Safety Bulletin
Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)

NEBULA
SAFETY & ENVIRONMENTAL

Recognized and Generally Accepted Good Engineering Practices (RAGAGEP)

RAGAGEP is an important concept within OSHA's Process Safety Management (PSM) and EPA's Risk Management Program (RMP) regulations. It forms the foundation for safe design, construction, inspection, and operation of covered processes. When facilities misunderstand or misapply RAGAGEP, gaps in mechanical integrity, equipment design, and operating practices can occur, increasing the likelihood of a process safety incident.

Understanding RAGAGEP and consistently applying it across all lifecycle stages is essential for regulatory compliance and effective risk management.

What Is RAGAGEP?
OSHA defines RAGAGEP as engineering, operation, or maintenance practices that are:
- **Published** by consensus organizations (e.g., API, ASME, ISA, NFPA, ANSI)
- **Widely used** and accepted within industry
- **Based on sound engineering principles**

RAGAGEP can include codes, standards, technical reports, or manufacturer recommendations. Employers must determine which RAGAGEP apply to their equipment and ensure their practices meet or exceed those requirements.

Regulatory Expectations
OSHA PSM explicitly references RAGAGEP within the Mechanical Integrity element (1910.119(j)(4)):
"Inspection and testing procedures shall follow recognized and generally accepted good engineering practices…"

EPA RMP includes similar language in 40 CFR Part 68. Both agencies enforce RAGAGEP through:
- Mechanical Integrity
- Process Safety Information
- Operating Procedures
- Management of Change
- PHA evaluations

OSHA has repeatedly cited facilities for failing to meet RAGAGEP in areas such as relief sizing, vessel code stamping, piping design, overfill prevention, and electrical installations.

In This Issue

This Safety Bulletin provides an overview of RAGAGEP and the importance of implementing RAGAGEP within the design and maintenance of a chemical process.

Safety Bulletins are published monthly and can be located on the Nebula Safety & Environmental LinkedIn page or website.

https://www.NebulaSafety.com

Examples of Common RAGAGEP Sources

Different industries rely on different RAGAGEP depending on process type and equipment. Common examples include:

- API Standards – pressure vessels, tankage, relief devices, inspections
- ASME Codes – pressure vessel design, boilers, piping systems
- NFPA Standards – fire prevention, electrical classification, flammable liquids
- ANSI/ISA Standards – instrumentation, alarms, control systems
- IEEE Standards – electrical equipment integrity
- Manufacturer Specifications – pumps, compressors, hoses, seals

Using "company standards" alone does not satisfy RAGAGEP unless they meet or exceed these external requirements.

Common RAGAGEP Deficiencies

Across industry, several recurring issues lead to OSHA or EPA citations:

- Reliance on outdated standards or superseded versions
- Inconsistent application across different units or facilities
- Lack of documentation proving that design complies with RAGAGEP
- Equipment installed without code stamping or with missing fabrication data
- Inspection and testing intervals not aligned with API/ASME guidelines
- Modifications performed without verifying that changes maintain RAGAGEP compliance
- Confusion between "best practice" and mandatory RAGAGEP requirements

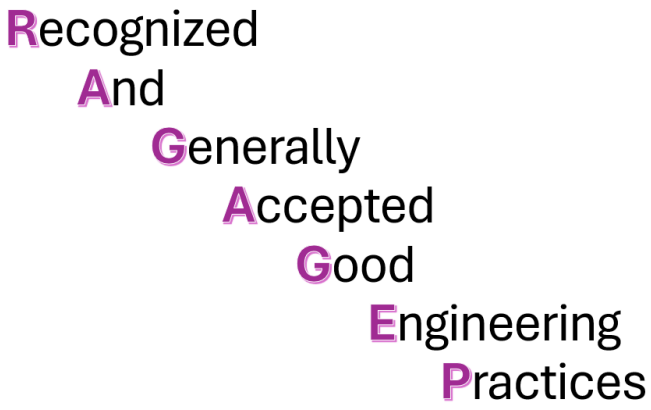
Many of these gaps are discovered only during PHAs, audits, or mechanical integrity reviews.

Continuous Improvement

Because codes and standards evolve, RAGAGEP should be periodically reviewed for updates. Key opportunities for improvement include:

- Updating inspection intervals
- Verifying relief valve sizing when process conditions change
- Upgrading equipment that no longer meets current standards
- Closing PHA action items related to RAGAGEP gaps
- Ensuring training reflects applicable RAGAGEP expectations

Even when not required retroactively, adopting newer standards often reduces long-term risk.



Applicable Codes, Standards, and Guidance

Some example codes/standards that can be referenced for RAGAGEP are listed below:

OSHA

- OSHA 29 CFR 1910 Subpart H – Hazardous Materials
- OSHA 29 CFR 1910 Subpart S – Electrical Safety
- OSHA 29 CFR 1910 Subpart Z – Toxic and Hazardous Substances

Fire and Explosion Protection

- NFPA 30 – Flammable and Combustible Liquids Code
- NFPA 68 – Explosion Protection by Deflagration Venting
- NFPA 69 – Explosion Prevention Systems

Electrical and Equipment Safety

- NFPA 70 (NEC) – National Electrical Code

Ventilation and Industrial Hygiene

- ACGIH Industrial Ventilation Manual

Equipment Type	Example RAGAGEP Standard	Notes
Pressure Vessels	ASME BPVC Section VIII	Requires code stamping & documentation
Storage Tanks	API 650 / API 653	External & internal inspection requirements
Relief Devices	API 520/521/576	Includes sizing & inspection frequency
Piping Systems	ASME B31.3	Materials, minimum thickness, flexibility
Electrical	NFPA 70 / NEC	Hazardous area classification
Instrumentation	ISA/ANSI Standards	Alarm management, calibration

References:

1. OSHA 1910.119(j)(4) and 1910.119(d)(3)(ii)
2. API Standards 520, 521, 650, 653, 570, 510.
3. ASME Boiler and Pressure Vessel Code (BPVC).
4. NFPA Fire Protection and Electrical Codes.
5. ISA/ANSI Alarm Management Standards (ISA 18.2).

Nebula Safety and Environmental is experienced facilitating and supporting PHAs. Please reach-out to the Nebula Safety and Environmental Team at NebulaSafety.com for additional information.