

FCSS Interim Staff Guidance-11, Revision 0 **10 CFR Part 70, Appendix A - Reportable Safety Events**

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Issue

This guidance addresses event reporting criteria in Appendix A to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 70 [Appendix A].

Introduction

Effective October 18, 2000, licensees subject to the 10 CFR 70.62 integrated safety analysis (ISA) summary requirements were required to report events in accordance with Appendix A. Event reporting is an important part of the regulatory framework because it provides the U.S. Nuclear Regulatory Commission (NRC) with real-time information about unfolding conditions at its regulated facilities, allows it to inform other licensees of potentially safety-significant concerns at other fuel facilities, and contributes to performance-based regulation through monitoring and trending of performance.

Fuel facility events occurring since Appendix A was implemented, have raised a number of issues concerning the interpretation of these reporting requirements. In June 2007, industry representatives and NRC staff met to discuss these issues and areas where conflicting interpretations had resulted in events or conditions not being reported in accordance with Appendix A. Industry presented a white paper prepared by the Nuclear Energy Institute documenting some of the challenges and inconsistencies regarding reportability. Additionally, NRC staff had also observed inconsistent reporting of events under Appendix A and had developed a matrix of reporting issues based on actual events.

The purpose of this Interim Staff Guidance (ISG) is to clarify some of the reporting requirements in Appendix A, which contains criteria for submitting one hour reports, twenty-four hour reports, and concurrent reports. These criteria are discussed below.

Discussion

Time of Discovery

Paragraphs (a) and (b) of Appendix A pertain to one-hour and twenty-four hour reports, respectively, and are tied to when the reportable event is discovered. One-hour reportable events are significant operational events that must be quickly reported. Such events typically do not require substantial evaluation to determine reportability (e.g., an event involving the loss of all controls, such that a release or criticality accident is possible). However, if a licensee cannot determine whether an event requires reporting under paragraph (a) of Appendix A, the licensee should assume that the one hour rule is applicable¹. Twenty-four-hour reportable events have less safety significance than one-hour reportable events and sometimes require more extensive evaluation to determine reportability. The twenty-four hour time period for reportable events is

¹ Additional guidance can be found in NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility," Section 5.4.3.4.7 (7)(d) which states that, "If the licensee cannot ascertain within one hour of whether the criteria of 10 CFR 70 Appendix A Paragraph (a) or (b) apply, the event should be treated as a one-hour reportable event."

intended to allow licensees sufficient time to make this determination. However, if the determination cannot be completed within this time frame then the event must be reported to the NRC Operations Center within twenty-four hours of discovery. Licensees are encouraged to be conservative in making decisions of reportability, in order to ensure compliance with the specified time periods established in the regulations. Event reports may be corrected or supplemented in accordance with 10 CFR 70.74(a)(4) as appropriate. The flowchart in Attachment A of this guide illustrates an example of a typical notification process at a fuel cycle facility.

The time of discovery begins when a cognizant individual observes, identifies, or is notified of a safety significant event or condition. A cognizant individual is anyone who, by position or experience, is expected to understand that the particular condition or event adversely impacts safety. For some conditions, such as the examples² shown in Table 1 and Attachment B, an investigation and evaluation is necessary that leads to the discovery of a potentially reportable situation. The evaluation should proceed on a time scale commensurate with the safety significance of the issue. The flow chart in Attachment C of this guide provides an example of the process a facility may take when determining reportability.

Table 1 Examples of discovery determination

| Issue | Discovery Determination |
|---|---|
| <p>Poor quality uranium powder is observed and reported as being discharged from a heated calciner process.</p> | <p>After the process was shutdown and the equipment was disassembled, it was discovered that the calciner tube had cracked allowing uranium to accumulate outside of the analyzed geometry.</p> |
| <p>A crack is found in a liquid uranium process area that may have allowed uranium-bearing solutions to accumulate beneath the floor. Initial probing could not determine the extent or depth of the crack. The licensee had not anticipated any problems but was aware of prior spills of uranium solution in the area and decided to investigate further. Arrangements were made to remove the damaged section of floor in this area and soil samples were collected.</p> | <p>Upon analysis, it was discovered that a mass of uranium had accumulated in an unanalyzed area beneath the floor.</p> |
| <p>A small release of UF₆ occurred during a cylinder change-out inside a process area. Although the air monitoring system in the area did not alarm, an operator reported he was working in the area during the release.</p> | <p>The time of discovery is when the operator realized he may have been exposed. Nasal smears did not indicate a significant intake occurred. At this point the licensee had reasonable justification for not reporting the event since it did not appear to meet the reporting requirements. One hour, eight hour and twenty-four hour urine samples were collected and analyzed, which revealed the worker had received an intake of approximately 40mg of uranium. This constituted a new time of discovery.</p> |

² These examples are not meant to be an exhaustive list and should not be used as such.

Loss or Degradation of Items Relied on for Safety (IROFS)

This section applies to the reporting requirements in Paragraphs (a)(4), (a)(5), and (b)(2) of Appendix A.

10 CFR 70.61(e) requires that the controls needed to meet the performance requirements (i.e., §70.61(b), §70.61(c), and §70.61(d)) must be designated as IROFS. In addition, each IROFS must be described in the ISA (§70.62(c)(1)(vi)) and in the ISA Summary (§70.65(b)(6)). Thus, for the reporting requirements in Paragraphs (a)(4), (a)(5), and (b)(2) of Appendix A, no control can be credited which is not listed as an IROFS in the ISA Summary.

When a licensee discovers a condition where there are one or more failed or degraded IROFS, it must assess whether such an event or condition is reportable under Paragraphs (a)(4), (a)(5), or (b)(2) of Appendix A. The following situations are not reportable for this condition:

1. The failed or degraded IROFS are not needed to meet the performance requirements. Thus, the ISA Summary should indicate that the remaining IROFS are sufficient to meet the performance requirements; or
2. IROFS listed for other accident sequences are applicable to the accident sequences where the ISA Summary indicates that the failed or degraded IROFS were needed to meet the performance requirements. These other IROFS must be in place physically where the event occurred, and must be available and reliable when the event occurred; it must also perform a safety function that prevents or mitigates the event in question. In this case, the performance requirements were met, but had not been adequately demonstrated in the ISA Summary; or
3. The capabilities of the degraded IROFS are still sufficient to meet the performance requirements.

Licensees may also apply IROFS from another sequence, in the manner described above, to evaluate reporting under Paragraph (b)(2) instead of Paragraphs (a)(4) or (a)(5).

Non-IROFS cannot be credited for the purpose of determining reportability under Paragraphs (a)(4), (a)(5), or (b)(2). Thus, all other situations where IROFS have failed or degraded are reportable under Paragraphs (a)(4), (a)(5), or (b)(2).

Inadequate ISA

This section applies to the reporting requirement in Paragraph (b)(1) of Appendix A.

When a licensee discovers that the ISA is not adequate to demonstrate that the performance requirements are met, it must assess whether this event or condition is reportable under Paragraph (b)(1).

As mentioned in the previous section, controls which are needed to meet the performance requirements must be designated as IROFS in the ISA Summary. However, it is recognized that failing to properly document controls does not always pose a safety concern that is significant enough to warrant reporting to the NRC. The following guidance distinguishes between situations where an event occurred and situations where no event occurred in relation to the situation where the ISA is discovered to be inadequate. The reason for the distinction is that the occurrence of an event represents an actual challenge to the safety basis.

All situations

- An event or condition is not reportable if IROFS listed for other accident sequences are applicable for the situation of concern (see item 2 in section above) such that the combination of IROFS are sufficient to meet the performance requirements.
- If an event or condition has occurred that invalidates the assumptions used in the safety analysis then the condition is reportable unless there are sufficient IROFS and creditable controls available to demonstrate that the performance requirements are met.

Event occurred

- In the case where there is an IROFS failure, this condition should be evaluated under the section above (Loss or Degradation of an IROFS) since this may be a more safety significant condition.
- If there are no IROFS failures, but it is discovered that the available IROFS are not sufficient to meet the performance requirements, then the licensee may consider a combination of IROFS and creditable controls. If the combination of available IROFS and creditable controls are sufficient to meet the performance requirements the condition is not reportable.

No event occurred

- If the combination of available IROFS and creditable controls are sufficient to meet the performance requirements the condition is not reportable.

External Events

This section applies to the reporting requirement in Paragraph (b)(4) of Appendix A.

Any natural phenomenon (e.g., hurricane, tornado, earthquake, flood, fire) or other external condition that poses an actual threat to the safety of the facility must be reported within 24 hours³. Natural phenomenon which damages some portion of the facility would typically be reported. The licensee should decide if a phenomenon or condition actually threatens the facility. For example, a minor brush fire in a remote area of the site that is quickly controlled by fire fighting personnel and, as a result, did not present a threat to the facility should not be reported. However, a major forest fire, large-scale flood, or major earthquake that presents a clear threat to the facility should be reported. As another example, an industrial or transportation accident which occurs near the site, creating a safety concern, should be reported.

The licensee must use judgment to determine if an external event threatens the facility. For example, with regard to tornadoes the decision would be based on such factors as the size of the tornado, and its location. There are no prescribed limits. In general, situations involving only monitoring by the plant's staff are not reportable, but if preventive actions are taken or if there are serious concerns, then the situation should be carefully reviewed for reportability.

³ For those licensee's required to have an NRC approved Emergency Plan, it should be noted that the reportability of the natural phenomenon events may be superseded by site specific emergency action levels (e.g. sustained winds in excess of 70 mph onsite) which if met would result in an Emergency Plan classification and subsequent one-hour reportability requirement.

Concurrent Reports

This section applies to the reporting requirement in Paragraph (c) of Appendix A, pertaining to licensee issuance of news releases.

The purpose of the criterion in Paragraph (c) is to ensure the NRC is made aware of issues that will cause heightened public or government concern related either to the radiological health and safety of the public, on-site personnel or protection of the environment. Licensees typically issue press releases or notify local, county, State or Federal agencies on a wide range of topics that are of interest to the general public. The NRC Operations Center does not need to be made aware of every press release made by a licensee. The following clarifications are intended to set a reporting threshold that ensures necessary reporting, while minimizing unnecessary reporting.

Examples of events generating licensee news releases that are likely to be reportable to the NRC include:

- release of radioactively contaminated tools or equipment to public areas
- unusual or abnormal releases of radioactive effluents
- onsite fatality

Licensees generally do not have to report media and government interactions to the NRC unless they are related to the radiological health and safety of the public or onsite personnel, or protection of the environment. For example, the NRC does not generally need to be informed under this criterion of the following, even if these events may require notification to another regulatory agency:

- minor deviations from sewage or chlorine effluent limits
- minor non-radioactive, onsite chemical spills that do not affect the safety of NRC-license material and do not endanger life or health
- minor oil spills
- problems with plant stack or water tower aviation lighting
- peaceful demonstrations
- routine reports of effluent releases to other agencies

Press Release

The NRC has an obligation to inform the public about issues within the NRC's purview that affect or raise a concern about the public health and safety. Thus, the NRC needs accurate, detailed information in a timely manner regarding such situations. The NRC Operations Center should be made aware of any such information that the licensee has available for the press or other government agencies. However, the NRC need not be notified of every press release a licensee issues. The field of NRC interest is narrowed by the phrase "related to the health and safety of the public or onsite personnel, or protection of the environment," in order to exclude administrative matters or those events of no safety significance. Routine radiation releases are not specifically reportable under this criterion. However, if a release receives media attention, the release is reportable under this criterion. If possible, licensees are encouraged to notify the NRC Operations Center before issuing a press release because news media representatives will usually contact the NRC public affairs officer shortly after its issuance for verification, explanation, or interpretation of the facts.

Other Government Notifications

For reporting purposes, the phrase "other government agencies" in Paragraph (c) of Appendix A refers to local, State or other Federal agencies. Notifying another Federal agency does not necessarily relieve the licensee of the requirement to report to the NRC.

The examples in Attachment D of this guide provide additional guidance on the reportability of events under Paragraph (c) of Appendix A.

Regulatory Basis

Appendix A to 10 CFR Part 70

Applicability

This ISG is applicable to 10 CFR Part 70 fuel cycle facilities.

Recommendation

This guidance should be used to supplement Chapter 5, "Nuclear Criticality Safety," of NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility" and Chapter 6, "Nuclear Criticality Safety," of NUREG-1718, "Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility".

References

U.S. Code of Federal Regulations, *Title 10, Energy*, Part 70, "Domestic Licensing of Special Nuclear Material."

U.S. Nuclear Regulatory Commission. NUREG-1520, "Standard Review Plan for the Review of a License Application for a Fuel Cycle Facility." NRC: Washington, D.C. March 2002.

U.S. Nuclear Regulatory Commission. NUREG-1718, "Standard Review Plan for the Review of an Application for a Mixed Oxide (MOX) Fuel Fabrication Facility." NRC: Washington, D.C. August 2000.

NUREG-1022, "Event Reporting Guidelines 10 CFR 50.72 and 50.73," U.S. Nuclear Regulatory Commission, Revision 2, October 2000

Attachment A

Example of a typical notification process at a fuel cycle facility

Safety Concern, Process Upset, IROFS/Management Measure Failure or Degradation¹



Observed by any safety, operations, or maintenance personnel²



Then Notify:
Shift Team Leader or Supervisor³



Then Notify:
Safety Discipline Engineer and Management for reportability determination⁴

¹ Example Situations:

- Intended safety function, availability, or reliability of an IROFS has been affected
- Condition that was not analyzed, improperly analyzed, or different from analysis documented in ISA
- Acute chemical exposure requiring medical attention
- Abnormal situation where uranium has accumulated or been released
- Spill or contamination event
- Suspected intake of uranium
- Any situation resulting in a fire

² The time between this and the next step (notify supervisor) should proceed in a matter of minutes

³ Supervision takes lead to coordinate response and recovery

⁴ The evaluation should proceed on a time scale commensurate with the safety significance of the issue

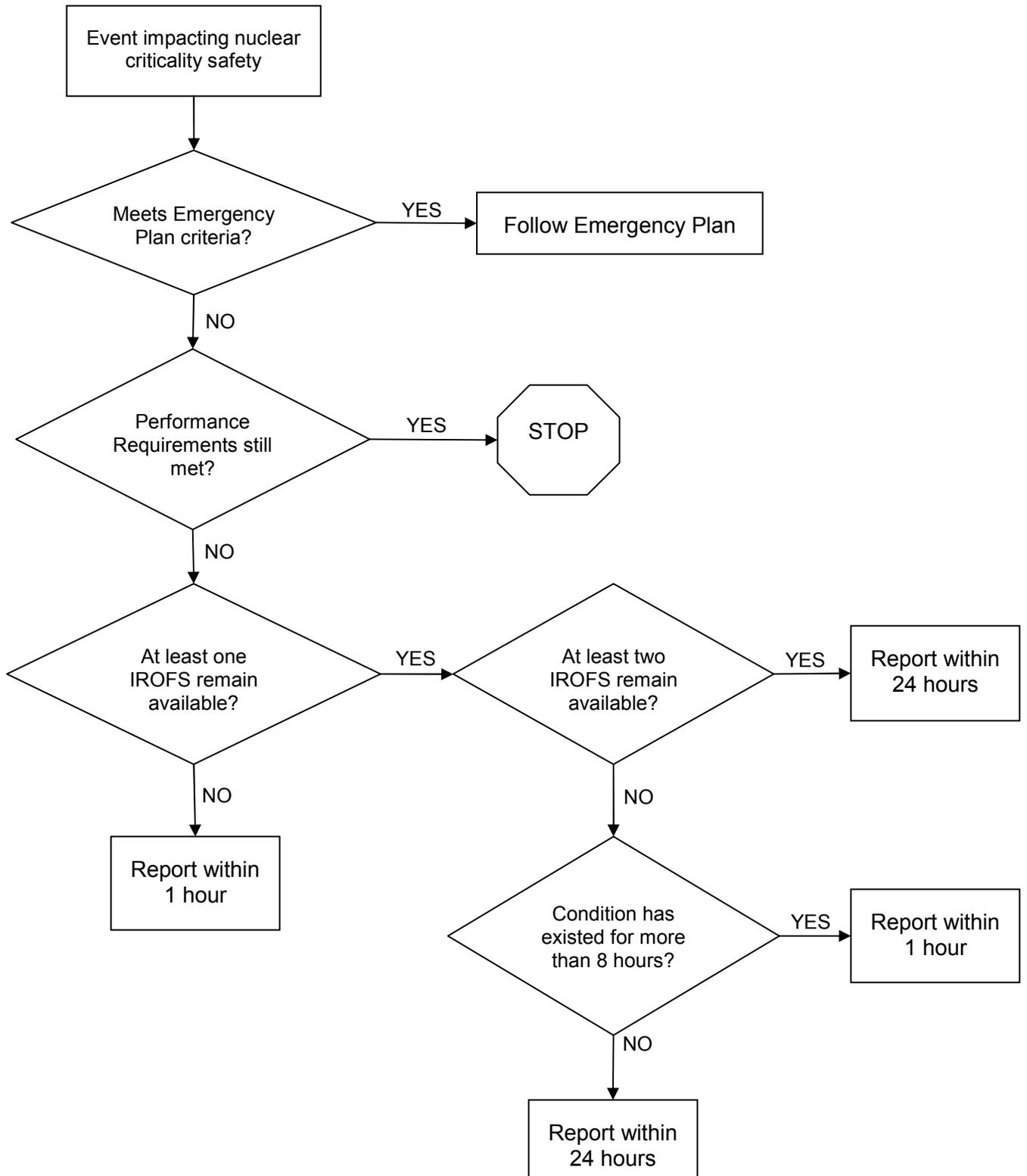
Attachment B

Additional examples of discovery determination

| Issue | Discovery Determination |
|--|---|
| <p>Based on information available, a facility ISA determines that a fire impinging on a propane tank will result in a torch fire but will not explode because the safety valves will adequately relieve pressure. Subsequently a worker questions the validity of this conclusion. The facility safety and licensing staff researches this topic and determines that the safety analysis was deficient based upon evidence that aluminum propane tanks, which are in use at the facility, are more likely to explode in fire scenarios than steel tanks.</p> | <p>Discovery occurred when it was determined that the safety analysis was deficient and resulted in a failure to meet the performance requirements.</p> |
| <p>A plant engineer notifies the safety staff of a newly installed pump that is connected to a fissile solution tank that uses an open process air line and a DP gage for a tank level indicator. The safety and licensing staff initially determined that this condition is bounded by a previously analyzed “reverse flow” accident sequence. However, upon subsequent review of detailed information relating to the pump characteristics, the flow path, the quantity of solution available, the potential U concentrations in the tank, and the location of IROFS that were used to prevent reverse flow in the analyzed reverse flow accident sequence, the plant safety and licensing staff determined that the plant condition was not bounded by the previously analyzed “reverse flow” sequence.</p> | <p>Discovery occurred when the plant staff determined that this reverse flow sequence “reverse flow” sequence was improperly analyzed in the ISA and resulted in a failure to meet the performance requirements.</p> |
| <p>A nitrous oxide gas detector designated as an IROFS to prevent chemical exposures to NOx emissions was calibrated in January using a NOx standard.</p> | <p>Several months later, it was discovered that the gas standard used had a calibration expiration date the previous September. No actual emissions occurred; however, the licensee had to assume that the IROFS was in a degraded condition since the last functional test. Without this IROFS the performance requirements could not be met. The condition was reported to the NRC under Appendix A (b)(2). It was later determined that the nitrous oxide gas detector would have been able to perform its safety function, and the licensee retracted its previous report.</p> |

Attachment C

Example of one way to determine reportability for an event impacting criticality safety



Attachment D

Examples of Concurrent Events reportable under Paragraph (c) of Appendix A

Onsite Fatality Government Notifications and Press Release

- A worker fell from an onsite cooling tower inside the controlled area due to an apparent heart attack and could not be revived. The licensee notified the local emergency agencies, company officials and Occupational Safety & Health Administration. The licensee also notified the NRC resident inspector and plans to issue a press release. An NRC notification was needed because of the fatality on-site, the other government notifications, and potential media involvement.

Licensee Media Inquiries Regarding NRC Findings

- As a result of a local newspaper article regarding the findings of an NRC regional inspection of the facility fire protection program, a licensee representative was interviewed on local television and radio stations. The licensee notified State and local officials. NRC notification was not needed because the subject of the radio and TV interviews was an NRC inspection.

State Notification of Improper Dumping of Radioactive Waste

- The licensee transported two exhaust High-Efficiency Particulate Air filters to the city dump as nonradioactive waste but later determined they contained radioactive material. The dumpsite was closed and the filters retrieved. The licensee notified the appropriate local and State agencies. An NRC notification is needed because of the notification to local and State agencies of the inadvertent release of radioactively contaminated material off site, which affects the radiological health and safety of the public and environment.

Routine Agency Notifications

- A licensee notified the U.S. Environmental Protection Agency (EPA) that a liquid effluent exceeded the release permit limit for biological oxygen demand. This event was caused by an unexpected loss of a circulating water pump at the site sanitary waste treatment facility. NRC notification was not needed because these events are routine and have little safety significance.
- A licensee notified the State, EPA, U.S. Coast Guard and Department of Transportation that 15 gallons of diesel fuel oil had spilled onto gravel-covered ground inside the controlled area. The spill was cleaned up by removing the gravel and dirt. NRC notification was not needed because these events are routine and have little safety significance.

Glossary

The following definitions apply to the guidance in this document and are not intended to replace any or affect Part 70 definitions or regulatory requirements.

IROFS: Controls which are designated as items relied on for safety in the ISA Summary.

Non-IROFS: Controls which are in place that can prevent or mitigate an accident that are not IROFS.

Creditable control: A non-IROFS which differs from an IROFS in name only. Thus, no change to the control, the management measures applied to the control, or the applicable safety analyses (i.e., nuclear criticality safety analyses, fire safety analyses, etc.) are required to designate it as an IROFS in the ISA Summary.

Failed (or lost) IROFS: An IROFS that is not available or cannot perform its intended safety function; an IROFS that did not perform its safety function.

Degraded IROFS: An IROFS that has not failed but may not be sufficiently capable or reliable to perform its intended safety function.