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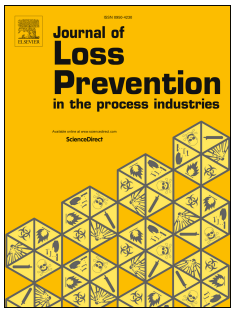

Industrial alarm systems: Challenges and opportunities

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Industrial Alarm Systems: Challenges and Opportunities

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Abstract
Industrial alarm systems are very critical for the efficient and safe operation and control of plants. Alarms are used to inform the operator about possible process deviations from the normal so that the operator can take appropriate corrective action. Alarm activation and the corresponding response from the operator together serve as one of the critical layers of protection during the occurrence of a process fault. With the rapid advancement in control systems technology over the past few decades, the number of process sensors deployed for a particular plant has dramatically increased. In addition, due to the ease in configuring the alarms in control systems, the number of alarms in a plant has also gone up. This has led to poor system performance, increase in the operator workload due to alarm overload, and catastrophic incidents in some cases. This review paper discusses such issues, provides details about the existing regulations, standards and guidelines, and challenges related to alarm management. In addition, it summarizes some of the open research problems in the area of effective alarm management.

Keywords: Alarm management; alarm flooding; abnormal situation; human-machine interface; chemical industry; process safety