



# Mechanical Integrity Essentials

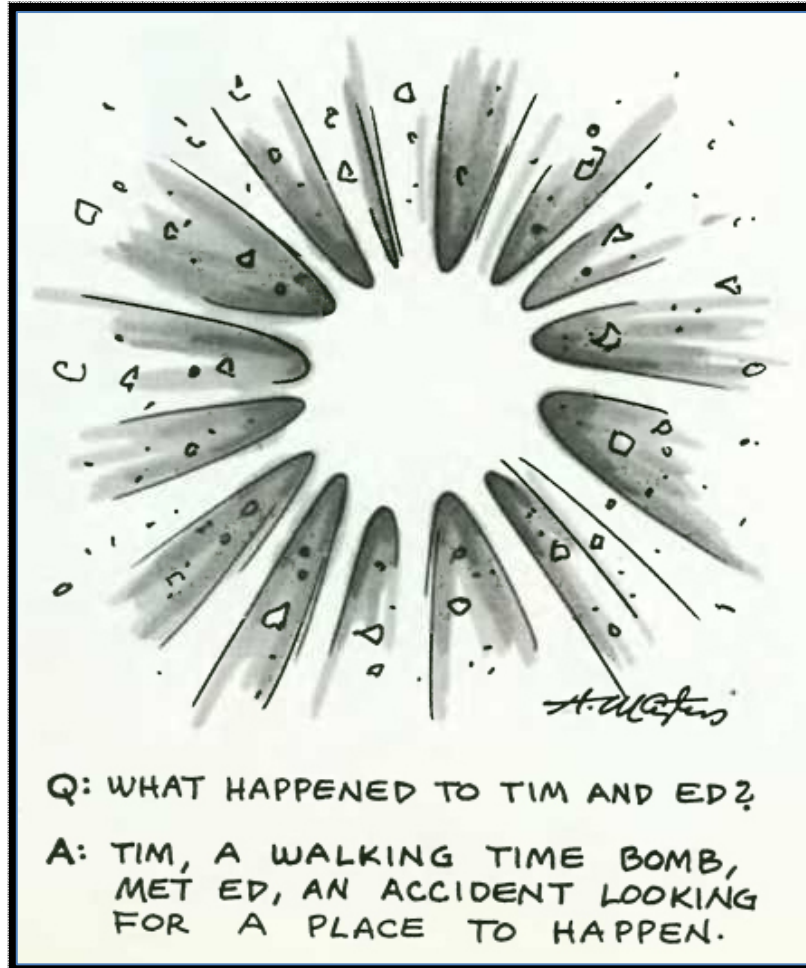
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SAFEGUARDING LIFE AND PROPERTY



# Safety Moment





# Regulations

- Federal Risk Management Programs (RMP) for Chemical Accident Prevention Program, 40 CFR 68.73.
- California Accidental Release Prevention Program (CalARP), 19 CCR 2760.5.
- California Process Safety Management (PSM) of Acutely Hazardous Materials, 8 CCR 5189(j).



# Definition

“Mechanical Integrity means the process of ensuring that process equipment is fabricated from the proper materials of construction and is properly installed, maintained, and replaced to prevent failures and accidental releases.”

19 CCR 2735.3



# Basic Concept

You design, build and install a process in accordance with your:

- Process Safety Information (PSI),
- Operating Procedures (SOP's), and,
- Process Hazard Analysis (PHA).

Your Mechanical Integrity program ensures it continues to perform in the way you initially intended it to.



# Application

- Pressure vessels and storage tanks;
- Piping systems (including piping components such as valves);
- Relief and vent systems and devices;
- Emergency shutdown systems;
- Controls (including monitoring devices and sensors, alarms, and interlocks); and,
- Pumps.

19 CCR 2760.5 (a)



# Program Components

- Written procedures.
- Training for maintenance activities.
- Inspection and testing.
- Equipment deficiencies.
- Quality assurance.

19 CCR 2760.5 (b)-(f)



# Written Procedures

- (A) The employer shall establish and implement written procedures to maintain the ongoing integrity of process equipment and appurtenances. These procedures shall include a method:
  - 1) for allowing employees to identify and report potentially faulty or unsafe equipment; and
  - 2) to record their observations and suggestions in writing.
- (B) The employer shall respond regarding the disposition of the employee's concerns contained in the report(s) in a timely manner.
- (C) The employer shall provide employees and their representatives access to the information required in this subsection.

8 CCR 5189 (j)(1)





# Inspection and Testing

- (A) Inspections and tests shall be performed on process equipment.
- (B) Inspection and testing procedures shall follow recognized and generally accepted good engineering practices.
- (C) The frequency of inspections and tests shall be consistent with applicable manufacturer's recommendations and good engineering practices and more frequently if determined necessary as dictated by operating history.
- (D) The employer shall have a certification record that each inspection and test has been performed in accordance with this subsection. The certification shall identify the date of the inspection; the name of the person who performed the inspection and test; and the serial number or other identifier of the equipment (also: a description of the test and the results).

8 CCR 5189 (j)(2)



# Equipment Deficiencies

The employer shall correct deficiencies in equipment which are outside acceptable limits defined by the process safety information before further use, or in a safe and timely manner provided means are taken to assure safe operation.

8 CCR 5189 (j)(3)



# Quality Assurance

- (A) The employer shall assure that in the construction of new plants and equipment modified, repaired, or fabricated equipment is suitable for the process application for which they will be used.
- (B) Appropriate checks and inspections shall be performed as necessary to assure that equipment is installed properly and is consistent with design specifications and manufacturer's instructions.
- (C) The employer shall assure that maintenance materials, spare parts and equipment, meet design specifications and applicable codes.

8 CCR 5189 (j)(4)



# Summary

MI ensures what you said your process was during design, fabrication, and installation still is!

- MI is more than a “maintenance program”.
- MI requires documented inspection and testing.
- MI does not tolerate indiscriminate “run to failure”.
- MI ties to PSI, PHA, SOP, PSSR, and MOC requirements.