INSPECTION MANUAL CHAPTER 0609 APPENDIX F ATTACHMENT 2

DEGRADATION RATING GUIDANCE

Effective Date: May 18, 2026

0609F.2-01 PURPOSE

This attachment provides guidance on the assignment of a low or high degradation rating to various performance deficiencies (PDs). Degradation rating guidance is provided for most of the PD categories defined in Step 1.3 of the Fire Protection Significance Determination Process (SDP), IMC 0609 Appendix F. This attachment does not provide a complete list of all potential types of degradation. The inspector should use the criteria provided along with their professional judgement when assigning a degradation rating. PDs assigned a low degradation rating will be screened as Minor. Depending on the type or location of degradation, a PD that could be categorized as low degradation per the guidance below, may be more problematic than anticipated by the guidance and may be considered a high degradation item at the discretion of the inspector.

0609F.2-02 DEGRADATION RATING GUIDANCE BY PD CATEGORY

02.01 Fire Prevention and Administrative Controls Program Category

This section provides guidance on assignment of a degradation rating to PDs against the plant fire prevention program and other administrative controls (e.g., hot work permitting, transient combustible control programs, fire watches, etc.).

02.01.01 PDs Against Hot Work Permitting or Fire Watch Provisions

Low degradations are warranted for inspection PDs that will not have any significant effect on the likelihood that a fire might occur, or that a fire which does occur might not be promptly suppressed. Examples of low degradations are as follows:

- Fire watch is not familiar with the facility or the location of the hot work, but understands the hazards of the work and procedures for sounding an alarm.
- The individual performing fire watch duties had improper training, such as records showing a lack of required basic courses, refresher courses, or practice drills, but was capable of performing an adequate fire watch.
- Cases where a portable extinguisher of the proper type is nearby (within 30 ft. of unobstructed distance) even though the fire watch is inadequately equipped with fire extinguishers or other required equipment. This includes cases where the proper portable extinguisher is nearby even though the relevant staff:
    - Does not have a portable fire extinguisher on the watch when one is required by the hot work permit.
    - Has only a discharged or inadequately charged extinguisher.
    - Has only the wrong type of extinguisher for the fire hazards involved or conditions at the site (e.g., dry chemical in an area of high wind currents).
- Violations of the hot work permitting program, but all normally required fire prevention measures (e.g., a properly equipped and trained fire watch) are in place.
- Violations associated with hot work record keeping.

High degradation implies that early suppression (by the fire watch) is not available. Examples of high degradations are as follows:

- Failures to implement a continuous fire watch in positions to observe all areas of vulnerability to a fire from the hot work operation.
- Failure to implement a fire watch at the site.
- Fire watch that is inadequately equipped with fire extinguishers or other required equipment. Inadequately equipped includes:

    - Not having a portable fire extinguisher on the watch when one is required by the hot work permit.
    - Having a discharged or inadequately charged extinguisher.
    - Having the wrong type of extinguisher for the fire hazards involved or conditions at the site (e.g., dry chemical in an area of high wind currents).

- Fire watch failing to maintain any one of the following safe conditions[1] during hot work operations:

    - Combustibles shall be removed from a radius of at least 35 ft (11 m) in all directions from the hot work area (including above and below). If removal is impractical, combustibles shall be shielded by a barrier constructed of noncombustible materials or otherwise protected by a listed welding curtain, welding blanket, welding pad, or equivalent.
    - Hot work equipment to be used shall be in satisfactory operating condition and in good repair.
    - Where combustible materials, such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 ft.
    - Combustible floors wet down, covered with damp sand or fire-resistant sheets for a 35 ft. radius. Where floors have been wet down, personnel operating arc welding equipment or cutting equipment shall be protected from possible electric shock.

- Fire watch failing to maintain fire watch for at least ½ hour after completion of hot work at all required observation points.

Note that fire watches compensating for temporary loss of detection/suppression and/or barriers primarily impact early fire detection/suppression time for ignition sources other than hot work and are treated in their respective places in this document.

02.01.02 PDs Against the Combustible Controls Program:

Another PD which can potentially affect fire ignition frequency is violation of transient combustible control limits, specifically those combustibles which could result in the ignition of a fire from existing sources of heat or electrical energy. Transient combustibles of significance from a fire frequency standpoint are considered to be low flashpoint liquids (below 200°F) and self-igniting combustibles (oily rags). In addition to combustibles, evidence of tobacco smoking or the existence of unauthorized heaters or heat sources can also be considered as adversely affecting compartment fire frequency.

Degradation ratings for PDs against the combustible controls program are either low or high. PDs that are not expected to increase compartment fire frequency are assigned a low degradation rating. PDs that could reasonably be expected to increase compartment fire ignition

[1] Safe conditions were obtained from list of conditions in subsection 3-3.2 in NFPA 51B, “Standard for Fire Prevention during Welding, Cutting, and Other Hot Work,” 2024.

frequency are assigned a high degradation rating. Examples of low and high degradations are as follows:

- Low degradation:
  - Generic transient combustibles (combustibles not in a transient combustible control location (TCCL)) that would not impact equipment important to safety and do not exceed fire hazards analysis limits.
  - Low flashpoint combustible liquids in quantities above those allowed by plant procedures but in approved containers.
- High degradation:
  - Generic transient combustibles found in an area that could impact equipment important to SSD or that exceeds fire hazards analysis limits.
  - A measurable quantity of a low flashpoint (<200°F) combustible liquid beyond the quantity allowed by the plant's combustible loading controls, unattended, and not in an approved container.
  - Unattended storage of self-heating materials such as oily rags not in an approved container.
  - Evidence of recent smoking in a non-smoking area.
  - An unapproved heater or heat source in the area.
  - Transient combustibles found in excess of analyzed amounts in a TCCL (e.g., combustible free zones).

02.02 Fixed Fire Protection Systems Category

02.02.01 Fire Detection:

PDs that are not expected to prevent a fire from being detected in a timely manner are assigned a low degradation rating. PDs that could reasonably be expected to prevent a fire from being detected in a timely manner are assigned a high degradation rating. Examples of low and high degradations are as follows:

- Low degradation:
  - Less than 10 percent of smoke or heat detectors are degraded (nonfunctional, misplaced or missing), and functional detection is available near combustibles of concern. This does not apply for areas with the potential for unconfined combustible or flammable liquid fire).
  - Less than 25 percent detectors (heat or smoke) degraded (nonfunctional, misplaced or missing) in continuously occupied areas.
- High degradation:
  - System will fail to function.
  - Power off.
  - Detectors incompatible with system.
  - Annunciators disabled, inaudible, or nonfunctional.
  - Greater than 10 percent of smoke or heat detectors are degraded, and functional detection is available near combustibles of concern.

- Greater than 25 percent detectors degraded in continuously occupied areas.

02.02.02 Water Based Suppression:

PDs that are not expected to prevent a fire from being extinguished in a timely manner are assigned a low degradation rating. PDs that could reasonably be expected to prevent a fire from being extinguished in a timely manner are assigned a high degradation rating. Examples of low and high degradations are as follows:

- Low degradation:
  - Less than 10 percent of heads are obstructed or nonfunctional, and
  - There is a functional head within 10 ft. of combustibles of concern (or the maximum spacing allowed between sprinklers by NFPA 13), and
  - System is nominally code compliant.
- High degradation:
  - Nonfunctional system, or
  - 10 percent or more of heads obstructed or nonfunctional, or
  - Nearest head greater than 10 ft. from combustibles of concern (or the maximum spacing allowed between sprinklers by NFPA 13).

02.02.03 Gaseous Based Suppression:

PDs that are not expected to prevent a fire from being extinguished in a timely manner are assigned a low degradation rating. PDs that could reasonably be expected to prevent a fire from being extinguished in a timely manner are assigned a high degradation rating. Depending on the type of degradation, a PD that could be categorized as low degradation, may be more problematic and should be considered a high degradation item. For example, a system with a hole that goes to the control room may be effective at extinguishing a fire but the system may cause control room evacuation or the donning of self-contained breathing apparatus (SCBAs) by the control room operators and therefore should be considered high degradation. Examples of low and high degradations are as follows:

- Low degradation:
  - Hole in wall or floor with an area less than a single five-inch diameter penetration seal (Not to control room or remote shutdown area).
  - Hole in ceiling up to 100 square inches (Not to control room or remote shutdown area).
  - Time delay in system operation that exceeds design by 60 seconds or less.
  - Discharge time exceeds allowable by less than 25 percent.
  - Lack of test data.
  - Test data shows concentration for 15 minutes (where 20 minutes are required for licensing basis).
  - Achievable concentration is Halon 6 percent (where 7 percent is committed), or CO_2 50 percent (where 60 percent is committed).

- High degradation:
    - Power off.
    - Inadequate agent to achieve required concentration for deep seated fires: Halon less than 5 percent; CO_2 less than 40 percent.
    - Design concentration achieved but cannot be maintained for sufficient time to ensure fire extinguishment.
    - Fully blocked discharge head where gas cannot be released. (e.g., something tied around the head, or a head that is encased in something.)
    - Hole in wall, floor, or ceiling greater than specified in the low degradation section.

02.03 Fire Confinement and Localized Cable or Component Protection Categories

The approach to assigning a degradation rating to fire confinement and localized cable or component protection categories (see Step 1.3) is similar. The analysis approach for quantifying these two PD categories is also similar. These two categories cover degradation to any passive fire barrier feature. The guidance for assigning low or high degradation levels depends on the type of fire barrier being considered. Examples are provided below to illustrate how an observed degradation is correlated to a degradation rating for each of several fire barrier types. The analyst should select the fire barrier type that most closely matches the barrier being considered and continue the evaluation. The examples are intended to provide a distinction between when a deficiency is expected to impact the ability of the barrier to perform its function (high degradation) and when it is not (low degradation). PDs that are not expected to prevent a fire barrier from performing its function are assigned a low degradation rating. PDs that could reasonably be expected to prevent a fire barrier from performing its function are assigned a high degradation rating.

02.03.01 Low Density/High Density Elastomers (e.g., Silicone Foam):

- Low Degradation
    - Less than 10 percent of required seal depth missing.
    - Barriers/components capable of performing their function but not in preventative maintenance program.
    - Poor quality foam cell structure over <25 percent of the surface area.
    - Cracks in seal material 1/8 inch or less that extend less than 50 percent of the seal depth.

- High Degradation
    - More than 10 percent of required seal depth is missing.
    - Poor quality foam cell structure of approximately > 25 percent of the surface area.
    - No tested or evaluated seal configuration and less than 11 inches of foam.
    - Cracks in seal material greater than 1/8-inch.
    - Cracks in seal material that extend 50 percent of seal depth or more.

02.03.02 Sacrificial and Non-sacrificial Boards or Blankets (e.g., Mineral Wool or Ceramic Fiber):

- Low Degradation:
  - < 10 percent depth of barrier material removed or never installed.
  - Through-crack of equivalent diameter of ½ inch or less.
  - Compression of material.
- High Degradation:
  - 10 percent or more design depth of barrier material removed or never installed over 6 square inch area.
  - Through-crack of equivalent diameter greater than ½ inch.
  - Large metallic cross-section support or large cross-section cables entering wrap with less than 6 inches of wrap.
  - Barrier configuration not tested or evaluated.

02.03.03 Unique/Boot Seals:

- Low Degradation:
  - Severe tears, loose bands, open bands.
  - Missing boot both sides.
- High Degradation
  - Support missing.
  - Less than 3 inches of seal.
  - No ceramic fiber.

02.03.04 Concrete and Cement-based Grout or Penetration Seal Materials:

- Low Degradation:
  - Through-cracks smaller than 1/8 inch in barrier that are not more than 50 percent of the required barrier thickness.
  - 1/16 inch through barrier gaps or cracks.
- High Degradation:
  - Greater than 30 percent of required concrete depth missing.
  - Large surface area deformations (over 50 percent of surface) which would cause higher heat absorptions.
  - Cracks determined to interfere with structural integrity.
  - Thickness < 4.5 inches.

02.03.05 Fire Doors:

- Low Degradation:
  - Door gap not exceeding 25 percent of manufacturer's recommended specifications or up to 3/8 inch gap.
  - Multiple holes in door on one side of a door surface with less than 1/8 inch opening.
- High Degradation:
  - Multiple holes in door surface with greater than 1/8 inch opening.
  - Door propped open or broken latch.
  - Fire Door closure mechanism fails to secure the door shut.
  - Fire door hardware issue that could cause failure of door to perform its function (e.g., incompatible or incorrect materials).

02.03.06 Dampers:

- Low Degradation:
  - Damper capable of performing its function but not in preventive maintenance program.
  - Damper is degraded but can continue to perform its function (e.g., close completely).
- High Degradation:
  - Temperature rating of fusible link excessively high or fusible link improperly installed.
  - Temperature rating of Electro-Thermal Link (ETL) is excessively high or ETL is improperly installed.
  - Damper will not close completely.
  - No damper at fire barrier in steel duct work.
  - Damper is not rated to close against anticipated ventilation.
  - Broken latch (where latch required for closure).
  - No damper installed.
  - Damper failed functional testing or required test data not available.

02.03.07 Unsealed Conduits:

- Low Degradation:
  - Conduits smaller than 1 inch with 3 feet on each side of barrier.
- High Degradation:
  - Conduits > 1 inch regardless of length on each side of barrier.

02.03.08 Water Curtains:

- Low Degradation:
  - Less than 10 percent of heads obstructed or fouled, and no adjacent heads fouled.

- High Degradation:
    - Greater than 10 percent of heads obstructed or fouled or two adjacent heads fouled or obstructed.
    - System nonfunctional.

02.03.09 Radiant Energy Shields:

Note: If the radiant energy shield is a 'Rated' barrier (Darmatt, Interram), use the appropriate barrier type from above.

- Low Degradation:
    - Barrier completely obstructs line of sight between the target of interest and potential fire sources that could affect redundant targets, and it is noncombustible.
- High Degradation:
    - Barrier provides no more than partial line of sight obstruction between target of interest and potential fire sources that could affect redundant targets, or
    - It is combustible.

02.04 Post-Fire Safe Shutdown Category

Post-fire safe shutdown (SSD) PDs are related to degradations in operational aspects of post-fire SSD such as manual actions, analysis of associated circuits, analysis of required circuits, spurious operation, alternate shutdown, fire response procedures, the post-fire SSD analysis, etc.

The post-fire SSD PD category is not intended to cover PDs against physical protection of the designated safe shutdown path such as passive fire barriers, fire detection, and fire suppression. PDs against physical protection features are covered under other PD categories.

Degradation ratings for PDs against the licensee's post-fire SSD program are either low or high. PDs that are not expected to significantly impact the ability to achieve any post-fire SSD strategy are assigned a low degradation rating. PDs that could adversely impact the ability to achieve SSD are assigned a high degradation rating. Examples of low and high degradations are as follows:

- Low Degradation:
    - Minor procedural deficiencies that are compensated by operator experience or familiarity.
    - Equipment deficiencies that would not impact functionality of the associated SSD equipment.
- High Degradation:
    - Procedural inconsistencies between Emergency Operating Procedures (EOPs) and Fire SSD procedures.
    - Equipment or tools not staged or located as specified by procedures.
    - Operator training on fire SSD procedures incomplete or inadequate.

- Feasibility to perform specified manual actions with available staff is not apparent.
- Post-fire SSD analysis is incomplete.
- Locations for actions required in SSD procedures are in environmentally challenging areas (e.g., low or high temperatures, high humidity).
- Plant conditions cannot be assessed or readily inferred from information available to the operators or as addressed in Fire SSD or EOP procedures.
- Plant design or component design severely impacts operator performance of SSD operations.
- Lack of alternate shutdown procedure.

END

Attachment 1: Revision History for IMC 0609, Appendix F, Attachment 2

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public)
	ML010750258 02/27/2001 CN 01-005	IMC 0609, App F, Att 2 "Additional Guidance for the Assessment of Findings Using Significance Determination Process Entry," is issued to provide guidance to assess the level of degradation associated with defense in depth (DID) fire protection features, (e.g. fire brigade automatic and manual fire protection systems, fire barriers). The revision also provides some fire protection equipment installation guidance based on code requirements. These should always be verified against the code of record.		
	ML041700310 05/28/2004 CN 04-016	IMC 0609, App F, Att 2 "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," is added to provide guidance on assignment of a degradation rating to findings against the plant fire protection program and other administrative controls such as hot work permitting, transient combustible control program, fire watches, etc.		
	ML050700212 02/28/2005 CN 05-007	IMC 0609, App F, Att 2 "Degradation Rating Guidance Specific to Various Fire Protection Program Elements," no changes - added for completeness.		
	ML17089A419 DRAFT CN 17-XXX	Revised to remove moderate degradation rating guidance, as it is no longer used in the Phase 1 or Phase 2 process (findings are either assigned a low or high degradation rating). Revised to re-order the categories based on changes to Phase 1. Renamed "Degradation Rating Guidance." CA Note sent 7/18/17 for information only, ML17191A681. Issued 10/11/17 as a draft publically available document to allow for public comments.	November 2017	ML17093A180

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public)
	ML18087A404 05/02/18 CN 18-010	Re-issued with new accession number in order to issue as an official revision after receipt of public comments.	Gap training covering changes to the procedure completed November 2017	ML17093A180
	ML24145A029 09/05/24 CN 24-024	This revision includes updating IMC 0609 Appendix F, its associated attachments and basis document to incorporate updated guidance for modeling transient fires per NUREG-2233, high energy arching faults per NUREG-2262, and electrical enclosure, electric motor, dry transformer and main control room fires per NUREG-2178 Volume 2.		ML24155A257
	ML26009A140 04/30/26 CN 26-014	Revised to reflect that low degradation rating issues will be considered Minor and to incorporate additional low degradation rating examples from IMC 0612 Appendix E, “Examples of Minor Issues. These revisions were recommended as a result of the ADVANCE Act 507 Report to Congress that discussed the revision of the ROP Baseline Inspection Program.		ML25274A088 ML25301A230