AND ISSUES THAT ARE NOT VIOLATIONS OF 10 CFR 50.65

The most straightforward method to determine whether a violation of the maintenance rule (or any other requirement) exists is to construct a "contrary to" statement that uses parallel language of the rule or requirement in a description of what the licensee did or did not do.

I. Paragraph (a)(1)

A. Issues that are violations of (a)(1):

1. Failure to establish goals for SSCs in (a)(1).
2. Failure to establish goals which are justifiable. Goals must be defensible and supported by either an adequate *Expert Panel* determination, adequate use of Probabilistic Risk Assessment (*PRA*), or some other reasonable basis and be commensurate with safety.
3. Failure to monitor performance or condition against established goals. The monitoring program must be sufficient in scope and frequency to adequately support a determination as to whether SSCs are meeting their assigned goals. Performance monitoring must include tracking of both availability and reliability, where goals of this nature are appropriate, since that provides the maximum assurance that SSCs are capable of fulfilling their intended functions.
4. Failure to take appropriate corrective action when performance or condition goals are not met. Corrective actions should sufficiently address actions to achieve goals, be commensurate with the goals being monitored, be timely and reasonable. The corrective actions of concern are those necessary to meet goals - not necessarily corrective actions to correct individual SSC failures. The standard for adequacy of corrective actions is reasonableness. Unless there are significant, credible, differing causes that are not reasonably addressed in the corrective actions, the licensee's actions should be considered adequate.
5. Failure to consider industry operating experience, where practical.

B. Issues that are not violations of (a)(1):

1. Failure to meet a goal. If a goal is not met, appropriate corrective action shall be taken.
2. Failure to establish goals based on industry-wide operating experience. The words of the rule, “where practical, take into account industry-wide operating experience,” were not intended to force compliance with industry goals, but rather were intended to require licensees to consider industry experience as an information source for setting reasonable goals. A decision not to take into account industry experience, on the basis that it is not practical to do so, should be justifiable.
3. Failure to subdivide SSCs into high safety significant (*HSS*) SSCs, low safety significant (*LSS*) SSCs, and low safety significant (*LSS*) standby SSCs. The rule does not require this.
4. Failure to link goals to the licensee’s *PRA*. The rule does not require this.
5. Failure to take corrective action as a result of condition monitoring which indicates that an SSC is degrading, but is still capable of performing its intended function. However, when established goals are not met, appropriate corrective action shall be taken to achieve the goals.
6. Failure to perform a cause determination when a performance criterion or goal is exceeded. Unlike Criterion XVI of Appendix B for significant conditions adverse to quality, (a)(1) does not require determination of causes, only that corrective actions be taken when goals are not met. However, if a licensee takes ineffective corrective actions due to fixing the incorrect cause, a corrective action violation could be considered. For corrective action issues involving safety-related SSCs, Appendix B, Criterion XVI, may be more easily used for enforcement purposes.

NOTE: The description of activities that are not violations of (a)(2) (described below) are also applicable to (a)(1).

II. Paragraph (a)(2)

NOTE: The focus of the rule is on the results achieved through maintenance. With that in mind, for a violation to exist, there must first exist an equipment performance problem which could indicate that preventive maintenance is not being effective. If a performance problem is determined to exist, then the following two questions are relevant to a determination of whether there is a violation:

1. Does that performance problem invalidate the demonstration that the performance of the SSC is being effectively controlled through appropriate preventive maintenance?
2. If the performance demonstration is invalid, did the licensee move the SSC to (a)(1)?

For enforcement purposes, the (a)(2) “demonstration” is not a one time or periodic evaluation of past SSC performance, but is a continuing requirement. Hence, if the *performance* or condition of an SSC decreases due to, e.g., failures or increased *unavailability*, the demonstration of effective maintenance can be questioned.

A. Issues that are violations of (a)(2):

1. Failure to move an SSC to (a)(1) when performance indicates that the SSC is not being effectively controlled through appropriate preventive maintenance. The performance demonstration must be technically justifiable and reasonable. When the performance demonstration is no longer technically justifiable, the demonstration ceases to be valid and the SSC is required to be moved to (a)(1) where the performance of the SSC is monitored against established goals. For example, a repetitive maintenance preventable functional failure (*RMPFF*) would indicate that the licensee has failed to demonstrate the effectiveness of preventive maintenance and consequently that SSC must be moved to (a)(1).
2. Failure to consider both reliability and availability when evaluating whether an SSC’s performance or condition has been demonstrated to be effectively controlled. In order for an SSC to remain capable of performing its intended function, it must be both reliable and available. If the degree of reliability and availability are not technically justifiable and reasonable, a violation may exist.

B. Issues that are not violations of (a)(2):

1. Failure to establish *performance criteria*, establish appropriate *performance criteria*, link *performance criteria* to the licensee’s *PRA*, or to meet established *performance criteria*.
2. Failure to move an (a)(2) SSC to (a)(1) **solely** because its performance criteria are not met. (Conversely, just because performance criteria **are** met does not necessarily mean that an (a)(2) demonstration is valid.)
3. Failure to correctly characterize a failure as a *functional failure (FF)* or *maintenance preventable functional failure (MPFF)*.
4. Failure to correctly consider a failure or unavailability period as potentially impacting the (a)(2) demonstration, but when considered, the demonstration remains valid.
5. Failure to document the demonstration. The rule has no explicit requirements to document the demonstration.

NOTE: These activities, although not violations of the rule, are **indicators** that the licensee’s performance demonstration **may** be invalid which could result in a violation of 10 CFR 50.65. If that is the case, the licensee must recognize the failure to demonstrate performance and, if appropriate, move the SSC to (a)(1). The items listed above **are not violations** of 10 CFR 50.65 because the methods to demonstrate performance, which they represent, are not specifically required by 10 CFR 50.65. 10 CFR 50.65 does not dictate by what method the performance is to be demonstrated. However, the licensee must be able to demonstrate,

through some reasonable means, that performance is being effectively controlled through appropriate preventive maintenance. RG 1.160 endorses an acceptable method for demonstrating performance. Whatever method the licensee uses to demonstrate performance must be reasonable, technically justifiable, and take into account availability and reliability. As stated previously, the focus of the rule is on the results achieved through maintenance. Consequently, there must first exist an SSC performance problem before the validity of the SSC performance demonstration comes into question. If there is a performance problem which invalidates the licensee's demonstration that the performance of the SSC is being effectively controlled through appropriate preventive maintenance, the SSC must be moved to (a)(1).

III. Paragraph (a)(3)

A. Issues that are violations of (a)(3):

1. Failure to perform the required periodic evaluation at least every refueling cycle. In any case, not to exceed 24 months.
2. Failure to evaluate (a)(1) activities (performance and condition monitoring activities and associated goals) and (a)(2) activities (preventive maintenance activities).
3. Failure to make adjustments, where necessary, to goals and monitoring to ensure that unavailability and reliability are balanced. The licensee's evaluation process must be reasonable and technically justifiable and should include a reasonable basis for making or not making adjustments. The intent of the evaluation is to provide an opportunity to feedback lessons learned into the process. Similarly, "taking into account, where practical, industry-wide operating experience" was not intended to force compliance with industry operating experience, but rather was intended to require licensees to consider industry experience as an information source when conducting the evaluation. A decision not to use industry experience, on the basis that it is not practical to do so, should be justifiable.

B. Issues that are not violations of (a)(3):

1. Failure to document the evaluation. The rule has no explicit requirements to document the evaluation. Licensees should use documentation to the extent necessary to assure themselves that the requirement for an evaluation has been acknowledged and performed adequately.
2. Failure to complete the evaluation in accordance with the licensee's administrative procedure. The licensee's administrative procedure for implementation of 10 CFR 50.65 or for performing evaluations cannot be cited as part of a maintenance rule violation.

IV. Paragraph (a)(4)

A. Issues that are violations of (a)(4):

1. Failure to perform a risk assessment prior to performing maintenance activities. Required assessments may be limited to those SSCs which, singularly or in combination, can be shown (by a risk-informed evaluation process) to have a significant effect on the performance of key plant safety functions; and hence, are significant to public health and safety.
2. Failure to perform an adequate assessment. To support a violation, there should be a technically justifiable reason as to why the assessment is determined to be inadequate. Keep in mind that the rule does not give guidance on what constitutes an adequate assessment. The sophistication of the assessment should be commensurate with the complexity of the configuration and should meet the test of reasonableness. If the assessment is sufficient in complexity, technically justifiable, and reasonable, it would be difficult to conclude that the assessment was inadequate. In any case, the information considered should be complete and accurate (e.g., congruence of the assessed configuration to the existing plant configuration and activities) and the assessment tool or process should be used appropriately (e.g., within its capabilities and limitations).
3. Failure to manage the increase in risk that may result from the proposed maintenance activity. The process for managing risk involves using the result of the assessment in plant decision making to control the overall risk impact. However, the licensee is not bound to keeping risk below some threshold or for taking particular actions when risk exceeds some threshold. The licensee is responsible for making conscious decisions as to how the increase in risk will be handled, then by following their own action plan for handling the increased risk.

B. Issues that are not violations of (a)(4):

1. Failure to document the assessment. The rule has no explicit requirements that the assessment be documented. Licensees should use documentation to the extent necessary to assure themselves that the requirement for an assessment has been acknowledged and performed adequately.
2. Failure to use probabilistic analyses to perform a risk assessment. See the statements of consideration in section 8.1.11.3. Depending on the complexity of the SSCs out of service, a probabilistic assessment may be the most defensible, but is not explicitly required. A violation may exist, however, if a probabilistic assessment of a deterministic risk assessment reaches a significantly different conclusion and indicates that a probabilistic assessment reasonably should have been performed in place of the deterministic assessment.

V. Paragraph (b)(1)

A. Issues that are violations of (b)(1):

1. Failure to include a safety-related SSC in scope.

B. Issues that are not violations of (b)(1):

1. Failure to properly classify an SSC as either *HSS* or *LSS*. The failure to place within the scope those safety related and non-safety related SSCs as described in (b)(1) and (b)(2) is the violation, not improper classification as *HSS* or *LSS*.

VI. Paragraph (b)(2)

A. Issues that are violations of (b)(2):

1. Failure to include in the scope those types of non-safety related SSCs described in (b)(2).

B. Issues that are not violations of (b)(2):

1. No specific guidance is provided.

8.1.11.2 EXAMPLES OF VIOLATIONS

I. Paragraph (a)(1)

A. Examples of violations of (a)(1):

Failure to set goals and monitor:

10 CFR 50.65 (a)(1), requires, in part, that the holders of an operating license shall monitor the performance or condition of structures, systems, or components (SSCs) within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, and components, are capable of fulfilling their intended functions. Such goals shall be established commensurate with safety.

Contrary to the above, between (dates), the licensee failed to perform monitoring and failed to established goals for the residual heat removal system although the system was classified as being within the scope of the monitoring program on (date) after the preventive maintenance program was shown to be ineffective due to repeat maintenance-preventable functional failures.

Failure to take corrective actions:

10 CFR 50.65 (a)(1), requires, in part, that the holders of an operating license shall monitor the performance or condition of structures, systems, or components (SSCs) within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, and components, are capable of fulfilling their intended functions. Such goals shall be established commensurate with safety. When the performance or condition of a structure, system, or component does not meet established goals, appropriate corrective action shall be taken.

Contrary to the above, from (date), the licensee did not take corrective actions when the performance of the Leakage Detection System (LDS) did not meet licensee established goals in that the LDS functions were determined not to have met the established goal for reliability on (date) and no changes were made to the preventive maintenance on the LDS system.

Example of a minor (a)(1) violation:

Inspectors identified that the licensee did not monitor the isolation function that is needed to mitigate a release of radioactive liquid and is provided by turbine building drainage system radiation monitors. The drainage system design included two flow paths to the facility heat sink reservoir. One path drained directly and the other through an oily waste separation system. These paths contained Process Radiation Monitors HFRT-45 and LERT-59 that provided alarm and automatic isolation of the flow paths.

It's a violation because: The Maintenance Rule requires that licensees monitor the performance or condition of SSCs against licensee established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended function.

It's minor because: This is a failure to implement the maintenance rule that had no equipment performance implications. The licensee's program regarding scoping of other non-safety related systems was otherwise satisfactory and the process radiation monitors were found to be functional.

More than minor if: the SSC could not perform its intended safety function and its performance did not meet the established a(1) goals.

II. Paragraph (a)(2)

A. Examples of violations of (a)(2):

Failure to demonstrate effective preventive maintenance nor set goals and monitor:

1. 10 CFR 50.65 (a)(1), requires, in part, that the holders of an operating license shall monitor the performance or condition of structures, systems, or components (SSCs) within the scope of the rule as defined by 10 CFR 50.65 (b), against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, and components, are capable of fulfilling their intended functions.

10 CFR 50.65 (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or

condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, as of (date), the licensee failed to demonstrate that the performance or condition of five primary containment isolation valves and the containment hydrogen analyzers had been effectively controlled through the performance of appropriate preventive maintenance and did not monitor against licensee-established goals. Specifically, the licensee failed to identify, and properly account for five maintenance preventable functional failures of primary containment isolation valves and nine maintenance preventable functional failures of the containment hydrogen analyzers occurring from (date) to (date) which demonstrate that the performance or condition of these SSCs was not being effectively controlled through the performance of appropriate preventive maintenance and, as a result, that goal setting and monitoring was required.

2. 10 CFR 50.65(a)(1) requires, in part, that holders of an operating license shall monitor the performance or condition of SSCs within the scope of the monitoring program as defined in 10 CFR 50.65(b) against licensee-established goals, in a manner sufficient to provide reasonable assurance that such SSCs are capable of fulfilling their intended functions.

10 CFR 50.65 (a)(2) states, in part, that monitoring as specified in 10 CFR 50.65 (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended function.

Contrary to the above, the licensee failed to demonstrate that performance of the 480-volt ac electrical distribution system was being effectively controlled through the performance of appropriate preventive maintenance in that a repetitive failure of a 480-volt ac electrical breaker occurred on (date) that was not prevented by preventive or corrective maintenance. Following the failure, the licensee failed to consider placing the 480-volt ac electrical distribution system under 10 CFR 50.65(a)(1) for establishing goals and monitoring against the goals.

Example of a minor (a)(2) violation:

The inspectors identified that the licensee failed to consider one MPFF of a system component during their a(2) demonstration that preventive maintenance was being effective.

It's a violation because:

The Maintenance Rule 10 CFR 50.65(a)(2) states, in part, that monitoring as specified in (a)(1) is not required where it has been demonstrated that the performance or condition of an SSC is being effectively controlled through the performance of appropriate preventive maintenance, such that the SSC remains capable of performing its intended

function. This demonstration did not consider the identified MPFF.

It's minor because:

When the additional MPFF was considered, the a(2) conclusion remained valid.

More than minor if:

The a(2) demonstration became invalid as a result of this additional MPFF.

III. Paragraph (a)(3)

A. Examples of violations of (a)(3):

1. 10 CFR 50.65 (a)(3) requires, in part, that performance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated at least every refueling cycle. Adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance (reliability) is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components (SSCs) due to monitoring or preventive maintenance.

Contrary to the above, the periodic evaluation conducted for the period (dates) did not adequately evaluate the maintenance activities to ensure that reliability was appropriately balanced against unavailability for two emergency diesel generators (EDGs). Specifically, unavailability monitoring of the EDGs during the refueling cycle completed (date) did not consider individual EDG maintenance periods for emergent work on (date) for EDG 1-1 and on (date) for EDG 2-1. As a result, total unavailability was not properly considered and assessed for the EDGs. Without considering this unevaluated unavailability, the balancing of unavailability and reliability was not adequate.

2. 10 CFR 50.65(a)(3) states, in part, that performance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months.

Contrary to the above, as of (date), the licensee had failed to complete the periodic evaluation for the refueling cycle which ended (date).

Example of a minor (a)(3) violation:

The inspectors identified that during an (a)(3) evaluation, the licensee failed to include the system unavailability time during TS required surveillance testing of the emergency diesel generators. Although the licensee conducts monthly EDG testing, the EDGs are unavailable to perform their intended safety function during TS surveillance testing for a few minutes during each monthly test. The unavailability time due to surveillance testing was insignificant when compared against total unavailability such that the (a)(3) balancing was not affected.

It's a violation because:	The licensee failed to consider all unavailability when conducting the (a)(3) evaluation.
It's minor because:	The small contribution to unavailability due to the surveillance testing is insignificant when compared to total unavailability.
More than minor if:	The contribution to unavailability due to surveillance testing was significant enough to affect the balancing determination.

IV. Paragraph (a)(4)

A. Examples of violations of (a)(4):

1. 10 CFR 50.65 (a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.

Contrary to the above, the licensee failed to perform an assessment prior to conducting maintenance activities between (dates) on the control rod drive (CRD) pump train B and the reactor core isolation cooling (RCIC) system. The failure to perform an assessment occurred during a Division 1 outage in which the residual heat removal (RHR) train A, the low pressure core spray system (LPCS), emergency closed cooling (ECC) train A, emergency service water (ESW) train A, and Division 1 emergency diesel generator (EDG) had already been assessed for risk and removed from service.

2. 10 CFR 50.65(a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.

Contrary to the above, the licensee failed to perform an adequate risk assessment in that the overall maintenance risk assessment performed by the licensee for all plant maintenance to be performed during the week of (date(s)) was inadequate because it failed to account for (certain HSS SSCs or others within the licensee-established risk assessment scope) that was/were concurrently out of service.

3. 10 CFR 50.65 (a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities.

Contrary to the above, the licensee failed to manage the risk associated with the repair of the pipe leak on A train of the essential service water system (ESW), in that, although a risk assessment had been performed for the A train emergent work leak repair, including a provision that isolation and draining of the affected pipe segment not commence until all repair materials and procedures were staged to immediately commence work, isolation was accomplished prior to the correct welding procedure being completed. This resulted in an unnecessary unavailability of A train ESW for 23 hours while the weld procedure was being approved.

Examples of minor violations of (a)(4):

In example 1. above, the violation (failure to assess risk) would be minor had the additional risk, once assessed been insignificant and/or would not have resulted in the need for risk management actions.

In example 2. above, the violation (failure to adequately assess risk) would be minor had the risk, once adequately or correctly re-assessed (i.e., taking into account all affected SSCs within the licensee-established risk assessment scope) remained very low, showed an insignificant increase over the original assessment, and/or would not have resulted in risk management actions or additional risk management actions.

In example 3. above, the violation (failure to manage risk) would be minor had the ineffective implementation of prescribed risk management actions not had any risk consequences or if, under the particular circumstances, fully effectively implemented risk management actions would not have been able to significantly reduce the risk anyway.

V. Paragraph (b)(1)

A. Example of a violation of (b)(1):

10 CFR 50.65 (b)(1) requires, in part, that the holders of an operating license shall include within the scope of the monitoring program specified in 10 CFR 50.65 (a)(1) safety-related structures, systems, or components (SSCs) that are relied upon to remain functional during and following design basis events to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accident that could result in potential offsite exposure comparable to the 10 CFR, Part 100 guidelines.

Contrary to the above, as of (date), the licensee failed to include within the scope of the monitoring program specified in 10 CFR 50.65 (a)(1), the safety-related SSCs that provide the pressurizer level, reactor pressure vessel level, and residual heat removal suction relief valve over-pressure protection functions as applicable for non-Mode 1 conditions. These SSCs are relied upon during and after design basis events to maintain the reactor in a safe shutdown condition.

Example of minor (b)(1) violation:

See the example for a minor violation of (b)(2), below.

VI. Paragraph (b)(2)

A. Examples of violations of (b)(2):

1. 10 CFR 50.65 (b)(2) requires, in part, that the scope of the monitoring program specified in paragraph (a)(1) include non-safety related structures, systems, and components whose failure can prevent safety-related structures, systems and components from fulfilling their safety-related function.

Contrary to the above, from (date) to (date), the Unit 2 turbine building sump system was not included in the scope of the monitoring program specified in 10 CFR 50.65 (a)(1). The inclusion of the turbine building sump in the scope of the monitoring program was necessary because the failure of that system could prevent the emergency feedwater system, a safety-related system, from fulfilling its safety-related function.

2. 10 CFR 50.65 (b)(2) requires, in part, that the scope of the monitoring program specified in paragraph (a)(1) include non-safety related structures, systems, and components that are relied upon to mitigate accidents or transients or are used in plant emergency operating procedures (*EOPs*).

Contrary to the above, as of (date), the licensee failed to include the area radiation monitoring system within the scope of the monitoring program specified in 10 CFR 50.65 (a)(1). The area radiation monitoring system is a non-safety related system used in the plant *EOPs*. As a result, the preventive maintenance on the system was not assessed following three maintenance preventable functional failures occurring between (dates).

Examples of minor (b)(2) violations:

1. The inspectors identified that the licensee had not scoped and thus failed to adequately demonstrate the performance or condition of functions for some components of the augmented off-gas system. Failure of these components could result in a plant transient or scram, but there are no known equipment performance problems.

It's a violation because: The *SSCs* were not scoped within the maintenance rule and if failures had occurred, they may have caused a transient or scram to an operating unit.

It's minor because: This is a failure to implement a maintenance rule requirement that has no equipment performance implications. Had the *SSCs* been scoped, the routine maintenance being performed on the system was adequate and would have demonstrated effective maintenance per (a)(2) of the maintenance rule.

More than minor if: An actual failure had occurred causing a transient or if equipment performance problems were such that an (a)(2) demonstration could not be justified.

2. The inspectors identified that the licensee had not scoped and thus failed to adequately demonstrate the performance or condition of a pressurizer heater group power supply breaker. The pressurizer heaters are a non-safety related system used in the plant *EOPs*. The breaker failed to close during routine plant operations due to a random failure. As a result of the failure, the licensee realized that the breaker should have been scoped into the rule, and placed it into (a)(2) after reviewing its performance history and concluding that an adequate (a)(2) demonstration could be made based on the existing preventive maintenance on this type of breaker.

It's a violation because: The breaker was not scoped within the maintenance rule.

It's minor because: When scoped, the routine maintenance being performed on the breaker was adequate and its overall performance history demonstrated effective maintenance per (a)(2) of the maintenance rule.

More than minor if: Equipment performance problems were such that an (a)(2) demonstration could not be justified.

8.1.11.3 10 CFR 50.65 AND EXCERPTS FROM STATEMENTS OF CONSIDERATION

NOTE: The statements of consideration (*SOC*) provide insight on the Commission's intentions with respect to the rule. However, licensee actions, which are inconsistent with the *SOCs* alone, do not constitute a violation of the rule. The *SOC* excerpts provided in this guidance are intended for use as background information only. The *SOC* excerpts were taken from the Federal Register, 56 FR 31308-31310, dated July 10, 1991 and 64 FR 38554-38555, dated July 19, 1999.

50.65 Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.

The requirements of this section are applicable during all conditions of plant operation, including normal shutdown operations.

Statements of Consideration

An introductory paragraph has been added to 10 CFR 50.65 clarifying that the rule applies under all conditions of operation, including normal shutdown. The intent of this paragraph is to ensure that assessments are performed before maintenance activities when the plants are shut down as well as when the plants are at power.

I. Paragraph (a)(1)

A. 10 CFR 50.65(a)(1)

Each holder of an operating license under 50.21(b) or 50.22 shall monitor the performance or condition of structures, systems, or components, against licensee-established goals, in a manner sufficient to provide reasonable assurance that such structures, systems, and components, as defined in paragraph (b), are capable of fulfilling their intended functions. Such goals shall be established commensurate with safety and, where practical, take into account industry-wide operating experience. When the performance or condition of a structure, system, or component does not meet established goals, appropriate corrective action shall be taken. For a nuclear power plant for which the licensee has submitted the certifications specified in 50.82(a)(1), this section only shall apply to the extent that the licensee shall monitor the performance or condition of all structures, systems, or components associated with the storage, control, and maintenance of spent fuel in a safe condition, in a manner sufficient to provide reasonable assurance that such structures, systems, and components are capable of fulfilling their intended functions

B. Statements of Consideration

1. The intention of paragraph (a)(1) of the rule is that the licensee establish a monitoring regime which is sufficient in scope to provide reasonable assurance that (1) intended safety, accident mitigation and transient mitigation functions of the structures, systems, and components (SSCs) described in paragraph (b)(1) and (b)(2)(i) can be performed; and (2) for the SSCs described in subparagraphs (b)(2)(ii) and (b)(2)(iii), failures will not occur which prevent the fulfillment of safety-related functions, and failures resulting in scrams and unnecessary actuations of safety-related systems are minimized.
2. Where failures are likely to cause loss of an intended function, monitoring should be predictive in nature, providing early warning of degradation.
3. Monitoring activities for specific SSCs can be performance oriented (such as the monitoring of reliability and availability), condition-oriented (parameter trending), or both.
4. The results of monitoring are required to be evaluated against the licensee-established goals. Goals should be established commensurate with an SSC's safety significance.
5. Where available, the assumptions in and results of probabilistic risk assessments (*PRAs*) or individual plant examinations (*IPEs*) should be considered when establishing goals.
6. SSCs which are treated under paragraph (a)(1) may have formally established reliability and availability goals against which they are explicitly monitored, where goals of this nature are appropriate. In addition, and regardless of the nature of the monitoring and goals established to satisfy paragraph (a)(1), reliability and availability over the longer term must be assessed periodically pursuant to the requirements of paragraph (a)(3), as part of the evaluation of goals, monitoring requirements, and preventive maintenance requirements.

II. Paragraph (a)(2)

A. 10 CFR 50.65(a)(2)

Monitoring as specified in paragraph (a)(1) of this section is not required where it has been demonstrated that the performance or condition of a structure, system, or component is being effectively controlled through the performance of appropriate preventive maintenance, such that the structure, system, or component remains capable of performing its intended function.

B. Statements of Consideration

1. The purpose of paragraph (a)(2) of the rule is to provide an alternate approach (a preventive maintenance program) for those SSCs where it is not necessary to establish the monitoring regime required by (a)(1).
2. Under the terms of paragraph (a)(2), preventive maintenance must be demonstrated to be effective in controlling the performance or condition of an SSC such that the SSC remains capable of performing its intended function. Hence, it is expected that, where one or more maintenance-preventable failures occur on SSCs treated under this paragraph, the effectiveness of preventive maintenance is no longer demonstrated. As a result, the SSC would be required to be treated under the requirements of paragraph (a)(1) until such time as a performance history is established to demonstrate that reliability and availability are once again effectively controlled by an established preventive maintenance regimen. Once such a demonstration has been made, it would be acceptable to return to treating the SSC under paragraph (a)(2).

III Paragraph (a)(3)

A. 10 CFR 50.65(a)(3)

Performance and condition monitoring activities and associated goals and preventive maintenance activities shall be evaluated at least every refueling cycle provided the interval between evaluations does not exceed 24 months. The evaluations shall be conducted taking into account, where practical, industry-wide operating experience. Adjustments shall be made where necessary to ensure that the objective of preventing failures of structures, systems, and components through maintenance is appropriately balanced against the objective of minimizing unavailability of structures, systems, and components due to monitoring or preventive maintenance.

B. Statements of Consideration

1. This provision requires that SSC performance or condition goals, performance or condition monitoring, and preventive maintenance activities implemented pursuant to paragraphs (a)(1) and (a)(2) be evaluated in light of SSC reliabilities and availabilities. In the case of SSCs treated under paragraph (a)(1), adjustments are to be made to goals, monitoring, or preventive maintenance requirements where equipment performance or condition have not met

established goals. Conversely, at any time the licensee may eliminate monitoring activities initiated in response to problematic equipment performance or industry experience once the root cause of the problem has been corrected or the adequacy of equipment performance has been confirmed. In the case of SSCs treated under paragraph (a)(2), adjustment of preventive maintenance requirements may be warranted where SSC availability is judged to be unacceptable.

2. SSCs which are treated under paragraph (a)(1) may have formally established reliability and availability goals against which they are explicitly monitored, where goals of this nature are appropriate. In addition, and regardless of the nature of the monitoring and goals established to satisfy paragraph (a)(1), reliability and availability over the longer term must be assessed periodically pursuant to the requirements of paragraph (a)(3), as part of the evaluation of goals, monitoring requirements, and preventive maintenance requirements.

IV. Paragraph (a)(4)

A. 10 CFR 50.65(a)(4)

Before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety.

B. Statements of Consideration

1. The intent of this requirement is to have licensees appropriately assess the risks related to proposed maintenance activities that will directly, or may inadvertently, result in equipment being taken out of service and then, using insights from the assessment, suitably minimize the out-of-service time resulting from the proposed maintenance activities while also controlling the configuration of the total plant to maintain and support the key plant safety functions.
2. In general, a risk assessment is necessary before all planned maintenance activities. Assessments should also be performed when an unexpected SSC failure initiates required maintenance activities or when changes to plant conditions affect a previously performed assessment. However, the reevaluation of a previous assessment should not interfere with, or delay, the plant staff's taking timely actions to restore the appropriate SSC to service or taking compensatory actions necessary to ensure that plant safety is maintained. If the SSC is restored to service before performing the assessment, the assessment need not be conducted.
3. Assessments may vary from simple and straightforward to highly complex. However, the degree of sophistication required for the assessment notwithstanding, the NRC intends that the assessment process will examine the plant condition existing before the commencement of the maintenance activity,

examine the changes expected by the proposed maintenance activity, and identify the increase in risk that may result from the maintenance activity. The assessments are expected to provide insights for identifying and limiting risk-significant maintenance activities and their durations.

4. The level of complexity necessary in the assessment would be expected to differ from plant to plant, as well as from configuration to configuration, within a given plant. When a licensee proposes to remove a single SSC from service for maintenance while no other SSC is out of service, a simple deterministic assessment may suffice. If the SSC is covered by TS, then the assessment could be as simple as an expert judgement, along with confirming the relevant requirements of TS. When one SSC is out of service and the licensee proposes to remove a second SSC from service for maintenance, the assessment could be simplified through the use of a table of results for pre-analyzed combinations, typically high-safety-significant SSCs paired against each other. However, more detailed assessments are required if a licensee proposes to remove multiple SSCs from service during power operations or to remove from service systems necessary to maintain safe shutdown during shutdown or startup operations. These more detailed assessments are expected to involve probabilistic analyses where possible, and to also include considerations of key plant safety functions to be maintained and defense in depth.
5. In general, the NRC expectation regarding managing the risk is a scrutable process for controlling or limiting the risk increase of the proposed maintenance activities. This process should include an understanding of the nature (i.e., affecting the core damage, or large early release frequency) and significance of the risk implications of a maintenance configuration on the overall plant baseline risk level. For example, risk-significant plant configurations should generally be avoided, as should conditions where a key plant safety function would be significantly degraded while conducting maintenance activities. The effective control of potentially significant risk increase due to an unexpected failure of another risk-important SSC can be reasonably assured by planning for contingencies, or coordinating, scheduling, monitoring, and modifying the duration of planned maintenance activities.
6. The second sentence in the new (a)(4) paragraph states: "The scope of the assessments may be limited to structures, systems, and components that a risk-informed evaluation process has shown to be significant to public health and safety." In response to public comments on the proposed rule, this second sentence has been added so that licensees may reduce the scope of SSCs subject to the pre-maintenance assessment to those SSCs which, singularly or in combination, can be shown to have a significant effect on the performance of key plant safety functions. The focus of the assessments should be on the SSCs modeled in the licensee's *PRA*, in addition to all SSCs evaluated as risk significant (high safety-significant) by the licensee's maintenance rule expert panel. Typically, these SSCs have been analyzed as causing potential initiating events, if failed, and as accident mitigators, or as high safety-significant SSCs with their support systems. Such SSCs may be identified by operating experience or by deterministic or probabilistic analyses.

7. The rule has no explicit documentation requirements. Instead, the rule emphasizes performance. A licensee's assessment process is expected to identify the impact on safety that is caused by the performance of maintenance. Licensees should use documentation to the extent necessary to assure themselves that the requirement for an assessment has been acknowledged and performed adequately.

V. Paragraph (b)

The scope of the monitoring program specified in paragraph (a)(1) of this section shall include safety related and non-safety related structures, systems, and components, as follows:

VI. Paragraph (b)(1)

A. 10 CFR 50.65(b)(1)

Safety-related structures, systems, or components that are relied upon to remain functional during and following design basis events to ensure the integrity of the reactor coolant pressure boundary, the capability to shut down the reactor and maintain it in a safe shutdown condition, and the capability to prevent or mitigate the consequences of accidents that could result in potential offsite exposure comparable to the guidelines in 50.34(a)(1) or 100.11 of this chapter, as applicable.

B. Statements of Consideration

The scope of SSCs subject to the final maintenance rule includes safety-related SSCs, and certain "non-safety" SSCs in the balance of plant (*BOP*) which meet one or more of four specific criteria. (Note: refers to the one general criterion, safety-related, described in (b)(1) and the three criteria of non-safety related described in (b)(2).

VII. Paragraph (b)(2)

A. 10 CFR 50.65(b)(2)

Non-safety related structures, systems, or components:

- (i) That are relied upon to mitigate accidents or transients or are used in plant emergency operating procedures (*EOPs*); or
- (ii) Whose failure could prevent safety-related structures, systems, and components from fulfilling their safety-related function; or
- (iii) Whose failure could cause a reactor scram or actuation of a safety-related system.

B. Statement of Considerations

The scope of SSCs subject to the final maintenance rule includes safety-related SSCs, and certain "non-safety" SSCs in the BOP which meet one or more of four specific criteria. (Note: refers to the one general criterion, safety-related, described in (b)(1) and the three criteria of non-safety related described in (b)(2).

VIII. Paragraph (c)

A. 10 CFR 50.65(c)

The requirements of this section shall be implemented by each licensee no later than July 10, 1996.