



## **Functional Safety: Alarm Management**

### **The Problem**

In July 1994 the Milford Haven Oil Refinery suffered an explosion that caused plant damage costing £48 million to repair, in addition to a substantial loss of production. Minor injuries were sustained by 26 people. Leading up to the event, there were several 'near misses' before the actual incident that occurred on Sunday lunchtime. At that time, few people were on site but if it had occurred on a weekday there may have been serious injuries and fatalities.

An HSE report into the incident identified a poor, unmanaged alarm system as one of the major contributing factors. Prior to the incident a lightning strike had occurred, which caused a severe disturbance to plant operation. For several hours after this the operators were heavily loaded with alarms at a rate estimated to be in excess of one every two or three seconds. During this period the operators failed to identify a valve that was stuck closed, allowing liquid to accumulate in a flare knockout drum. The drum overflowed, resulting in the explosion taking place. (HSE report)

Since then there has been a great deal of work put into avoiding similar problems occurring by applying best practice to the design of alarm systems

### **The Solution**

Your problems may not be as great as those outlined but can you be sure that the plant operation and the operators response to alarms is effective. On new and existing installations it is necessary to ensure that lessons learned have been applied to your alarm system to reduce the risk to personnel, the environment and the plant.

### **Improvement Strategies**

An GPO study is needed to determine the best approach to implementing an improvement philosophy that will reduce nuisance alarms during normal operations, and also during a process upset provide the operator with the right information allowing him to take actions to stabilise the process.

GPO can provide an improvement plan and an alarm philosophy and then work with the client to facilitate the alarm system changes.

Previous experience has determined the most cost effective approach to the management of the alarm systems ensuring that risks are fully explored.

An GPO engineer will work with operations staff to ensure that their knowledge and experience is fully utilized to analyse the process resulting in a successful project.

A typical project deliverable is expected to be:

- Alarm Management Plan
- Alarm philosophy
- A database file containing all of the alarms categorized and risk assessed
- Control System updated
- Operators Alarm Response Manual
- Alarm test and repair strategy
- Project final report detailing findings and recommendations.