

# **FAQ SHEET**

## **- THE NEED TO COMPLY WITH IEC 61511 / ISA 84**

### ***Acronyms and Abbreviations Used***

ANSI	-	American National Standards Institute
DCS	-	Distributed Control System
GEP	-	Good Engineering Practice
IEC	-	International Electrotechnical Commission
ISA	-	Instrumentation, Systems and Automation Society
NEP	-	National Enforcement Program
OSHA	-	Occupational Health and Safety Administration
PHA	-	Process Hazard Analysis
PLC	-	Programmable Logic Controller
PSM	-	Process Safety Management
RAGAGEP	-	Recognized and Generally Accepted Good Engineering Practice
SIS	-	Safety Instrumented System

### ***What is IEC 61511 / ISA 84?***

IEC 61511 / ISA 84, *Functional Safety - Safety Instrumented Systems for the Process Industry Sector, Parts 1 – 7, 2003 onwards*, is a standard for Safety Instrumented Systems (SISs). SISs take a process to a safe state when predetermined conditions are exceeded. Commonly, they are used to shut down processes.

### ***Do I need to comply with IEC 61511 / ISA 84?***

Simply put, yes. There are two reasons:

1. In the USA, OSHA effectively requires compliance with the IEC 61511 / ISA 84 standard both for processes that are covered under OSHA's PSM regulation and for those that are not covered.
2. The IEC 61511 / ISA 84 standard has become good engineering practice and is being adopted around the world.

### ***What is the basis for claiming that OSHA requires compliance with ISA 84?***

OSHA has endorsed ISA 84 as a "national consensus standard" for the application of safety instrumented systems for the process industries in two letters from Richard E.

Fairfax, Director, Directorate of Enforcement Programs to Lois M. Ferson, Manager of Standards Services, ISA:

3/23/00, "Compliance with PSM and ANSI/ISA-S84.01 for safety instrumented systems"

11/29/05, "Use of ANSI/ISA S84.00.01-2004 Parts 1-3 (IEC 61511 MOD) to comply with OSHA's Process Safety Management standard"

OSHA states that ISA 84 is considered "a recognized and generally accepted good engineering practice" for SIS. Furthermore, paragraph (d)(3)(ii) of the PSM standard specifies: "The employer shall document that equipment complies with recognized and generally accepted good engineering practices". Thus, OSHA's position is that PSM-covered processes must comply with IEC 61511 / ISA 84 or an equivalent. OSHA does not specify or benchmark ISA 84 as the only recognized and generally accepted good engineering practice for SIS. In evaluating whether an employer's engineering practices with respect to SIS comply with PSM, OSHA stated they will consider, among other factors, whether the employer meets the requirements of ISA 84.

OSHA stated that if an employer documents per 1910.119(d)(3)(i)(F) (design codes and standards employed) that it will comply with ISA 84 for SIS and it meets all ISA 84 and other OSHA PSM requirements related to SIS, the employer will be considered in compliance with OSHA PSM requirements for SIS.

OSHA notes that PSM standard contains a number of requirements for equipment associated with a covered process including SIS:

Employers must document information pertaining to equipment in the process [1910.119(d)(3)]. OSHA's position is that this equipment includes SIS when utilized.

Operating procedures requirements of PSM, [1910.119(f)(1)(iv)], require the development and implementation of written operating procedures for safely conducting activities involving safety systems and their functions.

The mechanical integrity element of PSM covers SIS under 1910.119(j)(1)(iv) and (v).

The employer is required by 1910.119(j)(4) to conduct inspection and testing on process equipment, including SIS, as per recognized and generally accepted good engineering practices.

Note that OSHA stated that compliance with S84 does not ensure compliance with the PSM standard. Employers must also determine if SIS are needed to control the hazards of a process.

OSHA stated that it is also important to note that there are a large percentage of processes which are not covered by PSM which may include SIS covered by ISA 84 and the employer may be in violation of the General Duty Clause, Section 5(a)(1) of the OSH Act if SIS are utilized which do not conform with ISA 84, and hazards exist related to the SIS which could seriously harm employees.

***Where does the requirement to comply with the ISA 84 standard appear in OSHA's PSM standard?***

The requirement does not appear in the PSM standard. The PSM standard is performance-based. OSHA has provided a general framework for an overall process safety program with some key requirements. OSHA expects employers to comply with current recognized and generally accepted good engineering practices (RAGAGEPs or GEPs) related to process safety. As GEPs evolve so must process safety compliance practices.

***Is OSHA serious about compliance with ISA 84?***

Yes. They have cited companies for non-compliance. For example, an explosion occurred in April, 2004 at a Formosa Plastics Corporation plant in Illiopolis, IL. Five workers died, three workers were seriously injured, and much of the facility was destroyed. In October 2004, OSHA issued citations for 45 alleged serious and 3 alleged willful workplace safety violations and penalized Formosa \$361,500 (US Department of Labor, OSHA, Formosa Plastics Corporation, Inspection Number 305893679, Inspection Dates 4/24/2004 through 10/20/2004).

In part, the citations read:

The employer did not document that it's PVC1 and paste programmable logic controllers (PLC) and distributed control systems (DCS), installed prior to 1997, complied with recognized generally accepted good engineering practices such as ANSI/ISA 84.01, "Application of Safety Instrumented Systems for the Process Industries", the current consensus safety standard for such systems, in that the devices were not being maintained, inspected, tested and operated in a safe manner as no maintenance was being done on the units, no inspections or tests were done, and the access to them was not controlled.

The employer had not, as part of any PHA study, included a team discussion and review (for instance of the required safety integrity levels, as per ANSI/ISA 84.01) of its PLCs and DCS, critical control and safety-instrumented systems, used in PVC1 and paste production.

### ***What are the risks of non-compliance?***

SISs play a key role in preventing accidents that can have serious impacts on employees, property, the environment, and the company. The IEC 61511 / ISA 84 standard helps to ensure the risk of such accidents is managed. Non-compliance may endanger people, property, the environment and the company.

Citations are virtually certain as a result of an OSHA inspection. Note that OSHA's Chemical National Enforcement Program (NEP) is now underway.

Notwithstanding the regulatory risk of non-compliance with IEC 61511 / ISA 84, the risk posed by litigation that most likely would result from any serious accident where a SIS played or could have played a role is likely considerably greater.

### ***How can I get more information?***

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- *Mechanical Integrity Program Development and Implementation*
- *Mechanical Integrity Program Audits and Assessments*
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