

How are alarm management and situation awareness related?

Inadequate situation awareness has been identified as a primary factor in accidents attributed to human error. Complete and accurate situation awareness is essential in control rooms where complexity on the human decision-maker is a concern.

Well-designed control rooms promote an environment with high levels of observation and situation awareness. When operators and controllers have a high level of situation awareness, they are more alert, prepared, and have an accurate perception of the current condition and understanding of various trends and key performance indicators.

Alarms and Situation Awareness

Alarms exist to make operators aware of abnormal situations. They are one of many resources used to communicate the condition of an environment. Alarms are intended to help operators target the source of an upset and guide them through its resolution. Alarm management helps control and optimizes the information provided by the alarm system. It is a methodical way of diagnosing and measuring alarm performance on a continuous basis.

Alarms are not the only way to create awareness. Effectively using human-machine interface graphics can create such an advanced state of awareness that many alarms will be rendered obsolete. Ultimately, when you question the validity of an alarm, you should determine if there is a more effective way to make the operator aware of the situation.

Alarms are victims of their own simplicity. It is much easier to add or change an alarm rather than considering the larger picture. For every situation we think the operator should be aware of, we add an alarm, often without considering the consequences - or other options. Misunderstanding the relationship between alarms and effective human-machine communications has led to the need for alarm management, where we force ourselves to evaluate the alarmed condition and strive to find the most effective way to communicate it.

Fortunately, alarm management is very straightforward. Using a good diagnostic tool, you can find alarms of questionable value and systematically evaluate and reduce them. Adopting this process of "continuous rationalization" as a regular practice will result in an alarm system that is well configured and very effective at maintaining awareness for operators. It will also ensure that operator graphics and other means of communicating plant condition are better used.

Establishing clear situation awareness for operators gives them the ability to keep things running smoothly and avoid upsets. This improves the stability and quality of output, reduces equipment wear, minimizes unexpected environmental discharge, and assists in the prevention of unscheduled downtime and incidents.