1. Course Introduction

GAS DETECTOR FUNCTIONAL SAFETY

OVERVIEW COURSE

Institute of Instrumentation Control and Automation

Purpose

Course Introduction

TOPICS

Welcome to the IICA course on
Gas Detector Functional Safety!

This slide in each module gives you a quick overview of what will be covered.

Let's start!

Introduction of Course Participants

Please briefly introduce yourself

- name, organization, position
- background/experience
- what are your expectations of this course?

About the trainer

Bob Weiss

Functional Safety Consultant
- based in Melbourne, Australia
- provides training and consulting in functional safety

Qualifications
- BE (Chem) 1974, MEngSci (Control Systems) 1983
- Functional Safety Expert (TÜV Rheinland) 2006
- Certified Functional Safety Expert (CFSE) 2003
- member of SA IT-06 committee that maintains AS 61508 & AS IEC 61511

14.5 years with Honeywell Process Solutions
- Principal Consultant
- safety system standards compliance
- abnormal situation management etc.

24 years with ICI Australia/Orica and Monsanto
- developed standards for safe use of programmable safety systems
- responsible engineer for application of safety systems and control systems on major projects
- involved in numerous safety reviews of safety systems
- Technical Investigator for Royal Commission into Longford gas plant explosion & fire

Safety

Emergency exits

Evacuation location

Fire and Evacuation Alarm

Other issues?

Meeting Protocol

Please leave phones OFF or on Silent
- Leave room to take urgent calls

Frequent breaks
- Interrupt if you are ready for a break!
- Please return promptly

Contribute
- Feel free to interrupt
- Ask questions!
- Share your experiences!

Course Objectives

Introduce the concepts and terminology of Functional Safety, SIL, SIF and SIS and their applicability to design, supply and installation of laboratory gas detection systems

Briefly review the applicable standards and legislative requirements

Illustrate how to comply with *AS IEC 61511 Ed.2 Functional safety—Safety instrumented systems for the process industry sector*

- using a gas detector case study as an example

About IICA

Institute of Instrumentation Control and Automation

Non-profit Institute serving the professional interests of instrumentation, control and automation personnel across Australia

Aims to provide:

- Benchmarking through contribution to standards development
- Networking through exhibitions, technical evenings and seminars
- Education through training courses such as this one

Founded in 1944

Almost 1,000 members Australia-wide

Course provider under the TÜV Rheinland Functional Safety Program

- A one week course leading to a FSEng certificate from TÜV Rheinland

Course Logistics

Course materials
- handouts and course binder
  - see Index

Timetable
- 8:30 to 4:30 (or maybe a little later?)

Breaks
- morning & afternoon tea
- lunch about 12:30

Course material

This course is based on the 4-day IICA TÜV Rheinland Functional Safety Engineer course

We will skip over detail on many of the slides
- still useful for reference

Adapted for gas detection in many places but some specific process references remain
- should still be understandable!
- if not, please ask.

What is Functional Safety?

Part of Overall Safety
- freedom from unacceptable risk

Achieved by a Safety Instrumented System (SIS)
- E/E/PE Safety Related System in IEC 61508
- examples:
  - Emergency Shutdown System
  - Burner Management System
- includes field devices as well as logic solver

A SIS places or maintains a process in a safe state
- Process = Equipment Under Control (EUC) in IEC 61508
- implements Safety Instrumented Functions (SIFs)
- each SIF achieves a Safety Integrity Level (SIL)

Acronyms to remember: SIS, SIF and SIL !

Why Functional Safety?

Buncefield, England 11 Dec 2005

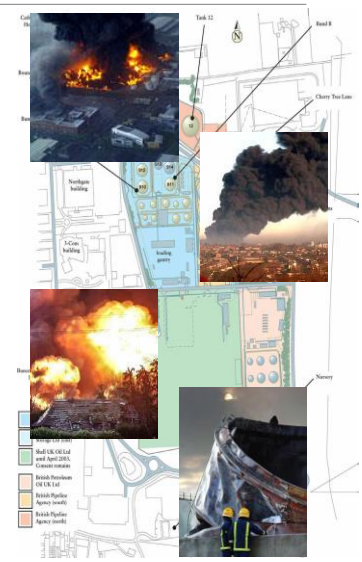
Storage tank level gauge showed constant reading

High level switch left in test mode

Gasoline tank overflowed

Mist exploded
- largest explosion in peacetime
- 20 tanks on fire
- burned for three days
- significant environmental impact
- hundreds of millions of pounds damage

Recommendation
- use IEC 61511



Summary

This module introduced course participants, the course itself and the term Functional Safety

For each module this slide will summarise the key points.

Functional Safety

- part of overall safety
- performed by a Safety Instrumented System
- that places the process in a safe state

Questions?