Master Alarm Database (MAD) to efficiently rationalise alarms

ABB deployed a MAD to rationalise 250,000 alarms very efficiently using a minimum of client resource.

ABB were engaged to manage the alarm rationalisation for a client who operates a number of offshore platforms. A key focus of the project was to develop an Alarm Response Manual (ARM) that the client could then access directly on the Integrated Control and Safety system (ICSS) operator interface.

The aim was to standardise on an alarm solution across all assets and have a review process to manage both full rationalisation projects (10s of thousands of alarms), as well as small projects (tens of alarms). The review process needed to be simple to make the most of a limited pool of experienced people (although the client had a good pool of people they were being stretched by work on other projects).

Solution
ABB's MAD functionality allows the import of data from a number of control systems. To date, for this client, data has been imported for 4 offshore platforms with a variety of different ICSS. The number of available alarms configured on each system ranged from 20,000 to 70,000. All were loaded automatically into a review tool for rationalisation. Initial reviews were carried out in MS Excel, but it was soon concluded that a more streamlined and automated approach was required.

It was therefore decided to develop an in-house tool which would also have the benefit of improving and enhancing project deliverables.
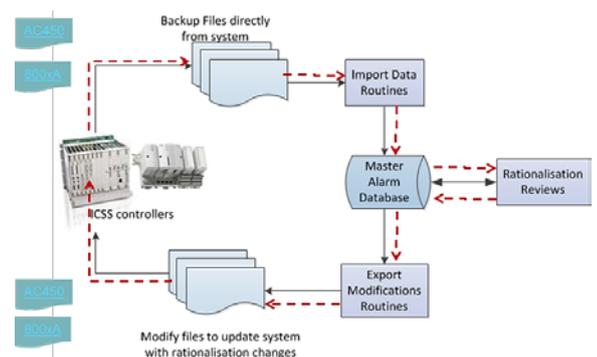

ABB developed a MAD to facilitate formulation and application of a consistent alarm rule set across all platforms.

ABB were engaged to mentor and lead the alarm rationalisation process. ABB's methodology involved managing the client teams, to use the right resources at the right time to ensure the least disruption to the day to day activities of the control room. The review process was with client representatives but the dedicated, specific and streamlined database allowed database pre-population ahead of review meetings.
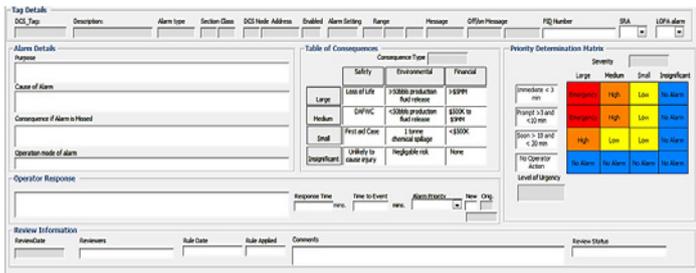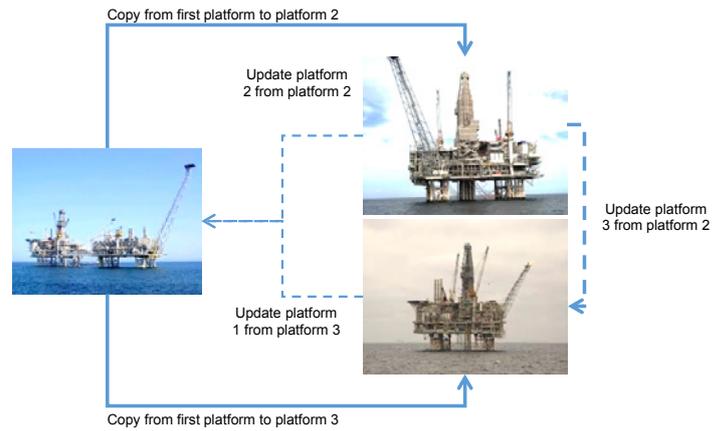
Alarm review data was presented to the review team so it could be quickly read and understood, allowing the focus on the rationalisation of the alarm. By presenting the information in this way and providing robust copy and paste utilities with selection criteria, the efficiency of the team increased by at least an extra 33%. Another significant change was the quality of operator responses that were recorded in the ARM.

The data structure of the MAD extended to utilities for copy and paste from multiple databases. This provided a means of taking what had been done on previous reviews for other platforms and applying it to the next asset. In this case the review team had only to inspect and confirm differences and efficiency savings increased to > 60%.

A key project benefit of developing this dedicated specific and streamlined database for effective alarm rationalisation was a reduction of the project delivery schedule by up to a third. Other benefits included the ability to output the changes in a format that could easily be used by the ICSS to implement the changes. Undertaking the changes in this way saved the time it would take to manually input these changes and eliminated the potential for human error.

100% verification of the changes made to the alarm priorities on the ICSS was made possible by taking backups after modification and running verification routines in the MAD.

The ARM needs to be maintained throughout the lifetime, so ABB developed a simple set of utilities based on the MAD that could be used to maintain and develop their investment.

This is a simple tool that can be used directly by the client or their design houses but can also be used by the ICSS suppliers to test changes to the system.

Benefits
- Reduced reliance on limited resources
- Review process productivity and cost savings of > 33% compared to previous reviews
- Re-use of data across other platforms' ARMs
- Risk reduction through elimination of manual data entry
- ARM content generated for direct input to Alarm Help on the ICSS
- No shutdown required for implementation