PROCESSVUE
Alarm Management Without Limits

Biomass Power Station
Case Study

ProcessVue improves alarm management and KPI reporting at biomass power station

By implementing new alarm management and KPI reporting software from MAC Solutions, engineers at a UK-based biomass power station are now able to easily and quickly identify KPIs for alarm trends and to analyse the root causes of plant upsets (i.e. events that lead to a loss of production).

ProcessVue is a suite of software from MAC Solutions that provides clear, relevant and prioritised information to plant operators, supervisors and managers, enabling them to make better-informed decisions about their processes and plant safety. The software combines the latest communication, data logging and reporting technologies with more than 30 years' experience in design and implementation of Alarm Management and Printer Replacement software. ProcessVue can be used as a standalone application or to bring together multiple disparate systems onto one common platform.

The architecture of ProcessVue has been designed to enable interfacing with almost any control system, bringing all data into a standard configurable format. This allows simple Operator Sequence of Event [SOE] display and high level KPI reporting and analysis. These disparate systems might include SCADA systems, Distributed Control Systems, emergency shutdown, fire control, buildings management or any system that can output data in an ASCII format. With ProcessVue, all alarm sources are put into a standard, open format so that operators can view the KPIs without the need to write complex code or script.

The UK-based power station operates on a Siemens' PCS 7 DCS/SCADA system, which handles all process data and alarms. As an efficient, lean power station, it is critical that the site's IT systems enable the control and instrumentation engineers to access process data and alarms quickly and easily, particularly if they need to report to higher management on a recent plant upset. Power stations typically witness thousands of events each day that need to be recorded, as well as safety-critical processes that need to be monitored and managed in terms of process alarms.

The power station initially approached MAC Solutions to ask for help in providing easier, faster access to plant process data. Within days, MAC Solutions had implemented ProcessVue at the site, enabling the power station's engineering team to access process alarm data and KPI reports securely and safely from the plant control room and from anywhere via an Internet browser. ProcessVue allows the team to view the sequence of events leading up to a plant upset. Engineers can then export this data in Microsoft Excel format and email it to senior management.

If the power station has a trip on a safety-critical system, for example, as part of its engineering management processes, it needs to record this for audit and reporting purposes. A good example is the boiler drum at the site, which acts as a storage vessel, ensuring that the boiler furnace tubes are full of water at all times. The drum also feeds steam to the superheaters and ultimately to the turbine. This vessel must never run dry as this would cause damage to the boiler. Similarly, if the drum was to overfill, this could severely damage boiler superheater tubes and the steam turbine. Therefore, the water level in the drum is continuously monitored and controlled using level sensors. Should the drum level fail, the engineering team needs to ensure that the plant shuts down safely and that any such event is recorded. All safety-critical processes at the site are therefore monitored and recorded using ProcessVue.

Connection from ProcessVue to the Siemens PCS 7 system is via a serial connection from the plant's primary and secondary business IT system. Outputs are taken from a serial interface into the ProcessVue® server. This is then linked to the business enterprise-wide network. Two identical feeds are used, one redundant and one live feed, which provide the power station with a back-up system.

MAC Solutions implemented three ProcessVue software modules at the power station: Collector, Archiver and Analyser.

ProcessVue Collector is designed to connect to multiple current and legacy control systems. The software module runs as a Microsoft Windows Service, collecting data from various input types, including RS232 (with specific drivers for Honeywell and Foxboro IA Systems), TCP/IP Ethernet, UDP, File Monitor Text, CSV and OPC A&E, which are widely used by SCADA and DCS vendors.

Archiver is designed to connect to a Collector and parse (convert complete string into individual fields) the incoming data into record fields for writing to the SQL database. In addition, Archiver provides many different features designed to manipulate the parsed data and add real value to the basic alarm string.

ProcessVue Analyser is a business intelligence software module, which offers a wide range of high level reporting features, including event reporting, frequency analysis, standing and chattering alarm reporting, operator response times, customised reporting, etc. The Analyser Web Client enables the presentation of EEMUA alarm-based KPIs through dashboards.

The power station also uses a frequency counter within ProcessVue, which can help to identify any nuisance alarms, which can then be targeted for rectification or repair, as these can often hide genuine alarms. If the software didn't help to identify these, the risk is that key events could be hidden within a nuisance alarm shower. In the first month after installation, ProcessVue enabled the power station to identify nuisance alarms, which in turn reduced alarm load by 30%.

In addition, ProcessVue automatically sorts out the text string of each plant alarm and tells the engineering team the status of these alarms, including whether the alarm is a first-stage Warning or a second-stage Alarm.

Typical KPIs at the power station include the 'load factor' (i.e. actual plant output versus production availability) and emissions (to both air and water). Since implementing ProcessVue, accessing process data has become easier and faster. The software also enables the engineers to react much more quickly after a plant upset or trip, providing reports to the appropriate personnel at headquarters and allowing them to perform alarm trending and other analyses on plant equipment.

Software to EEMUA 191 Guidelines

A properly managed alarm system is now a critical, integral part of any production or process manufacturing facility. Since its establishment in 1991, EEMUA 191 has become the globally accepted standard for good practise alarm management. ProcessVue reporting is based on EEMUA 191 guidelines.

To establish an alarm management system based on these guidelines or to ascertain if a current system is operating effectively and within the guidelines, alarm data must be collected and analysed on a continuous basis. Just collecting this data can be a challenge in itself. Bringing this data into a usable format for control room operators and reporting on this data to Alarm Managers are two critical functions.

Features within ProcessVue include: advanced KPI reporting based on EEMUA 191 guidelines, alarm rationalisation (locating 'bad actors' and 'nuisance alarms'), Sequence of Event and real time display; alarm system benchmarking, alarm and event analysis and alarm and event archiving.

ProcessVue is also being used by several major UK-based nuclear and energy utility companies. As James Fox, ProcessVue Product Manager at MAC Solutions states: "Energy utility companies are keen to improve their alarm management with a view to making more informed decisions about their plant and processes in terms of KPIs. There is also the issue of employee health and safety to consider. How a company manages and reacts to critical process alarms could save lives and this is where ProcessVue comes into its own."

Let’s talk

We’re here to help

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