

# Equipment deficiencies: How well are they being managed?

## Part 1 of 2

A key element of a successful mechanical integrity (MI) program is the equipment deficiency process. In addition to being a requirement and an MI emphasis area in many OSHA National Emphasis Program inspections, a facility's equipment deficiency process is a vital management system for ensuring safe process operations. This process helps ensure that deficient equipment conditions are identified in a timely manner and appropriately managed until the deficient condition is corrected (e.g., design condition restored).

Based on extensive plant experience and numerous MI program audits, common struggles that organizations have with equipment deficiency processes include:

- Proper identification of equipment deficiencies.
- Implementation of a system that properly manages continued safe operation of deficient equipment.
- Adequate involvement by appropriate levels of management in managing major deficiencies.

This two-part article discusses these common struggles and provides practical solutions. Part one discusses the identifica-

tion of equipment deficiencies. Part two will discuss issues related to the proper management of deficiencies.

Personnel often fail to identify equipment deficiencies because they lack an understanding of which equipment conditions constitute a deficiency. This is primarily because the equipment deficiency process does not guide personnel on how to judge when the operation or condition of equipment is considered to be deficient. For example, which of the following are considered equipment deficiencies?

- Piping leaking hazardous chemicals.
- A pressure vessel having a wall loss greater than the corrosion allowance.
- A ventilation system failing to pressurize a building in order to meet electrical classification standards.
- An instrumentation system (identified as a safety system) being bypassed due to nuisance alarms or false trips.

Which of these would your facility's personnel identify as a deficiency? What would be the basis for their decisions? Lacking written guidance and training, personnel are likely to make inconsistent judgments based on past experiences and personal biases.

A simple method for making consistent judgments is to compare equipment operation/condition issues against clearly established and documented standards of acceptable equipment performance and conditions. For project safety management/risk management program-covered processes (PSM/RMP), the regulatory expectation is that acceptable equipment performance and conditions are documented in the process safety information (PSI). Acceptable performance and conditions may also be documented in MI inspection and testing procedures and the operating limits included in the operating procedures. Based on typical equipment PSI, all of the examples above would likely be considered equipment deficiencies.

It is important to note that identifying an equipment condition as a deficiency doesn't necessarily signify that the equipment has failed or is about to fail. In fact, a successful equipment deficiency process identifies deficient conditions well in advance of failure. In addition, deficient conditions for some equipment (e.g., safeguards) result in hidden failures. These types of deficiencies present an interesting challenge because they seemingly have little or no impact on pro-

cess operations. This sometimes results in deficient conditions being overlooked and/or managed with less urgency because they typically do not cause downtime.

In addition to providing written guidance on identifying which conditions constitute an equipment deficiency, the equipment deficiency procedure must also define a management system that includes identification of deficient conditions that occur while operating and are discovered during inspection and test activities. The management system must also ensure that responsibilities are assigned for identifying deficient conditions (e.g., responsibility for reviewing inspection and test results).

Obviously, correcting shortcomings in the identification of deficient equipment conditions is a great starting point for implementing or improving an equipment deficiency process.

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