



# Safety services

Effective life cycle management of hazards and risks in high-hazard industries.

[triconex.com](https://triconex.com)

Life Is  On

**Triconex**<sup>™</sup>  
by **Schneider** Electric



# Safety services

Our team of experienced safety professionals work with you as a team to protect your most valuable assets from harm or damage while minimizing risk to people, property, and the environment.

## When your success depends on safe and reliable operations

Safety is almost certainly at the top of your organization's priority list. But if your operation is like many, the need to balance ever-increasing pressure to improve productivity, quality, and throughput while reducing cost against mandated safety regulations is one of the most demanding and complex challenges in industry today.

When the safety and protection of your most valuable assets is critical to the success of your business, you can rely on Triconex™. For more than 30 years our priority has been delivering safety for life, protecting people, the surrounding communities, the environment, and keeping equipment and production operating safely and continuously for the life of the asset.

Our team of dedicated functional safety experts help you identify, plan, and manage the operational risks inherent in high-hazard industries to avoid exposure to production outages, equipment damage, environmental incidents, injury to personnel, and loss of life.

## Risk management and regulatory compliance

Our safety services follow the structured and systematic approach defined in safety standards such as ISA 84 and IEC 61511. We use these internationally recognized standards as the benchmark and guiding principal for all of our activities.

Our safety life cycle services begin at the concept stage and cover detailed design and build, installation, and commissioning through to operation, as well as later maintenance. Particular attention is paid to the early life cycle stages to ensure that we identify and understand what the risks/hazards are, what can go wrong, how severe it may be, how likely it is to happen, whether it matters, what is acceptable for your facility, and, finally, what protection is required to manage/mitigate the causes and consequences.

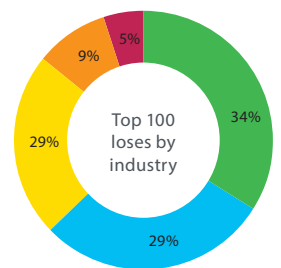
## Key benefits

Our proven expertise and dedication to your safety deliver the following benefits:

- Minimize your process hazards and risks
- Minimize costs of safety standards compliance
- Maximize production output and asset uptime
- Maximize return on investments
- Minimize investment and life cycle costs

## \$34 billion

The total accumulated value of the 100 largest property losses in the hydrocarbon industry. (source: Marsh report — the 100 largest losses 1974 – 2013 23rd edition)



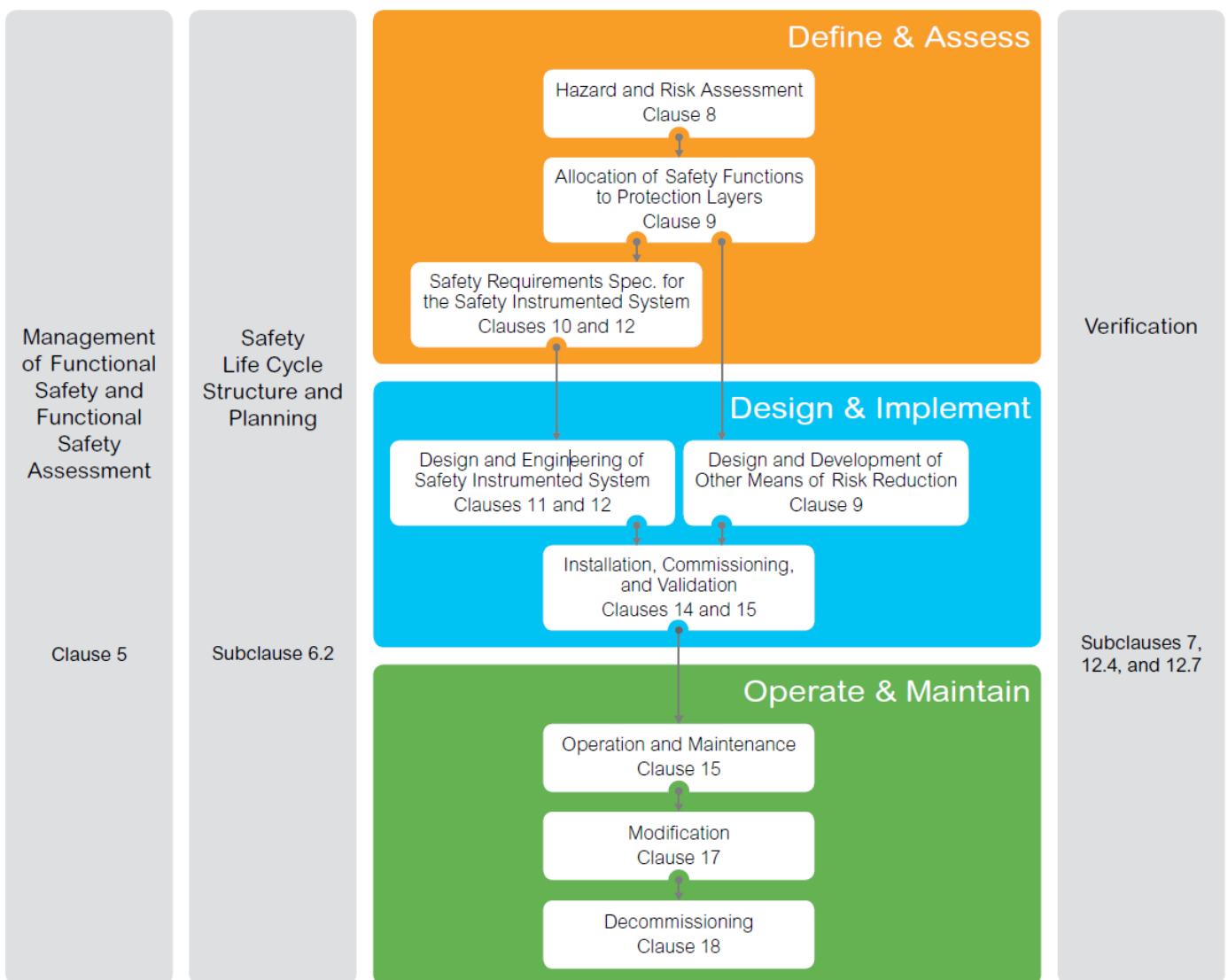
- Upstream
- Refining
- Petrochemical
- Gas processing
- Terminals and distribution

## >80%

Standards and conformity assessments impact more than 80% of global commodity trade. (Source: U.S. Department of commerce)

# Safety expertise, solutions, and services for life

Particular attention is given to the early life cycle stages to ensure that we identify and understand what can go wrong, what the impact is, and what protection is required to manage and mitigate the risks.



## A safety partner for life

Accidents in the process industry continue to provide a constant reminder of the inherent risks and hazards in industrial processes. You need a partner who can define and implement the risk reduction methods including Safety Instrumented Systems (SISs) that are consistent with the most stringent demands for protection, risk reduction, and asset availability. We work with you as a team to protect your most valuable assets from harm or damage while minimizing the risk to people, property, and the environment.

## Providing expertise every step of the way

Achieving safe and reliable operations requires more than just a Safety Integrity Level (SIL)-rated SIS. Safety considerations and critical decisions need to be made long before the need for a safety system is determined. This can be extremely complex and requires in-depth and specialist knowledge.

Our team of safety experts engage with you at the earliest stages of the life cycle to ensure that the right decisions are made and to ensure overall success for the project and operating life of the asset.

## Certified safety processes, certified safety personnel

All of our services are delivered by competent, knowledgeable, and experienced safety experts. Many are TÜV-certified Functional Safety Engineers as well as accredited Functional Safety Experts who have proven skills and competencies to carry out the activities for which they are accountable.

The processes and procedures that they follow are also certified by TÜV in alignment with IEC 61511.

Supported by a global infrastructure, you are assured to be supported by a safety life cycle partner with expertise and commitment every step of the way.

## Safety services

- Functional safety gap assessment and closure process hazard analysis
- Layer of protection analysis
- Independent Protective Layer (IPL) and SIL selection
- SIS front-end loading (FEL)
- Quantitative risk assessment
- SIL verification calculations
- Safety requirements specification generation
- Functional safety management planning (FSMP)
- Front-end engineering design
- Project management services
- End-to-end SIS design
- Detailed engineering, system configuration, build, test, and documentation
- Installation, commissioning, and startup assistance
- Training to ensure the competencies and skills are available at site
- Post-delivery support, such as expert hotline, spare parts management, on-site support, system maintenance, and system upgrades

# The world of functional safety is complex.

Standards are changing. Demonstrating compliance to regulatory bodies is becoming more demanding.

## Define and assess services

ISA 84/IEC 61511 gap assessment: Identify potential gaps and areas for potential improvement and gap closure.

Process Hazard Analysis (PHA): Identify the hazards and risks (often a regulatory requirement for companies that handle or process highly hazardous chemicals).

Layer of protection analysis (LOPA): Evaluate process safety risks and ensure proper safeguards or IPLs are in place to reduce risk to a tolerable level.

Independent Protective Layer (IPL) and Safety Integrity Level (SIL) Selection: further define and refine selected IPLs and set SIL target assignments.

Quantitative risk assessment (QRA): Verify the severity of the scenario, the consequence, and the frequency, as well as handling conditional dependence among IPLs and the initiating causes.

Safety Integrity Level (SIL) Verification: Comprehensive calculations for each SIF, including calculation parameters, assumptions, limitations, and sources of data for each calculation.

Safety requirements specification (SRS): Define the integrity and functional requirements of each SIF as defined in Clause 10 of IEC 61511.

Functional safety management planning: Ensure that each SIF is designed and operated correctly to obtain the appropriate levels of risk reduction.

## Industries served

- Oil & Gas
- Exploration and production
- Refining
- Chemical
- Pipelines and distribution
- Energy and power generation



# A safety partner for life

Supported by a global infrastructure, you are assured of a safety life cycle partner with expertise and commitment every step of the way, wherever and whenever you need them.

## Main automation contractor

Triconex has extensive knowledge of global safety standards supported by a global team of safety experts who can provide a single source for all of your safety system project needs. Safety services cover all aspects of the safety life cycle, from FEL through to the operation and maintenance of the systems during the operating life of the asset.

## Design and implement services (per IEC 61511 clauses 11 & 12)

**Project management** — A dedicated program manager ensures the successful implementation and timely delivery of your safety solution. Many of our project managers are certified Project Management Professionals with expertise in delivering projects of all sizes and complexity.

**System design** — Our design engineers design the safety system to meet the levels of risk reduction identified in the Define and Assess phase of the project life cycle.

**System configuration** — Our software engineers configure the safety system applications to provide the functionality needed to ensure safe operation of the plant. The use of proven software templates and function blocks ensures consistency and integrity of design.

**System build** — Our hardware engineers and approved panel vendors deliver your system wired, tested, and ready to go. The use of standard cabinet designs ensured uniformity and the highest levels of quality.

**System test** — All systems are designed and built to the specific needs of each customer. Rigorous testing and Factory Acceptance Testing is performed to prove and demonstrate system operation.

**System documentation** — All systems are delivered complete with a comprehensive documentation set that covers system engineering, hardware, software, and functionality.

## Installation, commissioning, and validation (per IEC 61511 clauses 14 & 15)

**The success of any safety system implementation extends beyond just designing, building, and testing the system. Our team of experts provides site services to ensure the successful startup and handover of the system.**

**Installation supervision** — Our engineers ensure that the safety system is delivered, installed, and wired correctly.

**System commissioning** — Our engineers verify that the system operates correctly including loop checks and proper communications between safety systems and the distributed control system.

**Site acceptance testing** — Our team ensures that the installed system functions as intended.

**Validation** — Through inspection and testing our team validates that the installed and commissioned system meets the requirements as stated in the safety requirements specification.

Our commitment doesn't just stop once the system is installed and operational. We are available throughout the operating life of the asset to ensure that your systems are always operating at peak performance.

#### Operate and maintain services (per IEC 61511 clause 16)

It is vital that the safety systems being relied on to protect your assets are always operating at peak performance and providing the designed levels of risk reduction throughout their operating life. We have a range of services designed specifically to optimize your investment and keep you operating safely.

Our Customer First program has been specifically designed to give you access to high-quality services and expertise, 24 hours a day, 7 days a week. As well as technical support, we offer parts management, on-site support, system maintenance, and life cycle management.

Learning services — The operation, maintenance and modification of SISs requires an in-depth understanding of the safety life cycle, international standards, hardware and software technology, as well as application knowledge. We offer a comprehensive range of courses including TÜV-certified training courses to ensure that you always have the requisite skills and competencies.

Cybersecurity services — Our experts understand the strong connection between cybersecurity and process safety and are able to ensure that your systems, procedures, and people are optimized against cyber threats.

Periodic proof testing is often necessary to validate the performance and operation of the SIS. Our experts have the knowledge and tools to streamline periodic testing, reducing time, effort, and cost.

Future-proof your investment — While our platforms have a proven track record we also have a commitment to protect your investments and serve your business in the future. Our future-proof philosophy protects your capital expenditure through a clearly defined technology path to ensure that your systems always stay current and adhere to the latest standards.

#### Experts in safety

Schneider Electric has partnered with aeSolutions, a process safety engineering services and safety life cycle software provider.

This relationship expands the depth of our assessment and design capabilities, and leverages additional tools to manage and maintain the safety life cycle.







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Schneider  
Electric

Schneider Electric

35 rue Joseph Monier  
92500 Rueil Malmaison — France  
Phone: +33 (0) 1 41 29 70 00

[www.schneider-electric.com](http://www.schneider-electric.com)  
[www.triconex.com](http://www.triconex.com)

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