

Meaning of the term “operable” in 10CFR50.72(b)(3)(v)/(vi) and 10CFR50.73(a)(2)(v)/(vi)

Position

The regulations (i.e., 10CFR50.72(b)(3)(v) / (vi) and 10CFR50.73(a)(2)(v) / (vi)) require the reporting of events or conditions that could have prevented the fulfillment of one of the specified safety functions by a structure or system. Neither of these regulations uses the Technical Specification (TS) term “operable” to describe the reportable condition. The language of the rules, focuses on the ability (or lack of ability) of structures or systems to fulfill their required safety function(s). There is a subset of conditions or events in which a system or structure is capable of performing its required safety function, yet may not fully meet the conditions to be “operable” as defined in TS that would not be reportable under these criterion.

For a structure or system to be “operable” in accordance with the Technical Specification (TS) definition it must be able to perform the specified safety function. Additionally, the TS application of the defined term “operable” has attendant requirements in excess of those physical requirements of the system or structure that must be in place for the system or structure to perform its specified safety function (e.g., use and application rules and conservatisms or other requirements in excess of the accident analysis included in the TS). In such cases a structure or system may be considered inoperable but still fully capable of performing the safety function associated with these reporting requirements (i.e., as listed in A-D subsections of each rule).

The Statements of Considerations (SOC) associated with the original reporting rules and their subsequent revisions do not identify any intention to require reporting under these reporting requirements any condition or event where the required safety function can still be performed by a structure or system. Additionally, other sections of 10CFR use the term “operable.” In many of these cases, if the term “operable” is directly tied to the TS application of the term “operable” the term would have no meaning in its use in the regulatory requirement since the regulatory requirements do not have corresponding TS requirements (e.g., Parts 30, 34, 36, 39, 73). It would be inconsistent to determine that this one section of 10CFR uses the term “operable” to mean something different from the other uses in 10CFR without some clear intent to deviate from the standard usage identified in the associated rule or associated rulemaking.

10CFR50.72(b)(3)(vi) provides clarification for some specific events that are considered to be covered in 10CFR50.72(b)(3)(v) and some that are not considered to be covered. During the 2001 rule change, The word “operable” was added to 10CFR50.72(b)(3)(vi). The intent of this addition was discussed in the associated SOC [65FR63769].

“A new paragraph, section 50.72(b)(3)(vi) is added to clarify section 50.72. The new paragraph explicitly states that telephone reporting is not required under section 50.72(b)(2)(v) for single failures if redundant equipment in the same system was operable and available to perform the required safety function. **That is, although one train of a system may be incapable of performing its safety function, reporting is not required under this criterion if that system is still capable of performing the safety function.** This is the same principle that was and continues to be stated explicitly in section 50.73(a)(2)(vi) with regard to written LERs.”

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As discussed in the SOC paragraph, the intent of this operability statement in the reporting requirements was not to increase the scope of the reporting requirement, but was to clarify that there was no intent to report conditions where another train in the same system was still capable of performing the safety function.

Similarly, in 65FR63774 in response to Comment F (Eliminate reporting of high pressure coolant injection (HPCI) inoperability) the staff stated:

“As indicated in the 1983 Statements of Considerations for 10 CFR 50.72 and 50.73, failure or inoperability of a single train system, such as the HPCI system in BWRs, is considered to constitute an ‘event or condition that alone could have prevented the fulfillment of the safety function’.” “Response: As indicated in the 1983 Statements of Considerations for 10 CFR 50.72 and 50.73, the purpose of this reporting criterion is to capture failure, inoperability, etc. on the basis of a structure or system...”

Also, in its assessment of plant performance, the NRC uses a performance indicator that includes failure or inoperability of single train systems such as HPCI. Thus, elimination of the requirement to report such events would be contrary to one of the objectives of the rulemaking – to maintain consistency with the NRC's actions to improve integrated plant performance.”

The use of the term “inoperability” in this section directly reflects the view that “operable” and “inoperable” were being used in the reporting requirements and SOCs to describe only those conditions where the structure or system could not perform the safety function. The performance indicator discussed by the NRC as including “failure or inoperability of single train systems such as HPCI” did not monitor the TS “operability” or “inoperability” of the monitored systems but monitored the availability of the systems to perform the required safety function. To interpret the reporting requirement to require the reporting of TS inoperabilities where the safety function can still be performed would be directly contrary to the staff’s stated purpose. In fact, in 48FR33850 the NRC Staff stated:

“Failures that affect inputs or services to systems that have no safety function need not be reported.”

These statements and other of statements provided below do not support direct application of the terms “operable” or “inoperable” as defined in Technical Specifications as a threshold for determining whether a condition or event requires notification or reporting under these rules. It is evident that throughout the SOCs and the guidance the terms “operable” or “inoperable” were used interchangeably with “a loss of ability to perform the safety function.” There is no discussion indicating an intent to report items under this criterion where the safety function could still be performed by the structure or system.

A sample review of Licensee Event Reports (LERs) from the late 1990's, prior to ROP implementation, was performed to review the relationship between the TS inoperability of multiple trains of TS systems and the applicability of reporting the event as a condition that could have prevented fulfillment of the system's specified safety function under the rule. The sample was chosen using LER's that referred to a TS 3.0.3 entry because these reported conditions generally were the result of a condition where all (e.g. 2 of 2)

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redundant trains were declared inoperable in accordance with the TS. The large majority of LER conditions related to TS 3.0.3 were only reported as either a condition prohibited by TS or completion of a shutdown required by TS. Only a small percentage were reported as a condition that could have prevented the fulfillment of the system's safety function. This data is consistent with the position that use of operability in discussions within the rule related to the safety system functional failure criterion are associated with functionality but not directly tied to TS operability. The conditions in the sample that were reported as a condition that could have prevented the fulfillment of a system's safety function appear to be only those that, as discussed in NUREG 1022, there was "a reasonable expectation of preventing fulfillment" of the system's specified safety function. Therefore, it is reasonable to conclude that any position where TS inoperability is directly equated to an inability to fulfill the the system's specified safety function under this criterion is a "change" to historical understanding of the reporting requirements.

Application of the TS operability to this reporting requirement would result in the reporting of potential reporting of conditions where a system is still capable of performing the safety function, which is in direct conflict with the stated purpose of the reporting requirement. This conflict is due to the TS requirements for a system to be considered operable exceeding those necessary for the system to be capable of performing the safety function in certain conditions. Requiring conditions to be reported as a loss of safety function when the structure of system could still perform the safety function would not be consistent with the purpose of the reporting requirements, the stated reporting requirement in the regulations, the intent of the reporting requirement as discussed in the associated SOCs, or historical industry reporting of the requirement.

10 CFR 50 Part 72 and 73 Sections

§ 50.72(b)(3)(v) / (vi)

"Any event or condition that at the time of discovery 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.

Events covered in paragraph (b)(3)(v) of this section may include one or more procedural errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported pursuant to paragraph (b)(3)(v) of this section if redundant equipment in the same system was **operable** and available to perform the required safety function."

§ 50.73(a)(2)(v) / (vi)

"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.

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Events covered in paragraph (a)(2)(v) of this section may include one or more procedural errors, equipment failures, and/or discovery of design, analysis, fabrication, construction, and/or procedural inadequacies. However, individual component failures need not be reported pursuant to paragraph (a)(2)(v) of this section if redundant equipment in the same system was **operable** and available to perform the required safety function."

Excerpts from Applicable Documents discussing preventing the fulfillment of the safety function

50.72(b)(3)(v), 50.72(b)(3)(vi), 50.73(a)(2)(v), 50.73(a)(2)(vi)

[Note: These sections require the reporting of could have prevented the fulfillment of the safety function and not the “INOPERABILITY” of the equipment as defined in the TS.]

§ 50.73(a)(2)(v)

"Any event or condition that **could have prevented the fulfillment of the safety...**"

§ 50.72(b)(3)(v)

"Any event or condition that at the time of discovery **could have prevented the fulfillment of the safety function...**"

NUREG 1022 Revision 2, Section 3.2.7

An LER is required for an event or condition that could have **prevented the fulfillment of the safety function** of structures and systems defined in the rules.

The level of judgment for reporting an event or condition under this criterion is a **reasonable expectation of preventing fulfillment of a safety function.**

The intent of these criteria is to capture those events where there would have been a failure of a safety system to properly complete a safety function, regardless of whether there was an actual demand. For example, if the high pressure safety injection system (both trains) failed, the event would be reportable even if there was no demand for the system's safety function.

...

The following types of events or conditions generally are not reportable under these criteria:

- **failures that affect inputs or services to systems that have no safety function (unless it could have prevented the performance of a safety function of an adjacent or interfacing system)**
- **a failure of a system used only to warn the operator where no credit is taken for it in any safety analysis and it does not directly control any of the safety functions in the criteria ...** [Note: These two examples reflect items that would not be considered reportable, although these examples may be part of the TS definition of operability by way of inclusion of the items in the TS requirements for a system.]

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Examples

...

(9) Contaminated Hydraulic Fluid Degrades MSIV Operation

...

Comments: The event is reportable under 50.73(a)(2)(v) because a single the condition **could have prevented fulfillment of a safety function**. The event is not reportable under 50.72(b)(3)(v) because, at the time of discovery, the plant was shutdown and the MSIV's were not required to be operable...

RIS 2001-14 Position on Reportability Requirements for Reactor Core Isolation Cooling System Failure July 19, 2001

In , paragraphs 50.72(b)(3)(v) and 50.73(a)(2)(v), require reports for any event or condition that could have **prevented the fulfillment of the safety function** of structures or systems that are needed to shut down the reactor and maintain it in a safe shutdown condition, remove residual heat, control the release of radioactive material, or mitigate the consequences of an accident...

NRC memorandum from Suzanne C. Black to Geoffrey E. Grant titled "Task Interface Agreement (TIA) 99-030 From Region III Regarding the Reportability Of Reactor Core Isolation Cooling (RCIC) System Failures" dated March 15, 2001 (Accession No. ML010740339).

The 1983 Statements of Considerations (SOCs) for 10 CFR 50.72 and 10 CFR 50.73 state the following:

It should be noted that there are a limited number of single-train systems that perform safety functions (e.g., the High Pressure Coolant Injection System [HPCI] in BWRs [boiling-water reactors]). For such systems, loss of the single train would prevent the fulfillment of the safety function of that system and, therefore, must be reported even though the plant Technical Specifications may allow such a condition to exist for a specified limited length of time...

48FR33850 (similar to other applicable SOCs)

In the Federal Register notice that accompanied the proposed rule, the Commission stated that licensee's engineering judgment may be used to decide if an event is reportable. Several commenters expressed the belief that some wording should be added to the rule of reflect that the NRC will also use judgment in enforcement of this regulation where the licensee is requested to use engineering judgment. The Commission believes that the LER rule adequately discusses the need for and application of the concept of "engineering judgment." The concept itself includes the recognition of the existence of a reasonable range of interpretation regarding this rule, and consequently the Commission recognizes and hereby acknowledges the need for flexibility in enforcement actions associated with this rule. The Commission believes that this concept is sufficiently clear and that additional explicit guidance is not necessary."

...

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This paragraph is also based on the assumption that safety-related systems and structures are intended to mitigate the consequences of an accident. While 50.73(a)(Z)(iv) of this final rule applies to actual actuations of an ESF, 50.73(a)(Z)(v) of this final rule covers an event or condition where redundant structures, components, or trains of a safety system could **have failed to perform their intended function** because of one or more personnel errors, including procedure violations; equipment failures: or design, analysis, fabrication, construction, or procedural deficiencies. The event must be reported regardless of the situation or condition that caused the structure or systems to be unavailable, and regardless of whether or not an alternate safety system could have been used to perform the safety function ...

...

Interaction between systems particularly a safety system and a nonsafety system, is also included in this criterion. For example, the Commission is increasingly concerned about the effect of a loss or degradation of what had been assumed to be non-essential inputs to safety systems. Therefore, this paragraph also includes those cases where a service (e.g., heating, ventilation, and cooling) or input (e.g., compressed air) which is necessary for reliable or long-term operation of a safety system is lost or degraded. **Such loss or degradation is reportable if the proper fulfillment of the safety function is not cannot [sic] be assured. Failures that affect inputs or services to systems that have no safety function need not be reported.**

65FR63769

Train inoperable longer than allowed. If a design or analysis defect or deviation (or any other event or condition) is significant enough that, as a result, one train of a multiple train system controlled by the plant's TS is not capable of **performing its specified safety functions** for a period of time longer than allowed by the TS, the condition is reportable under section 50.73(a)(2)(i)(B) [i.e., an operation or condition prohibited by TS]. For example, if it is found that an exciter panel for one EDG lacks appropriate seismic restraints because of a design, analysis, or construction inadequacy and, as a result, **there is reasonable doubt about the EDG's ability to perform its specified safety functions** during and after a Safe Shutdown Earthquake (SSE), the event would be reportable. Or, for example, if it is found that a loss of offsite power could cause a loss of instrument air and, as a result, there is reasonable doubt about the ability of one train of the auxiliary feedwater system to perform its specified safety functions for certain postulated steam line breaks, the event would be reportable.

...

A new paragraph, section 50.72(b)(3)(vi) is added to clarify section 50.72. **The new paragraph explicitly states that telephone reporting is not required under section 50.72(b)(2)(v) for single failures if redundant equipment in the same system was operable and available to perform the required safety function. That is, although one train of a system may be incapable of performing its safety function, reporting is not required under this criterion if that system is still capable of performing the safety function.** This is the same principle that was and continues to be stated explicitly in section 50.73(a)(2)(vi) with regard to written LERs.

Excerpts from Applicable Documents discussing Operability

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None of the below discussions indicate an intent to expand the reporting requirements to conditions where the structure or system could perform the safety function.

65FR63774

Comment F (Eliminate reporting of high pressure coolant injection (HPCI) inoperability): As indicated in the 1983 Statements of Considerations for 10 CFR 50.72 and 50.73, failure or inoperability of a single train system, such as the HPCI system in BWRs, is considered to constitute an ‘event or condition that alone could have prevented the fulfillment of the safety function’.” “Response: As indicated in the 1983 Statements of Considerations for 10 CFR 50.72 and 50.73, the purpose of this reporting criterion is to capture failure, inoperability, etc. on the basis of a structure or system...

Also, in its assessment of plant performance, the NRC uses a performance indicator that includes failure or inoperability of single train systems such as HPCI. Thus, elimination of the requirement to report such events would be contrary to one of the objectives of the rulemaking – to maintain consistency with the NRC's actions to improve integrated plant performance.

[Note: The use of the term “inoperability” in this section directly reflects the view that “operable” and “inoperable” were being used to describe only those conditions where the structure or system could not perform the safety function. The performance indicator discussed by the NRC as including “failure or inoperability of single train systems such as HPCI” did not monitor the TS “operability” or “inoperability” of the monitored systems but monitored the availability of the systems to perform the required safety function. To interpret the reporting requirement to require the reporting of TS inoperabilities where the safety function can still be performed would be in “contrary to one of the objectives of the rulemaking – to maintain consistency with the NRC's actions to improve integrated plant performance”.]

64 FR 36296

Comment 34: Some comments indicated that the licensing basis should be defined. Response: No changes are proposed. The term ‘licensing basis’ is not explicitly used in the event reporting rules or the draft reporting guidelines. It can come into play, via Generic Letter (GL) 91-18, ‘Information to Licensees **Regarding two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability,**’ in determining what the ‘specified safety function’ of a system is. This relates to whether an event is reportable as an event or condition that could have prevented the fulfillment of the safety function of structures or systems * * * and/or an operation or condition prohibited by the plant's technical specification (TS). **However, any unsettled details regarding exactly which commitments are included in the licensing basis (for example because of differences between the definitions in GL 91-18 and 10 CFR 54.3) are not of a nature that would change the determination of whether or not a system is capable of performing its specified safety functions (i.e., operable).**” 64 FR 36296 is for the proposed rule; however, nothing is noted in the final statements of consideration that would render the above discussion obsolete.

[Note: This SOC says that the guidance on operability can be used to determine ‘specified safety function’ of a system and goes on to define that to be operable a system must be capable of performing its specified safety functions. It does not say that a

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system determined to be “inoperable” is reportable of these criteria even if the system can perform the safety function.]

NUREG-1022

- Section 3.2.7 of NUREG-1022, Revision 2 (ML003762595) contains specific guidance in the Discussion section that states “Whenever an event or condition exists where the system could have been prevented from fulfilling its safety function because of one or more reasons for equipment inoperability or unavailability, it is reportable under these criteria. This would include cases where one train is disabled and a second train fails a surveillance test.” This guidance was first introduced in Section 3.3.3 of NUREG-1022, Revision 1 (ML070530420). The background information for this change can be found in 66 FR 18177 which states “The staffs previous guidance in NUREG-1022 at page C-42 provides an example of a two train overpressure mitigation system (OMS) failing to operate. The reasons for this system failing to operate were that one train was out of service for calibration (preventing its operation) and equipment failure occurred in the other train (preventing its operation) when the system was called upon. The staff guidance presented at the end of the discussion of the event stated: ‘The event is reportable because the OMS failed to perform its intended function [50.73(a)(2)(v)].’ ...Based on the rules, the staff has concluded that the relevant paragraph on page 92 of draft NUREG- 1022, Rev. 1, should be revised to read as follows: Multiple equipment inoperability or unavailability. Whenever an event or condition exists where the system **could have been prevented from fulfilling its safety function because of one or more reasons for equipment inoperability or unavailability, it is reportable under these criteria.** This is consistent with the guidance provided in the preambles to the final rules for both 10 CFR 50.72(b)(2)(iii) and 50.73(a)(2)(v) as discussed above. This is also consistent with the previous staff guidance provided in NUREG-1022 as discussed above.”
- Example 1 in Section 3.2.7 of NUREG-1022, Revision 2 states “When the licensee was preparing to run a surveillance test, a high-pressure coolant injection (HPCI) flow controller was found inoperable; therefore, the licensee declared the HPCI system inoperable. The plant entered a technical specification requiring that the automatic depressurization, low-pressure coolant injection, core spray, and isolation condenser systems remain operable during the 7-day LCO or the plant had to be shut down. **The licensee made an ENS notification within 28 minutes and a followup call after the amplifier on the HPCI flow transmitter was fixed and the HPCI returned to operability. As discussed above, the loss of a single train safety system such as BWR HPCI is reportable.**” This guidance first appears in Revision 1 of NUREG-1022.
- Example 4 in Section 3.2.7 of NUREG-1022, Revision 2 states “During refueling, one emergency diesel generator (EDG) in a two train system was out of service for maintenance. The second EDG was declared inoperable when it failed its surveillance test. An ENS notification is required and an LER is required. As addressed in the Discussion section above, loss of either the onsite power system or the offsite power system is reportable under this criterion.” This guidance first appears in Revision 1 of NUREG-1022.

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- An example on page C-5 of NUREG-1022, Revision 0 (ML101550096) is titled “RHR Inoperable,” and states “When the circuit breaker for the motor operated inlet isolation valve was closed the valve immediately shut. A ‘shut’ control signal was being transmitted to the valve operator controller as a result of Channel B wide range pressure instrumentation maintenance action. When motive power was provided to the motor by closing its power supply breaker it functioned to shut the valve. System low flow alarms occurred in the Control Room and an operator was dispatched to open the valve by hand. Flow was subsequently restored and the system was declared operable. Redundant trains of the Residual Heat Removal (RHR) System are supplied through a common inlet line from loop 3. The inlet line contains two essential motor operated isolation valves in series. Shutting either valve renders the RHR trains inoperable. Therefore, both trains of the RHR were declared inoperable when the inlet isolation valve was inadvertently closed. Comment: The event is reportable because failure of a single valve caused the RHR system to be inoperable [50.73(a)(2)(v)].”