

# FUNCTIONAL SAFETY – SAFETY INSTRUMENTED SYSTEMS FOR THE PROCESS INDUSTRY SECTOR –

## Part 3: Guidance for the determination of the required safety integrity levels

### 1 Scope

1.1 This part provides information on

- the underlying concepts of risk, the relationship of risk to safety integrity, see Clause 3;
- the determination of tolerable risk, see Annex A;
- a number of different methods that enable the safety integrity levels for the safety instrumented functions to be determined, see Annexes B, C, D, E, and F.

In particular, this part

- a) applies when functional safety is achieved using one or more safety instrumented functions for the protection of either personnel, the general public, or the environment;
- b) may be applied in non-safety applications such as asset protection;
- c) illustrates typical hazard and risk assessment methods that may be carried out to define the safety functional requirements and safety integrity levels of each safety instrumented function;
- d) illustrates techniques/measures available for determining the required safety integrity levels;
- e) provides a framework for establishing safety integrity levels but does not specify the safety integrity levels required for specific applications;
- f) does not give examples of determining the requirements for other methods of risk reduction.

1.2 Annexes B, C, D, E, and F illustrate quantitative and qualitative approaches and have been simplified in order to illustrate the underlying principles. These annexes have been included to illustrate the general principles of a number of methods but do not provide a definitive account.

NOTE Those intending to apply the methods indicated in these annexes should consult the source material referenced in each annex.

1.3 Figure 1 shows the overall framework for ~~IEC 61511-4~~ ANSI/ISA-84.00.01-2004 Part 1 (IEC 61511-1 Mod), ~~IEC 61511-2~~ ANSI/ISA-84.00.01-2004 Part 2 (IEC 61511-2 Mod), and ~~IEC 61511-3~~ ANSI/ISA-84.00.01-2004 Part 3 (IEC 61511-3 Mod), and indicates the role that this standard plays in the achievement of functional safety for safety instrumented systems.

Figure 2 gives an overview of risk reduction methods.

For existing SIS designed and constructed in accordance with codes, standards, or practices prior to the issue of this standard (e.g., ANSI/ISA-84.01-1996), the owner/operator shall determine that the equipment is designed, maintained, inspected, tested, and operating in a safe manner.

