The future is integrated operations
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Automation vendors, EPCs and End-users can no longer ignore integrated operations. Here Colin Pearson of ABB Ltd, puts forward operational, technical and organizational arguments as to why this approach is important for the future of the process industries automation strategy.

No longer is it a matter of cost whether to include integrated operations as part of the overall long term automation strategy, its becoming a matter of necessity. ABB is seeing a drive towards integrated operations from the initial outset of conceptual project thinking all the way through to operational excellence as the basis of long term operations.
Several factors are driving this rather refreshing new way of thinking:

The reducing engineering pool, and, as a consequence, the difficulty of getting the right people in front of the systems to ensure that all important production uptime.

Providing remote operation and technical support to remote plants. Where it is undesirable or impractical to have permanent manning with significant technical resources for the different disciplines involved.

The locations of these facilities, which is becoming more important as some plants/offshore platforms are becoming more remote or in environmentally unfriendly locations for permanent manning.

Ever present demand to drive down capital expenditure (CapEx) and operation expenditure (OpEx).

EPC’s and end-users having to integrate their engineering resource, due to cost/manning issues, which is being made easier due to integrated nature of the electronic engineering database tools.

Ever tighter project execution schedules.

Environmental issues such as the volatility of the oil price as well as the ever increasing demand for energy and energy efficiency (the demand in China alone is expected to increase from 105% to 195% - source IEA forecast 2006-2030)

Operational excellence as a main project driver as operations are now being seen to be the key to successful long term profitability.

Business decisions need to be made with real-time information and in a timely fashion to take full advantage of process variants and market conditions.

The shifting experience and expectation of the IT savvy ‘operator’ generation about to take over from the existing pre-PC operators.

Requirements for central production operational staff to have visibility of multiple process plant assets.
The advantages of integrated operations

These issues are real and are here today and are facing almost every automation project. This means the future needs to be addressed now. As almost every project today is looking for operational periods of between 20 – 30 years, this traditionally conservative industry needs to make some rapid changes to ensure systems can be engineered, manned and operated during the required periods, whilst keeping pace with technology and market demands.

ABB is seeing some forward thinking EPC’s, and owner/operators already planning changes to their automation strategies to account for these future challenges and each one is driving toward ‘Integrated Operations’ as a means to prepare for the future.

We are starting to see the same barriers which precluded integrated safety and automation some years ago being broken down and recognition of the advantages of now having an integrated automation, electrical and telecommunications systems.
The advantages of a fully integrated solution for process automation, safety, electrical control and power management using a common system and protocols are many and as the reliance on Asset Optimization grows the benefits can be self evident. These include:

Operators are now able to have a consistent look and feel across the whole platform and therefore the entire plant assets. Including common alarm lists and asset management reporting for automation, electrical and plant assets.

Common Engineering Tools are now possible for configuration and maintenance.

The use of IEC61850 as a standard for the integration of Intelligent Electrical Devices (IED’s) reduces risks and cost.

Computerised Maintenance Systems (CMS) can now manage the whole asset whether it be a lowly field instrument, Intelligent Electrical Device (IED) or CCTV camera through to asset monitoring of process plant units such as heat exchangers, rotating machinery or even process systems (through event early warning packages). From the HMI, a system user can now see, from the integrated alarm and asset systems, a fault occurring (regardless of system) and generate the work-order without having to leave the user workstation. This has obvious benefits when MTTR is an issue

Integrated networks allows time-synchronisation across the whole facility. This is imperative in fault rectification upon a plant shutdown as the integrated systems can all now appear in the same alarm and event lists at 1ms resolutions. No longer are the operators wondering what was the initiator for that costly shutdown or trying to mate multiple alarm and event lists which have been generated with a different time source

Documentation can now be made available from all user workstations so users can access information on automation, electrical or telecommunications systems giving the right information where and when needed

Video conference facilities between plant operators and remote experts.

Backup/restore functions now apply to the whole solution. Previous systems would have multiple backup/restore tasks and this often lead to some engineers knowing about one system but not all. Now it is not only possible to automatically make one system backup its also possible to have that backup written to a large storage device connected on the common Ethernet network
These systems will change the way operational staff (users and maintainers) carry out their business. System users now have more information at hand than ever before so they need to be trained to use it. This has been made easier due to the integrated nature and consistency in operation throughout, so users have never had a better opportunity to prepare their skills for future operations.

We currently work with the generation of operators/maintainers who are of the IT savvy generation and therefore will take to these solutions with remarkable ease. This next generation can then be left to concentrate on the process, its operation and maximizing productivity, rather than the technology to achieve this.
Fortunately, over recent years, some automation companies have positioned their products to enable future systems and technologies to take advantage of this new way of thinking and the automation companies have been trying hard to expedite this way of thinking to match the rapid pace of technology improvements. ABB with 800xA, Honeywell with Experion and Yokogawa with their CentrumVP are arguably out in front in this respect.

Unfortunately not all customers are signing on to this integrated operational philosophy (or cannot afford to change their internal systems to take advantage) but over the next few years will find these customers as the exception rather than the rule.

Not only have the automation companies had to look into the future and position their products accordingly but the engineering tools used by EPC’s and end-users have seen an equally impressive race towards integrated operations. Integrated database tools are now being used by EPC’s and end-users as a means to drive down their own internal engineering costs and it’s becoming more and more important that automation companies are aligned with this engineering approach. Working in their automation, safety, electrical and telecoms silo’s is seen to be too expensive an approach these days (on both sides of the fence).

These tools also give a consistent solution enabling the end user to minimise the Total Cost of Ownership (TCO) as well as minimizing that all too common “re-engineering” due to changing scope and process requirements. Similarly a non-integrated solution does not optimize CAPEX costs and therefore makes an EPC uncompetitive against other EPC’s that do take this approach.

To some extent this is also going to drive a restructuring within the automation companies. Customers are looking for a single point of contact and if they are moving this way with their engineering and operational philosophies then so must the automations companies, particularly ABB with a product portfolio of automation, instrumentation and electrical equipment and solutions that is so diverse. This is not a bad thing and can only create a better more streamlined organization.

Products like 800xA provide the platform to take full advantage of this new way of working and will ensure engineering as well as operational excellence being driven by ABB’s clients in both process automation and power applications. All pieces of the puzzle must be in place to take full advantage and unless the philosophy is adopted from the outset then there will always be hurdles to overcome which will be both costly and timely to rectify.

To some extent the seeds of operational error are laid at the procurement stage. Often procurement dictates that, for cost comparison purposes, various sections of a solution needs to be held up and cost compared across multiple suppliers.

The fact that one supplier may only be supplying a ‘black-box’ and not a solution is often lost and by the time many black-boxes are agreed upon the fact these will need to be interfaced and then used in the operational environment for the next 20-30 years is also often lost.

These are the contributing factors to operational error, much more than operators not knowing what to do or not understanding a process. Procurement strategies often have a knock-on effect for operators years into the future by increasing the level of system complexity and operator workload.

An example of this is often seen when EPC’s, user/operator companies purchase telecommunication systems. These request for quotations often arrive for the individual systems (and this can be as many as 16), which means that each one needs to be treated as a separate system to achieve a compliant offering. This disparate nature then has to continue through the documentation phase and then on through engineering. The cost to integrate these systems is often not part of the procurement process and can be a hidden cost which can make the difference between a successfully executed project and one that fails. Then the system users will have to deal with this for the next 20-30 years.

These issues are evident, to some extent, in every production plant currently in operation and is why operators are the biggest source of $ loss. Through not having clear concise information regarding all the process assets to hand to make informed decisions. This needs to be tackled by all participants of a project from procurement to operation and its often the projects where operational staff are embedded within the EPC engineering team which come out on top where operational excellence is required.
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