

WAC 296-67-347 Damage mechanism review. (1) The employer must complete a damage mechanism review (DMR) for each existing and new process for which a damage mechanism exists. Where no DMR is performed, the employer must document the rationale for determining that no damage mechanisms exist. The employer must determine and document the priority order for performing DMRs based on the process operating and maintenance history, the PHA schedule, and inspection records.

(2) The employer must complete no less than 50 percent of initial DMRs within three years and all remaining DMRs within five years of the effective date of Part B of this chapter. If the employer has performed and documented a DMR for a process up to five years prior to the effective date of Part B of this chapter, and that DMR includes the elements identified in subsection (8) of this section, that DMR may be used to satisfy the employer's obligation to complete an initial DMR under this section.

(3) A DMR must be revalidated at least once every five years.

(4) A DMR must be reviewed as part of a major change on a process for which a damage mechanism already exists, prior to approval of the change. If a major change may introduce a damage mechanism, a DMR must be performed prior to approval of the change.

(5) Where a damage mechanism is identified as a contributing factor in an incident investigation, the employer must review the most recent DMRs that are relevant to the investigation. If a DMR has not been performed on the processes that are relevant to the investigation, the incident investigation team must recommend that a DMR be performed and completed within a specified time frame.

(6) The DMR for a process must be available to the team performing a PHA for that process.

(7) The DMR must be performed by a team with expertise in engineering, equipment and pipe inspection, damage and failure mechanisms, and the operation of the process or processes under review. The team must include one member knowledgeable in the specific DMR methodology being used.

(8) The DMR for each process must include:

(a) Assessment of process flow diagrams;

(b) Identification of all potential damage mechanisms;

(c) Determination that the materials of construction are appropriate for their application and are resistant to potential damage mechanisms;

(d) Methods to prevent or mitigate damage; and

(e) Review of operating parameters to identify operating conditions that could accelerate or otherwise worsen damage, or that could minimize or eliminate damage.

(9) For purposes of this section, damage mechanisms include, but are not limited to:

(a) Mechanical loading failures, such as ductile fracture, brittle fracture, mechanical fatigue, and buckling;

(b) Erosion, such as abrasive wear, adhesive wear, and fretting;

(c) Corrosion, such as uniform corrosion, microbiologically induced corrosion, localized corrosion, and pitting;

(d) Thermal-related failures, such as creep, metallurgical transformation, and thermal fatigue;

(e) Cracking, such as stress-corrosion cracking; and

(f) Embrittlement, such as high-temperature hydrogen attack.

(10) DMRs must include an assessment of previous experience with the process, including the inspection history and all damage mechanism

data, a review of industry-wide experience with the process, and all applicable standards, codes and practices.

(11) At the conclusion of the analysis, the team must prepare a written DMR report, which must include the following:

- (a) The process and damage mechanisms analyzed;
- (b) Results of all analyses performed;
- (c) Recommendations for temporarily mitigating damage; and
- (d) Recommendations for preventing damage.

(12) The report must be provided to and, upon request, reviewed with affected employees, including affected employees of a contractor, whose work assignments are within the scope of the process evaluated in the DMR.

(13) The employer must implement all recommendations pursuant to WAC 296-67-383 Corrective action program.

(14) DMR reports must be retained for the life of the process.

[Statutory Authority: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060, and chapter 49.17 RCW. WSR 24-02-037, § 296-67-347, filed 12/27/23, effective 12/27/24.]