1 / 2014

energy manager

Newspaper for energy suppliers

Topics

Market integration of renewable energies

Integrated solution for virtual power plants

Virtual power plants (VPP) play a decisive role in the required market integration of renewable energy generation systems. PSI presents an integrated solution that maps a VPP in its entirety. As well as taking account of the required communications infrastructure, it also represents a solution that meets the increased requirements for next-generation intelligent portfolio management.

The concept of a "virtual" power plant appears inappropriate in light of the very real systems that are interconnected into a controllable network. Fundamentally, a virtual power plant refers to the creation of a portfolio of decentralised generators, energy storage providers and sliding-load consumers. Interesting marketing options can be derived from the different characteristics and options of these stakeholders—provided that a suitable marketing model is in place.

In contrast to the virtual contract world, which dominates the usual portfolio of an energy trader, the preferred term to be used here is a real portfolio. As you would expect, this includes conventional generation systems and consumers.

In pre-liberalised times, conventional energy management had the entire range

▸*Page 3*

PSI

News ticker

+++ PSI has one-off expenditures and increase in sales in the third quarter—at 143 million euro, the orders received are 11 % higher than turnover +++ PSI delivers Warehouse Management System to Kärcher—PSI*wms* controls logistics processes in expanded logistics centre +++ Swiss GIMOTA Group decides on PSI*penta* ERP system—multisite installation for five plants +++ PSI wins important contract from Hagener Straßenbahn AG—PSI*traffic* control technology increases profitability in bus operations +++ PSI receives contract for implementing Intraday Congestion Forecast for Polish Transmission System Operator PSE S.A. +++ PSI delivers new hardware for the baggage handling system at Hamburg Airport+++

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Page 1: Dr. Benno Zielonka
Pages 3–6: PSI Energy Markets GmbH
Page 7: DONG Energy
Page 9: Stadtwerke Krefeld
Pages 8, 10–12, 14: PSI AG
Page 13: Swiss Federal Railways

Editorial

Dear readers,

At the beginning of this new year, the accounts are there for all to see: The turnaround in energy policy has cost German businesses and households 21.8 billion euro over the past year. Despite this new record value, additional increases in eco electricity cost allocation are already in the pipeline. The continuous construction of renewable energy sources is increasing cost pressure for conventional generators while decreasing their profitability. As a result, the gap between guaranteed compensation and the market price to be closed by the consumer becomes ever greater—a cost factor that impacts on the family budget and, in the absence of further interventions, brings energy-intensive companies, in particular, ever closer to the limits of their competitive capacity.

*So, how can the turnaround in energy policy—which is, after all, the stated will of the majority of the population—be implemented not only from an ecological perspective but also from an economic one? Achieving this goal requires both skilful political framework conditions and intelligent technical solutions. As far as policy is concerned, the energy turnaround project must be one of the most demanding challenges for the new federal government. With regard to the technical component, we are fortunate enough to have our PSI engineers. In this edition, read about how the new PSI*vpp *solution helps to achieve improved market integration of renewable energy sources and portfolio management of virtual power stations—a contribution to the energy policy turnaround that is "Made by PSI".*

I look forward to your feedback and trust that you will enjoy reading the articles.
Regards

Dr. Benno Zielonka
Managing Director
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◀ *Page 1*

of instrumentation for generation control and load influencing at its disposal. However, as services were unbundled, energy suppliers, traders and distributors no longer had access to the required communications infrastructure, as this remained with the network operator. At the same time, there was no longer any need for influencing consumption, as the economic stimuli were no longer present. However, the increasing expansion of generation from renewable energy sources and the resulting price volatility has changed this scenario. The effect of this has been the construction of an efficient, affordable and secure communications infrastructure that is available to the energy trade and distribution sector, and has enabled the connection and integration of the systems under their control to the control concept.

Next-generation portfolio management

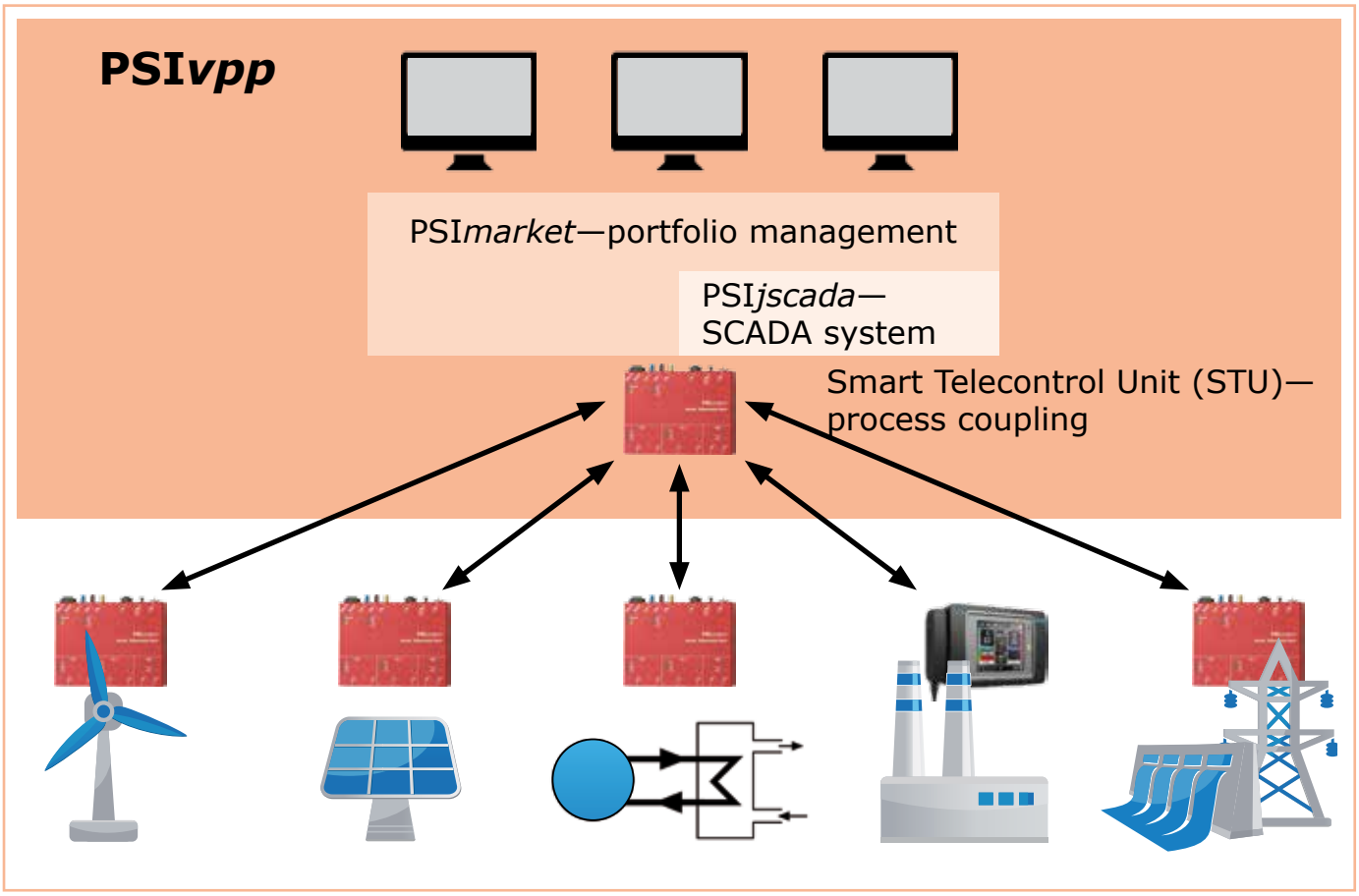
Setting up an independent communications infrastructure has resulted not only in increased opportunities for exerting influence on the portfolio with the aim of advancing various accounting objectives and marketing options, but also in more time and room for manoeuvre in the intra-day field, right up to real-time control of the systems.
As a result, portfolio management in its current form is gaining a new dimension, and we can confidently refer to a next generation and new quality of required portfolio management and optimisation systems.

A new system solution is presented below that has been designed with these requirements in mind and that meets these requirements.

PSI*vpp*—a comprehensive turnkey solution for VPP

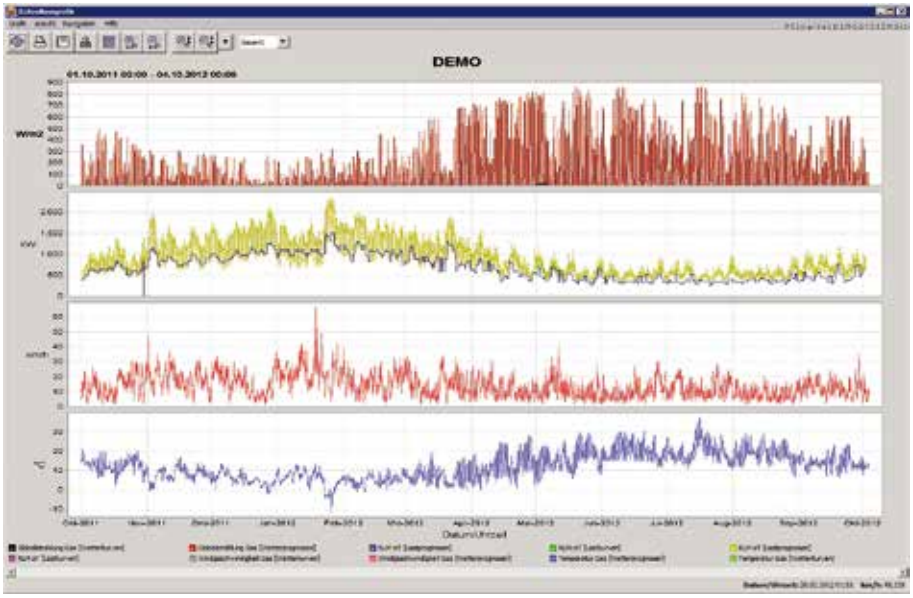
The proposed solution maps all the required aspects of a VPP in an integrated solution comprising individual modules. This starts with the connection of the systems to intelligent controllers that also enable decentralised control, and continues with a high-performance communications chain for transmitting control commands and capturing consumption and generation data online, right through to integration of the real portfolio into an overarching energy portfolio and optimum marketing of this portfolio.

Construction concept for a virtual power station.



The solution is based on three main components:

- A central portfolio management system with a stochastic procedure for portfolio evaluation and optimisation
- A streamlined, efficient SCADA system for data capture, control and monitoring of systems
- A Smart Telecontrol Unit—a hardware unit for decentralised coupling and control of the systems



Weather data and feed-in forecasts for wind power and photovoltaic systems.

All the components are seamlessly connected with one another in an integrated overall approach, but can also be implemented as "stand-alone" solutions.

Central portfolio management system

Portfolio management is used for mapping and evaluating all systems in a VPP, for determining the optimum marketing strategy and, optionally, for integrating the VPP in an overarching overall portfolio.

Contract management maps all physical and commercial contractual relationships of the (market) roles involved, and models all components of the VPP. A calculation of costs, revenue and results is derived from this process. This calculation forms the basis of a similarly integrated accounting. Based on a flexible time series system and a programmable formula system with more than 100 functions that relate to the energy sector, even complex compensation and invoicing models can be mapped and calculated.

To improve the integration of renewable energies in the energy market, the forecasting quality of the expected feed-in must be improved. To this end, new forecast models have been developed. This provides planning security when integrating VPP generation volumes into the overall portfolio and allows for optimisation while simultaneously taking account of the load transfer potential on the sales side. Forecast models have also been developed for this purpose; these need to take into account both the characteristics of different production processes as well as consumption price sensitivity.

Optimum use of market flexibility and thereby optimum use of the VPP in the overall portfolio is determined on the basis of stochastic optimisation. In this regard, the optimisation procedure takes into account the stochastic nature of the energy market, fluctuating generation, uncertain inflow forecasts on storage reservoirs and other imponderables in the market that are reflected in highly volatile pricing. This procedure brings significant performance and results benefits under uncertain framework conditions for many use cases.

Other optimisation algorithms and procedures that have been adapted to the task at hand can also be implemented. This can be advantageous in the very short term, as stochastics no longer play a significant role.

After determining the optimum power plant deployment, control signals or timetables can be transmitted to the systems. Similarly, there is an opportunity to influence demand among price-sensitive consumers by sending price signals. All control specifications for the optimisation are implemented via an integrated SCADA system.

Monitoring and control system in real time

A streamlined, efficient and high-availability SCADA system ensures secure data communication, technical control and system monitoring. This system is also based on many years of experience on the part of PSI with regard to large-scale, high-end control systems, and guarantees secure capture and transmission of generation and consumption data, while also serving as a monitoring and control system in real time.

Detailed modelling of objects provides visualisation and control of generation units, storage and (large) loads/consumers. The graphical preparation supports simple process monitoring and provides an overview of the current status of the entire system. The hierarchical display concept enables both an easy overview

as well as a detailed view right up to the level of the individual systems.

High availability is achieved in that distributed, redundant system architecture is supported. Implementation in Java ensures a high degree of user-friendliness and the seamless integration of the VPP components with the central portfolio management system, together with maximum platform independence.

The solution is rounded off by protocols as well as alarm management functions that support prioritisation of alarm messages and filtering according to criticality and time.

In addition to the display, storage and archiving of process information, the SCADA system also allows for control and monitoring of almost any number of connected intelligent end devices, otherwise known as Smart Telecontrol Units (STU). The control and regulation specifications are transmitted to these devices in real time.

Display of system overview in the monitoring and control system.

Smart Telecontrol Unit (STU)

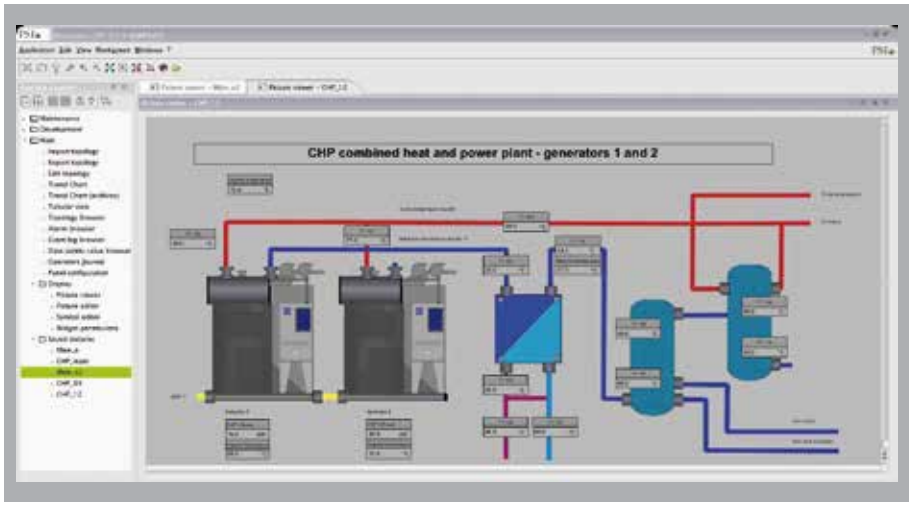
Developed by PSI, the Smart Telecontrol Unit (STU) is an intelligent device that can be connected to VPP components. Measurement data and messages for various generators and consumers are collected on the STU, stored and forwarded to the overarching VPS control system. In addition to the usual telecontrol protocols, such as IEC 60870-5-101/-103/-104, IEC 61850 and DNP3, the STU also supports proprietary telecontrol protocols (Modbus, CANopen) and numerous counter protocols (SML, SYM2, DLMS, IEC 62056-21). STU handles telegram forwarding as well as the required protocol conversion. An integrated Soft PLC, which can be programmed using industry standard IEC 61131, enables additional control and monitoring of systems where required.

Intelligent applications (also referred to as smart apps) allow for local optimisation of the process as early as the system or micro-grid stage. This includes short-term optimisations as well as autonomous fault handling. This optimisation is individually adapted to the requirements of the VPP, taking into consideration the special characteristics of the connected resources. The VPP can be flexibly adapted to future requirements by reloading applications.

The STU enables secure connection of decentralised generators and consumers in accordance with the BDEW (German Association of Energy and Water Industries) white paper. A robust STU system also meets the demand for secure communication. All data traffic between the central system, the transmission network operator and the decentralised resources is encrypted through a VPN tunnel. Central user authentication is possible using LDAP and RADIUS.

A configuration server ensures secure configuration and updating of the STU. The STU also assumes the task of redundant communication with the transmission network operator (ÜNB) for the provision of secondary balancing power. Communication with the ÜNB is via a

Detailed display of an individual system in the monitoring and control system.



Smart Telecontrol Unit (STU) for secure, flexible connection of the systems.

serial interface that meets the requirements of IEC-60870-5-101. The protocol in the network-capable IEC-60870-5-104 variant is converted and secured via an IPSec VPN for data exchange with the central system.

Support for a wide range of communications interfaces, together with the integrated IP routing functions, provides support for flexible, redundant network structures. The integrated firewall function ensures additional communications security.

Virtual power plant—real benefits

The business models permitted by the current market model are limited in their appeal at present. However, there are some interesting and lucrative marketing options in the balancing power market, in particular with regard to the provision of negative balancing power. Alongside the additional value creation resulting from the marketing of the real portfolio, other opportunities also arise for making the described infrastructure available to the relevant network operator as a service, provided, for example, that the shutdown of systems is required for safety reasons.

In general, few useful alternatives to a future market model will exist that ensure stronger market inclusion of energy generation from renewable sources and the corresponding financial incentives.

The flexibility of the presented solution provides solid preparation for the future market, as it offers scalability that supports economic marketing of smaller systems and also fulfils the performance requirements of larger volume structures, while also guaranteeing the required data security.

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Pan-European Gas Dispatching

Danish energy trader DONG Energy selects PSI*transact*

DONG Energy Customers & Markets, a business unit of DONG Energy A/S, has decided to manage its operational activities using the PSI AG Gas Dispatching Solution. The solution, based on the standard applications within PSI Gas Management Suite, has also been implemented in numerous European gas companies.

DONG Energy's business activities include exploration, production, transport, storage, trade, LNG and sales of natural gas in Northwestern Europe. The Customers & Markets business unit is responsible for the secure transportation of gas from the source. These may include gas fields, preliminary suppliers or even the end user. Their natural gas portfolio serves markets in Denmark, Sweden, Norway's North Sea area, Denmark's North Sea area, Great Britain, Holland, Belgium, Germany, France and Austria.

The new system ensures that the agreed volume of natural gas is transported from the best possible source to business partners within an agreed timeframe and according to contractual agreements and market regulations. Using the PSI solution, short-term traders organize and optimise the task of physical dispatching for a specified time period—from the current day to one week in the future. The physical deliveries are planned and balanced according to the conditions specified for gas demand, production, transport ca-

pacity, physical deals and nominations from third parties. Every market area is balanced and optimised according to applicable rules. The nominations are triggered and the confirmations monitored for subsequent concrete processing. Finally, the allocations are received and processed.

PSI's standard products PSI*transact*, PSI*comcentre* and PSI*gasaf* will be seamlessly integrated into the existing environment at DONG Energy for gas dispatching.

PSI*transact* is the core component of the solution. It manages all required objects such as contracts, capacities, shippers, points, balances and portfolios. It also enables, monitors and controls all required processes. Modules for transport planning, accounting, nomination management and allocation are also available. Together with a comprehensive workflow and calculation engine for process and regulation mapping, these modules will provide support for the market areas.

PSI*comcentre* provides the necessary communication formats and transmission methods. Starting from an internal format, any number of configurable formats can be derived. Incoming and outgoing messages are monitored and displayed on efficient monitors. Complete integration ensures that communications processes are executed at a technical level and processed at a specialist level.

PSI*gasaf* provides all basic services required for the secure, flexible operation of the overall solution. These include service monitoring, user and authorisation administration, information display, event and alarm management, as well as calculation rules and the EXCEL interface.

Increased efficiency in short-term trading at DONG Energy.

A major increase in efficiency in handling business processes for short-term trading has been achieved by replacing the four existing systems and merging and expanind the range of functions using PSI's Gas Management Suite.

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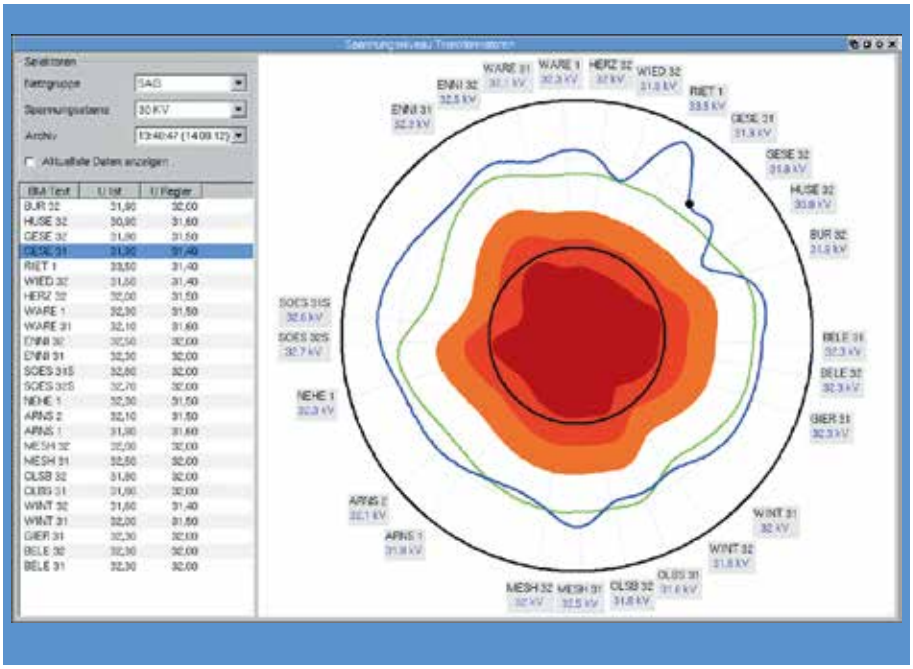
Security Assessment and Stability Optimisation

Network status assessment for transport network operators

The management of high-voltage and extra-high-voltage networks is becoming increasingly complex. In particular, volatile feed-in, a reduction in the capacity of large power stations and predominantly market-driven electricity transport place high demands on control centre personnel and the tools used.

With Security Assessment and Stability Optimisation (SASO), PSI is now providing network operators with a system that allows a concentrated, simple assessment of the network status and presents suggestions for remedying identified results. The supplied components are status assessment, decision support and visualisation. In the first instance, the database is formed from network statuses determined from the control system (snapshots). In a subsequent extension phase, projected statuses can also be taken into consideration alongside additional information. The status assessment is performed based on conventional network calculations.

Algorithmic procedures and Computational Intelligence (CI) procedures, such as fuzzy logic or neural networks, are used for the purposes of decision support. New, hierarchically structured concepts that enable a quick overview of the net-



Assessment of the network status using SASO.

work status are provided for the visualisation component.

The SASO system is designed to be independent of the control system. This means that the control system is not loaded with additional tasks and enables experimentation with new procedures without impacting network control. The first SASO project was awarded by Tennet TSO in January 2014.

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Vattenfall Europe network service

Optimum network service by personnel and workforce management

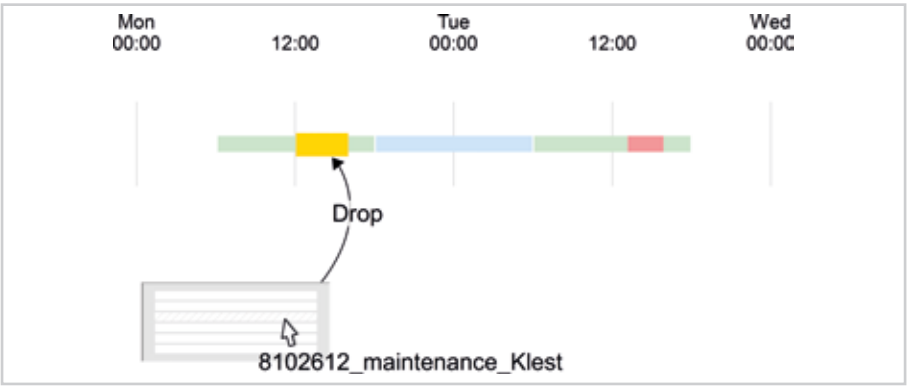
Since June 2013, PSI has been implementing the APEKS (Auftragsoptimierte Personal- und Einsatzkräfte-Steuerung—task-optimised personnel and workforce management) planning and optimisation system for managing maintenance activities for the high-voltage network service of Vattenfall Europe in Berlin and Hamburg. The production start is planned for 2014.

The APEKS system enables all tasks transferred from SAP-PM (e.g. switching requests, material reservations and personnel qualification) to be planned, either manually or automatically, for the responsible operational units under various framework conditions.

For the purposes of processing these tasks, all data is transferred electronically to the mobile components of these units. The generated job reports are consolidated in APEKS and reported back to third-party systems such as SAP.

This seamless process of data collection, data control and planning, which has already been tested at EnviaM, is designed to lead to significant collaborative benefits at Vattenfall Europe through the implementation of up to 300 mobile end devices. Some 100 internal employees will also benefit from the use of APEKS. The focus here is not only on data capture for the planned on-site tasks, but also on recording activities that are obviously necessary, such as maintenance by the units.

Seamless planning.



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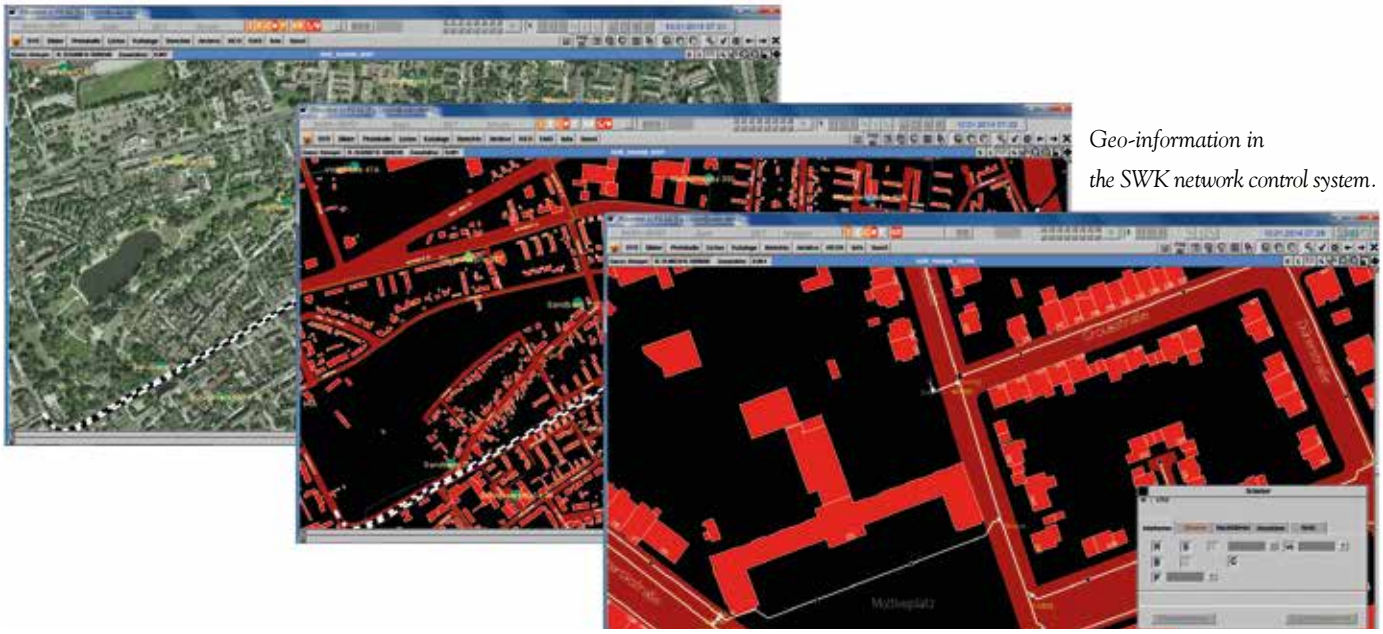
Problem-free updates and upgrades

Approval of the first PSI*control* base project at Stadtwerke Krefeld

STADTWERKE KREFELD AG (SWK) is the multi-service provider for Krefeld and the surrounding region. Electricity, gas and district heating operations are combined under the energy sector. The core business unit is SWK ENERGIE GmbH, which, together with various affiliated companies, is responsible for production, procurement and distribution as well the associated services. Operation of the electricity and gas distribution networks falls under the remit of SWK NETZE GmbH, while technical services are provided by SWK SETEC GmbH.



Geo-information in the SWK network control system.

The PSI multi utility system that has been in use at Krefeld Stadtwerke (SKW) since 2001 has been replaced by the current PSI*control* Base 4.0 system. On 18 December 2013, SWK SETEC GmbH issued the final approval for the 2020 plus project.

Network control system in use at Stadtwerke Krefeld.

When replacing the old system, a great deal of emphasis was placed on extensive use of the existing functions in the BASE system, with as few project adjustments as possible, to allow for problem-free updates and upgrades in years to come.

New, additionally integrated functions include orthophoto display, training mode and the Xchange module for exporting and importing data and for creating reports.

Special mention should be made of the strong link with the SWK geo-information system (GIS). In addition to the incremental importing of GIS data via the standardised exchange database and the graphical display of the well-maintained electricity, gas, water, district heating and cadastral data, a direct activation of GIS within the control system has been included. This permits the corresponding extract from the GIS to

be displayed in a fully operational form on the control centre screen by selecting a network station.
The inclusion of mobile devices in the control room was tested on a prototype basis. A secure WLAN connection can be used to transmit alarms to an iPhone or an iPad, and images can be activated and transmitted to the rear projection in a zoom format. These images can also be zoomed in and viewed on the devices offline.
The completion of this project has laid the foundation for an upgradeable project. The upgrade to Base Release 4.3 is planned for 2014.

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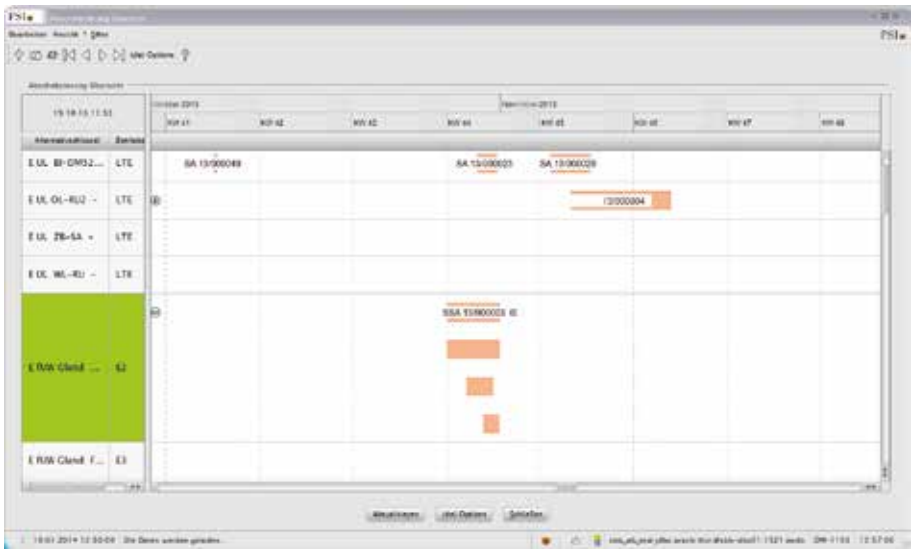
PSI*command*: Integrating operations management into the network control technology

Seamless connection of two systems for an efficient switching request procedure

In 2013, the development focus for the PSI*command* operations management system was on continued integration into the PSI*control* control system. In particular, this affects the switching request procedure, which has already been successfully implemented in a customer project.

The resulting benefits allow the planners at the control centres to combine the functions of both applications seamlessly. The drag & drop function, which is characteristic of PSI*control*, has a direct effect on the PSI*command* screens. Accordingly, complex switching sequences can be constructed by means of simple operating sequences, for example. Conversely, the users of the control systesm are always informed about the planning sequences in the switching request procedure and have access to all PSI*command* planning data. In this way, the strengths of both systems are consolidated in a single application: the database-oriented processing of back-office processes, authorisations, reservations and planning that are possible at any workstation using PSI*command* and the complex network management functions of the control system. This enables interruption-free work sequences for the user, and permits reliable planning and processing of the many changes in the electrical network on the basis of maintenance measures and via complex organizational processes over a longer timeframe.
This integration was accompanied by the connection of both systems on a data level for user maintenance. The reinforcement of control technology demanded by the German Association of Energy and Water Industries (BDEW) is achieved by means of secure interface technology in PSI*command*. With PSI*command*, LDAP connection to user administration systems on a local or company-wide basis is now also available in the field of control technology.
The integration of the PSI Java Framework (PJF) in PSI*command*, which started in 2012 and is being implemented throughout the company, is progressing. In version 3.2, the functions for service and standby planning have been improved and additional overview lists have been converted to current PJF technology with its strong filter and sorting functions, thereby resulting in significant performance improvements. For IT security reasons, the plans for 2014 include upgrading the JBOSS version, further integrating current PJF components

Outage planning in PSI*command*.



Mobile application.

and replacing various screens with more modern interfaces.

In particular, PSI*command* will gain maintenance support functions. These include manual resource planning (planning board), the connection of mobile end devices and improvements to the integration of the optimisation core (Qualicision technology). An extremely significant change affects the administration of resources, which now allows allocation of an activity or resource to multiple mobile units.

There are also new features for the connection of mobile devices: In future, the mobile component in PSI*command* will support all current mobile operating systems; in version 4.3 of PSI*mobile*, this now also includes iOS and Android in addition to Blackberry 10. The functionality also includes feedback interviews, document transfer, coordinate transfer and connection to the prevalent navigation apps Navigon and TomTom. This version is available from the end of January 2014. By summer 2014, PSI*mobile* (version 4.4) will also support Windows RT and Windows Phone.

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PSI*control*: Transformation to a standard system

The third generation as a multi-network system

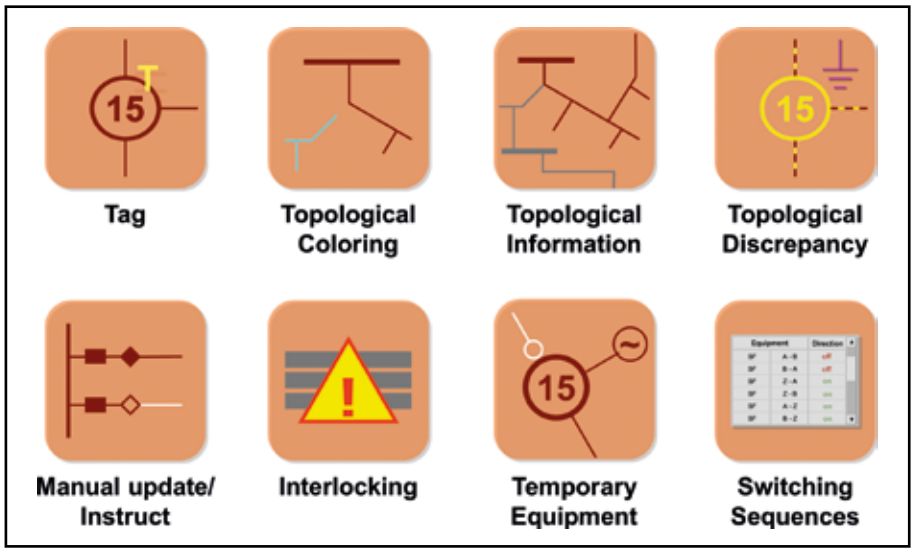
With the release of 4.2 in the autumn of 2013, the third generation of PSI*control* became available as a multi-network system. With this open system, PSI has managed to standardise the system, while nevertheless being able to keep including individual sub-components in the modular PSI*control* by means of module encapsulation, without affecting the standard functions.

As before, PSI*control* sets the standard for customers, and is characterised by excellent dynamic properties within a unique system architecture that uses secure UDP broadcasting. Innovative functions, such as decentralised feed-in management, a feed-in management regulator, dynamic limit value monitoring and overhead line monitoring, are already part of the PSI*control* standard and do not need to be implemented again on a project-specific basis. These modules are based in part on tried-and-tested network safety calculation functions, such as estimation, load flow and contingency analysis, and represent a consistent, market-oriented development. This development also includes preview calculation, which is available to transmission network operators and distribution network operators. Of course, the input parameters are different for the different tasks. Low-voltage network management features in PSI*control* are also extensively available in the system.

By using the SPI interface (SCADA Programming Interface), customers are able to write their own programs and integrate these seamlessly in PSI*control*. The interface even makes it easy to connect third-party software. Using these options, PSI customers or partners are able

Display example with new interface.

to implement changes or extensions to the system that go well beyond flexible interpretative data preparation.
In connection with the current system generation, PSI offers a future-proof variant of continuous system refreshes by means of the maintenance, update and upgrade concept. New releases can simply be integrated into the customer's system environment as an update or upgrade. Encapsulation of the new modules and components means that the absence of adverse effects on existing components in the existing system is guaranteed to the greatest possible extent.
With release 4.3, which will be available in the first half of 2014, additional functions will be available as standard. These functions include the implementation of a new medium-voltage concept for connecting extremely large numbers of decentralised EEG (Renewable Energy Sources Act) providers by means of small telecontrol devices, load shedding, and video and object monitoring. Lists and catalogues are also converted to widget technology in 4.3. The new PSI*control* standard system generation ensures that PSI customers are as well equipped for the future as they can be.



Pictograms for low-voltage network management.

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Charged up: New developments and projects

News from the PSI Electrical Energy division

Further developments

- Release 4.2 of the PSI*control* network control system became available in October 2013, and now offers as standard basic functions for feed-in management and low-voltage network management as well as network calculations and functions for data exchange with external systems (PSI xchange). The user interface has also been modernised.

- PSI*command* has been enhanced with regard to integration into the control interface and functional improvements (see “Seamless connection of two systems for an efficient switching request procedure”, page 10).

Commissioning and extensions

- Feed-in management for EEG (Renewable Energy Sources Act) systems has been integrated and commissioned in numerous projects, including E.ON Bayern, Lechwerke, Thüringer Energienetze and Westnetz (Nord). Implementation is planned for additional systems.

- The two large network control systems for Swiss Federal Railways (SBB), EMS (high-voltage) and FSL (traction current) entered the production phase in December 2013 following extensive preliminary testing. This means that the power supply to the world's most used railway network is monitored and controlled using PSI*control* control systems.

- The PSI integrated energies system that has been in use at Stadtwerke Krefeld (SKW) since 2001 has been replaced by the current third-generation PSI*control* Base 4.0 system (see “Problem-free updates and upgrades”, page 9).

New projects and developments

- The 2013 edition featured an article on the NetSam system, which will be used by a number of companies in Jütland, Denmark. Since then, four

users have been added as clients and more are set to follow.

- The Vattenfall Europe network service has commissioned PSI to implement a Workforce Management System (see "Optimum network service thanks to personnel and workforce management", page 8).

- ELE Verteilnetz GmbH, Gelsenkirchen, Germany has commissioned PSI to upgrade its existing control system.

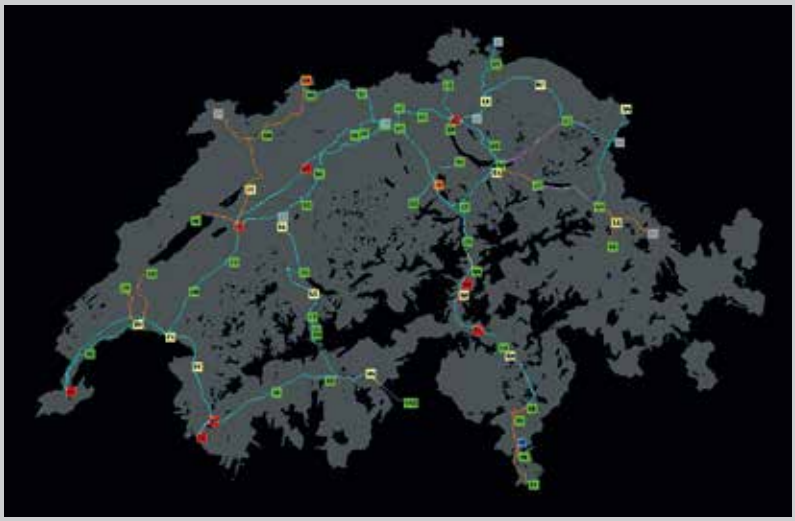
- PSI has implemented the PSI*control* control system at French transport network operator RTE. The system will be tested by RTE over one year, together with systems from several competitors.

- The 110-kV systems of E.ON Hanse are now managed by the PSI*control* control system of E.ON Netz. The network calculations that have been implemented are proving particularly useful. Plans are in place to provide in-house control technology at a later stage.

PSI*control control room at Swiss Federal Railways*.

- Polish transport network operator PSE will also be using PSI network calculations going forwards—particularly preview calculations (initially IDCF).

Overview of the SBB high-voltage network.



- The wind farm management system for ENEA in Poland has been approved. Data validations are currently being performed.

- DB Verbund Nord: DB is planning to combine traction current network management for the Northern regions and the Hamburg S-Bahn in a single system. PSI received this order in January 2014.

- ERRP 4.1 at 50Hertz Transmission based on PCOM+: The ENTSO-E Reserve Resource Process (ERRP) has been specified for the standardised and automated exchange of planning data between power station operators and transmission network operators (ÜNB).
50Hertz Transmission GmbH has become the first German ÜNB to opt to implement the process via PCOM+

from the PSI*passage* family. The specification phase begins in February 2014, and the start of production is scheduled for the third quarter of 2014.

- PSI is developing the Security Assessment and Stability Optimisation (SASO) system for overarching network status assessment for transport network operators (see "Network status assessment for transport network operators", page 7).

Maintenance concept

- Increasing standardisation and current safety specifications (BDEW, ISO 27019) require systematic maintenance of the network control systems.

- The maintenance concept of the PSI Electrical Energy division takes account of this requirement and provides the user with various service packages. This ensures that both fault correction and cyclical maintenance (updates and upgrades) are covered.

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Virtual power plants, trade, distribution and optimisation, regulatory messages and gas logistics

PSI presented new energy solutions at the E-world 2014

From 11 to 13 February 2014, PSI presented a comprehensive solutions portfolio for the energy sector at E-world 2014 in Essen (hall 3, stand 326). In addition to new software solutions for virtual power plants, trade, distribution and optimisation, the company will also focus on the implementation of regulatory requirements and gas logistics systems.

PSI presented the PSI*vpp* solution for virtual power plants for the first time at the E-world. The intelligent portfolio management system with stochastic optimisation for power station deployment optimisation represents the central component for the market integration of renewable energies. This central component is augmented by the functions required for secure data communication, control and monitoring of the systems in the form of a SCADA system and a Smart Telecontrol Unit for data and control connection of the systems. PSI*vpp* also supports business models for market bonus schemes and marketing for balancing energy.

In addition, the prototype for the new release of the energy trading system PSI*market* 4.1 has also been demonstrated. This release is based on the new PSI Group platform and integrates functions for gas industry analysis, planning and optimisation as well as the implementation of regulatory requirements. PSI*market* 4.1 achieves a new dimension in continuous process support in the energy industry—from planning through energy trading and distribution right up to settlement in a continuous solution.

In addition, the new release of the market-leading TS Energy system for stochastic optimisation and risk assessment, which features a significantly extended functionality, has been presented at the trade fair.

PSI*transport*, PSI*transact* and PSI*transstore* map the logistical business processes of transport and storage service providers, storage and network operators, and traders within the gas industry. The web-based PSI*portal* solution is used to view and report master data and movement data. Data from different sources and technical applications, such as planning, dispatching or settlement, can be archived in a system and made available for assessments.

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Energy trade fairs

11/02–13/02/2014	E-world 2014	Essen, Germany
07/04–11/04/2014	Hanover trade fair	Hanover, Germany
24/04–26/04/2014	E-world energy & water Turkey	Istanbul, Turkey
13/05–15/05/2014	Stadtwerke conference	Berlin, Germany
03/06–05/06/2014	Power days	Zurich, Switzerland
15/06–19/06/2014	World Petroleum Congress 2014	Moscow, Russia
30/09–01/10/2014	GAT 2014	Karlsruhe, Germany
25/08–29/08/2014	CIGRÉ	Paris, France
23/09–26/09/2014	InnoTrans	Berlin, Germany
16/09–18/09/2014	Energetab 2014	Bielsco-Biala, Poland
08/10–09/10/2014	EE Infodays	Aschaffenburg, Germany
04/11–06/11/2014	European Utility Week	Amsterdam, Netherlands

Learn more about all the PSI Group's events at: www.psi.de/de/events

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