

Draft: Element 8: Mechanical Integrity

1. **Intent of the SEMS Element:** Components are in place to ensure that critical equipment for a facility is designed, installed, tested, inspected and maintained in a way to ensure that it remains reliable and fit for service.
2. **Audit Objectives:** Verify that components have been established, implemented, maintained and are suitable, adequate and effective in meeting element requirements.

Key Principles:

- Components are established.
- Components are implemented and maintained.
- Components are suitable, adequate and effective.

3. **Key Questions:**

- a. What components have been implemented to ensure the identification of critical equipment for a given facility? Examples of equipment that may be considered critical includes:
 - i. Well pressure containment systems
 - ii. Downhole safety valves
 - iii. Blow preventer and intervention systems
 - iv. Pressure vessels and piping used to transport hydrocarbon or other potentially hazardous substances
 - v. Automated safety instrumented systems / shutdown systems
 - vi. Pressure relief devices, flares, blowdowns, rupture discs
 - vii. Fire/gas detection and automated fire-fighting equipment
 - viii. Station keeping systems
 - ix. Bilge / ballast systems
 - x. Other equipment/systems used to prevent or mitigate the uncontrolled release of hydrocarbons, toxic substances and other materials that may have environmental and/or safety consequences
- b. What components have been implemented to ensure written procedures are created that encompass the testing, inspecting and maintaining of critical equipment.
- c. What components have been implemented to ensure that the written procedures for testing, inspecting and maintaining critical equipment follow the manufacturer's design and material specifications or generally accepted engineering practices?

- d. What components have been implemented to ensure that the personnel performing the testing, inspections and maintenance have the appropriate training / qualifications / certifications (as appropriate)?
- e. What components have been implemented to ensure that the frequency of the testing and inspections are in accordance with regulatory requirements, manufacturer's recommendations and previous operating/reliability history, and that they are being conducted and documented appropriately?
- f. What components have been implemented to ensure that the appropriate corrective actions are taking place to address deficiencies found during testing, inspections and maintenance or for equipment operating outside the manufacturer's recommended limits?
- g. What components have been implemented to ensure new equipment, modified equipment, spare parts and/or maintenance materials are appropriate to the application(s) for which they will be used?
- h. What components have been implemented to ensure that deviations from the regular testing, inspection and maintenance procedures are reviewed and approved by the appropriate level of management? *NOTE: this may be part of the Management of Change system.*
- i. What components have been implemented to ensure changes in the Mechanical Integrity program are communicated to all affected personnel?
- j. Do all affected personnel understand their roles and responsibilities in the Mechanical Integrity system?