Advanced logic for alarm and event processing: Methods to reduce cognitive load for control room operators

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Abstract: In modern control rooms operators monitor complex operations which are highly automated and optimized. In normal conditions the automation system keeps the processes at an optimum. In abnormal situations the automation system might generate an avalanche of alarms and messages to which the operator needs to respond in the most appropriate way. Some of these alarm avalanches have lead to serious incidents, with damage and injuries as a consequence. Further to such an incident, guidelines have been published to reduce the workload of operators. This paper discusses the origin of the alarm overload, the measures taken in recent years and the advanced methods which are being developed and applied in industry. More attention should be paid to operator guidance to deal with and to avoid abnormal situations. Model-based reasoning and expert systems offer a good basis for such operator guidance. Recent data mining techniques make it possible to shorten engineering of such decision support systems. Further steps can be taken to automate the workflow between data mining tools and decision support tools for better operator guidance.

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