

NRC INSPECTION MANUAL

IRAB

INSPECTION MANUAL CHAPTER 0609, ATTACHMENT 04

INITIAL CHARACTERIZATION OF FINDINGS

0609.04-01 APPLICABILITY/PURPOSE

The framework described in this attachment to the Significance Determination Process (SDP) is designed to provide guidance to NRC inspectors and management for use in the initial characterization of safety or security findings within the seven safety cornerstones of the Reactor Oversight Process (ROP). The initial characterization of findings is designed to perform three functions:

- a. Provide an opportunity to the inspector to document all applicable information regarding the finding, and its associated impact on safety or security, in a consolidated format (Table 1).
- b. Support the identification of safety cornerstone(s) affected by the degraded condition or programmatic weakness resulting from the finding (Table 2).
- c. Direct the inspector to the appropriate SDP appendix of Inspection Manual Chapter (IMC) 0609 for further evaluation (Table 3).

0609.04-024 GUIDANCE

Each finding entering the SDP, regardless of the cornerstone under which it is identified, is by definition a performance deficiency that is “more than minor” as prescribed in IMC 0612. Performance deficiencies that are determined to be “minor” are not findings, and therefore, not subjected to the SDP.

02.01 Finding Consolidated Information Sheet (Table 1)

The objective of Table 1 is to provide the inspector and management the opportunity to document and review all the supporting information pertaining to a finding in a concise format. Below are detailed descriptions of the table sections to facilitate documentation:

- a. Clearly Articulated Finding – Describe the identified performance deficiency and the “more than minor” determination in accordance with applicable IMC 0612 guidance. Each finding is treated independently in the SDP.
- b. Factual Description of Degraded Condition or Programmatic Weakness – State the facts pertaining to the degraded condition or programmatic weakness without any hypothetical situations, failures, or occurrences. For conditions that involve degraded equipment, include the affected system(s), structure(s), component(s) (SSCs), and/or train(s), to include their associated function(s), and how they impacted safety or security. The Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones primarily deal with degraded conditions. For a programmatic weakness, include the affected program(s) and describe how the programmatic weakness impacted safety or security.

Other pertinent information to consider are root/apparent/proximate cause evaluations, extent of condition assessments, interdependencies with other systems, perspectives from the licensee, and the duration of the degraded condition or programmatic weakness (i.e., exposure time).

- c. Logical Link(s) that Connect(s) the Finding to the Degraded Condition or Programmatic Weakness – Clearly articulate the nexus (i.e., logical link(s)) between the inspection finding and the degraded condition or programmatic weakness. The finding should most often be identified as the proximate cause of the degraded condition or programmatic weakness. The determination of cause need not be based on a rigorous root cause evaluation, but rather on a reasonable assessment and judgment of the staff. If the proximate cause of multiple degraded conditions or programmatic weaknesses is the same, there may be just one independent finding provided that the finding is not defined at a level associated with a cross-cutting area as defined in IMC 0310.
- d. Supporting Documentation and References – List the documents used during the inspection process. Examples include, but are not limited to, inspection procedures, plant status, licensee event reports, and condition reports.

NOTE: If Table 1 is used to document information pertaining to a security finding, then the table will have to be properly labeled as Safeguards or Official Use Only - Security Related Information.

02.02 Cornerstones Affected by Degraded Condition or Programmatic Weakness (Table 2)

The objective of Table 2 is to support the identification of safety cornerstone(s) affected by the degraded condition or programmatic weakness resulting from the finding. The affected cornerstone(s) may already have been identified previously (e.g., scope of the inspection procedure, inspector experience and knowledge of the ROP); however, Table 2 helps to support this determination. Below is a detailed-description to facilitate filling out Table 2:

- a. Read through the degraded conditions and programmatic weaknesses listed in all seven cornerstones and check all that are applicable. For the degraded conditions, many of the options are associated with SSCs and events.
- b. Review all the checked boxes and determine which cornerstone(s) are affected by the degraded condition or programmatic weakness.

02.03 SDP Appendix Router (Table 3)

After the affected cornerstone(s) are identified, use the SDP Appendix Router (Table 3) to facilitate determining the appropriate SDP appendix for further evaluation. If more than one cornerstone was affected and results in direction to more than one SDP appendix, the inspector should identify one SDP appendix for use based on reasonable judgment of the specific situation. If more than one cornerstone was affected but results in direction to one SDP appendix, the inspector and management should initially identify one cornerstone based on reasonable judgment of the situation. Typically, one affected cornerstone is identified in Table 2. The inspector should use the SDP Appendix Router (Table 3) to determine the appropriate SDP appendix for further evaluation of the finding. If more than one cornerstone is affected, and Table 3 results in direction to one (or multiple) SDP appendices, the inspector and management need to ultimately identify one cornerstone based on reasonable judgment of the situation. If

the finding progresses to a detailed risk evaluation (e.g., Phase 3 analysis), the inspector, regional Senior Reactor Analyst (SRA), and management should confirm reassess the identified cornerstone based on the proportional contribution from each cornerstone to the total risk estimation.

NOTE: If the SDP Appendix Router directs the user to a particular appendix, and upon further evaluation that SDP appendix is not capable of evaluating the finding and associated degraded condition or programmatic weakness, the inspection staff and regional applicable SRA, with support from management as needed, should determine if IMC 0609, Appendix M is an appropriate tool. A planning Significance and Enforcement Review Panel (SERP) is required before transitioning to Appendix M other than when directed explicitly by procedure. Refer to IMC 0609, Attachment 1 for additional guidance.

0609.04-035 REFERENCES

IMC 0310, “Components-Aspects Within The Cross-Cutting Areas”

IMC 0612, “Power Reactor Inspection ReportsIssue Screening”

IMC 0609, Attachment 1, “Significance and Enforcement Review Panel Process”

IMC 0609, Appendix A, “Significance Determination of Reactor Inspection Findings for At-Power SituationsThe Significance Determination Process for Findings At-Power”

IMC 0609, Appendix B, “Emergency Preparedness SDP”

IMC 0609, Appendix C, “Occupational Radiation Safety SDP”

IMC 0609, Appendix D, “Public Radiation Safety SDP”

IMC 0609, Appendix E, “Security SDP for Power Reactors”

IMC 0609, Appendix F, “Fire Protection and Post Fire Safe Shutdown SDPSignificance Determination Process”

IMC 0609, Appendix G, “Shutdown Operations Safety SDP”

IMC 0609, Appendix H, “Containment Integrity SDP”

IMC 0609, Appendix I, “Licensed Operator Requalification SDP, Human Performance”

IMC 0609, Appendix J, “Steam Generator Tube Integrity SDP”

IMC 0609, Appendix K, “Maintenance Risk Assessment and Risk Management SDP”

IMC 0609, Appendix L, “Significance Determination Process for B.5.b”

IMC 0609, Appendix M, “Significance Determination Process Using Qualitative Criteria”

END

<u>Table 1- FINDING CONSOLIDATED INFORMATION SHEET</u>
<u>Clearly Articulated Finding:</u>
<u>Factual Description of Degraded Condition or Programmatic Weakness:</u>
<u>Logical link(s) that Connect(s) the Finding to the Degraded Condition or Programmatic Weakness:</u>
<u>Supporting Documentation and References:</u>

Table 2 – CORNERSTONES AFFECTED BY DEGRADED CONDITION OR PROGRAMMATIC WEAKNESS (✓) Check the appropriate boxes

<u>INITIATING EVENTS CORNERSTONE</u>	<u>MITIGATING SYSTEMS CORNERSTONE</u>	<u>BARRIERS INTEGRITY CORNERSTONE</u>
<p><input type="checkbox"/> A. Primary System LOCA initiator contributor— (e.g., RCS leakage from pressurizer heater sleeves, RPV piping penetrations, CRDM nozzles, PORVs, SRVs, ISLOCA issues, etc.)</p> <p><input type="checkbox"/> B. Transient initiator contributor (e.g., reactor/turbine trip, loss of offsite power, <u>loss of service water</u>, main steam/feedwater piping degradations, <u>internal fires or flooding</u>, etc.)</p> <p><input type="checkbox"/> C. <u>Support System initiator contributor (loss of service water, loss of instrument air, DC power, etc.)</u></p> <p><input type="checkbox"/> D. Steam Generator Tube Rupture (SGTR)</p> <p><input type="checkbox"/> E. External Event initiators (limited to fire and internal flooding)</p>	<p><input type="checkbox"/> A. Mitigating Systems <u>and PRA Functionality</u></p> <p><input type="checkbox"/> Core Decay Heat Removal Degraded</p> <p><input type="checkbox"/> Short Term Heat Removal Degraded</p> <p><input type="checkbox"/> Primary (e.g., Safety Injection—PWR only; main feedwater, HPCI, and RCIC - BWR only) High Pressure—Both Types Low Pressure—Both Types</p> <p><input type="checkbox"/> Secondary - PWR only (e.g. AFW, main feedwater, ADVs)</p> <p><input type="checkbox"/> Long Term Heat Removal Degraded (e.g., ECCS sump recirculation, suppression pool)</p> <p><input type="checkbox"/> B. External Event Mitigating <u>ingion</u> Systems (Seismic/Fire/ Flood/Severe Weather Protection Degraded)</p> <p><input type="checkbox"/> C. <u>Reactivity Control Systems Degraded (including Reactor Protection System (RPS))</u></p> <p><input type="checkbox"/> Uncontrolled Control Rod Movement</p> <p><input type="checkbox"/> Inadvertent RCS Dilution or Cold Water Injection</p>	<p><input type="checkbox"/> A. <u>Fuel Cladding Integrity</u></p> <p><input type="checkbox"/> <u>Reactivity Management (e.g., exceed licensed power limit, command and control, uncontrolled control rod movement, inadvertent RCS dilution or cold water injection)</u></p> <p><input type="checkbox"/> <u>Mismanagement of foreign material exclusion program (e.g. loose parts)</u></p> <p><input type="checkbox"/> <u>BA.</u> RCS Boundary as a mitigator following plant upset (e.g., pressurized thermal shock)</p> <p>Note: All other RCS boundary issues, such as leaks, will be considered under the Initiating Events Cornerstone.</p> <p><input type="checkbox"/> <u>CB.</u> Reactor Containment <u>/Drywell</u> Barrier Degraded</p> <p><input type="checkbox"/> Actual Breach or Bypass (<u>Such as</u> e.g., leakage past penetration seals, isolation valves that can contribute to ISLOCA, vent and purge system. Failure of <u>systems/components</u> <u>SSCs</u> critical to suppression pool integrity)</p> <p><input type="checkbox"/> Heat Removal, Hydrogen or Pressure Control Systems Degraded</p> <p><input type="checkbox"/> <u>DC.</u> Control Room, Auxiliary, Reactor, or Spent Fuel Building Barrier Degraded</p> <p><input type="checkbox"/> <u>ED.</u> Spent Fuel Pool (SFP)</p> <p><input type="checkbox"/> Maintaining subcritical conditions</p> <p><input type="checkbox"/> Spent Fuel Pool Water Inventory and/or Temperature (i.e., cooling) Fuel Handling</p>

	<ul style="list-style-type: none"><input type="checkbox"/> Reactivity Management (e.g. exceed licensed power limit, command and control)<input type="checkbox"/> <u>D. Fire Brigade</u><input type="checkbox"/> <u>E. Flexible Coping Strategies (FLEX)¹</u>	
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- ~~Reactivity Management (e.g. exceed licensed power limit, command and control)~~
- D. Fire Brigade
- E. Flexible Coping Strategies (FLEX)¹

¹ FLEX strategies are associated with Orders EA-12-051, EA-12-049, or EA-13-109. After implementation of SRM-SECY-16-0142, Orders EA-12-051 and EA-12-049 will be codified in 10 CFR 50.155.

<u>EMERGENCY PREPAREDNESS CORNERSTONE</u>	<u>OCCUPATIONAL RADIATION SAFETY CORNERSTONE</u>	<u>PUBLIC RADIATION SAFETY CORNERSTONE</u>
<input type="checkbox"/> Failure to Comply with a Planning Standard or Risk-Significant Planning Standard <input type="checkbox"/> Actual Event Implementation Problem	<input type="checkbox"/> ALARA Planning or Work Controls <input type="checkbox"/> Exposure or Over-exposure problem <input type="checkbox"/> Ability to Assess Dose Compromised	<input type="checkbox"/> Radioactive Effluent Release Program <input type="checkbox"/> Radioactive Environmental Monitoring Program <input type="checkbox"/> Radioactive Material Control Program <input type="checkbox"/> Transportation or Part 61
<u>SECURITY CORNERSTONE</u>		
<input type="checkbox"/> Findings identified under the IMC-2201, Security and Safeguards Inspection Program		

Table 3 – SDP APPENDIX ROUTER

If the finding and associated degraded condition or programmatic weakness is in the licensee's:

1. Emergency Preparedness cornerstone, STOP. Go to IMC 0609, Appendix B.
2. Occupational Radiation Safety cornerstone, STOP. Go to IMC 0609, Appendix C.
3. Public Radiation Safety cornerstone, STOP. Go to IMC 0609, Appendix D.
4. Security cornerstone, STOP. Go to IMC 0609, Appendix E.
5. Initiating Events, Mitigating Systems, or Barrier Integrity cornerstones, CONTINUE below.

Read sections A thru E and answer the YES or NO questions. If NO is answered to all the questions in sections A thru E, the user is directed to Appendix A.

A. Shutdown, Refueling, and Forced Outages:

1. Does the finding pertain to operations, an event, or degraded condition while the reactor vessel is defueled, relate to fuel handling issues, or involve spent fuel pool issues?
 - a. If YES → STOP. Go to IMC 0609, Appendix A.
 - b. If NO, Continue.
2. Does the finding pertain to operations, an event, or a degraded condition while the plant was shutdown?

NOTE: Appendix G is applicable during refueling, forced, and maintenance outages starting when the licensee has met the entry conditions for RHR and RHR cooling has been initiated the system used to remove residual heat and ends when RHR this system has been secured during plant heat-up.

- a. If YES → STOP. Go to IMC 0609, Appendix G.
- b. If NO → Continue.

B. Licensed Operator Requalification:

Does the finding involve the operator licensing requalification program or simulator fidelity?

- a. If YES → STOP. Go to IMC 0609, Appendix I.
- b. If NO → Continue.

C. Maintenance Rule Risk Assessments:

Does the finding involve the licensee's assessment and management of risk associated with performing maintenance activities under all plant (operating or shutdown) conditions in accordance 10 CFR 50.65(a)(4) and the Baseline Inspection Procedure (IP) 71111.13, "Maintenance Risk Assessment and Emergent Work Control"?

- a. If YES → STOP. Go to IMC 0609, Appendix K.
- b. If NO, Continue.

D. 10 CFR 50.54(hh)(2) Mitigating Strategies:

Is the finding associated with the mitigating strategies to maintain or restore core cooling, containment, and spent fuel pool cooling?

- a. If YES → STOP. Go to IMC 0609, Appendix L.
- b. If NO, Continue.

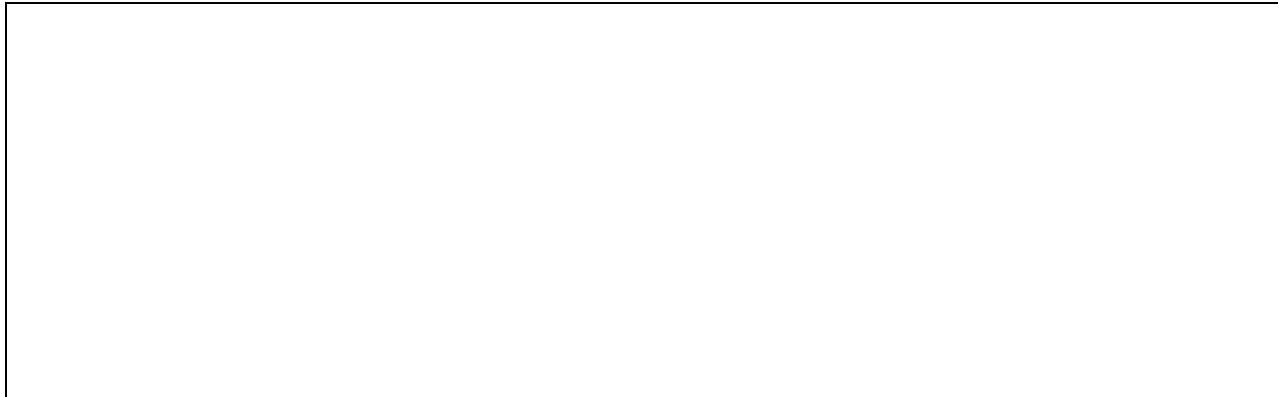
E. Mitigating Strategies and Spent Fuel Pool Instrumentation (Orders EA-12-049 and EA-12-051):

~~Is the finding associated with equipment (i.e., FLEX), procedures and/or training used to maintain or restore core cooling, containment cooling or spent fuel pool cooling required by Order EA 12-049 or spent fuel pool level instrumentation required by Order EA 12-051?~~

- ~~a. If YES → STOP. Go to IMC 0609, Appendix O.~~
- ~~b. If NO, Continue~~

EE. Fire Protection:

1. Does the finding involve discrepancies with the fire brigade?
 - a. If YES → STOP. Go to IMC 0609, Appendix A.
 - b. If NO, Continue.
2. Does the finding involve: (1) A failure to adequately implement fire prevention and administrative controls for transient combustible materials, transient ignition sources, or hot work activities? (2) Fixed fire protection systems or the ability to confine a fire? (3) Or affect the ability to reach and maintain safe shutdown conditions in case of a fire?
 - a. If YES → STOP. Go to IMC 0609, Appendix F.
 - b. If NO → STOP. Go to IMC 0609, Appendix A.



Attachment 1 – Revision History for IMC 0609.04

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Resolution Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML063060347 01/10/08 CN 08-002	Revision History reviewed for last four years. IMC0609 Attachment 4 has been created to remove Phase 1 - Characterization and Initial Screening of Findings of the significance determination process (SDP) from IMC0609 Appendix A - At Power.	NO	ML073460588
N/A	ML101400531 06/19/12 CN 12-010	Removed the Phase 1 screening criteria pertaining to the Initiating Events, Mitigating Systems, and Barrier Integrity cornerstones and placed the screening criteria in IMC 0609, Appendix A. Revised Table 1 so it is applicable to all cornerstones. Updated Table 2 to add some more items to the Reactor Safety Performance area. Revised Table 3 to clarify which SDP appendices are applicable given the cornerstones of interest and details of the finding. Incorporated feedback from ROPFF 0609.04-1458, 0609.04-1372, and 0609.04-1678. This is a complete reissue no red line.	Senior Reactor Analysts and headquarters staff provided detailed instructor-led training to resident inspectors, region based inspectors, and other regional staff. June 2012	ML110240265 Closed FBF: 0609.04-1372 ML12171A239 0609.04-1678 ML12171A241
N/A	ML16056A317 10/07/16 CN 16-026	Table 3, SDP Appendix Router was revised to accommodate SDP IMC 0609, Appendix O, "Significance Determination Process for Mitigating Strategies and Spent Fuel Pool Instrumentation" (Orders EA-12-049 and EA-12-051).	No training is required.	ML16060A285

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Resolution Form Accession Number (Pre-Decisional, Non-Public Information)
	<u>MLXXXXXXXXX</u> <u>7/XX/19</u>	<u>Made draft publicly available to discuss at the July 31, 2019 ROP monthly public meeting.</u>	<u>N/A</u>	<u>N/A</u>
N/A	ML19011A326 <u>Date TBD</u> CN	<u>Revised document to reflect retirement of IMC 0609 Appendix O, "Significance Determination Process for Mitigating Strategies and Spent Fuel Pool Instrumentation" and to align with changes to IMC 0609 Appendix A (ROPFF 0609.04-2295). Table 2 was modified to include support system initiators (ROPFF 0609.04-2289) and move reactivity management issues to the barrier integrity cornerstone (ROPFFs 0609.04-2133 and 0609.04-2201). Table 3 was modified to direct users to IMC 0609 Appendix A for spent fuel pool issues during shutdown (ROPFF 0609.04-2084). Document was reviewed and minor changes were made to allow for use with new reactor designs (AP1000).</u>	No training is required.	ML19014A064 Closed FBFs: 0609.04-2084 ML19014A099 0609.04-2295 ML19014A103 0609.04-2133 ML19014A100 0609.04-2201 ML19014A101 0609.04-2289 ML19064A974