Process Safety & Loss Prevention Module

Computer Control — Safe Practice

Unit Code: CPE 6280

Computers control every part of modern chemical processing plants. It is vitally important that operators understand the hazards that can be associated with hardware and software errors. This four-day course gives you all the tools you need to minimise these problems.

An introduction is given to computer architecture. Requirements analysis and systems analysis with supporting tools are described followed by software concepts and tools.

Training is given in software and system testing and validation, software maintenance and redesign, and the development of fault tolerant systems. The standards required for safety critical computer systems are examined. □□□□

Other topics include the use of expert systems in design, operation and maintenance, and the application of database technology in safety critical systems.

Course Content

- **Computers** — what they are and how they can go wrong
- **Hazards in computer control** — introduces the concept of using Hazard and Operability Studies (HAZOP)
- **Modelling systems** — this covers various tools which are available and of benefit to the design of computer systems
- **Principles of safe computer control** — gives an introduction to the requirements of safe control systems
- **IEC 61508 / 61511** — gives a complete overview of the IEC 61508 and 6511 standards
- **Establishing integrity levels** — IEC 61508 and similar standards require the setting of integrity levels for safety
- **Sneak Analysis (SA)** — a technique for identifying design errors
- **Life-cycle specifications** — describes the design life-cycle of typical software-based systems and explains what is to be specified, by whom, and when
- **Towards safer industrial computer controlled systems** — a study of previous incidents and an introduction to a systems tool variation of HAZOP called HAZAPS
- **The PES checklists** — the HSE PES Guidelines contain a very useful and extensive set of checklists

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Engineering from Molecules