

A woman wearing a blue hard hat and safety glasses is looking upwards. She is wearing a white shirt and a high-visibility yellow safety vest. The background is a dark industrial setting with various pipes, tanks, and structures illuminated by blue and white lights. There are several out-of-focus light sources in the foreground, creating a bokeh effect.

HIMA

**SMART
SAFETY.**

**Enhanced Safety for the Process Industry
with Expert Consulting Services**

To Support the Safety Lifecycle needs Extensive Industry Experience

Safety is not a one-off initiative or a quick and permanent fix – it is a continuous, dynamic process. That is why you need to consider the entire lifecycle of your safety system, from planning and installation to operation and modification. In this way, you reduce the total lifecycle costs and avoid safety errors, preventable downtime, and unexpected costs. Your systems are guaranteed to stay reliable, available, and productive.

Safety - It's what we do

We are passionate about safety and our mission is to assist you in achieving your safety goals. For more than 50 of the past 110 years of our company history we have been involved exclusively with the safety of critical processes. HIMA Smart Safety Services provide you with flexible and scalable support from a single partner throughout the entire lifecycle.

Due to many years of experience, we have a deep safety knowledge that is often missing in today's planning and operational activities.

Thanks to our independence, we are able to work in any project configuration. Both partial tasks and complete projects when working with end customers. Or as part of a team with EPC, MAC and DCS manufacturers to support:



Reduction in planning/implementation errors and therefore cost



Reduced CAPEX/OPEX due to optimized safety



Full conformity with the latest standards

The related services can also be provided independent of the use of HIMA products. By choosing HIMA as your Safety Partner, you gain the benefits of an organization who understands that your business needs to deliver both safety and profitability.

Optimizing process Functional Safety

Process Safety requires a wide range of specialized skills and competencies. HIMA Consulting is the expert in safety, risk and engineering consultancy. We have a broad range of experience gained in the oil & gas, power generation, process, transport and related industries.

The services encompass process, functional and machinery safety and include all aspects of Functional Safety Support, cyber security as well as assisting companies achieve regulatory compliance, including safety case preparation. We also provide in-house and public training courses on all aspects of IEC 61508, IEC 61511 including TÜV Functional Safety Training. Our highly specialized consultants and engineers have a practical focus and a wide range of industry knowledge.

Application areas within industries include:

- Emergency Shut Down (ESD)
- Burner Management and Control (BMS/ BCS)
- Fire and Gas Systems (FGS)
- High Integrity Pressure Protection Systems (HIPPS)
- Turbomachinery Critical Safety Control (TMC)
- Pipeline Management and Control (PMC)
- Any safety related application



Success through cost effective solutions

Time spent analyzing the safety-related systems and safety loops should be seen as an investment as it ensures that the most cost effective solutions are designed into the project from the outset. Incorrectly performed risk analyses can either lead to overly conservative, high SIL classifications and thus to high costs or to classifications that are set too low and thus impair safety. Often low CAPEX options can incur significant cost penalties during future ongoing maintenance and testing practices.

HIMA Functional Safety Consulting has the experience to identify such problems and ensure your lifecycle costs are optimized. We assist you in aligning your processes and safety system design with plant-specific requirements and relevant Functional Safety Standards. Documentation of safety lifecycle activities is also considered so that you can demonstrate

your due diligence and fulfill your obligations under the legislation. Functional Safety Reviews, Audits and Assessments are carried out within projects and periodically during operation. This ensures that you achieve the integrity of your safety systems and a functionally safe plant.

Our early involvement releases you to focus on what you do best with the peace of mind of having a true safety specialist as your safety partner.

With HIMA's Functional Safety Experts at your side, you can be sure to be making the right decisions and developing the right solutions from the outset, that offer maximum safety and compliance, whilst permanently strengthening the productivity and profitability of your plant.

Benefits

- Use the safety expertise and experience of certified experts to be more efficient and focus on your core business
- Choose tailor-made services as required or outsource the entire life cycle planning
- Reduce plant lifecycle costs by focusing on the full safety lifecycle
- Minimize downtime and operate your plants more profitably
- Reliable compliance with international standards
- Use Functional Safety Experts who are independent of other parties involved

Norms and Standards

The basis for effective consulting services are the following standards:

- IEC 61511: Functional Safety - Safety instrumented systems for the process industry sector
- IEC 61508: Functional Safety of electrical/electronic/programmable electronic safety-related systems
- IEC 62443: Security for industrial automation and control systems
- IEC 62061 and ISO 13849: Safety of machinery
- Industrial application standards such as:
 - Burner management systems EN 50516 (Electrical equipment for furnaces and ancillary equipment)
 - Industrial thermoprocessing equipment EN 746-2
 - Turbomachinery and generators VDMA 4315-5:2013-02
- Other provided client specific standards or working practices



HIMA Lifecycle Services - Covering all Functional Safety Requirements



Management of
Functional Safety,
Functional Safety
Assessments
and auditing

Safety lifecycle
structure and
planning

● = Design, ● = Engineering, ● = Operation, ● = Overall activities

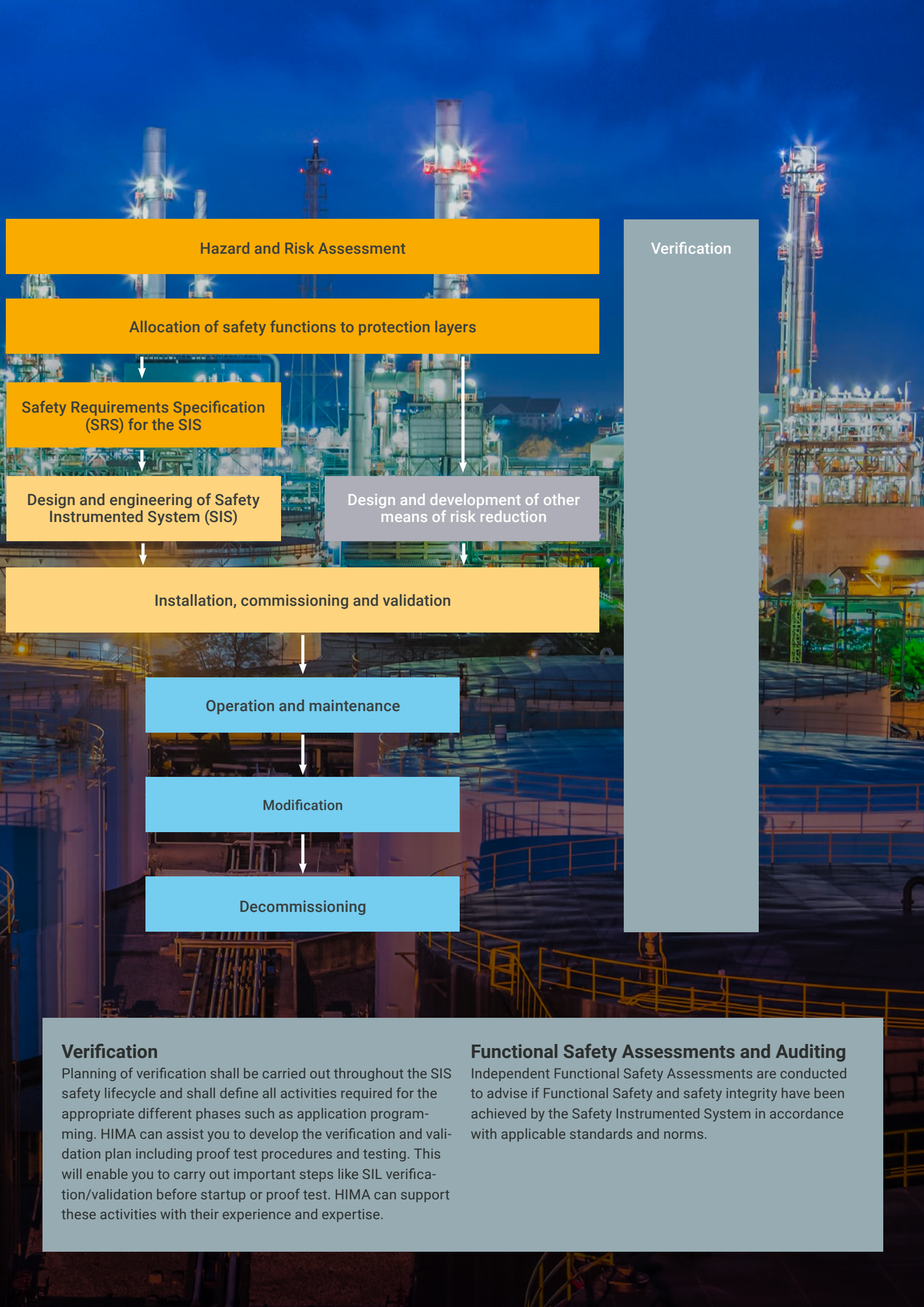
Overall lifecycle model according to IEC 61511

Functional Safety Management (FSM)

Professional FSM ensures that your company has a clear safety policy that includes the measures and systems used to achieve Functional Safety. It secures that there is a clear organizational structure with clear responsibilities and procedures for safety. FSM will manage competency of staff or different parties involved and ensure documented traceability of results and decisions made in all lifecycle phases. It takes care that non-conformances or hazardous incident

are identified and recorded to learn from, as well as any modifications are assessed, checked and reviewed.

HIMA can help you to build a comprehensive Functional Safety Management system that fits to your plant and organization. In addition HIMA can also take on the role of Functional Safety Manager for you and thus control and document the Functional Safety Management.



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graph TD; A[Hazard and Risk Assessment] --> B[Allocation of safety functions to protection layers]; B --> C[Safety Requirements Specification (SRS) for the SIS]; C --> D[Design and engineering of Safety Instrumented System (SIS)]; D --> E[Installation, commissioning and validation]; E --> F[Operation and maintenance]; F --> G[Modification]; G --> H[Decommissioning]; I[Design and development of other means of risk reduction] --> E; J[Verification] --- A; J --- B; J --- C; J --- D; J --- E; J --- F; J --- G; J --- H; J --- I; J --- L[Functional Safety Assessments and Auditing];
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Hazard and Risk Assessment

Allocation of safety functions to protection layers

Safety Requirements Specification (SRS) for the SIS

Design and engineering of Safety Instrumented System (SIS)

Design and development of other means of risk reduction

Installation, commissioning and validation

Operation and maintenance

Modification

Decommissioning

Verification

Verification

Planning of verification shall be carried out throughout the SIS safety lifecycle and shall define all activities required for the appropriate different phases such as application programming. HIMA can assist you to develop the verification and validation plan including proof test procedures and testing. This will enable you to carry out important steps like SIL verification/validation before startup or proof test. HIMA can support these activities with their experience and expertise.

Functional Safety Assessments and Auditing

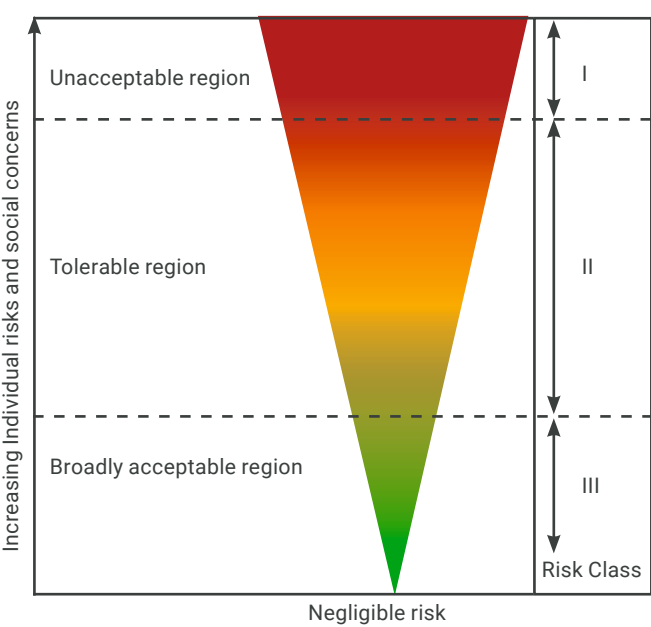
Independent Functional Safety Assessments are conducted to advise if Functional Safety and safety integrity have been achieved by the Safety Instrumented System in accordance with applicable standards and norms.

Functional Safety Services for the Assessment and Specification Phase

Facilitation of Hazard and Risk Assessment workshops

Risk Assessment Workshops can be conducted at all phases of the project lifecycle to identify potential hazards associated with a system and initiate appropriate control measures. Certified independent expert facilitators will perform the necessary preparation activities then chair and deliver the appropriate reporting for the qualitative Hazard Analysis activities including HAZID, HAZOP, CHAZOP and FMEA.

Risk Assessment using ALARP principle



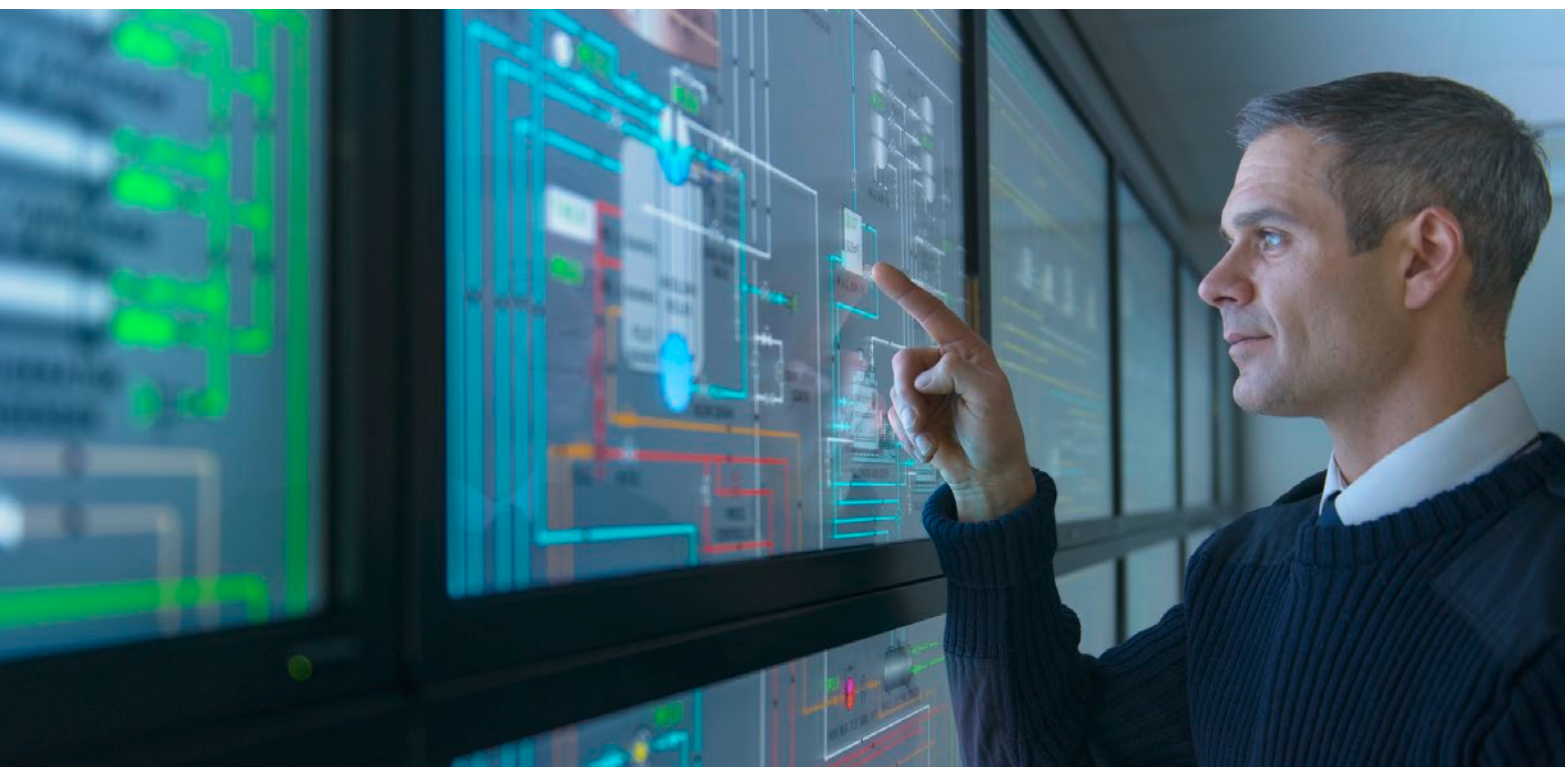
SIL Assessment

HIMA will assist you in determining the necessary Safety Instrumented Functions (SIFs) and to allocate them to appropriate protection layers. HIMA's experts will also help you to decide which safety integrity levels (SILs) belong to which SIFs. This involves the use of tools such as risk graph, a risk matrix and layers-of-protection analyses (LOPA).

Safety Requirements Specifications

Safety Requirements Specifications (SRS) describe every required safety function that must be performed by a Safety Instrumented System (SIS). It guides the design and creation of a safety system depending on the requirements and provides a clear explanation of the safety capabilities. Experienced safety experts compile your specific requirements (e.g. architectures, device requirements, environmental conditions, etc.) into detailed SRS to meet the requirements of IEC 61511.

ALARP =
As Low As
Reasonably
Practicable



Functional Safety Services for the Engineering and Operation Phase

Conceptual Design

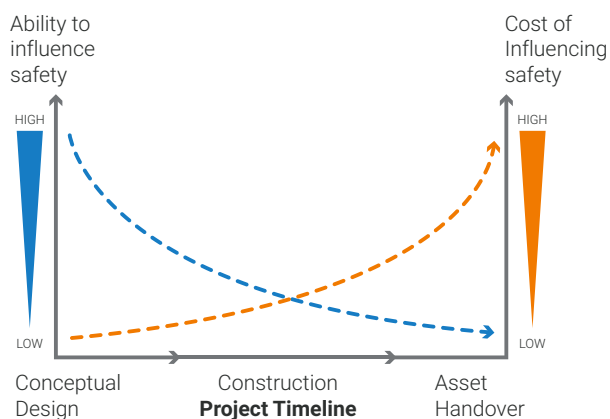
Selecting the correct equipment and architecture are key to achieving Functional Safety and reliability targets. HIMA carry-out conceptual designs of the Safety Instrumented Function (SIF) including operational requirements like availability for proof testing and selecting the right equipment based on integrity and functional requirements (SIF device selection).

SIL Verification

We also verify the capability of SIF's in accordance with IEC 61508 and IEC 61511 by quantifying the effects of random hardware failures such as PFD or Frequency of Dangerous Failures (PFH), calculating the hardware safety integrity architectural constraints including Systematic Capability (SC), Safe Failure Fraction (SFF), Hardware Fault Tolerance (HFT) and Common Cause Failure (CCF). Once quantified, the target SIL is verified by using various modelling techniques including Reliability Block Diagram (RBD), Fault Tree Analysis (FTA) and Failure Mode & Effect Analysis (FMEA).

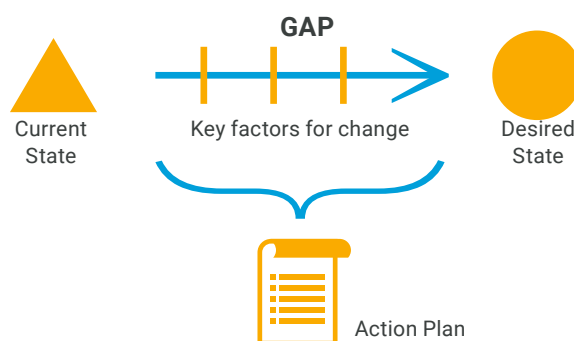
Functional Safety Review

As part of the Functional Safety Review, we conduct a review of your safety instrumented systems and related documentation to ascertain the level of compliance with the current standards and norms. This helps to identify the necessary measures at an early stage of the project and thus to gain the possibility to influence the safety processes and to avoid unexpected and therefore expensive rework.



Gap Analysis of existing processes and methodologies against specified standards

The Gap Analysis, conducted by our independent experts, identifies if the correct and appropriate procedures are followed in accordance with the Functional Safety Lifecycle - subject to the availability of the necessary documentation and personnel.



TÜV Certified Training for Safety and Security



International standards, such as IEC 61511, require employees who work with safety-related applications to prove that they have the necessary competence to do so. Moreover, this qualification must be regularly renewed. HIMA is an accepted course provider of the TÜV Rheinland Functional Safety Program. The TÜV certified trainings provide an overview of current industry standards, Functional Safety concepts and current tools used to determine Safety Integrity Levels (SIL), while applying industry recognized techniques and methodologies.



About HIMA

The HIMA Group is the world's leading independent provider of smart safety solutions for industrial applications. With more than 40,000 installed TÜV-certified safety systems worldwide, HIMA qualifies as the technology leader in this sector. Its expert engineers develop customized solutions that help increase safety, cyber security, and profitability of plants and factories in the digital age.

For over 50 years, HIMA has been a trusted partner to the world's largest oil, gas, chemical, and energy-producing companies. These organizations rely on HIMA solutions, services and consultancy for uninterrupted plant operation and protection of assets, people, and the environment.

HIMA's offering includes smart safety solutions that help increase safety and uptime by turning data into business relevant information. HIMA also provides comprehensive solutions for the efficient control and monitoring of turbomachinery (TMC), burners and boilers (BCS), and pipelines (PMC). In the global rail industry, HIMA's CENELEC-certified SIL 4 COTS safety controllers are leading the way to increased safety, security, and profitability.

Founded in 1908, the family-owned company operates from over 50 locations worldwide with its headquarters in Brühl, Germany with a workforce of approximately 800 employees.

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 <https://www.hima.com/en/products-services/consulting>

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