

Mechanical Integrity for research scale environments

Presentation title: Mechanical Integrity for research scale environments

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Abstract

Synopsis:

Mechanical integrity is an important element in an overall safety management system and is applicable in a wide variety of industrial settings. This presentation will define mechanical integrity, discuss why it is a key ingredient to improve and maintain safe operations in a research scale environment using cases from industrial research settings. It will also describe the components to include when building a sustainable program.

Method:

A Mechanical Integrity program is a means of risk management. The program applies to equipment that when failure occurs, it's most likely to cause personal injury or environmental insult.

Well intended designs may lack components to ensure safe operations. Improper inspections and maintenance provide a false sense of security. Several cases are examined and discussed.

Result:

The contents of a sustainable Mechanical Integrity program:

- **Requirements:** describes what to do, and what is required for the Mechanical Integrity program.
- **Guidance:** how to do it.
- **Maintaining:** team effort responsible for maintaining the guidance.

Use a practical failure mode and mitigation approach consisting of five (5) components.

1. Define the Process.
2. Define the Equipment.
3. Identify Failure Scenarios.
4. Consider Failure Mode.
5. Employ "Mitigation Methods" or "layers of protection" to prevent or mitigate the effects of failure.

Conclusions:

Mechanical Integrity is a program to manage risks to prevent injury and environmental insult by use of proper:

- Design of the equipment to ensure it is suitable for the application.
- Inspections needed to ensure continued safe operation of the equipment.
- Maintenance of the equipment to ensure the equipment is always fit for service.

Components of a sustainable program:

- Define the Process
- Define the Equipment
- Identify Failure Scenarios
- Consider Failure Mode
- Employ "Mitigation Methods"

Biography

Eddy Borchert joined The Dow Chemical Company in 1981 after graduating from Purdue University with a bachelor's degree in chemical engineering.

During his 43 years in Dow and related businesses, he has been involved in a variety of roles including engineering, manufacturing, research operations, and safety.

Today, Eddy is a mechanical integrity manager for Dow's Global R&D organization. His focus since 2010 is to leverage best practices for effective implementation of mechanical integrity requirements for research scale environments to prevent incidents and sustain compliance.