

Case Study

Alarm Management



BACKGROUND

The primary function of an alarm is to alert an operator to an abnormal situation requiring a timely response to prevent further escalation of the condition.

The alarm system is a safety barrier, which not only provides a layer of protection for personnel and the environment but also helps improve production availability through the early identification of a potentially more significant equipment failure or process upset. Efficient alarm operation relies on managing the alarm in such a manner that it aids the operator i.e. it is relevant, concise and has a defined response.

There are numerous historic examples where bad alarm management has had a catastrophic effect on life, the environment or a business's liquidity (e.g. Three Mile Island (USA), Longford Gas (Australia), Texas City (USA), Buncefield (UK)) and this has resulted in the introduction of industry guidance and standards based upon lessons learned, such as EEMUA 191, BS:EN 62682:2015 and the ASM Guidelines.

THE CHALLENGE

In 2015, the alarm system performance of a major international oil and gas exploration and production company was the subject of a senior management audit against company corporate standards and guidelines. The audit concluded that with over 27,000 configured alarms, 800 standing alarms, frequent daily alarm counts of more than 7,000 alarms in 24 hours and alarm flood issues associated with major equipment trips, that the alarm system had failed to meet the company's own key performance indicators.

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CORE'S SOLUTION

CORE reviewed the standing alarms in detail to establish the function of the alarm, the time it had been in place and the benefit to the operator.

Many alarms were discovered to be on redundant equipment or equipment that had not been returned to service following a major production shutdown or they were secondary / consequential alarms. Alarms providing no benefit were removed and a procedure developed to allow genuine alarms likely to be present for more than 24 hours to be 'shelved' (removed from alarm list).

In parallel with the Standing Alarm review, CORE compiled a set of rules to categorise what an alarm is and if there are ways to allow grouping based upon criteria such as similar function or operator response. Once agreed with the client, these rulesets were applied by CORE to the configured alarms to reduce the overall quantity.

This revised list was reviewed with control room operators and the priority of the individual alarm revised based upon the consequence of failure to act and the actual response time available. Finally, an alarm response manual was developed to provide guidance to the operator upon alarm initiation.

RESULTS



26,171 configured alarms reduced to 4,667



800 shelved alarms reduced to 135



Alarm count per 24-hr period reduced by 96% in the first 6 months of 2018



Alarm priority distribution better aligned with corporate guidance