



ASSET CRITICALITY ASSESSMENTS



ASSET & MECHANICAL INTEGRITY EXPERTISE

Continuous improvement is a key element of an MI program to ensure it evolves with changes in technology and requirements in the industry. E²G's mechanical integrity team combines its industry experience with a multi-disciplinary approach to support your MI program improvements and the full life-cycle management of assets.

70+ combined years
of field experience

Pioneered development of
FFS & RBI

Primary authors of
API 571, WRC 528, & 562

Lead investigators on
API 579

INDUSTRIES



Ammonia/
Fertilizer



Biofuels/
Renewables



Chemical &
Specialty
Chemicals



Oil & Gas



Petrochemicals

WHAT IS A CRITICAL ASSET AT YOUR FACILITY?

Did you know only 10% to 20% of a plant's assets should be deemed critical?
Does every department agree on the asset criticality ranking?

Determining the criticality of all assets at a refinery, petrochemical, chemical or other industrial processing facility is an important element of effective maintenance and reliability programs. However, asset criticality is often overlooked when developing strategies or managing equipment resources.

A well-planned and executed criticality assessment identifies the most critical equipment to your organization's risks and objectives. The assessment will provide a better cross-functional understanding of what impact each asset has to the business and will help prioritize resources and future activities to continuously improve plant performance and reduce risk

WHAT IS ASSET CRITICALITY?

Asset criticality is the process of risk ranking each asset against other assets and comparing the impact to business objectives, personnel safety, and environmental or community damage. The risk ranking will consider operational parameters, fluid, pressure, temperature, consequence of failure, and probability of failure.

FIVE CONSEQUENCE CATEGORIES:

- Impact to personnel health and safety
- Direct cost from a loss of containment, such as an explosion or fire
- Material release within a one-hour period
- Impact on the surrounding community
- Offsite environmental effects, including acute or long-term impact and mitigation costs

CRITICAL ASSET	MAJOR INCIDENT	SAFETY CRITICAL ASSET
An asset, the malfunction or failure of which could cause, contribute to, or fail to prevent or mitigate a major business impact or majorsafety, health, environmental or security incident.	A process safety incident falling into either of the highest two severity categories in the Process Safety Event (PSE) severity table of ANSI/API RP 754 modified as necessary to meet a particular company's objectives.	Assets which meet or exceed the threshold level of criticality with respect to process safety reasons. Having consensus across the organization will help everyone handle critical assets more smoothly.



Improve
organizational
communication



Meet regulatory
requirements



Maintain asset
reliability



Prevent and
mitigate major
incidents



Reduce capital
project risk

CROSS-FUNCTIONAL PERSPECTIVE TO ASSET CRITICALITY

Every department has a different perspective or definition of criticality. What may be critical to one group may not be relevant to another group. A successful asset criticality assessment starts with understanding how each department defines criticality

- **Safety** – assets that prevent or mitigate a major incident or protect personnel (e.g. fire protection systems)
- **Health** – equipment that minimizes long-term exposure to hazardous fluids and minimizes the impact on personnel or the community
- **Environmental** – assets that reduce facility emissions, groundwater contamination, flaring events, etc.
- **Quality** – components that impact production and the end-customer if production lines are shutdown
- **Business** – new equipment or components that impact the facility, product changes, and company reputation
- **Security** – equipment that protects the plant's physical and cyber security
- **Maintenance** – equipment with high repair costs, limited access to spare parts, or requires speciality service or maintenance personnel
- **Operations** – assets that provide stable operations and meet the business requirements for the product line

BEST PRACTICES

An effective asset criticality assessment will identify the facility's most important assets, outline the impact to your business and surrounding community, and prioritize resources to improve asset performance, plant reliability, and reduce risk.

- Review critical assets annually to ensure alignment with business objectives, operations, and maintenance
- Get common agreement on what equipment criticality is by assembling a cross-departmental team

E²G'S ASSET CRITICALITY ASSESSMENT WORKFLOW

At E²G, we use a multi-disciplinary approach to develop an asset criticality assessment for all equipment at your facility. The mechanical integrity team will provide master asset list with criticality rankings that can be used to develop asset reliability strategies, inspection planning, and maintenance schedules.

- Define "criticality" for each area of your organization
- Establish a risk decision matrix
- Assemble documentation, including process flow diagrams (PFDs), risk assessments, P&IDs, and other inspection and maintenance documentation
- Perform criticality assessments
- Analyze results and establish criteria for
- Develop a proactiv