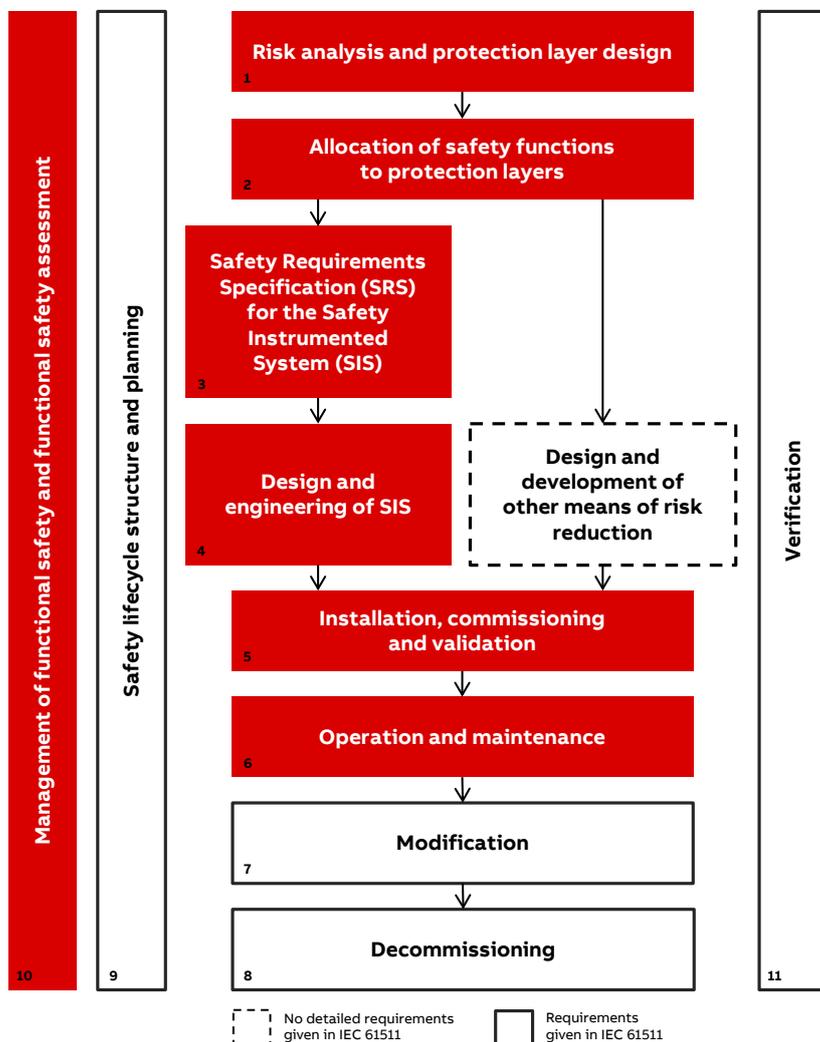


Applying IEC 61511 to legacy systems



ABB’s experience, expertise and rigorous testing helps meet Health and Safety Executive (HSE) requirements.



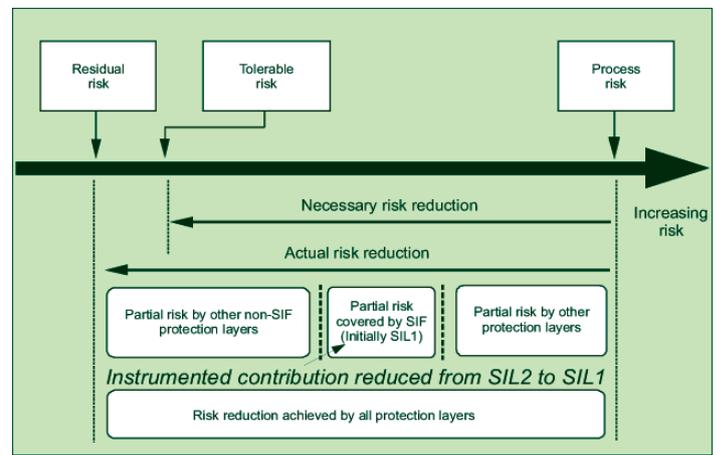
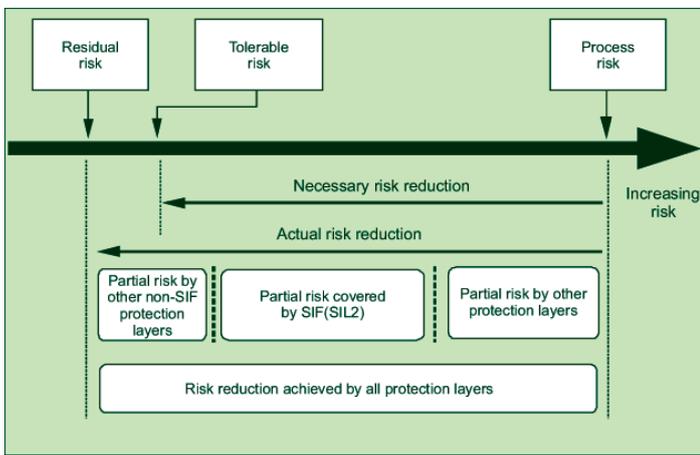
Following a visit to the client’s premises, the HSE instructed them to use the principles of IEC 61511 to produce the necessary documentation and maintenance procedures associated with their Safety Instrumental Systems (SIS). They asked ABB to apply IEC 61511 to their legacy systems.

Solution

We had shadowed the preparation and participated in reviews of IEC 61508 and IEC 61511. Using this knowledge and our operational heritage we explored the practical implications of the concepts within it and developed safety application techniques that helped our client to implement these standards into both their new and their legacy systems.

We followed the relevant phases of the SIS lifecycle in order to achieve this task.

- Using ABB’s Process Hazard Review (PHR) techniques, the COMAH case and plant operating experience, we identified hazardous events and severities (phase 1)
- Using Layer of Protection Analysis (LOPA) for each hazardous event, we identified the non-Safety Instrument Function (SIF) risk reductions (phase 2)
- Using the remaining required risk reduction from LOPA, we produced a target Safety Integrity Level (SIL) for each SIF (phase 3). Note: A SIF may also be referred to as a trip system or a instrumented protective system



- No specific documentation was available from the client, so we undertook a detailed site investigation for each SIF. Using this information and the Trip and Alarm Calculator (TRAC) software, we verified the required architecture to achieve the target SIL and identified the corresponding test intervals (phase 4)
- Using the SIF documentation, we produced test procedures retrospectively and tested each SIF to validate its performance. We proved that, due to previous plant modifications, some of the documentation was inaccurate. Our correct SIF documentation was then used to revise the TRAC verification and test procedures and the SIF was retested (phase 5)
- Our client now has in place the necessary SIS documentation and test procedures to carry out the ongoing operation and maintenance required by IEC 61511 (phase 6)
- ABB is working with our client regarding the ongoing auditing and functional safety assessment (phase 10)

Our expert input accurately analysed and quantified the contribution of the non-SIF risk reduction methods. Minor plant modifications were identified which enabled the target SIL of several SIFs to be reduced from SIL2 to SIL1, providing significant cost savings in design, installation and maintenance over the lifetime of the loop.

Benefits

- Ability to demonstrate compliance with SIL to the regulator
- Safety application techniques developed
- New standards implemented into both new and legacy systems
- Old, inaccurate information corrected
- Target SILs of several SIFs reduced