

Enclosure 2

Handouts discussed during the November 20, 2013 ROP WG Public Meeting

November 20, 2013 ROP Public Meeting Handout: System Actuation Event Reporting

NOTE: A public meeting was held on June 26, 2013 (ML13182A334) in order to solicit comments on identified issues associated with the event reporting of system actuations. The discussion below is provided in order to facilitate further dialog on the matter. This document is not intended to and should not be considered to contain NRC positions on the issues.

1. Is a system considered to actuate if the only components to change state are those channels enough to complete the minimum actuation logic?

Comments Received: Stakeholders indicated that a system is considered to actuate even if the only components to change state are those channels enough to complete the minimum actuation logic. The minimum actuation logic is that associated with at least a train that correlates to the system's intended function. There are no exceptions for the reporting of valid actuations, but there may be exceptions to reporting for invalid actuations.

NRC Follow-Up Discussion: The NRC tentatively agrees. A system is considered to actuate even if the only components to change state are those channels enough to complete the minimum actuation logic. There are no exceptions for the reporting of unplanned valid actuations, but there may be exceptions to reporting for unplanned invalid actuations. "System's intended function" is addressed in issues #3.

Basis for NRC Discussion: With regards as to what is considered a system actuation, Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3 (ML13032A220), states "Actuation of multichannel actuation systems is defined as actuation of enough channels to complete the minimum actuation logic. Therefore, single-channel actuations, whether caused by failures or otherwise, are not reportable if they do not complete the minimum actuation logic." This statement is found in the Federal Register Notice (FRN) associated with the original 1983 rule (48 FR 33850).

The first scenario in Example 1 of Section 3.2.6, of NUREG-1022, Revision 3, indicates a valid actuation of RPS and containment isolation occurred due to signals generated as a result of actual plant conditions even though no components other than the logic may have changed position. This example first appears in Section 3.3.2, "Actuation of an Engineered Safety Feature (ESF) or the RPS," of NUREG-1022, Revision 1 (ML070530420).

With regards to the exceptions to reporting for unplanned invalid actuations, the rule itself [10 CFR 50.73(a)(2)(iv)(A)(2)] indicates when exceptions apply. 10 CFR 50.73(a)(2)(iv)(A)(2) indicates an invalid actuation need not be reported if the actuation occurred while the system was properly removed from service or occurred after the safety function had been already completed.

2. There is an additional discussion found only in NUREG-1022 that indicates a system is considered to actuate if enough components actuate to carry out the system's function (typically at least a train). Is the intent of this discussion to emphasize the original FRN discussion that single channels actuations, pump starts, other component manipulations, etc., are not reportable if the minimum actuation logic for a train is not met? If not, could this discussion be in conflict with the Background discussion found in Question 1 above?

Comments Received: Stakeholders reiterated the answer to question #1 above. Stakeholders also emphasized that the minimum actuation logic is that associated with at least a train that correlates to the system's intended function.

NRC Follow-Up Discussion: With regards to the definition of an actuation, the NRC tentatively agrees. As indicated in Issue #1 above, a system is considered to actuate even if the only components to change state are those channels enough to complete the minimum actuation logic. The NUREG-1022 discussion in question is intended to focus on which logic actuations are potentially reportable (i.e. component level, train level, or system level actuation as a result of a minimum logic within the system being met). It is not intended to imply that a system would be considered to actuate absent minimum logic being met or that an actuation does not occur if only the logic changes state. "System's intended function" is addressed in issues #3.

Basis for NRC Discussion: Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3, states: "The intent is to require reporting of the actuation of systems that mitigate the consequences of significant events. Usually, the staff would not consider this to include single-component actuations because single components of complex systems, by themselves, usually do not mitigate the consequences of significant events. However, in some cases a component would be sufficient to mitigate the event (i.e., perform the safety function) and its actuation would, therefore, be reportable. This position is consistent with the statement that the reporting requirement is based on the premise that these systems are provided to mitigate the consequences of a significant event." This discussion is found only in NUREG-1022 guidance.

This discussion is first found in Section 3.3.2, "Actuation of an Engineered Safety Feature (ESF) or the RPS," of NUREG-1022, Revision 1. The background for the Revision 1 discussion can be found in a Federal Register Notice (58 FR 18167). With regards as to whether or not the discussion conflicts with the NUREG-1022 definition of an actuation, the following discussions can be found:

- 58 FR 18171 (third column): "1.2 Reporting of ESF Component Level Versus System Actuation.

Issue. Draft NUREG-1022, Revision 1, Section 3.3.2, indicates that actuations of ESF components are reportable under § 50.72 (b)(2)(i) and 50.73 (a)(2)(iv).

Some commentors indicate that ESF actuations are only reportable at the system level (i.e., completion of system actuation logic). They indicate that ESF component actuations are not reportable.

Discussion. Sections 50.72(b)(2)(ii) and 50.73(a)(2)(iv) require reporting of the following: 'Any event or condition that results(ed) in (a) manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS). However, ***'

The preamble to the final rule discussing § 50.73(a)(2)(iv) [July 26, 1983; 48 FR 33853], states: 'This paragraph requires events to be reported whenever an ESF actuates either manually or automatically, regardless of plant status. It is based on the premise that the ESFs are provided to mitigate the consequences of a significant event and, therefore: (1) they should work properly when called upon, and (2) they should not be challenged frequently or unnecessarily. The Commission is interested both in events where an ESF was needed to mitigate the consequences (whether or not the equipment performed properly) and events where an ESF operated unnecessarily.'

This indicates an intent to require reporting actuations of features that mitigate the consequences of significant events.

The same discussion in the preamble to the final rule [July 26, 1983; 48 FR 33853], states: 'Actuation of multichannel ESF Actuation Systems is defined as actuation of enough channels to complete the minimum actuation logic (i.e., actuation of sufficient channels to cause activation of the ESF Actuation System). Therefore, single channel actuations, whether caused by failures or otherwise, are not reportable if they do not complete the minimum actuation logic.'

This indicates an intent to require reporting actuation signals sufficient to complete the minimum actuation logic but not single channel actuations that do not satisfy the minimum actuation logic.

The preamble to the final rule for § 50.72(b)(2)(c) [August 29, 1983; 49 FR 390431] parallels the above discussion closely.

No specific discussion of this issue was found in the staff's previous generic guidance in NUREG-1022 and its supplements.

Two staff letters were found which indicate that, with respect to specific licensees, the staff has taken the position that actuations of single components such as pumps, valves and fans are reportable (see References).

Conclusion. As discussed above, the preamble to the final rule indicates an intent to require reporting actuations of features that '*** mitigate the consequences of significant events ***.' Generally, this would not include

single component actuations because single components of complex systems, by themselves, usually do not mitigate the consequences of significant events.

Single trains do mitigate the consequences, and, thus, train level actuations are reportable.

In addition, as discussed above, the preamble to the final rule indicates an intent to require reporting actuation signals which are sufficient to satisfy the minimum actuation logic.

As indicated above, no specific discussion of this issue was found in the staff's previous generic guidance in NUREG-1022 and its supplements. On that basis, this guidance could possibly be considered a new generic staff position. However, it is not considered different from previous generic guidance because it is simply a straightforward interpretation of the preamble to the final rule.

Also, as indicated above, two staff letters were found which indicate that, with respect to specific licensees, the staff has taken the position that actuations of single components such as pumps, valves and fans are reportable. This current guidance is a relaxation relative to those positions.

Number of reports. This guidance might reduce the number of LER's by a small amount, on the order of 12 reports per year among 109 operating units. The basis for the estimate is provided below.

In 1991, about 609 LER's (involving 723 events) were submitted which indicated actuations of ESF's. About 366 of these LER's (involving 450 events) indicated actuation of only a single ESF system. Of these, only about 12 appear to involve actuation of a single component without development of an accompanying actuation signal from the ESF actuation system or its equivalent (for example, an event where a ruptured diaphragm caused an air operated valve to change position). The staff does not know if additional events of this type occurred but were not reported (because licensees did not consider them reportable).

These particular reports of single component actuations, without an accompanying actuation signal from the ESF actuation system or its equivalent, do not appear to involve safety significant events nor do they appear to be needed to support the NRC's screening and review activities. It is possible to postulate single component actuations, such as opening of a high pressure/low pressure interface valve, that could be considered significant. However, such events would usually be reportable under other criteria if they are significant."

Based on the FRN discussion, it appears the NUREG-1022 discussion is intended to focus on which logic actuations are potentially reportable (i.e. component level, train

level, or system level actuation as a result of a minimum logic within the system being met).

3. Is it considered an actuation if enough channels complete the minimum actuation logic but are only functions associated with continued system operation or protection (e.g. storage water tank swap or system isolation)?

Comments Received: Stakeholders reiterated the answer to questions #1 and #2 above. If the minimum actuation logic is not associated with at least a train that correlates to the system's intended function, the event would not be considered an actuation.

NRC Follow-Up Discussion: With regards to train level vs. component level actuations, the NRC partially agrees. While it is expected that most reportable actuations would be at the train level, component actuations are not excluded from event reporting. As a result, there is engineering judgment involved in determining whether or not a component level actuation is reportable. That judgment would take into account the function(s) that the component performs. In order to facilitate greater consistency in event reporting, the NRC is willing to consider feedback as to whether or not more specific guidance is warranted.

Basis for NRC Discussion: (Discussion is similar in nature to issue #2).

- Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3, states: "The intent is to require reporting of the actuation of systems that mitigate the consequences of significant events. Usually, the staff would not consider this to include single-component actuations because single components of complex systems, by themselves, usually do not mitigate the consequences of significant events. However, in some cases a component would be sufficient to mitigate the event (i.e., perform the safety function) and its actuation would, therefore, be reportable. This position is consistent with the statement that the reporting requirement is based on the premise that these systems are provided to mitigate the consequences of a significant event."

Single trains do mitigate the consequences of events, and, thus, train level actuations are reportable.

In this regard, the staff considers actuation of an EDG to be actuation of a train—not actuation of a single component—because an EDG mitigates the event (performs the safety function)."

This discussion is found only in NUREG-1022 guidance. The guidance indicates that while it is expected most actuations would be reportable at the train level, component actuations are not excluded from reporting. As a result, there is engineering judgment involved in determining whether or not a component actuation is reportable.

- This discussion is first found in Section 3.3.2, “Actuation of an Engineered Safety Feature (ESF) or the RPS,” of NUREG-1022, Revision 1. The background for the Revision 1 discussion can be found in a Federal Register Notice (58 FR 18167). The following discussions can be found:
 - 58 FR 18169 (first column): “The phrase ‘associated valves, piping, instrumentation, interlocks, pumps, tanks and necessary heat tracing’ has been deleted at several places. This phrase is no longer appropriate because the staff has concluded, in response to Issue 1.2, that actuation at the train level, rather than at the component level, is reportable.”

The passage indicates that only train level actuations are reportable and appears to potentially conflict with the actual guidance in the NUREG that was eventually documented.

- 58 FR 18171 (third column): “1.2 Reporting of ESF Component Level Versus System Actuation.

Issue. Draft NUREG-1022, Revision 1, Section 3.3.2, indicates that actuations of ESF components are reportable under § 50.72 (b)(2)(i) and 50.73 (a)(2)(iv).

Some commentors indicate that ESF actuations are only reportable at the system level (i.e., completion of system actuation logic). They indicate that ESF component actuations are not reportable.

Discussion. Sections 50.72(b)(2)(ii) and 50.73(a)(2)(iv) require reporting of the following: ‘Any event or condition that results(ed) in (a) manual or automatic actuation of any Engineered Safety Feature (ESF) including the Reactor Protection System (RPS). However, ***’

The preamble to the final rule discussing § 50.73(a)(2)(iv) [July 26, 1983; 48 FR 33853], states: ‘This paragraph requires events to be reported whenever an ESF actuates either manually or automatically, regardless of plant status. It is based on the premise that the ESFs are provided to mitigate the consequences of a significant event and, therefore: (1) they should work properly when called upon, and (2) they should not be challenged frequently or unnecessarily. The Commission is interested both in events where an ESF was needed to mitigate the consequences (whether or not the equipment performed properly) and events where an ESF operated unnecessarily.’

This indicates an intent to require reporting actuations of features that mitigate the consequences of significant events.

The same discussion in the preamble to the final rule [July 26, 1983; 48 FR 33853], states: 'Actuation of multichannel ESF Actuation Systems is defined as actuation of enough channels to complete the minimum actuation logic (i.e., actuation of sufficient channels to cause activation of the ESF Actuation System). Therefore, single channel actuations, whether caused by failures or otherwise, are not reportable if they do not complete the minimum actuation logic.'

This indicates an intent to require reporting actuation signals sufficient to complete the minimum actuation logic but not single channel actuations that do not satisfy the minimum actuation logic.

The preamble to the final rule for § 50.72(b)(2)(c) [August 29, 1983; 49 FR 390431 parallels the above discussion closely.

No specific discussion of this issue was found in the staff's previous generic guidance in NUREG-1022 and its supplements.

Two staff letters were found which indicate that, with respect to specific licensees, the staff has taken the position that actuations of single components such as pumps, valves and fans are reportable (see References).

Conclusion. As discussed above, the preamble to the final rule indicates an intent to require reporting actuations of features that '*** mitigate the consequences of significant events ***.' Generally, this would not include single component actuations because single components of complex systems, by themselves, usually do not mitigate the consequences of significant events.

Single trains do mitigate the consequences, and, thus, train level actuations are reportable.

In addition, as discussed above, the preamble to the final rule indicates an intent to require reporting actuation signals which are sufficient to satisfy the minimum actuation logic.

As indicated above, no specific discussion of this issue was found in the staff's previous generic guidance in NUREG-1022 and its supplements. On that basis, this guidance could possibly be considered a new generic staff position. However, it is not considered different from previous generic guidance because it is simply a straightforward interpretation of the preamble to the final rule.

Also, as indicated above, two staff letters were found which indicate that, with respect to specific licensees, the staff has taken the position that actuations of single components such as pumps, valves and fans

are reportable. This current guidance is a relaxation relative to those positions.

Number of reports. This guidance might reduce the number of LER's by a small amount, on the order of 12 reports per year among 109 operating units. The basis for the estimate is provided below.

In 1991, about 609 LER's (involving 723 events) were submitted which indicated actuations of ESF's. About 366 of these LER's (involving 450 events) indicated actuation of only a single ESF system. Of these, only about 12 appear to involve actuation of a single component without development of an accompanying actuation signal from the ESF actuation system or its equivalent (for example, an event where a ruptured diaphragm caused an air operated valve to change position). The staff does not know if additional events of this type occurred but were not reported (because licensees did not consider them reportable).

These particular reports of single component actuations, without an accompanying actuation signal from the ESF actuation system or its equivalent, do not appear to involve safety significant events nor do they appear to be needed to support the NRC's screening and review activities. It is possible to postulate single component actuations, such as opening of a high pressure/low pressure interface valve, that could be considered significant. However, such events would usually be reportable under other criteria if they are significant."

The passages indicate an intent to focus on train level vice component level actuations. However, the actual guidance in the NUREG that was eventually documented does not exclude component level actuations.

4. Are system classification (i.e. safety-related / non-safety related) or plant status (i.e. operating in a Mode in which system may not be needed) considerations in determining if an "actuation" occurred or in determining the classification of the actuation (i.e. valid vs. invalid)?

Comments Received: Stakeholders indicated that plant status (i.e. operating in a Mode in which system may not be needed) is not taken into account in determining if an "actuation" occurred or in determining the classification of the actuation (i.e. valid vs. invalid). However, plant status may result in meeting one of the reporting exceptions for invalid actuations.

Stakeholders indicated that system classification (i.e. safety-related / non-safety related) is a consideration in determining if an "actuation" occurred. Stakeholders indicated that systems within scope of system actuation reporting include only systems credited in the accident analysis chapter of the Final Safety Analysis Report

(FSAR). If a system listed under the rule is not credited in the accident analysis chapter of the FSAR, its actuation would not be reportable.

NRC Follow-Up Discussion: With regards to plant status, the NRC tentatively agrees that plant status (i.e. operating in a Mode in which system may not be needed) is not taken into account in determining if an “actuation” occurred or in determining the classification of the actuation (i.e. valid vs. invalid). The NRC tentatively agrees that plant status may result in meeting one of the reporting exceptions for unplanned invalid actuations.

With regards to system classification, the NRC tentatively does not agree with comments received. System classification (i.e. safety-related / non-safety related) is not a consideration in determining if an “actuation” occurred or in determining the classification of the actuation (i.e. valid vs. invalid). Systems within scope include all systems listed in the rule itself (regardless of site specific classification). Considerations for determining whether or not an actuation is valid or invalid do not take into account a system’s classification.

Basis for NRC Discussion: With regards to plant status, the FRN associated with the original 1983 rule (48 FR 33850) states “This paragraph requires events to be reported whenever an ESF actuates either manually or automatically, regardless of plant status.”

With regards to system classification in determining if an “actuation” occurred:

- (1) The rule itself, 10 CFR 50.72(b)(3)(iv)(A) states a report is required for, “Any event or condition that results in valid actuation of any of the systems listed in paragraph (b)(3)(iv)(B) of this section except when the actuation results from and is part of a pre-planned sequence during testing or reactor operation.” 50.72(b)(3)(iv)(B) lists specific systems. 10 CFR 50.73(a)(2)(iv)(A) states a report is required for “Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section, except when: (1) The actuation resulted from and was part of a pre-planned sequence during testing or reactor operation; or (2) The actuation was invalid and; (i) Occurred while the system was properly removed from service; or (ii) Occurred after the safety function had been already completed.” 50.73(a)(2)(iv)(B) lists specific systems. The rule itself requires reports for actuations of listed systems. There are no stated considerations for system classification.
- (2) The FRN associated with the 2000 rule change (65 FR 63769) contains discussions on systems within scope. All discussions indicate that systems within scope are those included on the list regardless of plant specific classification of the system. The following discussions are found:
 - Stakeholder comments on systems within scope are found in Comment B, “Do not change the term ‘any engineered safety feature [ESF] * * *’.” The NRC

response is lengthy and the pertinent discussions on systems within scope are cited.

- “The NRC believes providing a list of systems is the best approach because it will obtain consistent reporting of events that result in actuation of highly risk-significant systems. Consistent reporting for such events is needed to support estimating equipment reliability parameters and is important to several aspects of the NRC's general move towards more risk informed regulation.”
- “The NRC believes that these systems remaining on the list are of sufficient risk significance to warrant reporting of a system actuation. The principal reason for reporting an actuation of one of these systems is that it is indicative of an unplanned plant transient that the NRC needs to evaluate to determine if action is necessary to address a safety problem. In this context, the NRC's need to evaluate the event is independent of classification of the system.”
- “Commenters indicated that providing an all-inclusive list of systems in the rules is inappropriate. However, the NRC does not believe the list is all inclusive. It contains only systems that are highly risk-significant and omits systems of lesser risk-significance, even if the systems of lesser risk-significance are designated as ESFs. The NRC also believes the list is appropriate because it provides consistent reporting of events that result in actuation of these highly risk-significant systems and, at the same time, a net reduction in reporting burden.”
- “Commenters stated that each facility's FSAR specifies equipment that is designated as ESF equipment. However, the NRC believes that those lists are not consistent or risk-informed. For example, at several plants, emergency diesel generators (EDGs), which are highly risk-significant, are not identified as ESFs. At several pressurized water reactors (PWRs), the AFW system which is highly risk significant; is not identified as an ESF. At most boiling water reactors (BWRs), the reactor core isolation cooling (RCIC) system, which is highly risk-significant, is not identified as an ESF. On the other hand, most plants identify systems with lesser risk-significance, such as fuel building ventilation and filtration systems, as ESFs.”
- “Commenters stated that plant specific differences exist in the safety related status of systems. However, the NRC does not believe that this fact bears directly on the question of which system actuations should be reported. There is no need to report the actuation of all safety related systems, and there is no reason to exclude reporting for the actuation of a non-safety-related system if it is highly risk-significant simply on the basis that it has not been classified by the licensee as an ESF.”

- “The proposed rule would have required reporting actuations of the RCIC system. Commenters stated that RCIC is included in the Improved Standard Technical Specifications (ISTS) because it meets criterion 4 of 10 CFR 50.36, based on its contribution to the reduction of overall plant risk. They further stated that RCIC is not credited in the plant's safety analysis. The NRC believes that RCIC is highly risk significant and, therefore, it remains on the list in the final rule.”
 - “Previously, the rules generally required reporting the actuation of any ESF including the RPS. The final rule, instead, generally requires reporting for actuation of specific listed systems. These systems are *{systems listed}*. This approach provides for consistent reporting of actuations for these highly risk-significant systems.”
- (3) A Discussion of Change document (ML12216A185) accompanied the publication of NUREG-1022, Revision 3. The Discussion of Change document was also referenced in the FRN (78 FR 9743) that announced the publication of NUREG-1022, Revision 3. Regarding changes in Section 3.2.6, “System Actuation,” the document states “Changes in this section reflect two considerations... The second consideration involves changes that reiterate that valid signals are those signals that are initiated in response to actual plant conditions or parameters satisfying the requirements for initiation of the system. The intent of this change is to reiterate that, in accordance with the 2000 rule change (65 FR 63769), the mode of applicability or plant specific classification of the system has no direct bearing on reportability under this criterion.”
- (4) The disposition of external stakeholder comments associated with the issuance of NUREG-1022, Revision 3 was also documented (ML12216A191). This document was also referenced in the FRN that announced the publication of NUREG-1022, Revision 3. Once commenter indicated that “NUREG-1022, Revision 3, Section 3.2.6, ‘System Actuation,’ should be clarified to indicate that reporting of system actuations of emergency service water (ESW) systems that do not normally run, and serve as ultimate heat sinks is only required for those ESW systems which are specified in the plant's accident analysis or included in Technical Specifications.” The NRC did not agree and responded “The Federal Register Notice (FRN) associated with the 2000 rule has various discussions on this change. The discussions highlight that system classification have no bearing on reportability. Comment B (65 FR 63770) opposes the change and highlights of the NRC response are: ‘The NRC believes providing a list of systems is the best approach because it will obtain consistent reporting of events that result in actuation of highly risk-significant systems. Consistent reporting for such events is needed to support estimating equipment reliability parameters and is important to several aspects of the NRC's general move towards more risk-informed regulation.’ ‘The NRC believes that these systems remaining on the list are of sufficient risk significance to warrant reporting of a system actuation. The principal reason for reporting an actuation of one of these systems is that it is indicative of

an unplanned plant transient that the NRC needs to evaluate to determine if action is necessary to address a safety problem. In this context, the NRC's need to evaluate the event is independent of classification of the system.”

With regards to system classification in determining the classification of the actuation (i.e. valid vs. invalid), the FRN associated with the 2000 rule change also states “A valid actuation is one that results from either a ‘valid signal’ or an intentional manual initiation. A ‘valid signal’ is one that results from actual plant conditions or parameters satisfying the requirements for system actuation. An invalid actuation is one that does not meet the criteria for being valid.” The definitions do not take into account system classification in determining if an actuation is valid or invalid.

5. Is a signal’s classification (i.e. credited in FSAR / non-credited in FSAR) consideration in determining if an “actuation” occurred or in determining the classification of the actuation (i.e. valid vs. invalid)? For example, can a non-credited signal still result in a valid actuation of a safety-related system?

Comments Received: Stakeholders indicated that a signal’s classification (i.e. credited in FSAR / non-credited in FSAR) is considered in determining if an “actuation” occurred. Actuation of a safety-related system due to a non-credited signal would not be reportable.

NRC Follow-Up Discussion: The NRC tentatively does not agree. For systems listed in the rule, unplanned actuation of those systems (regardless of signal classification) is reportable (subject to the exceptions for invalid actuations).

Basis for NRC Discussion: The basis for the NRC decisions associated with Issue #4 indicates actuations under consideration are for those system listed in the rule regardless of plant specific classification of the system. With regards to determining if the actuation was valid or invalid, the FRN associated with the 2000 rule change (65 FR 63769) states “A valid actuation is one that results from either a ‘valid signal’ or an intentional manual initiation. A ‘valid signal’ is one that results from actual plant conditions or parameters satisfying the requirements for system actuation. An invalid actuation is one that does not meet the criteria for being valid.” The definition of a valid signal does not take into account signal classification.

6. Is a report required for a “System Actuation” if an actuation should occur due to unplanned actual plant conditions, but fails to do so?

Comments Received: Stakeholders indicated that a “System Actuation” report is required if an actuation should occur due to unplanned actual plant conditions, but fails to do so. Stakeholders indicated that other reporting criteria may also apply.

NRC Follow-Up Discussion: The NRC tentatively agrees. A “System Actuation” report is required if an actuation should occur due to unplanned actual plant conditions, but fails to do so. .

Basis for NRC Discussion: Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3, states: "The Commission is interested both in events where a system was needed to mitigate the consequences of an event (whether or not the equipment performed properly)..." This discussion is also found in the FRN associated with the original rule (48 FR 33850).

Section 3.2.6 of NUREG-1022, Revision 3, also states "Note, however, that if only a single logic channel actuates when, in fact, the system should have actuated in response to plant parameters, this would be reportable under these paragraphs..." This discussion first appears in Section 3.3.2, "Actuation of an Engineered Safety Feature or the RPS," of NUREG-1022, Revision 1.

7. Is actual performance of a system's function (i.e. ECCS discharge, EDG output breaker closing, etc.) a consideration in determining if an "actuation" occurred or in determining the classification of the actuation (i.e. valid vs. invalid)?

Comments Received: Stakeholders indicated that actual performance of a system's function (i.e. ECCS discharge, EDG output breaker closing, etc.) is not a consideration in determining if an "actuation" occurred or in determining the classification of the actuation (i.e. valid vs. invalid).

NRC Follow-Up Discussion: The NRC tentatively agrees. Actual performance of a system's function (i.e. ECCS discharge, EDG output breaker closing, etc.) is not a consideration in determining if an "actuation" occurred or in determining the classification of the actuation (i.e. valid vs. invalid).

Basis for NRC Discussion: The first scenario in Example 1 of Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3, indicates a report due to a valid actuation is required even though there is no performance of the actual system's function due to plant conditions. This example first appears in Section 3.3.2, "Actuation of an Engineered Safety Feature (ESF) or the RPS," of NUREG-1022, Revision 1.

The FRN associated with the 2000 rule change states "A valid actuation is one that results from either a 'valid signal' or an intentional manual initiation. A 'valid signal' is one that results from actual plant conditions or parameters satisfying the requirements for system actuation. An invalid actuation is one that does not meet the criteria for being valid." The definitions do not take into account actual performance of a function.

Example C-1 of NUREG-1022, Revision 0 (ML101550096) indicates that a report is required for an actuation of a Safety Injection System due to actual plant conditions, even though no injection occurred since plant pressure remained above the pump shutoff head.

8. If an actuation occurs, is the only justification as to why an actuation is invalid, is that it is not considered valid? In other words, are there additional considerations for determining if an invalid actuation exists?

Comments Received: Multiple comments were received. Some comments indicated that a licensee's procedure will have criteria that indicate whether the actuation was valid or invalid. Stakeholders reiterated that valid actuations are those that start from actual plant conditions or parameters that complete the actuation logic requirements, and is either at the train level or has sufficient components to mitigate the consequences of the significant event. At least one commenter indicated that if an actuation occurs, the only justification as to why an actuation is invalid is that it is not considered valid.

NRC Follow-Up Discussion: Tentatively, the NRC partially agrees. While licensees may have procedures in place to help determine whether an actuation is valid or invalid, the NRC's focus is the outcome of the determination. As a reiteration, there are specific considerations for determining if an actuation is valid, however, there are no specific considerations for determining if an actuation is invalid. The only justification as to why an actuation is classified as invalid is that it is not considered valid.

Basis for NRC Discussion: The FRN associated with the 2000 rule change states "A valid actuation is one that results from either a 'valid signal' or an intentional manual initiation. A 'valid signal' is one that results from actual plant conditions or parameters satisfying the requirements for system actuation. An invalid actuation is one that does not meet the criteria for being valid."

Section 3.2.6, "System Actuation," of NUREG-1022, Revision 3, provides additional information and states "Valid actuations are those actuations that result from valid signals or from intentional manual initiation, unless it is part of a preplanned test. Valid signals are those signals that are initiated in response to actual plant conditions or parameters satisfying the requirements for initiation of the system. They do not include those that are the result of other signals. Invalid actuations are, by definition, those that do not meet the criteria for being valid. Thus, invalid actuations include actuations that are not the result of valid signals and are not intentional manual actuations."

9. What constitutes a "mitigation of the consequences of an event" with regards to System Actuation reporting?

Comments Received: Stakeholders indicated that the phrase reflects that systems within scope of system actuation reporting include only systems credited in the accident analysis chapter of the FSAR. If a system listed under the rule is not credited in the accident analysis chapter of the FSAR, its actuation would not be reportable. However, plant status (i.e. operating in a Mode in which system may not be needed) or actual performance of a system's function (i.e. ECCS discharge, EDG

output breaker closing, etc.) are not taken into account. Stakeholders also indicated that invalid actuations of such systems are considered events.

NRC Follow-Up Discussion: The NRC tentatively does not agree that the phrase reflects that systems within scope of system actuation reporting include only systems credited in the accident analysis chapter of the FSAR. The principal reason for reporting an actuation of one of the listed systems is that it is indicative of an unplanned plant transient that the NRC needs to evaluate to determine if action is necessary to address a safety problem. With regards to event reporting, System Actuation “events” are actuations of the listed systems as a result of an unplanned plant transient.

Basis for NRC Discussion: Section 3.2.6, “System Actuation,” of NUREG-1022, Revision 3, states “These paragraphs require events to be reported whenever one of the specified systems actuates either manually or automatically. They are based on the premise that these systems are provided to mitigate the consequences of a significant event and, therefore, (1) they should work properly when called upon, and (2) they should not be challenged frequently or unnecessarily. The Commission is interested in both events in which a system was needed to mitigate the consequences of an event (whether or not the equipment performed properly) and events in which a system actuated unnecessarily.” A later passage states, “Actuations that need not be reported are those initiated for reasons other than to mitigate the consequences of an event (e.g., at the discretion of the licensee as part of a preplanned procedure).” Similar discussions can be found in the FRN from the original rule (48 FR 33850). There is no additional information as to what is considered a significant event with regards to this reporting criterion. In addition, while there is no mention of unnecessary actuation in the later passage, the later passage does also place an emphasis on the fact that planned evolutions are not reportable.

As indicated in the basis for issue #4, systems within scope include all systems listed in the rule itself (regardless of site specific classification). As indicated in the FRN associated with the 2000 rule change, “The NRC believes that these systems remaining on the list are of sufficient risk significance to warrant reporting of a system actuation. The principal reason for reporting an actuation of one of these systems is that it is indicative of an unplanned plant transient that the NRC needs to evaluate to determine if action is necessary to address a safety problem. In this context, the NRC’s need to evaluate the event is independent of classification of the system.” With regards to event reporting, System Actuation “events” are actuations of the listed systems as a result of an unplanned plant transient.

Whitepaper on the Definition of “Concurrent” Failures

Introduction

The resolution of Reaction Oversight Process FAQ 12-04 required development of a revision to a footnote in the section on Occupational Exposure Control Effectiveness (OR01). In Revision 7 of NEI 99-02, the crucial footnote is number 14 on page 66 of the line-in/line-out version, which reads as follows:

"Concurrent" means that the nonconformances occur as a result of the same cause and in a common timeframe."

Proposed Change to NEI 99-02

As a result of numerous discussions on the meaning and original intent of “concurrent nonconformances” during the resolution of FAQ 12-04, the following is the proposed new text of Footnote 14:

"Concurrent" means that the nonconformances occur as a result of the same cause and in a common timeframe. Failing to take reasonable action that would end a nonconformance when new information (i.e., a survey indicates, or a knowledgeable individual finds evidence of, unidentified or unexpected radiological conditions) is presented, is itself a new and separate cause for the subsequent (or continued) Tech. Spec. nonconformance, and would not be concurrent with the original Technical Specification High Radiation Area Occurrence."

Definition of Terms

A Safety System Functional Failure (SSFF) is any event or condition that could have prevented the fulfillment of the safety function of structures or systems that are needed to:

- (A) Shut down the reactor and maintain it in a safe shutdown condition;
- (B) Remove residual heat;
- (C) Control the release of radioactive material; or
- (D) Mitigate the consequences of an accident.

The indicator includes a wide variety of events or conditions, ranging from actual failures on demand to potential failures attributable to various causes, including environmental qualification, seismic qualification, human error, design or installation errors, etc. Many SSFFs do not involve actual failures of equipment.

Because the contribution to risk of the structures and systems included in the SSFF varies considerably, and because potential as well as actual failures are included, it is not possible to assign a risk-significance to this indicator. It is intended to be used as a possible precursor to more important equipment problems, until an indicator of safety system performance more directly related to risk can be developed.

Clarifying Notes

The definition of SSFFs is identical to the wording of the current revision to 10 CFR 50.73(a)(2)(v). ~~Because of overlap among various reporting requirements in 10 CFR 50.73, some events or conditions that result in safety system functional failures may be properly reported in accordance with other paragraphs of 10 CFR 50.73, particularly paragraphs (a)(2)(i), (a)(2)(ii), and (a)(2)(vii). An event or condition that meets the requirements for reporting under another paragraph of 10 CFR 50.73 should be evaluated to determine if it also prevented the fulfillment of a safety function. Should this be the case, the requirements of paragraph (a)(2)(v) are also met and the event or condition should be included in the quarterly performance indicator report as an SSFF. The level of judgment for reporting an event or condition under paragraph (a)(2)(v) as an SSFF is a reasonable expectation of preventing the fulfillment of a safety function.~~

~~In the past, LERs may not have explicitly identified whether an event or condition was reportable under 10 CFR 50.73(a)(2)(v) (i.e., all pertinent boxes may not have been checked). It is important to ensure that the applicability of 10 CFR 50.73(a)(2)(v) has been explicitly considered for each LER considered for this performance indicator.~~

NUREG-1022: Unless otherwise specified in this guideline, guidance contained in the latest revision to NUREG-1022, "Event Report Guidelines, 10CFR 50.72 and 50.73," that is applicable to reporting under 10 CFR 50.73(a)(2)(v), should be used to assess reportability for this performance indicator. Questions regarding interpretation of NUREG-1022 should not be referred to the FAQ process. They must be addressed to the appropriate NRC branch responsible for NUREG-1022.

~~*Planned Evolution for maintenance or surveillance testing:* NUREG-1022, Revision 2, page 56 states, "The following types of events or conditions generally are not reportable under these criteria:... Removal of a system or part of a system from service as part of a planned evolution for maintenance or surveillance testing..."~~

~~"Planned" means the activity is undertaken voluntarily, at the licensee's discretion, and is not required to restore operability or for continued plant operation.~~

A single event or condition that affects several systems: counts as only one failure.

Multiple occurrences of a system failure: the number of failures to be counted depends upon whether the system was declared operable between occurrences. If the licensee knew that the problem existed, tried to correct it, and considered the system to be operable, but the system was subsequently found to have been inoperable the entire time, multiple failures will be counted whether or not they are reported in the same LER. But if the licensee knew that a potential problem existed and declared the system inoperable, subsequent failures of the system for the same problem would not be counted as long as the system was not declared operable in the interim. Similarly, in situations where the licensee did not realize that a problem existed (and thus could not have intentionally declared the system inoperable or corrected the problem), only one failure is counted.

Additional failures: a failure leading to an evaluation in which additional failures are found is only counted as one failure; new problems found during the evaluation are not counted, even if the causes or failure modes are different. The intent is to not count additional events when problems are discovered while resolving the original problem. *Evaluation types include Causal Evaluation Extent of Condition or Extent of Cause reviews that are undertaken as a result of a discrete event reported in an LER as a SSFF. Additional failures discovered during these reviews would not count as separate SSFF PI occurrences.*

A comment should be added to the publicly viewable quarterly CDE submittal file explaining that newly discovered additional failures, even if reported under a new LER number, only count as a single SSFF PI occurrence.

Engineering analyses: events in which the licensee declared a system inoperable but an engineering analysis later determined that the system was capable of performing its safety function are not counted, even if the system was removed from service to perform the analysis.

Reporting date: the date of the SSFF is the Report Date of the LER. If the LER is revised to reflect the occurrence of an SSFF, the date of the SSFF is the Report Date of the revised LER.

Klett
Whitepaper
2/23/2012

The LER number should be entered in the comment field when an SSFF is reported

Industry Response to Staff's White Paper on Objective of the RCS Leakage Performance Indicator

Summary

The industry appreciates the staff's efforts to document the background behind the Reactor Oversight Process (ROP) Reactor Coolant System (RCS) leakage performance indicator (BI02); describe the apparent disconnect between the basis for the performance indicator as described in IMC0308, Attachment 1, and the actual metric used; and identify an array of possible solutions. This indicator has been a source of discussion between the industry and NRC staff over the life of the ROP.

Although alternatives based on measuring unidentified leakage have been investigated repeatedly, a workable replacement to the current indicator has proven elusive. A performance indicator that monitors total leakage instead would, arguably, be reconcilable with the ROP performance indicator basis document. However, in practice identified leakage would still dominate the result. Thus the indicator would retain a significant flaw: for all intents the threshold would be tripped by a single discrete event, rather than being an aggregate measure of performance over time. A metric that counts Reactor Coolant Pressure Boundary leakage events, similar to the Unplanned Scrams with Complications indicator or MSPI performance limit exceeded (PLE), has merit conceptually. However, defining a "leakage event" could prove difficult and take considerable effort.

Despite its acknowledged faults, the current performance indicator measures an RCS parameter important enough to require its own Technical Specification limits, is well understood and generates few FAQs. Therefore, of the options proposed by the staff, the industry's preference is for the agency to modify the Technical Basis objective of the RCS Leakage PI to be consistent with the current indicator.

Text for Reconciliation

The following text could be added to IMC 0308, to document the 2013 discussions on options for addressing the difficulties with the RCS Leakage PI:

In 2013 the basis for the Identified Leakage performance indicator was reviewed, recognizing that it is an incomplete indicator of RCS barrier integrity. The review affirmed that the Identified Leakage indicator is an appropriate surrogate for measuring RCS barrier integrity. More direct measures, such as Unidentified Leakage, were considered and determined to be problematic, such as being more susceptible to spuriously crossing the Green-White threshold.