



# Functional Safety Assessments



A functional safety assessment (FSA) is a required investigation to judge the functional safety achieved by one or more safety instrumented systems (SIS) and other protection layers. An effectively designed SIS will detect dangerous process conditions and automatically respond to bring the process to a safe state.

A successful FSA will determine compliance with IEC 61511 and whether it is implemented properly to prevent or mitigate a hazardous event or failure. At Equity Engineering, our Instrumentation, Controls, & Electrical Engineering team offers technical support for all stages of a safety system's lifecycle.

## Why Choose Equity for a Functional Safety Assessment?

### Regulatory Compliance:

The results of an FSA will measure the functional safety performance achieved by the SIS and/or other protection layers and are aligned with IEC 61511.

### Evidence-Based Investigation:

Our team conducts evidence-based investigations to provide recommendations that outline a comprehensive understanding of your SIS performance and compliance.

### Review of Safety Lifecycle:

We will thoroughly conduct all five stages of the FSAs that are required throughout the SIS safety lifecycle and consider the conclusions and recommendations from past assessments to enhance the effectiveness of our assessment.

### Management of Functional Safety:

We will help implement functional safety management under the existing process safety management (PSM) program. Our extensive offerings will provide mechanical integrity, quality assurance, training, and more, ensuring a holistic approach to safety.

### Customization:

Each facility has a unique set of operational and production challenges that requires a personalized approach to functional safety. We know that one size does not fit all, so we customize our FSA approach to your facility, system, and the needs of your team.

### Proactive Risk Management:

Equity Engineering pioneered risk-based inspection (RBI) and integrates a risk-based approach into all FSA consulting projects. Integrating a variety of proactive risk management strategies will help mitigate incidents and accidents.

### Continuous Improvement:

We recognize that safety systems evolve with changing technologies and industry best practices; thus, we are committed to continuous improvement by offering ongoing support, monitoring, and reassessment.

## Case Study

### Understand Process Risk Associated with Instrument Maintenance

#### Industry:

Downstream Oil & Gas

#### Type of Asset:

Instrumented Independent Layers of Protection

#### Location:

USA

#### Issue:

A client wanted their operations and maintenance personnel to clearly understand the process risk when performing on-line maintenance on instruments that were associated with the layers of protection identified in process hazard analyses (PHAs).

#### Solution:

We conducted a thorough review of the client's PHAs, layers of protection analyses (LOPAs), and piping and instrumentation diagrams (P&IDs) based on client direction. Then we also completed individual bypass overrides and risk assessment forms for the instruments that linked to the independent layers of protection. The assessment of risk was based on findings from the PHAs, adjusted to account for the risk reduction achieved by the instrumented protection layer. By examining the P&IDs, we assessed whether risks associated with maintenance activities could be effectively controlled or mitigated through additional instrumentation or operator actions not initially considered as protective layers in the PHAs.

#### Result:

The client now has a database of bypass override risk assessment forms that supports the operations and maintenance teams in understanding the process risks associated with performing on-line maintenance on instruments. The database also provides guidance and recommendations for controlling or mitigating elevated operational risk.

## Benefits



Improve overall plant safety



Comply with jurisdictional requirements