Software for Facilities Safety:

E.ON Kraftwerke GmbH creates standardised safety processes for facilities maintenance

Hanover-based electric utility E.ON Kraftwerke implemented integrated, standardised facility maintenance and safety procedures based on SAP for Utilities industry solutions. By re-engineering these business processes, the company has achieved incredible added value across its operations. By **MANUEL OKROY**.

Power plants in Western industrialised countries must operate in absolute safety. In Germany, for example, the country's extensive body of rules and regulations prompted E.ON Kraftwerke to implement a quality assurance system in which every stage of testing, construction and operation of each of its facilities can be monitored by the government. The idea behind such a strong government oversight role is simple: *safety is more important than financial gain*.

Safety and maintenance do, however, have an undeniable economic impact. The longer individual power plant blocks remain shut down, the more time consuming and costly the complete maintenance process. "Being off-line – even for one day – means an average production loss of more than €100,000," says Walter Kienle, head of Solution Management for Enterprise Asset Management at SAP. "The immediate result of precise planning, management and execution of maintenance work is a dramatic reduction of costs."

With the extended functionality for work clearance management (WCM), the SAP software addresses the myriad of safety issues involved in the planning and execution of maintenance work. Although they are called 'work clearance' or 'tag-out / log-out' processes, a more descriptive name would be 'software that monitors safety compliance.' But WCM functions are not limited to clearing sections of a power plant for maintenance work. In fact, it actually takes the process one step further by monitoring, logging and managing all safety measures.

Required technical facility maintenance – inspection, repair and maintenance work – can only be completed once all work safety measures are finished. With the SAP software, maintenance workers enjoy the safest possible working conditions. Environmental compliance guidelines are met and overall facility integrity is ensured.

As Walter Kienle describes it, "Work clearances isolate technical objects for the duration of maintenance work. Similarly, special tests can be separated electrically or mechanically from other areas within the facility. The entire clearance process can also be run on any mobile device, eliminating all paper processes."

The WCM application from SAP is currently in operation in over 70 facilities worldwide, including 45 fossil fuel and 15 nuclear power plants, as well as 15 oil platforms and several subway systems.

This includes the power plant company E.ON Kraftwerke in Hanover, which has introduced the software in 17 of its facilities. The company operates 30 conventional power plants for the E.ON Energy Group in Germany, and its coal, gas and oil power plants generate about 15,000 megawatts annually, and more than 50 billion kilowatt hours of electricity. Annual revenues for 2004 were €2 billion.

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E.ON Kraftwerke GmbH was created by a merger of the PreussenElektra Kraftwerke AG and Bayernwerk Konventionelle Wärmekraftwerke AG. "With a background like that, you can imagine what our starting point looked like," says E.ON Kraftwerke project manager Norbert Stoll. "Facility maintenance processes varied from plant to plant. Each facility used automation, but in different ways with a lot of incompatible procedures and software systems. The decision of the E.ON Kraftwerke management to adopt a fully integrated business platform was crucial."

Making Process Quality Improvement a Key Goal

The newly merged E.ON Kraftwerke had to deal with a very heterogeneous IT landscape that had multiple interfaces and data management redundancies. Past attempts to adapt the various pieces of legacy hardware and software helped maintain operability, but they did not provide any real functional improvement. Each system required its own support know-how, and the business applications of the individual plant divisions, which were only partially available, served different functions. Their usefulness varied greatly. "The sheer number of interfaces was a nightmare for everyone involved with the system. These 'interfaces' were often nothing more than an actual person. Many processes were basically half-automated," says Stoll of the situation. "Above all, we wanted to ensure work safety by achieving formal, integrated, comprehensive communication."

In response to the growing challenges, E.ON Kraftwerke management launched Project BFS@EKW to review all available options and to implement the appropriate business solution. The plant maintenance and work clearance management applications from SAP emerged as the clear winner. Because E.ON Kraftwerke had already implemented a company-wide SAP business solution, the benefits of a universal application and integration platform and shorter turnaround times for adaptation and maintenance had already been realised. The need to accommodate multiple systems with tedious interfaces was also eliminated.

Not surprisingly, the actual status of processes within the merged company and its various business areas resulted in different maintenance task workflows among E.ON's plant divisions. To remedy that, a target process definition was adopted, allowing all processes to become more precise. Data could then be stored in the SAP

E.ON Power Plant: Advantages of Standardised Maintenance Processes

- System breaches are eliminated
- No redundant functions; no interfaces
- Integrated process support for technical and business management
- Improved planning capabilities
- Optimised procurement
- Automatic ordering procedures and billing of services
- Seamless integration with outside firms
- Standardised, high level of safety in all power plants
- Integrated technical and business tasks

system and solutions could be adapted to specific needs within E.ON Kraftwerke.

Bridging the Gap Between the Business and Technology Worlds

E.ON Kraftwerke then decided to embark on one of the most ambitious, integrative projects that the company had ever undertaken. At first glance, it was the software that posed the biggest challenge. But it actually went much further than that – SAP software actually helped E.ON Kraftwerke completely evolve its processes. The maintenance department and materials logistics were given a common interface through the plant maintenance and work clearance management applications, which meant that procurement and vendors were fully integrated. And because there had never been a WCM in place, the changes were dramatic, particularly across the company's divisions. “Successfully bridging the gap between the business and technical worlds meant a huge win for our maintenance processes,” says Stoll. “Maintenance subcontractors – in our case the subsidiary E.ON facilities management service – and stock supplies are stored directly in the system. We no longer need to enter orders by hand. All processes are much clearer because they’re based on rules – which means that the system is safer and faster. Thanks to today’s fully structured processes, short-term shutdowns – planned or unplanned – are possible. And we don't need additional personnel.”

> “For power plant operators, a well planned approach to facility safety is a business asset – a competitive factor and a central task for management”

The solution gives E.ON Kraftwerke a thorough overview of its facilities and maintenance resources. “With SAP software, we can optimise processes and minimise risks,” says Stoll. “We have quick access to all facility-specific information and structure data, which makes the ‘tagout’ process – the shutdown of individual power plant blocks for maintenance tasks – much easier. But the maintenance processes themselves have become much more structured and smooth.”

The next expansion stage at E.ON power plants is already being planned. An interface to the control and communication platform is being developed which will allow safety system notifications to flow automatically and directly into work order documents for the maintenance department over SCADA (Supervisory Control And Data Acquisition).

Prepared For the Future

Because the software connects all safety and maintenance relevant processes with the company-wide ERP system, maintenance tasks can also be calculated in terms of business size. They can also be optimised from a cost standpoint without compromising operational safety. “For power plant operators, a well planned approach to facility safety is a business asset – a competitive factor and a central task for management,” emphasises Stoll.

E.ON Kraftwerke is confident that the transparency it has achieved by integrating all of the company’s maintenance work will make it even stronger in the future. “To succeed, you have to be able to run company-wide, standard safety procedures that integrate all processes, from managing power outages to billing and maintenance service,” notes Stoll. That has a direct effect on profitability: The warehouse, for example, now receives on-time notification that maintenance is being performed and that materials are needed; and IT costs sink because the overall system has been simplified. “But the actual savings are not the most important thing. Far more important is the future stability of our processes: Today, E.ON Kraftwerke can react much faster to changing conditions. Changes in legal compliance, mergers, new company divisions, reorganisation and outsourcing are daily events for a global power plant operator. With our company-wide maintenance and work clearance management solution, we’re well prepared for these organisational challenges,” explains Stoll ■

Work Clearance Processes by Mobile Device

With SAP’s plant maintenance and work clearance management applications, the tagging and untagging of work clearances with a mobile device is possible, eliminating paper-based processes. For work clearance processes, a work clearance document is crucial: It contains the sequence of steps that are necessary to conduct a ‘tagout’, i.e. to clear a facility for maintenance. The clearance list serves as a formal basis for work to be done. With it, the ‘clearance’ (i.e. the ‘untagging’), is logged and verified.

Running work clearance processes over a mobile device eliminates having to fill out documents by hand, which speeds up processes and increases worker and facility safety.

With ‘mobile’ work clearance, validation processes are automated to the greatest extent possible, ensuring that individual safety steps can be carried out safely and without conflict. The clearance list is downloaded onto the mobile device, processed, and then uploaded into the system where it is archived. Completed safety checks can be confirmed immediately, on location, to the central system where the facility is then put back in operation.

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