Maintenance Rule
Frequently Asked Questions
(FAQs)

This page was last updated July 19, 2000 by Donnie Ashley and will not be updated.

This page provides the answers to questions that have been asked of the NRC staff concerning the Maintenance Rule. Links are provided when referenced documents reside on the Web Site. FAQ's for Maintenance Effectiveness may be found at the Maintenance Effectiveness FAQ.

Disclaimer: In answering questions, the staff has used the best information available at the time. The staff believes that making these questions and answers available to industry will promote a better understanding of the maintenance rule. Licensees that use these questions and answers as guidance should understand that because some of the questions were very specific in nature, the answers to them may be very limited in their applicability to other licensees with different plant or equipment configurations. Licensees are cautioned to use the questions and answers as an aid in understanding the elements of the maintenance rule and to not rely on individual answers to determine applicability.

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End of list!

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Issue	Does the NRC allow using 0 % unavailability and 0 MPFFs as reliability criteria (so that effectively a train could always be a(1))? OR is the NRC's position that you can't balance relability and availability using this approach? **submitted on 03/23/98**
Answer	A licensee may use reliability and unavailability criteria of 0 MPFFs and 0% respectively, provided there is an adequate technical justification for them. However, licensees would have to demonstrate that the preventive maintenance activities in place for the SSCs are effective in assuring the performance criteria are not exceeded. This could be accomplished through condition monitoring activities that would indicate degrading performance such that appropriate actions could be taken to prevent failure. 0 MPFFs and 0 unavailability performance criteria to keep an SSC in (a)(1) would not be appropriate. A licensee can always place any or all SSCs under (a)(1) without having to establish (a)(2) performance criteria and then exceeding them. If a licensee is able to adequately demonstrate that preventive maintenance is effective to assure an SSC has had 0 MPFFs and 0% unavailability, the balance (per (a)(3)) would be effectively acheived. *Return to Table of Contents*

Issue	1. Where is the boundary for the switchyard inter-breaker tie. Is it the first breaker away from the plant or the first breaker from outside the plant? 2. In the face of restructuring, how will off-site power supplies to safety related busses be controlled? Is their any specific direction that the NRC is headed to address this problem? What about the maintenance that occurs in the switchyards for which offsite power is supplied. The power could be supplied by a separately owned utility **submitted on 3/8/98**
Answer	Regulatory Guide 1.160, rev, 2 states the following in section 3 (Title -Inclusion of Electrical Distribution Equipment) on page 1.160-9: "The monitoring efforts under the maintenance rule, as defined in 10 CFR 50.65 (b), encompasses those systems, structures or components (SSCs) that directly and significantly affect plant operations, regardless of what organization actually performs the maintenance activity. Maintenance activity that occurs in the switchyard can directly affect plant operations; as a result, electrical distribution equipment out to the first inter-tie with the offsite distribution system (i.e., equipment in the switchyard) should be considered for inclusion as defined in 10 CFR 50.65 (b). The intent of the above RG section is that all equipment in the switchyard should be considered for inclusion within the scope of the rule. The reference to "the first inter-tie" is meant to limit the scoping consideration to the switchyard proper, as opposed to including portions of the offsite distribution system. It is recognized that all plants have different switchyard configurations and it is important that the licensee carefully evaluate where onsite-off-site inter-tie exists (i.e., the breaker location where the plant can isolate offsite power from onsite power, immediately after entering the switchyard from the offsite electrical distribution system). *Return to Table of Contents*

Issue	Can I get a copy of the following: • Maintenance Rule Handbook mentioned in Inspection Procedure 62706 • The Maintenance Rule Flow Chart • The supplemental inspection guidance document **submitted on 3/4/98**
Answer	The information contained in the Maintenance Rule Guideline Book (10CFR50.65, Statements of Consideration, Regulatory Guide 1.160; Rev 2, NUMARC 93-01; Rev 2, Inspection Procedure 62706, and Inspection Procedure 62707) is available in the Public Document Room or on the NRC Web Site. The "Flow Chart" mentioned in TAB G is very similar to the one contained in the NUMARC 93-01 document has been loaded on the on the Maintenance Rule Web Site. (Note: The staff has added the Maintenance Rule Flow Chart (mentioned in the new Inspection Procedure 62706) to the Web Site. This file requires that the Adobe Acrobat Reader be installed on your machine. To View .pdf files, get free Acrobat Reader at the Adobe Web Site. Supplemental Maintenance Rule Inspection Guidance (Tab H) is not included in the published Inspection Procedure 62706 (dated 12-31-97). This supplemental inspection guidance is under development and will be used only as an inspection planning and methods guide for inspectors. *Return to Table of Contents*

Issue	How can I get a copy of administrative letter 98-01 and other documents? **submitted on 2/20/98**
Answer	The NRC home page has several ways to obtain copies of documents. • The Reference Library will probably have the document you want. • Generic Communication listing at FEDWORLD has a very good selection of documents. • The document you referred to AL 98-01, may be found here!You can then print it, or save it to a file. • You can download a zipped version of any Maint. Rule Baseline Inspection Report from this page. *Return to Table of Contents*

Issue	NUMARC 93-01 Section 9.4.4, , states ... "During initial implementation of the Maintenance Rule, repetitive failures that have occurred in the previous two operating and refueling cycles should be considered. After the initial rule implementation, utilities should establish an appropriate review cycle for repetitive MPFFs (e.g., during the periodic review, during the next maintenance or test of the same function, or in accordance with NUMARC 93-01 Section 9.4.3" This appears to suggest that the review period, or "look-back" period, should be based upon the testing frequency for the individual components. However, since like components are tested on different frequencies, common sense would dictate that a utility should establish a set time period for this review or "look-back" period for all SSCs. Given this approach, what would be considered an "appropriate review cycle?" **submitted on 03/07/98**
Answer	Generally, the look backs or periodic assessments should be consistent with the initial periodic assessment interval of two operating and refueling cycles or three years whichever is less. However, some SSC's are tested very infrequently (i.e., integrated leak rate testing every ten years, local leak rate tests on containment isolation valves performed every outage on a sample basis); therefore, these SSC look backs should not be solely based on what is in NUMARC 93-01 Section 9.4.3, , "Dispositioning of SSC's from (a)(1) to (a)(2)", since it does not fit within the appropriate time interval. Rather, the look back should be based on the testing interval of the equipment with consideration given to equipment performance during test and actual demands, any cause determination and effectiveness of corrective actions.. *Return to Table of Contents*

Issue	What is the schedule for the rulemaking which will change "should" to "shall?" **submitted on 2/2/98**
Answer	Staff Requirements Memo: SECY 97-173 requested the staff to have a proposed rule change to the Commission by 4/30/98 and the final rule issued by 12/15/98. *Return to Table of Contents*

Issue	The 12/31/97 revision to IP 62706, section 03/05, states that "To implement the requirements of the station blackout rule (10 CFR 50.63), licensees shall maintain target EDG reliability values of either 0.95 and 0.975 as specified in NUMARC 87-00 and in licensee responses to Generic Letter 94-01. These target values shall be used as the basis for goals or performance criteria for EDG reliability under the maintenance rule. In addition, licensees shall monitor the reliability and unavailability performance of the EDGs due to maintenance in accordance with the reliability and availability goals or performance criteria established under the maintenance rule and consistent with the assumptions used in the plant-specific individual plant examination (IPE) analysis." This paragraph represents a change from the previous revision of this inspection procedure, and appears to contradict the guidance provided in Section B (Discussion) of NRC Reg. Guide 1.160 , under the heading of Emergency Diesel Generators. This section appears to allow the use of the NUMARC 87-00 trigger values, and makes no requirement that they be validated through the assumptions made in the PSA. The only comment made relative to the PSA regarding EDG performance criteria in this section relates to the unavailability criteria or goals established. Does the revsion to the inspection procedure represent a shift in the NRC's postion from allowing the use of EDG reliability indicators? Is there a pending revision to NRC Reg. Guide 1.160 to align the guidance given the industry with the guidance given the NRC inspectors? **submitted on 03/17/98**
Answer	The official agency guidance is offered in the Reg. Guide. There is not a shift in position from the Guidance described in Reg. Guide 1.160. *Return to Table of Contents*

Issue	Is there a way to do effective word searches on the documents loaded on the home page. (i.e. searching for "instrument air system" on a specific baseline inspection report.) **submitted on 12/31/97**
Answer	There is no search routine built into the Maintenance Rule Web Page, however both Netscape Navigator, MS Explorer and other Web Browsers have "built in" search capability. For example: In Netscape, select "Edit" from the Menu and then select "Find" or "Ctrl+F" and enter the information you want to Find. The entire document may be searched in this way. After finding the information press "F3" to find the next occurrence. *Return to Table of Contents*

Issue	Have any utilities contested a maintenance rule violation. If so, has anyone been successful in contesting the violation? **submitted: 5/5/98**
Answer	Licensee's have contested violations which have subsequently been withdrawn. Licensees normally use two methods to disagree or contest an issue that is characterized by an NRC inspector as a potential violation. The first method is used during or immediately following the inspection before the inspection report has been issued. This method involves providing the inspector with supplemental information which contains an appropriate basis to allow the inspector to verify the licensee is meeting the requirement in question. The inspector's review of this information will subsequently be documented in an NRC inspection report and the issue will then be dispositioned with a determination that the licensee is meeting NRC requirements or that the potential violation still exists. Licensee's use the second method after the NRC inspection report and Notice of Violation are issued and involves providing a formal denial to the NRC in correspondence which is required to be submitted in response to the Notice of Violation. Once again, the licensee must provide in this denial an appropriate basis for the inspector to verify that the licensee is meeting the requirement in question. Following consideration of the licensee's denial the NRC will sustain or withdraw the violation as appropriate. *Return to Table of Contents*

Issue	What time period would be considered reasonable for monitoring repetitive MPFF's? **submitted: 5/1/98**
Answer	There are two ways to address this question: (1) from a historical review prospective and (2) from a current perspective. 1. Generally, the historic reviews should be consistent with the initial periodic assessment interval of two operating and refueling cycles or three years whichever is less. However, some SSC's are tested very infrequently (i.e., integrated leak rate testing every ten years, local leak rate tests on containment isolation valves performed every outage on a sample basis). The review should be based on the testing interval of the equipment with consideration given to equipment performance during test and actual demands, cause determination, and effectiveness of corrective actions. 2. Current MPFFs should be reviewed in a timely manner using guidance in Paragraph 1.3 of Reg. Guide 1.160 rev 2. *Return to Table of Contents*

Issue	If MRule function applies during ShutDown conditions (CSD/Refueling), but the ORAM or outage risk assessment procedures requires only 1 of the 2 trains to be available; is unavailability monitoring required on the second train when it becomes unavailable ? Example: 2 CVCS pump trains req'd at power; one Boric Acid flowpath req'd during CSD = one CVCS train, so is CVCS train unavailability monitoring during CSD req'd on one train (OR none or both trains during CSD) ? We recommend one train, so planned inspections & maintenance may be performed during SD without 24-hour coverage, etc. **submitted: 4/29/98**
Answer	To answer the above question, three areas need to be addressed: (1) 10 CFR 50.65 (b) addresses scoping of systems, structures and components (SSCs) within the maintenance rule. The scoping area is also addressed in NUMARC 93-01, rev. 2 sections 8.1 and 8.2. Licensees commonly accomplish the scoping task by addressing which SSCs are within the scope of the MR along with identifying related functions and associated modes of operations. Monitoring of these SSCs under either (a)(1) or (a)(2) on high safety significant or standby low safety significant SSCs will need to be performed to monitor the above functions during the noted modes of operation. (2) 10 CFR 50.65 (a)(3) addresses the need to perform an on-line and shutdown safety assessment while performing monitoring and preventive maintenance. This assessment needs to include the total plant equipment that is out of service to determine the overall effect on performance of safety functions. The on-line and shutdown safety assessment is also addressed in NUMARC 93-01, rev. 2 section 11. During cold shutdown or refueling conditions, some licensee have used the ORAM (Outage Risk Assessment Monitor) program that was developed from the NUMARC 91-06. In accomplishing this task, licensees have instituted a color code process to reflect the plant conditions as they relate to risk. For example, high risk conditions identified as red and low risk conditions identified as green. There is sometimes a yellow or orange condition posted as risk increase from low to high. This varies according to the licensee program. SSCs effect on risk are measured to develop an overall risk condition (i.e., green, red) and to develop contingency plans. In general, having one train of an ECCS system available would be a greater risk than multiple trains being available. The licensee would have to consider total plant equipment that is out of service to accomplish maintenance related task. (3) With regard to your last sentence, we did not consider your recommendation. Plant specifics (ie;24 hour coverage) cannot be addressed in this forum without detailed regulatory review. In summary, per 10 CFR 50.65, the licensee should monitor each (a)(1) or (a)(2) SSC's function during applicable modes of operations and consider risk during on-line and shutdown conditions when monitoring or preventive maintenance. This would include monitoring the unavailability times of the second train during modes where the function was needed. If allowed by technical specifications, design basis, licensing basis, etc; it could be acceptable to only monitor unavailability of one train. *Return to Table of Contents*

Issue	NUMARC 93-01 does not explicitly define a functional failure; however, based on the MPFF definition in Appendix B of the guideline, one can infer that a failure of an SSC within the scope of the Maintenance Rule to perform its intended function would constitute a FF, and if the cause of the failure of the SSC is attributable to a maintenance related activity it would be considered an MPFF. The current FF/MPFF definition seems to imply that an actual failure (i.e., loss of function either during an actual demand or test) would have to occur for an event to be considered an FF/MPFF. Contrary to the Appendix B definition, Paragraph 9.4.5 of the guideline indicates that an MPFF is an "unintended event or condition such that a SSC within the scope of the rule is not capable of performing its intended function and that should have been prevented by the performance of appropriate maintenance actions by the utility." Is it the NRC's position that an actual loss of function within the scope of the rule (either during a test or operational demand) must occur for an FF to be declared, OR should an FF be declared if it is determined (by analysis) that a function would not have been fulfilled when expected (e.g., due to a design discrepancy, a function would not have initiated when originally expected but no operational demand failure had occurred). **submitted: 4/29/98**
Answer	The SSC does not have to fail to be declared a Functional Failure. It does not matter how the failure is identified (analysis, observation or other). The root cause of the failure should be identified and may or may not be a Maintenance Preventable Functional Failure (MPFF). *Return to Table of Contents*

Issue	Is unavailability monitoring (hrs/cycle) required on key safety SSCs/trains during shutdown operations (eg-CSD), or is an ORAM or colored (green to red) shutdown risk assessment (SRA) sufficient? If SRA is sufficient, and requires 1 of 2 EDGs available during CSD, may 1 EDG be unavailable the entire outage/CSD if 1 EDG is available? If the second EDG becomes unavailable, are the OOS (Out Of Service) hours counted against the MRule unavailability performance criteria (ie- against the At-Power PSA perf.criteria) ? **submitted: 4/27/98**
Answer	To answer the above question, three areas need to be addressed: (1) 10 CFR 50.65 (b) addresses scoping of systems, structures and components (SSCs) within the maintenance rule. The scoping area is also addressed in NUMARC 93-01, rev. 2 sections 8.1 and 8.2. Licensees commonly accomplish the scoping task by addressing which SSCs that are within the scope of the MR along with identifying related functions and associated modes of operations. Monitoring of these SSCs under either (a)(1) or (a)(2) on high safety significant or standby low safety significant SSCs will need to be performed to monitor the above functions during noted modes of operation and count the unavailability hours. These unavailability hours are tracked against the performance criteria or goals developed from PRA and expert panel input. (2) 10 CFR 50.65 (a)(3) addresses the need to perform an on-line and shutdown safety assessment while performing monitoring and preventive maintenance. This assessment needs to include the total plant equipment that is out of service to determine the overall effect on performance of safety functions. The on-line and shut down safety assessment is also addressed in NUMARC 93-01 rev. 2 sections 11, . During cold shut down or refueling conditions, some licensee have used the ORAM program (i.e., shutdown risk assessment) that was developed from NUMARC 91-06. In accomplishing this task, licensees have instituted a color code to reflect the plant conditions as they relate to risk. For example, high risk conditions identified as red and low risk conditions identified as green. There is sometimes a yellow or orange condition posted as risk increase from low to high. This varies according to the licensee program. SSCs effect on risk are measured to develop an overall risk condition (i.e., green, red) and to develop contingency plans as needed. In general, having one train of an ECCS system available would be a greater risk than multiple trains being available. A licensee would have to consider total plant equipment that is out of service to accomplish the maintenance task and consider SSC availability when developing the shutdown risk assessment. . (3) The NRC has noted that one critical area which applies to monitoring unavailability hours is the need for the licensee to have a clear definition of 'availability' that satisfied the NUMARC 93-01 rev. 2 definition. This same definition of 'availability' should be used when establishing performance criteria or goals from PRA and expert panel input. In turn, the same definition of 'availability' and method of counting unavailability time should be used to track and trend data associated with unavailability times. In summary, per 10 CFR 50.65, the licensee should monitor each (a)(1) or (a)(2) SSC's function during applicable modes of operations and count unavailability times and track those unavailability times against established performance criteria or goals. Also, the licensee should consider risk during on-line and shutdown conditions when performing monitoring or preventive maintenance activities. If allowed by technical specifications, design basis, licensing basis, etc; it could be acceptable to only monitor unavailability of one train. *Return to Table of Contents*

Issue	According to NUMARC 93-01, Section 9.4.5, if a failure that caused an MPFF recurs during post-maintenance testing but before returning an SSC to service, it could be indicative of unacceptable corrective actions but is not considered an additional MPFF. For plants with reliability performance criteria set at the FF level, if an SSC is removed from service for routine preventive maintenance and a failure occurs during PMT (but before the SSC is returned to service) that involves equipment covered by the PM activity, does the NRC consider the PMT failure to represent a functional failure? **submitted: 4/27/98**
Answer	The short answer is No. - unless the PMT failure was caused by a new problem or a different failure occured. For example: If a pump motor failed during the PMT for pump packing replacement it should be counted as a functional failure. If you find that the SSC had actually failed prior to PM or that if demanded would have failed, the FF (or MPFF) could have occurred. Even though a FF or MPFF may not have occurred during PMT/failure, unavailability is still accumulating and could result in exceeding the performance criteria. If the "new" failure was not related to the PMT then see NUMARC 93-01, Section 9.4.5. *Return to Table of Contents*

Issue	If the MRule Program is based on system functions, and review of the MRule function performance criteria (PC) determines PC for reliability or unavailability have been exceeded, can FUNCTION be placed in (a)(1), rather than the entire system being put in (a)(1) ? Often, exceedence of the component or train function PC does not impact/affect system function. eg- Containment integrity is intact and not failed if one Contmt. isolation valve has a repeat MPFF, since second, series CIVmaintains Type C penetration & Type A integrity. If Primary Containment (PC)is monitored as a Supersystem, with each CIV tested under Appx.J as condition Monitoring, why should we consider PC in (a)(1) for a repeat CIV MPFF? **submitted: 4/27/98**

Answer	To answer the above question, two areas need to be addressed: (1) The first part of your question relates to moving system, structure or component (SSC) function into an (a)(1) status. This is acceptable. All of the SSC or a part of the SSC, such as the system function, can be moved into an (a)(1) status with appropriate goals established to correct the deficient condition that caused the reliability or unavailability performance criteria to be exceeded, including consideration of industry operating experience. Also, after moving into an (a)(1) status, monitoring should be established to ensure the deficient condition is corrected. (2) The second part of your question dealt with a repetitive maintenance preventable functional failure (MPFF) of a containment's isolation valve. 10 CFR 50.65 (b) addresses scoping of systems, structures and components (SSCs) within the maintenance rule. The scoping area is also addressed in NUMARC 93-01, rev. 2 sections 8.1 and 8.2. Licensees commonly accomplish the scoping task by addressing which SSCs that are within the scope of the MR along with identifying related functions. Monitoring of these SSCs under either (a)(1) or (a)(2) on high safety significant or standby low safety significant SSCs will need to monitor the above functions. Some licensees have established super or pseudo system to encapsulate multiple components and monitor these components under the super or pseudo system to help monitor some common functions. In turn, performance criteria or goals are established commensurate with safety. When establishing these performance criteria or goals, there should be consideration for the reliability of the entire a super or pseudo system along with the system function that is tied to the containment isolation valve. Thus, if either function fails (i.e., the individual valve's function or the entire containment isolation system's function) and it is determined maintenance preventable, and repeats itself, this would be a repetitive maintenance preventable functional failure. See NUMARC 93-01, rev. 2, definition MPFF. In turn, if determined a repetitive MPFF, the licensee should consider going into an (a)(1) status. *Return to Table of Contents*

Issue	May I use only two of the three risk significance method (RRW, RAW CDF),to determined which of the SSCs that are risk significant to consider under the scope of the maintenance rule? **submitted: 4/24/98**
Answer	If a licensee uses a PRA model which provides meaningful values for these three importance measures then all three should be utilized when performing risk significance determinations. Per the guidance referenced in NUMARC 93-01, Rev. 2 section 9.3.1, if a utility selects a method based on PRA to establish risk significance, it should begin the process by assembling a panel of individuals. The panel should utilize their expertise and PRA insights to develop the final list of risk significant systems. The panel should review input from all three specific risk importance calculational methods listed and described in NUMARC 93-01, Rev. 2 section 9.3.11, 9.3.1.2, 9.3.1.3 (RRW,CDF,RAW) in making its judgement regarding risk significant systems. The expert panel is expected to compensate for PRA limitations Some licensee's have PRA models which do not provide valid or meaningful values for all three referenced importance measures. In these cases, utilities may develop additional sensitivity methods to supplement the valid importance measures as a basis for establishing risk significance as discussed in NUMARC 93-01, Rev. 2 section 9.3.1. *Return to Table of Contents*

Issue	Is it acceptable to establish a run-to-failure policy on an SSC after the failure occurs? If not, what is the rationale? Discussion: If a non-safety-related, low safety significant SSC was not previously evaluated for PM, and it subsequently fails, resulting in a FF, is it necessary to classify it as an MPFF even though a run-to-failure policy on the SSC could be easily and appropriately established. For those utilities that may have completed an RCM program, they may have many run-to-failure determinations documented. So that when an FF occurs, it is not an MPFF. Consider a plant of similar design where an RCM program was not completed (and no run-to-failure determinations are documented) and the same failure occurs, why couldn't the second plant establish a run-to-failure policy as the failures occur and not declare them MPFFs? If not allowed, it seems this is a penalty for not having a "documented" RCM program. **submitted: 4/24/98**
Answer	It may be acceptable to establish a run-to-failure policy on an SSC after the failure has occurred. Reasonable care should be taken when deciding which SSCs are in scope before allowing the SSC to run to failure. If after rule implementation, periodic evaluations are reviewed, a change to run-to-failure for an SSC may be made. If an SSC is in scope, it has implicit safety significance. Run-to-failures analyses have to demonstrate that very little or no impact on plant safety would occur. One might question whether the SSC is in scope. Also, as part of the (a)(3) safety assessment prior to preventative maintenance or surveillances, you would need to determine the impact on plant safety functions for assuming that the SSC could fail at any time. *Return to Table of Contents*

Issue	Is there any specific regulatory guidance on how to evaluate balancing unavailability and reliability? If not, can you provide the NRCs expectations or what would be considered acceptable balancing. **submitted: 5/11/98**
Answer	Regulatory guidance on how to evaluate balancing unavailability and reliability is available in NUMARC 93-01 section 12.2.4 and NRC inspection procedure 62706 section 03.03.b. As documented in the many maintenance rule baseline inspection reports one acceptable approach to balancing that is commonly used by licensees is to balance unavailability and reliability on an ongoing basis as an integral part of monitoring against performance criteria. Since performance history, preventive maintenance activities and out of service time are taken into consideration when performance criteria are developed, a satisfactory balance of unavailability and reliability is achieved when performance criteria are met. *Return to Table of Contents*

Issue	What is the NRC's position on monitoring supplemental flow paths. Palo Verde has 5 possible boration flow paths of which two must be available at all times. The PRA only credits two of the paths. The remainder were scoped simply because they are long lead time alternative possibilities mentioned in the EOP's but not specifically designed as Emergency Boration flow paths. We would like to maintain and monitor (with performance criteria) our three normal paths, and prefer to not monitor the remaining two as they are never lined up to provide that function and there is no surveillance method to test for operability. These flow paths cross-tie the Spent fuel pool to the charging pump suction. This line up is never actually performed to verify flow capability but is clearly a fourth and fifth alternative should the first three paths become unavailable for some reason. **submitted: 5/13/98**
Answer	Guidance for monitoring levels of SSCs scoped in the maintenance rule can be found in Reg. Guide 1.160 revision 2, section B. The NRC's position in the Guide states that the extent of monitoring may vary from system to system depending on the system's importance to safety. SSCs with high safety significance and standby SSCs with low safety significance should be monitored at the system or train level. Without additional information regarding your specific plant configuration it appears that the boron injection function is a standby function. If this is the case then train level monitoring with appropriate performance criteria would be warranted. If within scope, the NRC expects licensees to monitor all functions that were scoped in the Maintenance Rule, not necessarily flow paths/components. *Return to Table of Contents*

Issue	A nonsafety-related, low safety significant SSC has experienced a failure. The cause was attributed to a design problem. Because of its low safety significance and the cost to repair, a run-to-failure determination was developed, documented, and approved by the expert panel. Since the run-to-failure determination was made, several failures have occurred. Since we use FF's as performance criteria, we have exceeded our criteria. An evaluation was conducted. Because of the run-to-failure determination, the SSC remains in (a)(2) because no MPFFs occurred. Subsequently, plant management decided (change of original plan) to direct the system engineer to go forward with a modification to correct the problem. It was proposed (by a utility representative) that the NRC may conclude that if a utility goes forward with a design change than it is clear the utility does not intend to allow the SSC to run to failure. Our plan was to rescind the run-to-failure determination AFTER the modification was installed. **Question: 1**. Is it acceptable to have a run-to-failure determination on a low safety significant SSC even though you eventually plan to implement a design change that would solve the problem. **2.** Should the SSC be placed in (a)(1) until the modification is installed and monitored for acceptable performance? **submitted: 7/1/98**
Answer	**Answer to Question Number 1:** A run-to-failure determination for LSS SSCs should be evaluated on a case by case basis in accordance with Reg. Guide 1.160 Section 1.8. and NUMARC 93-01, section 9.3.3 and 10.2. To justify a run-to-failure determination, NUMARC 93-01, section 9.3.3 , states "SSCs that provide little or no contribution to system safety function could be allowed to run to failure (i.e., perform corrective maintenance rather than preventive maintenance)." It may be acceptable to have a run-to-failure determination on a LSS SSC, however If the SSC has a function which caused it to be under the scope of the maintenance rule (MR), it has some safety significance; therefore, licensees should provide a sound technical justification which appropriately establishes a run to failure determination. **Answer to Question Number 2:** With respect to the design problem on the SSC involved, MR guidance is provided in Reg. Guide 1.160 Revision 2, Section 1.8, "Clarification of MPFFs Related to Design Deficiencies." Guidance is also provided in NUMARC 93-01, section 9.4.4, "Unacceptable Performance or Failure Cause Determination and Dispositioning SSCs from (a)(2) to (a)(1)". *Return to Table of Contents*

Issue	Our question concerns the selection of Plant Level Performance Criteria. We currently are monitoring reactor trips and safety system actuations, among several other plant level criteria. Would it be acceptable to monitor reactor trips and safety system actuations, as we are now doing as plant level criteria, and to monitor transients instead of Unplanned Capability Loss Factor (UCLF)? Transients could be defined as any unplanned load change (those events without 4 hours advance planning) greater than 10% MWe or any load change greater than 10%/hour. The Maintenance Rule was not put in place to improve the economic performance of the nuclear units, only to improve their safe performance. It is our understanding that the reason for monitoring UCLF as a plant level performance criteria is to detect/evaluate transients. It is recognized that transients are precursors to trips, and trips are precursors to significant events. If the UCLF was meant to act as a precursor to a trip, then monitoring transients should be an effective way to monitor a precursor to a trip. The use of UCLF as a plant level criteria was convenient because it was already being monitored, but performing evaluations for small losses and for shutdown time adds no safety value. The time a unit is shutdown or operated at a reduced load is of monetary significance to the utility, but does not indicate safe or unsafe operation therefore a significant amount of UCLF does not accurately predict a safety concern. **submitted: 5/18/98**
Answer	Yes *Return to Table of Contents*

Issue	May any operator actions be credited when determining SSC unavailbility? **submitted: 7/1/98**
Answer	The definition of unavailability provided in NUMARC 93-01, Rev. 2, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants", which is endorsed by Reg. Guide 1.160, Rev 2, states in part that, "an SSC that is required to be available for automatic operation must be available and respond without human action." Credit may be taken for operator action provided the response is rendered by a dedicated plant operator and that the prescribed action is appropriately controlled by established procedures. In addition, the operator action is expected to produce an automatic initiation of the out-of-service SSC in the event of an actual demand. *Return to Table of Contents*

Issue	Have examples of adequate "Run to Failure" evaluations been evaluated by the NRC? What are the required elements of the evaluation? **submitted: 6/15/98**
Answer	To date the NRC has not identified any specific examples of acceptable run-to failure evaluations. However, Reg. Guide 1.160, Rev. 2, Section 1.8, discusses licensee options following equipment failures which include provisions for performing an evaluation that demonstrates equipment can be run to failure. Additionally, NUMARC 93-01, Section 9.3.3, states, in part, that SSCs that provide little or no contribution to system safety function could be allowed to run to failure (i.e., perform corrective maintenance rather than preventive maintenance) and are addressed by the provisions of paragraph (a)(2) of the rule. Although neither of these documents provide explicit elements which must be included in the evaluation, the purpose of this process is to objectively establish that the random failure of the SSC can be tolerated with little or no adverse impact on the functional requirements of the SSC under consideration. *Return to Table of Contents*

Issue	Does condition monitoring of containment isolation valve leakage performance below the Tech Spec limit of 0.6 La at a lower plant specific Maintenance Rule condition monitoring limit of 0.45 (which is 75% of 0.6) La adequately address the NRC finding identified in the Maintenance Rule inspections of Callaway, River Bend and San Onofre? **submitted: 6/25/98**
Answer	Yes. For the conditions identified in the referenced examples the use of a fraction of the Technical Specification La limit and the application of a licensee-determined Appendix J administrative leakage limit to define a component failure, would represent an acceptable response to the identified violation of §50.65(a)(2). *Return to Table of Contents*

Issue	What is being done about coatings failure in nuclear plants containments? **submitted: 7/23/98**
Answer	The maintenance rule requires monitoring the performance or condition of safety-related and certain non safety-related structures, systems or components (SSCs) to assure they remain capable of performing their intended function. Failure of protective coatings applied to or adjacent to these SSCs could affect their capability to perform these intended functions. The maintenance rule would treat the failure of containment coatings in the same manner that all failures are treated. First the licensees must determine if a coating failure resulted in a functional failure of any SSC that is affected by the coating. (i.e. The containment coating failure resulted in a functional failure of the containment structure by allowing unacceptable degradation to occur or the containment coating failure indirectly resulted in a functional failure of an SSC because of debris transport of pieces of the failed coating). The licensee should then perform a cause determination and establish whether the failure was maintenance preventable. It will then be necessary to then determine if a goal should be established. *Return to Table of Contents*

Issue	The NRC's GL 98-04 implies Coatings may be covered by the maintenance rule. The MR applies only to SSCs - coatings is not an SSC. While it could be true, as the GL suggests that a coating is part of the SSC it seems inappropriate to imply that coatings are scoped into the MR. Can NRC provide some clarification on this specific matter i.e. what does NRC see as the relationship between the MR and coatings. **submitted: 8/5/98**
Answer	The maintenance rule provides licensees flexibility in monitoring the effectiveness of maintenance at nuclear power plants. The language of Generic Letter 98-04 as it pertains to monitoring protective coatings under the maintenance rule incorporates this allowance for flexibility by stating that the licensees can monitor protective coatings as "discrete systems or components or as part of any SSC." As discussed in Generic Letter 98-04 the failure of protective coatings can result in preventing SSCs from fulfilling their intended functions. The licensee's cause determination of this type of functional failure must address whether the loss of function should have been prevented by the performance of appropriate maintenance actions by the licensee regardless of how protective coatings are chosen to be monitored. *Return to Table of Contents*

Issue	*****For Permanently Shutdown Plants**** Since specific reliability and availability data need not be maintained for most active components due to their low risk significance, balancing reliability and availability may need to be a qualitative assessment. Therefore, the process should be less involved than would be expected for an operating plant. As part of our periodic evaluation process, reliability issues and situations where equipment was removed from service will be discussed. Specific attention will be given to assuring that proper planning was given to removing equipment from service and that necessary compensatory measures were in place. Opportunities for improvement will be identified and action plans developed, as required. Please confirm that this would be considered an acceptable method of meeting the requirements of the Rule. **submitted: 7/30/98**
Answer	Take note that we are not confirming the acceptability of your proposal; acceptability is determined through the inspection process. Your question alludes to the specific implementation of maintenance rule requirements at your plant. The acceptability of that implementation can only be determined through the inspection process. As far as it goes, this is an acceptable evaluation of the Rule. However, it does not address other areas such as operating experience, nor does it deal with issues such as performance against goals or effectiveness of corrective actions. *Return to Table of Contents*

Issue	*****For Permanently Shutdown Plants**** Monitoring the performance of non-risk significant SSCs at only the plant, or pool level, seemed to be well accepted by the NRC at the April Workshop. As such, failures of SSCs which do not impact the pool or other plant level criteria would not be tracked as a Maintenance Rule concern. The licensee would need to document the bases for the SSCs low risk significance, which in general would be all SSCs not associated with maintaining the pool's water inventory. Please confirm that this is an acceptable interpretation of the requirements of the Rule. **submitted: 7/30/98**
Answer	Not true, this is not an acceptable interpretation of the Rule. Risk significance is a NUMARC 93-01 concept drawn from the PRA-based implementation scheme it advises be used. This is not a valid foundation for determining what SSCs should be monitored at a permanently shutdown plant. This is because the Rule in section (a)(1) requires the licensee to "...monitor the performance or condition of all structures, systems, or components associated with the storage, control, and maintenance of spent fuel..." This clearly makes the above approach too narrow. Maintaining water inventory does not constitute all three elements of storage, control and maintenance, nor does it scope all SSCs required for all three elements. To further explain, SSCs within the scope of the maintenance rule are those that have a function associated with the storage, control, and maintenance of spent fuel in a safe manner. These SSCs must be monitored in an acceptable manner. For SSCs that are not included in the maintenance rule scope, failures associated with them do not have to be tracked by the maintenance rule program. Some SSCs (low risk) may not be adequately monitored by plant or pool level criteria such that specific criteria may be required. In some cases where necessary, the risk significance of an SSC may be other than maintaining the pool's water inventory, such as pool cooling, water chemistry and radiation monitoring. *Return to Table of Contents*

Issue	*****For Permanently Shutdown Plants**** The NRC summary of the April Workshop provided the NRC's conceptual listing of SSCs "which typically should be addressed," however, it did not document a clarification made during the meeting regarding fuel handling cranes. Both the NRC and licensees agreed that cranes would not need to be within the scope of the Maintenance Rule due to the code required tests and inspections required prior to their use. **submitted: 7/30/98**
Answer	For permanently installed equipment, if fuel handling cranes provide a function associated with the storage, control, and maintenance of spent fuel in a safe condition, then it would be required to be monitored under the maintenance rule. Monitoring of the crane may be based on the maintenance and testing performed prior to the crane being used. That is, the code required testing and inspection can be used to accomplish required monitoring. If the cranes, plus slings, chains, etc., were brought in and temporary, that is they are not permanently installed, then they would be treated as tools. Therefore they would be outside the scope of the rule and 10 CFR 50, Appendix B, Test Criteria should be sufficient. *Return to Table of Contents*

Issue	Previously, the NRC has stated that it will not use the number of systems that are in category (a)(1) as an indicator of poor plant performance. Using the number of systems in (a)(1) as an indicator may incorrectly be interpreted as meaning that placing a system in (a)(1) is "bad" and discourage utilities from clasifying a system as (a)(1) when appropriate. However, we have heard that the number of systems in category (a)(1) is being used as an indicator of plant performance. *My question is: Has the NRC position regarding using the number of systems in category (a)(1) as an indicator of plant performance* changed? **submitted: 7/30/98**
Answer	The NRC position on this issue has not changed. We would like to reaffirm our position regarding the regulatory use of 10 CFR 50.65(a)(1). This position has clearly been delineated in our Regulatory Guide as well as the instructions to inspectors in the applicable inspection procedures. Also, it has always been recognized that at a utility's option, all SSCs could be placed in (a)(1), if so desired. Regional and Headquarters management discussions with the program office have also reaffirmed that position. *Return to Table of Contents*

Issue	Is it acceptable to establish run-to-failure PSA importance criteria by demonstrating that the plant specific threshold for screening those SSCs which provide a (very) little contribution to the system safety function is equivalent to the Regulatory Guide 1.174 acceptance guidelines for very small changes? Regulatory Guide 1.174, An Approach For Using Probabilistic Risk Assessment in Risk-Informed Decisions in Plant Specific Changes To the Licensing Basis and NUREG -0800, states in section 2.2.4 (Acceptance Guidelines) that a very small increase in Core Damage Frequency (CDF) is less than 10-6 per reactor year and a very small increase in Large Early Release Frequency (LERF) is less than 10-7 per reactor year. An example of the plant specific PSA demonstration of very little contribution to the system safety function associated with CDF follows: if the CDF for a plant is 10-5 per reactor year, then the run to failure criteria for the Risk Achievement Worth could be established at less than 1.1 (which is equal to 1.0 + {10-6/10-5}*1.0, and interpolated from the NUMARC 93-01 criteria of 2.0), and the run to failure component criteria for the Risk Achievement Worth could be set at less than 1.0005 (which is equal to 1.0000 + {10-6/10-5}*0.005, and interpolated from the NUMARC 93-01 criteria of 1.005). **submitted: 10/8/98**
Answer	In NUMARC 93-01, Section 9.3.1.1, Risk Reduction Worth, page 18, the following guidance is provided: "The following are two alternative methods for applying Risk Reduction Worth techniques in the identification of risk significant SSCs." This sentence contains footnote 11 which states "Risk Reduction Worth is the decrease in risk if the SSC is assumed to be available for all failure modes (e.g., failure to start and failure to run) reference NUREG/CR-3385, "Measure of Risk Importance and Their Application." On page 19, the guidance further states "An SSC would probably be considered risk significant if its Risk Reduction Worth (RRW) value exceeds 0.5% of the overall core damage frequency (RRW > 1.005). In NUMARC 93-01, Section 9.3.1.3, Risk Achievement Worth, page 20 states "An SSC would probably be considered risk significant if its Risk Achievement Worth shows at least a doubling in the overall core damage frequency and should be provided to the expert panel as an input in risk determination. This sentence also contains footnote 12 which states "Risk Achievement Worth is the increase in risk if the SSC is assumed to be failed for all failure modes (e.g., failure to start and failure to run)." In NUMARC 93-01, Section 9.3.3, page 25 states "SSCs that provide little or no contribution to system function could be allowed to run to failure (i.e., perform corrective maintenance rather than preventive maintenance). Appendix A of Regulatory Guide 1.174 provides guidance on the use of importance measures in risk-informed regulatory applications. In the discussion of the relationship of importance measures to risk changes, this Appendix clearly states that "(I)mportance measures do not directly relate to changes in risk. Instead, the risk impact is indirectly reflected in the choice of the value of the measure used to determine whether an SSC should be classified as being of high or low safety significance. This is a concern whether importances are evaluated at the component or at the group level". As presented in Regulatory Guide 1.174 , the acceptance criteria for changes in CDF and LERF implies that the criteria should be a function of the base case CDF and LERF for a particular plant rather than being fixed for all plants. The established RAW criteria should take into account that the allowable risk increase associated with the change would have an impact on the group of SSCs, rather than on one individual SSC. Thus, the licensee should demonstrate how the chosen criteria are related to, and conform with, the acceptance guidelines described in Regulatory Guide 1.174 . The mathematics in the

	provided example do not clearly demonstrate that the importance criteria conform with an allowable small increase in risk, and the reference to interpolation from the NUMARC 93-01 criteria is unclear. Based on the guidance in NUMARC 93-01, the expert panel should make the final decision on risk significance and run to failure criteria. The expert panel makes up for limitations in the PRA by examining the actual system component functions in question and using operating experience and sound engineering judgement to evaluate the run to failure criteria. Any criteria established for run to failure SSCs should be based on the key principles for risk-informed decisionmaking. The principles are: (1) current regulations must be met, (2) defense-in-depth must be maintained, (3) safety margins must be maintained, and (4) increases in CDF or risk should be small and consistent with the intent of NRC's Safety Goal Policy Statement. *Return to Table of Contents*

Issue	Plant Management was discussing the possibility of coming up with some sort of "Big Picture" indicator that would tell us whether we are implementing the rule effectively. Many ideas that we came up with appear to be too much like, "How Many SSCs are in (a)(1)?" We do not want to send the message that would imply having a certain number of systems in (a)(1) is too many. We want the indicators to encourage the use of the Maintenance Rule framework to address plant equipment/maintenance performance issues. One indicator that seems to be appropriately focused is, "How many systems have been returned to (a)(1) within 2 years of being moved to (a)(2)?" Is the NRC considering the development and use of some sort of Maintenance Rule Index to judge the effectiveness of a Plant's Maintenance Rule Program? Please share any plans or ideas in this area. **submitted: 10/8/98**
Answer	The NRC is considering the development of "tools" to be used to measure the efficacy of the Maintenance Rule. The work being done is preliminary and has not been fully evaluated. We agree that the "counting" of systems in (a)(1) is not an indicator of program health and may distract licensees from efficient use of the program. (See the FAQ's on a related issue) Your suggestion on how many systems have returned to (a)(1) in a 2 year period would be an appropriate starting point. We assume that you would also look at why the systems returned to (a)(1) and not just how many. In addition one could look at the evaluation of Repeat Maintenance Preventable Functional Failures. (R-MPFF) We suggest that you contact other maintenance rule coordinators to see how they are measuring the effectiveness of their programs. Joe Gonyeau's web site (http://www.cannon.net/~gonyeau/mrule/) may be of assistance as well. *Return to Table of Contents*

Issue	Paragraph (b)(2)(i) of 10 CFR 50.65 requires that equipment used in the emergency operating procedures (EOPs) be included within the scope of the rule. The EOPs were developed in response to NUREG-0737 and the TMI Action Plan. Currently, utilities are in the process of developing and implementing Severe Accident Management Guidelines (SAMGs) to address accident situations which become more severe than anticipated by the EOPs. Execution of the SAMGs is typically directed from the Technical Support Center (TSC). Does the NRC consider the SAMGs to be EOPs as discussed in paragraph (b)(2)(i)? If so, is all equipment used in the SAMGs required to be within the scope of the rule? **submitted: 10/29/98**
Answer	The NRC currently does not have requirements for Severe Accident Guidelines. The NRC does not consider SAMGs to be EOPs. The development of SAMGs is an industry initiative. As a result, equipment described only in SAMGs would not be in scope unless otherwise required by paragraph 50.65(b). *Return to Table of Contents*

Issue	The external events PRAs (IPEEEs) have shown that for some reactors (primarily BWRs), the risk of fire events exceeds that for all the internal events combined. Industry operating experience (Browns Ferry fire) has also demonstrated that fires can pose a considerable risk to plant safety. Has there been any thought in making the Maintenance Rule "truly" risk informed by including fire protection and mitigation systems within the scope of the rule? **submitted: 12/30/98**
Answer	At present, there are no requirements to include fire protection and mitigation systems within the scope of the maintenance rule based solely on PRA. However, certain functions performed by the systems may be included within the scope of the Rule based on the scoping criteria described in NUMARC 93-01. The Nuclear Energy Institute (NEI) has proposed that the scope of the Structures, Systems, and Components (SSC's) covered by the Maintenance Rule be revised in a risk informed manner. This proposal and other related issues are currently before the Commissioners for consideration (Reference SECY 98-300) *Return to Table of Contents*

Issue	Do you have a breakdown (percentage) of the facilities that permit operator action for availability of SSC's that are required to have "automatic" response. In other words, what percentage of facilities DO NOT use the strict interpretation of the NUMARC guideline for reporting unavailability? **submitted: 12/15/98**
Answer	The NRC does not track this type of information. However, The NRC has allowed some limited operator action provided the following criteria has been met: *Licensees may take credit for operator action if the plant uses a dedicated plant operator and that the prescribed action is appropriately controlled by established procedures. In addition, the operator action is expected to produce an automatic initiation of the out-of-service SSC in the event of an actual demand.* The licensee must make reasonable evaluations when using this method. The NRC will evaluate each instance of this type of operation on it's own merits and not on a global approval of the method itself. *Return to Table of Contents*

Issue	NUMARC 93-01 section 13 requires that documentation developed for maintenance rule implementation be available for internal and external review, but is not required to be submitted to the NRC. This documentation includes SSC selection process, maintenance rule scoping, (a)(1) activities, (a)(2) activities and periodic assessments. How long should these type documents be retained for NRC review during audits or inspections? **submitted: 2/24/99**
Answer	10CFR50.71c states that "Records that are required by the regulations in this part, by license condition, or by technical specifications, must be retained for the period specified by the appropriate regulation, license condition, or technical specification. If a retention period is not otherwise specified, these records must be retained until the Commission terminates the facility license." *Return to Table of Contents*

Issue	Section C " REGULATORY POSITION" of Reg. Guide 1.160 1.1.2 "SSCs Relied Upon To Mitigate Accidents or Transients or Used in Emergency Operating Procedures" 3rd sentence: " The NRC staff considers this to mean that SSCs that are directly used to address the accident or transient or explicitly used in the EOPs are within the scope of the rule, as are SSCs whose use is implied and that provide a significant fraction of the mitigating function." *Question:* "If, upon reviewing the intended use of the SSC in the Emergency Operating Procedures, a utility determines that the SSC provides NO accident mitigation value to the EOP, can the SSC be excluded from the scope of the rule?" The reason I ask: There are steps within EOPs that deal with post accident cleanup steps. For instance, the Condensate polishers are not used during any step in an EOP during the accident mitigation sequences. However, there are steps in EOPs that have you place them on line to clean up the condensate after the accident. This does not appear to provide any accident mitigation to the EOPs. **submitted: 4/1/99**
Answer	Yes, based on the information provided in your example, the technical justification for exclusion is correct. The SSC has to be used to mitigate the consequences of the event/accident/ that the EOP is addressing. There are other SSCs "mentioned" in EOPS that are there solely for personnel and/or equipment protection also but have no mitigation function. *Return to Table of Contents*

Issue	What is the intent of "when required" when discussing Unavailability? **submitted: 4/9/99**
Answer	"When required" is a phrase that is most often applied during shutdown operations. More specific use and interpretations are highly plant-specific. In general, mode and power level cause certain functions to be necessary. When a function is not "required" by technical specifications or other controlling plant documents, then unavailability is not an issue. *Return to Table of Contents*

Issue	Do similar causes on similar equipment result in a Repetitive MPFF when the equipment is not identical or the cause is related to human performance? **submitted: 4/9/99**
Answer	Repetitive MPFF's are normally described as "Same Failure - Same Cause". In some cases, "same failures" on different equipment (e.g.; errors by technicians; etc.) should be evaluated for "common cause failures". In most cases, if the cause is known and corrected (i.e.;personnel errors) then the monitoring of goals is unnecessary. *Return to Table of Contents*

Issue	NUMARC 93-01, 9.3.2 allows the establishment of plant level performance criteria, and also monitoring against these criteria for low risk significant systems that are normally operating, and whose functions impact plant performance. However, 93-01 Section 9.3.2, also states that should a plant level performance criteria be exceeded, a cause determination will be conducted to determine whether the failure of a SSC that impacted the plant level criteria was within the scope and whether the failure was an MPFF. Also, a review of the MPFF is required to determine if it is repetitive. One interpretation of this requirement is that, any failure that impacts a plant level criteria is automatically a functional failure and is reviewed for being maintenance preventable, as well as repetitive. *Should performance criteria be established for the number of allowed MPFFs for that SSC, like any other SSC whose reliablility is monitored by MPFFs?* **submitted: 4/9/99**
Answer	Not like any other SSC. If the function of the scoped system is lost and it causes a scram, for example, the cause determination has to be completed to determine if it is an MPFF. If it is, the MPFF has to be tracked. If a second scram occurs that is caused by the same failure (i.e., repetitive) or a plant-level performance criteria is not met, a goal has to be established; it may be established at the train or component level. However, failures that do not cause a scram, actuation of a safety system or result in an unplanned capacity loss factor do not have to be tracked. *Return to Table of Contents*

Issue	*When a support system is required for the supported system to be available, does unavailability have to be counted against the supported system when the support system is tagged out for the maintenance?* Keep in mind when answering this questions that no maintenance is being performed on the supported system (it is fully functional except for the unavailability of the required support system, i.e., no cooling), and the PSA models only the unavailability of the system that is being worked on. **submitted: 5/3/99**
Answer	The expectation is that licensees should only count unavailability against the support system as long as the support system has a separate function described under the licensees maintenance rule program. When considering availability of supported SSCs, the question that must be answered is, "Can the supported system perform its intended function if the supporting SSC is unavailable". If the answer is YES then, only the supporting system time is counted, if NO then, both supported and supporting systems unavailability must be counted. One must bear in mind that the purpose of monitoring performance (ie; availability / reliability) is to determine the effectiveness of maintenance, therefore; monitoring the system that is actually being maintained is the system that must be considered unavailable. *Additional information added 9/1/99:* Generally, if the supported SSC cannot function - it is unavailable. However, the plant's PRA may account for the impact of supporting systems being unavailable. When licensees developed maintenance rule programs, they established one of the following practices: 1. Capturing unavailability times under the "problem" system or train and each system that supported the "problem system or train" or; 2. Only capture unavailability time under the "problem" system or train. These practices were based on the results of the plant's PRA and associated unavailability time. Depending on the method established under the licensee's maintenance rule program, unavailability of supported systems may either capture or not capture unavailability time. The Bottom Line in all of this is: "As long as the unavailability can be accounted for in the performance criteria and appropriate judgements made concerning the effectiveness of maintenance, the process used by the utility would be adequate. . *Return to Table of Contents*

Issue	*When is "human error" or "operator error" considered a MPFF?* If the SSC failure occurred through human error while perfoming a maintenance activity, a Tech Spec surveillance activity, or during a system lineup, *can it be considered a MPFF?* **submitted: 5/13/99**
Answer	If the error caused a failure of the function that caused the SSC to be included in the Scope of the Maintenance Rule **and** is part of a maintenance activity (ie; corrective, preventative, predictive or testing) it would be considered a MPFF. An error made during routine operations (ie; not in support of maintenance)**would not be** a MPFF .*Return to Table of Contents*

Issue	The web page once had a pop-up screen that told you when the page had changed. It is gone now. What happened? **submitted: 8/23/99**
Answer	The pop-up attention box was replaced with a JAVA Script routine that provides a "News Ticker" in the lower part of the screen. This was done to provide more information yet still allow the user to be able to skip the news if desired. To be able to see the "News Ticker" you must enable JAVA script in your web browser, then reload the page. *Return to Table of Contents*

Issue	The three importance measures, namely, Fussel-Vesely (FV), Risk Reduction Worth (RRW), and Risk Achievement Worth (RAW) are used to determine the risk significance of SSCs in scope to the Maintenance Rule. The RRW measure expresses the relability of the component (i.e., being a super component that has a zero failure probability). Since FV and RRW are mathematically correlated via the Equation RRW = 1 + FV, could one say that the value of FV also expresses the component reliability? Note that, by definition, FV means the sum of minimal cutsets in which the component appears divided by the mean core damage frequency. **submitted: 12/24/99**
Answer	The answer to your question is no, the value of FV does not express reliability for the following collective reasons: 1) The three importance measures are (Risk Reduction Worth) RRW, (Risk Achievement Worth) RAW, and top 90% cutsets. [see line 34 of page 17, and Sections 9.3.1.1, 9.3.1.2, and 9.3.1.3. of NUMARC 93-01] (Note that a Fussel -Veseley value of equal to or greater than10% may or may not fall within the top 90%, depending on all factors involved.) 2) As suggested in the web page question, the RRW is one of the importance measures used to risk rank the SSCs; however, it is not a measure of reliability. As discussed in the footnote on page 18 of NUMARC 93-01, the RRW can, however, be used to determine the impact that an SSC has on the Core Damage Frequency value if the SSC were assumed to not fail. [RRW assumes perfect reliability for all failure modes, but is not the measure of reliability.] 3) The mathematical relationship between FV and RRW, for one SSC considered at a time, is: RRW = 1/(1-FV) or FV = 1 - 1/RRW *Return to Table of Contents*

Issue	What is the intent of "when required' when discussing unavailability during shutdown/refueling outages? **submitted: 10/28//99**
Issue	Does the Maintenance Rule require licensees to monitor components and trains planned uavailability during shutdown conditions? If so, what is the value added by this monitoring activity? It seems that planned unavailability of components and trains does not impose additional risk as long as the required layers of defense in depth for each of the five key safety functions/systems are maintained. **submitted: 12/24/99**
	During my plant's baseline inspection in the latter half of 1997, our SSC performance criteria for shutdown conditions were reviewed, and no non-compliances were identified. These criteria do not include availability monitoring in some cases for SSCs deemed important to risk during shutdown conditions. (Functionality is monitored in other ways.) A sister plant had a similar experience with a different inspection team. At the NEI conference in Charleston on March 13 - 14, 2000, an NRC official stated that availability monitoring is

Issue	required in all cases for SSCs during shutdown conditions if they are considered important to risk at that time. When asked, he stated this has been the NRC's position throughout the baseline inspections. Please provide a definitive statement on the availability monitoring requirements for systems considered important to risk during shutdown, and note any changes in the NRC's position on this issue since the baseline inspection process! . **submitted: 03/15/00**
Issue	In getting ready to monitor risk significant systems in all modes, we are wondering what the rest of the industry is going to use for a monitoring period for Shutdown Cooling (SDC). For SDC, our plant uses components from several systems (LPSI pumps, Cont. Spray HX, piping, etc.). This mode of operation is not single failure proof. There are valves and piping spools that are only used and only required during plant shutdown for SDC. Normally, we unavailability monitor for a rolling 24 month period. However, we are looking at changing this monitoring period for those valves and piping spools only used for SDC. We are looking to revise the monitoring period to be two refueling shutdowns and any shutdowns that occur between the two refueling. We want to be sure we have enough operating history to ensure unavailability trend is correct. **submitted: 03/22/00**
Issue	My level 1 PSA provided the basis for establishing performance criteria for risk-significant SSCs during power operations, and the tech specs established the required operational hours. My plant does not have a shutdown PSA and follows the N+1 philosophy in NUMARC 91-06 for managing the plant configuration during shutdown conditions. How do I establish performance criteria for risk-significant SSCs during shutdown, and how do I define the required operational hours? Additionally, how would I comply with the (a)(3) requirement for balancing reliability and unavailability? **submitted: 03/21/00**
	The NRC expects licensees to use the MR in two principal ways while shutdown. **First**, licensees are expected to use the MR to measure the health of systems required during shutdown by continuing to monitor reliability and availability of SSCs under 10 CFR 50.65(a)(1) or to track SSC reliability and availability against performance criteria under 10 CFR 50.65(a)(2). **Second**, under 10 CFR 50.65(a)(4), licensees must assess and manage the shutdown risk associated with maintenance, including the configuration changes needed to conduct required maintenance. As described in the guidance documents for implementing 10 CFR 50.65 (a)(1) - (a)(2) and discussed in Section 9.3.2 of NUMARC 93-01, high-safety-significant (HSS) SSCs should be monitored against reliability and unavailability performance criteria. Also, as discussed in NUREG 1526, page 24, multi-train HSS SSCs should be monitored at the train level. This monitoring approach should be used in any mode where the system's function is HSS. During shutdown conditions, when the licensee has determined that the SSC is HSS and has identified shutdown functions (normally accomplished by the expert panel), then the licensee shall monitor availability and reliability of this SSC while shutdown at the train level. Given that the basis for determining which SSCs are risk-significant during shutdown

Answer	is different than during power operations, and that the establishment of required operational hours may go beyond tech specs during shutdown, a licensee may opt to establish separate performance criteria for shutdown conditions. The outage schedule should establish which SSCs/trains will fulfill those functions. Consistent with that schedule, required operational hours can be defined as the time a train is actually performing the function, as well as when a train serves as the primary backup for that function. A licensee need not establish required hours for equipment that is counted on as a secondary or tertiary backup for the function. Using engineering judgment, the unavailability criterion can be established as a fraction of the required hours of operation during the outage. Careful consideration should be given to establishing reliability criteria. If the function during power operations is exactly the same as during shutdown (e.g., emergency AC power), a single reliability criterion can be used for both time periods. If the functions are different (e.g., RHR system serves as low head safety injection at power vs. shutdown cooling), a licensee may opt to establish a separate reliability criterion for each condition. However, for equipment whose failures would affect either the at-power or shutdown function (e.g., RHR pumps), those failures should be considered together under one of the criteria so as not to mask poor equipment performance. As described in the guidance documents for implementing 10 CFR 50.65 (a)(4) and discussed in the new Section 11 of NUMARC 93-01, assessing and managing the risk associated with maintenance activities is required both during power operations and during shutdown. 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. During shutdown conditions, these key safety functions include: Decay Heat removal capability, Inventory Control, Power Availability, Reactivity Control and Containment (primary/secondary). *Return to Table of Contents*

Issue	The web page once had a pop-up screen that told you when the page had changed. It is gone now. What happened? **submitted: 8/23/99**
Answer	The pop-up attention box was replaced with a JAVA Script routine that provides a "News Ticker" in the lower part of the screen. This was done to provide more information yet still allow the user to be able to skip the news if desired. To be able to see the "News Ticker" you must enable JAVA script in your web browser, then reload the page. *Return to Table of Contents*

Issue	For standby components (or trains) that are tested less frequently than monthly, say every quarter, it is difficult to capture a reasonable number of demand failures in order to set the performance criteria for number of functional failures (#FFs). For example, if a component is demanded quarterly (say an EDG or a HPSI pump), then there are 8 expected demands per 24 months rolling average. In such cases, would it be possible for the licensee to consider the number of demands per 36 months rolling average (i.e., 12 demands)in order to capture more demand failures? This would make a difference in calculating the performance criteria (PC) for the number of functional failures. For instance, based on 8 expected demands, the calculated PC for # of FF would be less than 1, but for 12 demands,the # of FF would be less than 2 or possibly less than 3. **submitted: 12/23/99**
Issue	If a risk significant standby SSC has a performance criteria for the number of MPFF < 1 over 24 months rolling average, could the licensee use 36 months (or 48 months) rolling average to better capture demand failures? **submitted: 12/29/99**
Answer	As stated in NUMARC 93-01, Section 9, Establishing Risk and Performance Criteria/Goal Setting and Monitoring, page 24, licensees should establish goals and performance criteria commensurate with safety and consistent with the reliability and availability assumptions in licensees PRA, IPE, IPEEE or other risk determining analysis for high safety significant (HSS) SSCs. Depending on each licensee's program, licensees may use extended time periods for monitoring functional failures (FFs) and maintenance preventable functional failures (MPFFs); however, licensees should be careful that performance problems are not masked when relying on higher performance measures chosen for extended monthly rolling averages. In addition, licensees should consider condition monitoring performance measures to cover limitations in monitoring FFs and MPFFs in a given cycle for HSS SSCs. *Return to Table of Contents*

Issue	What methodology has the NRC accepted for determining a technical basis for setting the Reliability performance criteria for Risk Significant (High Safety Significant) systems and components? Background: NUREG-1648 discusses that "the (NRC) staff has cited numerous licensees for not establishing reliability performance measures that are commensurate with safety because the licensees did not have a sound technical basis for the performance measures they established." However, NUMARC 93-01, Rev.2 does not document a methodology, have any other industry positions been endorsed (or accepted) on this subject? **submitted: 1/6/2000**
Answer	Some licensees have used the methods described in EPRI technical bulletins 96-11-01 and 97-03-01. These technical bulletins are not referenced in NUMARC 93-01 and they have not been officially endorsed by the NRC. However, during the maintenance rule baseline inspections, the methodology described in the bulletins was accepted if the methods were appropriately used to establish performance measures for structures, systems and components (SSCs) commensurate with safety. Nevertheless, There are limitations in the methodology discussed in the EPRI bulletins. For example, the EPRI bulletins point out that the data expected to be collected are sometimes insufficient to demonstrate consistency with PRA/IPE assumptions. Using an adequate sample size of demands for statistical tests, it is should be possible to establish goals or performance measures that can be used to determine when the data are not consistent with the PRA assumptions. *Return to Table of Contents*

Issue	We have again been asked for clarification on how to treat failures in which there was no damage to, malfunction of, or degraded condition of the affected SSC, but rather the root cause of the failure was attributed solely to some human performance deficiency. The type of failure in question would be included among failures of structures, systems, or components (SSCs) within the scope of the MR to perform one or more of the functions for which they were included in the MR scope. The postulated failure of concern, is therefore a Maintenance Rule functional failure. **submitted: 6/15/2000**
Answer	Having first established that the failure was a Maintenance Rule Functional Failure , the NRC expects that the licensee would then determine whether the failure was maintenance preventable. This would include considering maintenance in the broad sense which would include, for example, deficiencies in procurement, acceptance, installation, initial testing, etc., as well as subsequent preventive or corrective maintenance. If the failure were to be deemed a maintenance-preventable functional failure (MPFF), then regardless of the root cause, it would be counted as an MPFF against the licensee's established performance criteria (e.g., availability and reliability) for SCCs in 10 CFR 50.65(a)(2) status or against goals for those already in (a)(1). However, the NRC also expects that, as required by 10 CFR 50.65(a)(1), should the MPFF in question cause the SSC to exceed the established thresholds, the licensee would (1) take appropriate corrective action and (2) consider placing the SSC in (a)(1) status. In this case, in which human performance is implicated and not a deficiency of the SSC itself, it would be reasonable for an expert panel to determine that the SSC would not necessarily have to be put in (a)(1) status as a result of this MPFF alone, but rather the appropriate corrective action be taken to correct the human performance problem. *Return to Table of Contents*

This page was last updated July 19, 2000 by Donnie Ashley and will not be updated.