

Nuisance alarm management



How do you know that your operators will always respond promptly and correctly to an alarm?

Poor alarm management is a serious issue and has been cited as a contributing factor in a number of major accidents including Milford Haven, Texas City and Buncefield. Guidance documents such as EEMUA 191 are recognised by regulatory bodies as good practice and the UK HSE in particular are increasingly prepared to intervene where alarm systems are not being managed effectively.

Nuisance alarm behaviour is very common on modern control systems. It devalues the alarm system and yet targeting nuisance alarm behaviour can be a 'quick win' for any organisation wishing to improve the performance of its manufacturing assets.

Addressing nuisance alarm behaviour is a quick win because:

- a. It helps drive down the frequency of alarms operators have to deal with. This reduces the workload and stress on operators and helps increase their confidence in the alarm system, meaning they are more likely to take appropriate and timely action when a genuine alarm occurs
- b. The discipline of regularly reviewing nuisance alarms often reveals maintenance needs such as equipment or instrumentation which is faulty, failing or simply not appropriate for the job. It can therefore help achieve a focus on beneficial maintenance activities

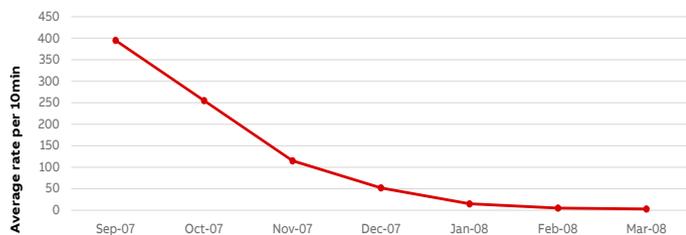
- c. In a well-configured system an alarm is giving early warning of a process excursion or other abnormal situation. Nuisance alarm analysis can be an important tool in improving the effectiveness of an alarm system as a decision support tool for operators because it helps improve the quality of alarm information presented. Because the right action is likely to be taken more quickly on more occasions this often leads to bottom line benefits such as less equipment damage and improvements in process up time, throughput or quality
- d. It is an essential element of your Process Safety Management (PSM) system

How do I know if I have a problem?

Do any of the following apply?

- Alarms that repeat frequently
- Alarms that have no defined response
- Operators frequently ignore alarms or acknowledge them without taking further action
- A high percentage of all alarms are due to a small minority of 'bad actors'

Then you probably have a nuisance alarm problem.



01 Nuisance alarm trend.

The nuisance alarm management service from ABB

Our nuisance alarm management service is structured as a support contract, renewable each year. It is based on top 10 alarm analysis and consists of three main components:

1. **Alarm logging.** Nuisance alarm analysis depends on the reliable capture of alarm statistics from the control system. Many DCS have their own historian system but this is usually not appropriate for alarm analysis either because the record is too short or is not stored in a format that can be analysed effectively. For this reason we normally recommend the installation of a dedicated alarm logging and analysis package. We will either work with the existing system if suitable or we will install and maintain a dedicated PC running ABB's Smartlogger suite of software
2. **Routine analysis of the top 10 statistics, typically every month.** The output is a report covering the statistics themselves, an analysis of each alarm's behaviour and recommendations for corrective action. This report should be used as an input to maintenance planning, thereby driving continuous improvement of the alarm system's performance
3. **Site visits.** Optionally we will visit site periodically, typically every quarter during a year's support contract. This gives the opportunity to review progress with responsible managers and help identify corrective actions for any bottlenecks in the review process. This also gives you the opportunity to draw on the extensive experience of our alarm management consultants in other aspects of alarm management

Benefits

Nuisance alarm management can bring significant benefits when applied as part of an improvement initiative. In summary the likely areas of benefit include:

- Process Safety Management
- Production quality, throughput and OEE
- Maintenance excellence

In one case study a reduction in alarm rate from an average of 400 down to less than 5 alarms in a 10 minute period has been achieved. This is a reduction of over 98% and brings the systems concerned much closer to the rate of 1 alarm per 10 minutes recommended by EEMUA 191. (See figure 1).

Our client reports that the number of unscheduled process trips has dropped from 25 in 2007 to less than 6 following the alarm reduction programme, resulting in a **saving in excess of USD 2M in lost production!**

Without an effective alarm management strategy it is not possible to be certain that operators will respond correctly when there is a problem. This is especially important for any safety-critical alarms. The UK's HSE have also made it clear that doing nothing is no longer an acceptable option:

"Better alarm handling should be seen in an overall context of encouraging companies to seek the best opportunities for improvement rather than just to prospect for problems alone. The key message is that it is never going to be acceptable to conduct one review and implement the conclusions. This has to be part of a continuous process of improvement, just as it is with most other business areas such as quality. Why manage safety any differently?"

Source: A paper entitled 'Better Alarm Handling - a practical application of human factors' by John Wilkinson and Dr Debbie Lucas of the HSE.

Why ABB?

ABB Consulting has unrivalled experience gained from over 30 years with one of the world-class manufacturing organisations of our time. This includes delivering focused alarm management improvement programmes for manufacturing clients in both batch and continuous processes. We also have access to the wealth of experience available in ABB worldwide, meaning we are capable of delivering a complete service, leaving you free for other priorities. Please contact us for information on the other components in ABB's portfolio of alarm management services.

Total alarm management from ABB: Turning alarm management into profit