

API Recommended Practice 17V

Recommended Practice for Analysis, Design, Installation, and Testing of Safety Systems for Subsea Applications

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This RP presents recommendations for designing, installing, and testing a process safety system for subsea applications. The basic concepts of subsea safety systems are discussed and protection methods and requirements of the system are outlined.

For the purposes of this RP, 'subsea system' includes all process components from the wellhead (and surface controlled subsurface safety valve [SCSSV]) to upstream of the boarding shutdown valve. For gas injection, water injection, and gas lift systems, the shutdown valve is within the scope of API 17V. This also includes the chemical injection system.

Subsea systems within the scope of this document include:

- subsea trees (production and injection), flowlines, and SCSSVs;
- chemical injection lines;
- manifolds;
- subsea separation;
- subsea boosting;
- subsea compression;
- flowlines;
- gas lift;
- high integrity pressure protection system (HIPPS);
- subsea isolation valves;
- risers;
- hydraulic power unit.

The safety system includes valves and flow control devices in the production system. The safety system also includes sensors installed in the production system to detect abnormal conditions and allow corrective action to be taken (whether manual or automatic).

The intention is to design subsea safety systems to meet the requirements of IEC 61511; this document supplements these requirements.

Procedures for testing common safety devices are presented with recommendations for test data, test frequency, and acceptable test tolerances.

Instrumentation logic circuits are not discussed since these should be left to the discretion of the designer as long as the recommended safety functions are accomplished. Rotating machinery is considered in this RP as a unitized process component as it interfaces with the subsea safety system. When rotating machinery (such as a pump or compressor) is installed as a unit consisting of several process components, each component may be analyzed as prescribed in this RP.

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