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Who's alarm system is it anyway?

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Introduction

Often, large Automation projects have a number of parties involved such as the end user of the system, maybe some design consultancy/client engineer representation, the EPC responsible for delivering the overall project (who then in turn sub contracts to a systems integrator for the DCS platform), and possibly multiple bespoke OEM suppliers providing specific packaged equipment such as compressors, boilers and analyzers, etc.

With so many organisations involved with differing responsibilities and commercial obligations, the delivery interactions can get complicated and the decision making fragmented. As such, the answer to the question “*who's alarm system is it anyway?*” can get lost and delivery decisions regarding alarm management are left to the discretion of the EPC. As a result, all too often the end user receives an “out of the box” vendor solution, rather than the alarm system they actually need.

Drivers for improving alarm management

The regulatory authorities are becoming increasingly intolerant of poor alarm system design and associated human factors thinking as being an afterthought in the project FEED process, since most major incident investigations cite poor alarm handling as a significant contributing factor.

The Alarm Management standards and guidance (IEC 62682, ISA 18-2 and EEMUA 191) all recommend a lifecycle which includes steps associated with project delivery. The standards set out the requisites for detailed design, including the importance of developing an Alarm Philosophy and a subsequent Alarm System Requirement Specification (both unique and specific to the needs of the end user).

Experience shows that such comprehensive documents rarely get created during the project lifecycle. Alarm philosophies get written retrospectively and alarm system requirement specifications frequently appear as no more than a small section within the overall user requirements specification for the Distributed Control System (DCS). This omission leads to too many assumptions by the systems vendor, trying to fill in all the blanks. Important alarm requirements end up being set to default values, or worse still, left out altogether.

Even when a process trip and alarm schedule is produced, this can still have its issues. Often the alarm thresholds are based on provisional understanding of the process chemistry and under the execution

and delivery pressures, the actual operational alarm response necessary to control the plant is not given full consideration. Such an alarm system is likely to cause many operational frustrations.

Equipment vendors have adopted standard local control system platforms for their packages and given their investment and commitment to these standard offerings, such vendors are normally resistant to any changes without significant cost penalty to the end user. This typically results in projects with a number of different alarm systems usually inconsistent with the conventions of the main DCS.

This can result in a high volume of nuisance alarms and potential mal-operation of the process plant.

Getting it right?

End users need to re-assert themselves as the true owner of their alarm system from day one and throughout the execution of the project, since their alarm system will be one of the primary operational mechanisms used for driving their plant.

The alarm management standards describe the need to develop a comprehensive master alarm database (MAD) which is more than just the DCS alarm configuration. The MAD should also contain the decision-making processes and the operator responses that would form the basis of the operational Alarm Response Manual (ARM). From this the strategy for how vendor packages will be integrated into the alarm system can be defined at the very early stages of project execution to avoid issues and any confusion in requirements.

Alarm rationalisation reviews at various stages of the project will ensure the quality, consistency and relevance for the alarms being configured, particularly during commissioning to ensure all temporary alarms are removed.

Essentially the project should follow the lifecycle as defined in the alarm management standards, in just the same way as it follows all the other associated project execution methodologies. This will ensure that the alarm system is in good shape from the start and will be easier to maintain throughout its operational lifetime.

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For further information see [Alarm management lifecycle services](#)