# Pressure Equipment Integrity Incident Investigation

API RECOMMENDED PRACTICE 585
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# Pressure Equipment Integrity Incident Investigation

## 1 Scope

### 1.1 General

The purpose of this document is to provide owner-operators with practices for developing, implementing, sustaining, and enhancing an investigation program for pressure equipment integrity (PEI) incidents. This recommended practice (RP) describes how an effective investigation could be structured so organizations can learn from PEI failures, near misses, or discoveries. This RP is not intended to define or supplement criteria for compliance with regulatory requirements for which companies already have defined investigation processes. Instead, API 585 focuses on investigating PEI failures, near misses, or discoveries that are precursors to potential failures that could have a significant impact on safety, health, and the environment. As such, this RP can add value to process safety incident investigations by helping to focus specific investigative techniques that would enhance learning and value from PEI incidents.

Significant pressure equipment mechanical integrity incidents are rarely the result of one isolated problem; there are almost always less-severe precursors to an equipment failure. These precursors are frequently called “near misses” or “discoveries” when they occur. Additionally, this document highlights the value of recognizing these precursor occurrences and promotes investigating them to determine the immediate, contributing, and root causes. If these precursor occurrences are uncovered and investigated, and the contributing and root causes are resolved, major catastrophic failures of pressure equipment could be minimized or prevented.

### 1.2 Industry Scope

The investigation principles and concepts presented in this RP are specifically targeted for application to pressure equipment in the oil, gas, refining, and petrochemical industries, but may be applied to other equipment and industries at the discretion of the owner-operator.

### 1.3 Flexibility in Application

Because of the broad diversity in an organization’s size and culture, as well as national and local regulatory (i.e., jurisdictional) requirements, API 585 offers owner-operators the flexibility to apply the investigation methodology within the context of existing incident investigation practices and to accommodate unique local circumstances. API 585 is intended to promote the use of systematic investigations as a way to learn from unexpected leaks, equipment degradation, or near misses associated with PEI.

As such, API 585 is intended to supplement owner-operator incident investigation procedures when the incident involves pressure equipment failures, near misses, or discoveries such as those involving one of the equipment-damage mechanisms outlined in API 571. As indicated in 1.4, API 585 offers information focused on PEI incidents that can enhance the typical features of process safety incident investigations. Owner-operator and site investigation procedures can reference API 585 to help bring a PEI focus on such incidents.

Investigation methodologies consist of investigators collecting evidence and analyzing it to determine the causes. Many types of investigation analysis methods exist and are used throughout the industry. This document is not intended to single out any specific investigation analysis method. This document highlights PEI issues for investigation and provides guidelines and work processes for PEI incident investigations.

### 1.4 Pressure Equipment Integrity (PEI) Focused

Investigation is a vital element for learning from unexpected discoveries or incidents, e.g., finding significantly more corrosion damage or other forms of deterioration than expected. This information can be used in a continuous improvement process. Investigating and determining the causes of unexpected leaks, equipment degradation, or near misses associated with pressure equipment may be used to improve mechanical integrity programs and management systems for maintaining PEI, such as design and construction procedures, maintenance and inspection practices, and operating practices. These programs/systems include but are not limited to: