

# Mechanical Integrity Program Services

## Problem Statement

The protection of people, property, and the environment at industrial facilities is a serious concern, and failure to adequately maintain equipment can have catastrophic results. Process safety standards require companies that handle hazardous materials to maintain equipment in accordance with recognized and generally accepted good engineering practices. Federal regulations requiring Mechanical Integrity programs include:

- OSHA 29 CFR 1910.119 (PSM)
- EPA 40 CFR Part 68 (RMP)

Numerous states also require similar programs.

Maintaining the integrity and ensuring safe operation of process equipment in a cost-efficient manner is a significant challenge. The operating environment of each process is unique, and many plant-specific factors must be considered. An effective Mechanical Integrity program will prioritize risks and make the best use of internal and external resources in planning and scheduling activities to cost-effectively achieve safety gains and regulatory compliance while decreasing downtime.

## The GP Solution

For over 35 years, GP has been a leading provider of Engineering, Workforce Development, and Technical Training services to U.S. process companies. Our background includes long-term involvement with regulated facilities in the chemical, food and beverage, pharmaceutical, nuclear power, metals, refining, and defense industries. Since the inception of the Process Safety Management (PSM) and Risk Management Program (RMP) regulations, GP has provided Process Safety Services at more than 100 client sites. GP offers a proven, systematic, value-added approach to regulatory compliance. Our approach is based on maximizing performance and achieving compliance by leveraging existing resources to minimize implementation costs.

## GP Services:

**Mechanical Integrity Program Procedures**

**Covered Equipment Selection**

**Inspection and Test (I&T) Programs**

**Non-Destructive Examination (NDE)**

**Engineering Analysis**

**Maintenance Procedures and Training**



GP offers a full range of Mechanical Integrity Program Services. The following are representative of GP's capabilities:

### Mechanical Integrity Program Procedures

- Roles & Responsibilities
- Preventive Maintenance
- Corrective Maintenance
- Quality Assurance

GP develops comprehensive risk-based Mechanical Integrity programs, beginning with an overall plan that provides the framework for addressing regulatory elements. The plan includes program organization, responsibilities, and work processes. Our technical staff then develops customized procedures addressing elements such as covered equipment, quality assurance, training, safe work practices, preventive and predictive maintenance, corrective actions, and records management.

### Covered Equipment Selection

- Program Scope
- Equipment Lists
- Selection Criteria
- Equipment Categorization

GP assists facilities in establishing and documenting the rationale for covered process boundaries. Our engineers develop criteria to categorize equipment as covered by the regulations or otherwise critical to safety, environmental protection, or operations. The resulting covered equipment list is used to ensure that the appropriate components are included in the Mechanical Integrity program.

### Inspection and Test (I&T) Programs

- Program Scope
- Risk Ranking
- I&T Tasks
- Acceptance Criteria

GP develops and implements I&T programs following a risk-based approach to make effective use of available resources. The scope of the program is established, and a relative risk ranking is assigned to each piece of equipment. Individual I&T tasks that specify the inspection technique and frequency are developed. Acceptance criteria for evaluating results are also established based on engineering analyses and applicable codes and standards.

### Non-Destructive Examination (NDE)

- Visual
- Radiography
- Magnetic Particle
- Liquid Penetrant
- Ultrasonic
- Training

GP performs NDE in support of clients' Mechanical Integrity programs. Our inspectors are certified in visual, ultrasonic, liquid penetrant, magnetic particle, and radiography methods and maintain AWS and API certifications. Our staff additionally provides training and qualification of plant personnel in NDE methods following American Society for Nondestructive Testing recommended practices.

### Engineering Analysis

- Design Basis Reconstruction
- Failure Analysis
- Fitness-for-Service
- Deficiency Disposition

GP performs engineering analyses of inspection results to establish equipment fitness-for-service. Our engineers disposition results and recommend follow-up actions in accordance with consensus codes and standards. This includes development of repair plans and coordination of repairs. GP also supports incident investigations through engineering failure analyses.

### Maintenance Procedures and Training

- PM Tasks
- Troubleshooting Guides
- Skills Training
- Maintenance Improvement

GP develops maintenance procedures and training to ensure that tasks are performed safely and efficiently. These services include equipment-specific PM tasks, troubleshooting guides, and process hazards training. GP develops maintenance skills training programs, including classroom, on-the-job, web-based, and computer-based delivery options. Our professionals also provide maintenance improvement and reliability-centered support.



Leading the World to Better Performance

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