Maintenance for regional utility companies

Lean and Flexible IT Solution

by Markus Indenbirken and Christian Basler

The system SI®/PAM developed by STEAG Energy Services is a technical operation management system that is adjustable in a highly flexible way and can be applied in many industries. The modular concept and the comfortable user guidance offer numerous advantages. The following report on the experiences during the introduction of SI®/PAM at Energieversorgung Oberhausen describes the benefit the system offers to the user.

Utility companies are facing increasing market requirements. Therefore the operating procedures have to be designed to be as efficient as possible, in particular regarding the operation of technical installations. In most cases, the resulting requirements to an efficient maintenance including documentation can only be fulfilled by means of an IT-supported solution.

As a regional utility company, Energieversorgung Oberhausen AG (EVO) has been supplying its customers with energy for more than 100 years, delivering electricity, natural gas, and district heat. EVO attaches particular importance to a sustainable energy generation in order to offer the right balance between sustainability, security of supply, and economic efficiency. This also represents the context of the most recent project of EVO: a new biomass CHP plant in Oberhausen-Sterkrade (*Fig. 1*).

Fig. 1: Biomass CHP plant in Oberhausen-Sterkrade

Construction of the new biomass CHP plant started in January 2012, and only 13 months later, in February 2011, the plant went on line.

High requirements to the availability

For the purpose of a high security of supply, the requirements to the availability of energy generation plants are enormous. Thus an efficient, sustainable and always reasonable maintenance strategy is essential.

Since as early as 2005, the Oberhausen utility company has been using the SI® system by Essen-based STEAG Energy Services (SES) for the IT-supported maintenance of technical installations. Therefore EVO also decided for a co-operation with SES in the new project. First, EVO considered an update of the existing SES maintenance planning and control system, with the updated IT solution used for the new biomass CHP plant as well.

Decision for more flexibility

At that time, SES were already developing SI®/PAM, the next generation of their SI® system. Therefore the company proposed their most recent maintenance planning and control system as an alternative with a higher ease of use and a more flexible adaptivity to the available plant data of the new biomass CHP plant in mind. The already highly stable current development status of SI®/PAM was provided to EVO as a test system prior to deployment.

This decision by EVO was remarkable, because usually introducing a new IT system is more complex than updating an existing software, of course. Although EVO needed the maintenance planning and control system on very short notice for documenting the trial operation, SES promised to provide SI®/PAM on schedule. This commitment as well as an elaborate preliminary test of the most recent version eventually led to the decision to use the new system already during the trial operation of the biomass CHP plant. Here the utility company also considered the complete changeover of three existing plants to SI®/PAM – always provided that the current project was completed successfully.

Modular, user-oriented structure

The special feature of the new software solution is its modular and thus both flexible and user-oriented design. Therefore very different requirements can largely be covered already by the standard system of SI®/PAM, and also project-specific needs can be implemented by configuration with little effort as a rule.

SI®/PAM represents business processes in a transparent way, allowing also individual requirements to be implemented quickly and easily (*Fig. 2*). Work flows and processes are simplified and designed to be more efficient. Owing to the reliable provision of data, SI®/PAM also allows for a legally compliant documentation, thus covering all requirements to a modern maintenance planning and control system.

Fig. 2: Module overview of the operation management system SI®/PAM

Near-term introduction requested

The specific requirements of EVO to SI®/PAM consisted in the near-term introduction of the modules Plant index and Event log. At a later date, the module Tasks should be implementd for entering recurring items for maintenance and repair of the biomass CHP plant, along with the module Document management.

The module Plant index represents all system parts of a plant in a clear tree view. Each element of the tree view receives an unambiguous name (key). The hierarchical structure of the directory can be freely selected, allowing to choose a systematic encryption of the data e.g. according to KKS or RDS-PP. In addition, the module allows for a free allocation of names, a distribution of system parts from different categories to own tabs, as well as freely definable attributes. Moreover, the user receives direct access to all important data like documents, event logs, tasks, recurring items, etc. via the Plant index.

Module with high adaptivity

In many projects, the provision of plant data by the plant suppliers in a quality and level of detail suitable for a maintenance planning and control system has proven to be a particular challenge. Owing to the flexibility of SI$^®$/PAM, the system can easily be adapted to the actual conditions if a revision of the plant data is impossible for reasons of time or cost.

A plant index according to KKS was created for the operation of the biomass CHP plant. As desired by the customer, a representation as well as encryption up to equipment unit level was chosen (*Fig. 3*). The individual levels were to be selected after the field trial. Instead of component types, equipment unit classes were set up and furnished with special attributes. Data were imported into the plant index based on lists with technical data in table form provided to some extent by the plant suppliers. Here the configuration of the technical characteristics using the supplier data at the KKS level "Equipment unit" was simplified in particular because SI$^®$/PAM permits a flexible representation of the available data. Moreover, the intelligent import interface of the software detected inconsistencies in the data, so that the system could be used only one week after provision of the data.
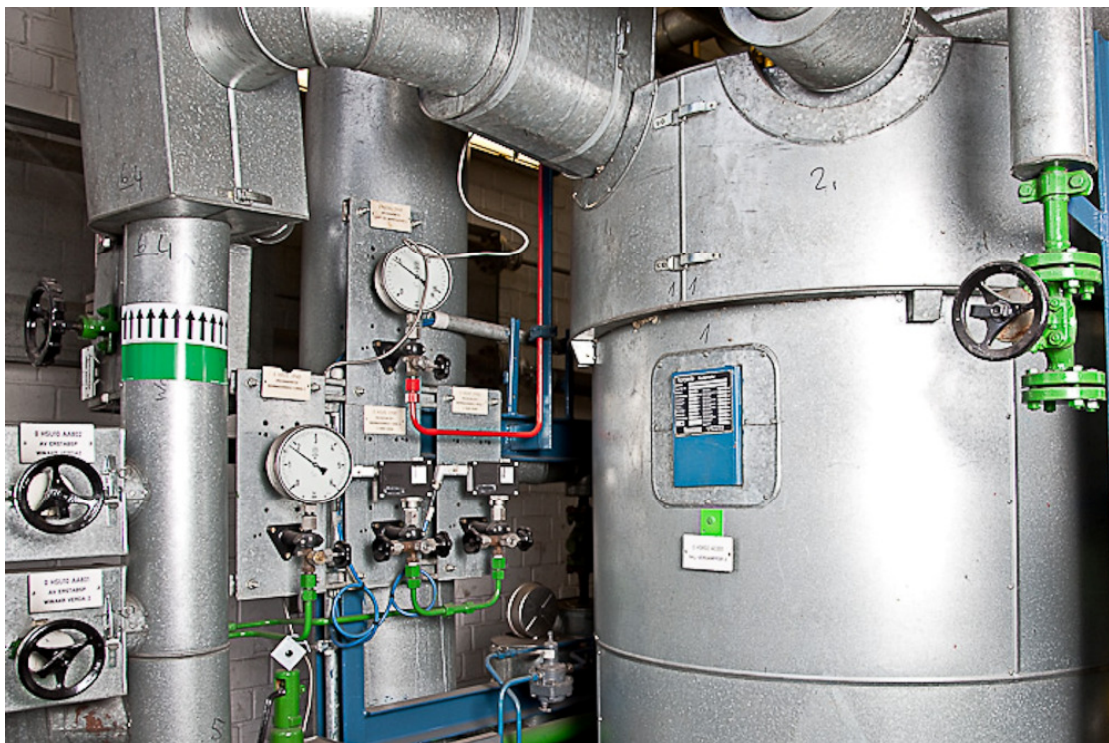
Fig. 3: The individual equipment units of the plant are recorded in the plant index

Shift log for particular events

SI®/PAM provides the module Event log for unexpected events and information subject to record keeping obligations. This module can be used by various groups of persons for any kind of logs, shift logs (*Fig. 4*), damage reports, or event logs. Already during the commissioning and in trial operation, the specific project at EVO required a shift log with several message types for recording faults, shift changes, and other information. Thus for documenting the trial operation, the above-mentioned message types were set up in an event log; here SES could draw on the experiences of EVO with SI® Version 3.4 for the configuration of the individual data fields. For the trial operation of the biomass CHP plant, the configuration of the module was also supplemented with additional data fields for selecting the most frequent causes of faults and the resulting downtimes. In this context, SES was able to fulfill the request of EVO for an evaluation of the message types with little effort.
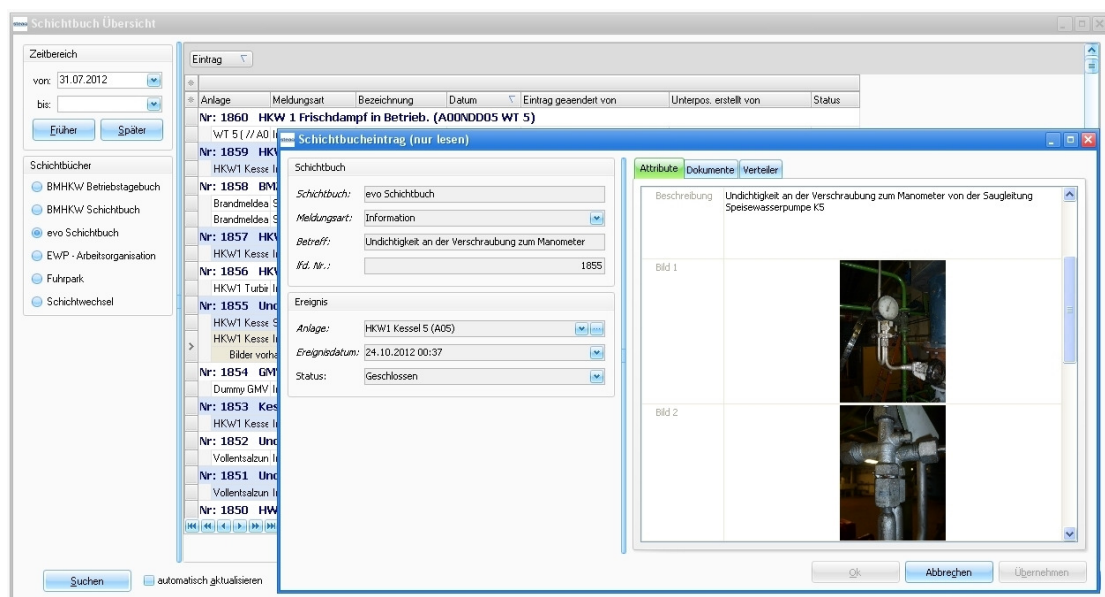

Fig. 4: Creating a shift log entry

Information box and Administration

In addition to the modules mentioned above, SI®/PAM integrates the modules Information box and Administration. The information box resembles an electronic mailbox; however, each user has their own information box where all information relevant to them arrives. This information hub thus keeps the user up to date concerning all relevant procedures in the system at all times. Optionally, additional messages can be sent via the corporate e-mail system.

The module Administration comes with a tried and tested standard configuration and is adjusted to customer requirements in the context of the project development.

Project requirements fulfilled

The experiences of EVO with SI®/PAM have been positive throughout, because all requirements of the specific project were implemented quickly, among them the uncomplicated and flexible adjustment of the fault documentation with recording of downtimes to the particular situation of the trial operation of a biomass CHP plant with the appropriate reporting. In this context, EVO particularly emphasizes the fast commissioning of the system by importing the KKS lists, the option to supplement shift logs with photos, and the form-like input of shift

changes with predefined value sets and learning input fields. Also the various logs – biomass CHP plant, plant log for the staff on site, and shift changes – can be designed freely. From the point of view of EVO, the use of SI®/PAM thus offers immediate added value for the claim management.

Important practical experiences

Meanwhile, EVO has replaced the previously used SI system by SI®/PAM in all its plants. Important experience from operational practice was gained in the course of this. For example, during operation it turned out that documenting the shift changes for three plants in the existing shift log made the handling unnecessarily difficult. Configuring an additional shift log named Shift change, however, made it possible to improve the handling without influencing the quality of the documentation. This was supported by the option to carry out the evaluation comprehensively across several shift logs if needed.

The module Event log was supplemented with further shift logs and message types e.g. to replace the paper-based reading of some operating parameters. The freely configurable reporting module of SI®/PAM made the evaluation based on Excel lists redundant. The previous input effort was no longer required.

EVO also supplemented the plant index several times with additional data considering the data base recorded so far. Owing to the intelligent import interface of the system, this was effected flawlessly.

Finally, EVO put the function Recurring items (*Fig. 5*) into operation with the module Tasks to be able to coordinate both maintenance measures and inspections by the authorities in a single system. Here SI®/PAM allows to control the responsibilities and processes entirely according to the operational necessities; the function Information box informs about the currently pending tasks.
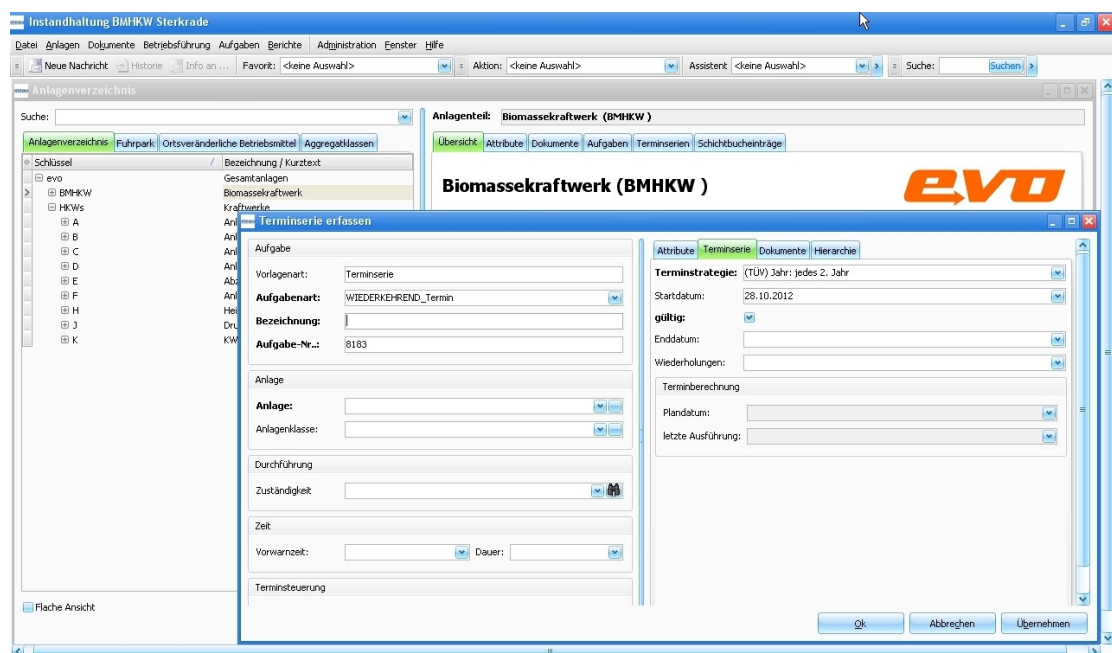

Fig. 5: Editing recurring items

As EVO is already using a document management system (DMS), the module Document management in SI®/PAM has only been used for linking the documents stored in the DMS with

the plant index in SI®/PAM so far. This way, a double data administration is avoided and at the same time a more transparent information platform for all relevant plant data is achieved.

More than a maintenance management system

SI®/PAM is not just a maintenance planning and control system, but rather a flexibly configurable asset management solution. Therefore by now EVO is using the system for further tasks like e.g. for fault tracking or for managing IT requirements. The utility company has implemented these tasks in SI®/PAM autonomously, which is possible owing to the intuitive operability of the software solution.

As a next step, the introduction of the SI®/PAM module for the mobile processing of tasks is being considered, which allows the confirmation and documentation of tasks on a PDA, identifying the respective installations easily and safely via RFID and barcodes.

Contact:

STEAG Energy Services GmbH

Dr. Martin Stephan

Phone +49 201 801-4109