

production manager

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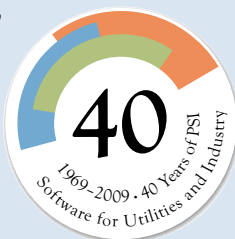
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BMW 3 series production in Leipzig

Photo: BMW AG

Decision Support Software

Speed up production with Qualicision®

It is of great advantage for any producer to be able to take into consideration customer requests as late as possible when configuring products. Precisely, this can be achieved by using the decision support software Qualicision® from F/L/S Fuzzy Logik Systeme GmbH in Dortmund. The result at BMW: The customer-oriented sales and production process allows customers to

change their specification as late as six days before the start of production.

Production and logistics processes in the automobile industry need to be designed efficiently to ensure the shortest throughput and delivery times. This is partially due to the situation in the European car market, which is

Read further on page 3

News ticker

+++ Since December 2008, PSI subsidiary PSI Transcom GmbH has been a certified data partner of Vodafone Germany +++ PSI allows group calling with mobile networks – Push-to-Talk solution PSIptt replaces trunked radio, walkie-talkie and pager services +++ With caplog-x fit for the liberalised gas market – New company covers the entire process for energy data management – VNG-Erdgascommerz GmbH and PSI AG are the shareholders +++ PSI withdraws about 1.8 percent of shares – Share buyback continues depending on market conditions +++ PSI presents solutions for energy and gas operations at E-world 2009 +++

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Events

Hannover Messe/ Digital Factory www.hannovermesse.de/digital_factory_e	20/04–24/04/09	Hanover Hall 17, Stand B50
The World of Information Systems sis.cvis.cz/eng/	20/04–21/04/09	Zlin, CR
Production Systems www.productionsystems.de	05/05/09	Munich BMW World
Transport Logistic 2009 www.transportlogistic.de	12/05-15/05/09	Munich Hall B2, Stand 624
ITS Spain www.itsspain.com	02/06–04/06/09	Andorra La Vella, ESP
UITP - Mobility & City Transport Exhibition www.uitp.org	08/06–11/06/09	Vienna, AUT Hall A, Stand 1C310
Aachen ERP Days www.erp-tage.de	16/06–18/06/09	Aachen



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Editorial

Dear readers,



Qualicision® technology from F/L/S enables implementation of software systems for intelligent decision support and process optimisation across industry sectors and for more efficient handling of production

processes and any other business processes. This saves time and money for customers and improves stability and quality.

We will be reporting on Qualicision®-based sequencing at BMW AG, which has been using this solution globally in all its plants for several years. Other automotive manufacturers including Volkswagen, Audi and Volvo are also using Qualicision®.

In the future Qualicision® solutions will complement the PSI product portfolio in production, energy and infrastructure management with additional unique features. Integration into PSI real-time systems clearly improves responsiveness to new situations in customer processes. F/L/S has already developed the first new Qualicision® solution in the PSI group for PSI Transcom, namely for optimal management of bus and tram depots. Read more in this edition.

Enjoy reading!

Dr. Rudolf Felix

Managing director
F/L/S Fuzzy Logik Systeme GmbH

characterised by customers configuring their vehicles individually as a rule, additionally demanding quick delivery. By comparison, the range of variants in a car model in Japan is considerably more limited, and in the USA cars are typically sold from the yard. That makes it easy for OEMs to apply a different production and sales strategy than what is the rule in Europe. However, the option of customising a car actually provides an instrument for European manufacturers to differentiate within the global market, an instrument that can also be linked to the market value. The extremely high degree of flexibility in configuration is to some extent a common trademark of Europeans.

The incredible demands on the definition of the company and IT processes for highly flexible production and logistics structures of this nature become clear when one realises that even the penultimate BMW 3 series was assembled in so many variants that in general a maximum of two to three identical vehicles left the plant annually.

Using the Qualicision® tool not only allows granting the customer a reliable delivery date but also the realisation of feasible desired car features at as early a moment as the first consulting session or when the order is placed. Moreover, all BMW customers have the option of reconfiguring practically all possible car variations until six days before the start of production of their personalised vehicle.

Production planning and the entire logistics department know that a car is on its way, but they do not know the final details of its construction. All measures determined after the options freeze must be ensured within six days. That means detailed time planning, internal scheduling and co-ordination of suppliers must be incorporated into this step.

Another element that increases the demand on processes and IT even further is that reoptimisation of planning must be ensured as soon as possible in the event of a problem and its subsequent solution. That is the only way to ensure a return to normal status in production or assembly for the orders that follow after an unforeseen event of this nature. The spectrum of ad-hoc measures ranges from access to an individual component that will not be installed until a later stage right up to the theoretical case where a vehicle must be withdrawn from the sequence at short notice. The system must allow for adaptability in planning and execution that does not conflict with the range of possible variants.

It would be impossible to realise specifications of this nature using conventional mathematical methods or the solution approaches found in measurement and regulation technology, even with the most powerful computers. The reason for this is that the logical contradictions that would be possible due to the theoretical range of variants would have to be defined in advance



BMW 3 series production in Leipzig

Photo: BMW AG

and represented with various branches in the programs.

The new flexibility is only possible because the approach to human thinking and action has been adapted in Qualicision® and transferred to the IT and vehicle production processes. Decisions in a situation are made based on fewer general conditions i. e. parameters, but the conditions are always straightforward. This is not based on formulas, but rather heuristics, which then allow flexibility and speed. The logical kernel here is the Qualicision® technology based on fuzzy logic, which - on the basis of fuzzy information - allows for absolutely precise decisions,

as for instance sequencing in production planning with tight deadlines.

A suitable analogy is the image of mixing desk in a recording studio. In practice, the recording engineer uses certain slides or controls and sets levels according to his audio input. This is an activity based on direct experience rather than arithmetic logical functions. Some sliders are interconnected in such a way that both a parallel or opposite correlation of individual channels can be achieved.

The Qualicision® system interface used to control the production of cars contains a monitor with slide

controls that can be adjusted steplessly between 0 and 1 or 0 and 100 %. Each slide control corresponds to a relevant production parameter. In the case of binary decisions, that is, yes or no, an instruction is stored to the effect that only the values 0 or 1 are permissible for the decision generation. Soft decisions occur most frequently. This can be a condition with a complex structure, in which a specification must be balanced along a continuum from 0 to 1, and where no concrete default exists.

A situation of this type might be related to preventing employees from being overloaded in their jobs, for example. If an assembly worker


deals with three or four fully configured vehicles in succession, a high degree of concentration is required, which is accompanied by fatigue. The aim is therefore to minimise the associated risk of error by means of a more balanced sequence. The requirement could be expressed in words as follows: If a fully configured car is assembled, the system must be optimised in such a manner that the following vehicle has a basic configuration. Another example is the planning of the paint shop for the chassis that will later be incorporated into the assembly via the buffer stock. In this case it is important to ensure that light lacquers are applied first and subsequently those with darker tones. The requirement could be expressed in words to the effect that the colour

change must occur from light to dark to prevent excessively long set-up times for cleaning the coating systems.

These two examples alone illustrate that there are different and possibly contrasting objectives for an optimal production sequence in different areas, and that the system must be able to handle both.

When assembling cars, the number of parameters required is around 100 to 120. This allows for a balanced production flow, which controls the preceding and subsequent logistics by means of the pull principle. The intralogistic and warehouse management processes are similarly controlled using the Qualicision® sequencing software, which takes into

consideration physical availability of subcomponents when determining sequences. This availability depends on extremely heterogeneous warehouse structures.

Qualicision® sequencing software is already used worldwide by BMW at all its plants, including motorcycle assembly. In addition, the solution is used by other automobile manufacturers and can naturally be adapted to sequencing optimisations in other industrial sectors. 

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Modernisation with 4Production

Traditional company Slim sets course for increased service skills

4Production AG is part of the PSI group and has special responsibility for the efficient planning and control of manufacturing processes in the aluminium industry. Together with Hydro Aluminium, the company is continuing the modernisation of the Slim rolling mill plant. The Manufacturing Execution System (MES) ensures clearly structured processes, maximum transparency and reliable implementation of strategic requirements.

Hydro Aluminium is one of the world's leading manufacturers of aluminium

rolled products and has been an important strategic partner of 4Production AG since this company was founded in 1998. The plants in Hamburg as well as those in Grevenbroich rely on solutions provided by 4Production. Hydro's rolled products are used for packaging in the lithography and automobile sectors as well as in construction, for example.

In Europe, Hydro operates a rolling mill plant as part of a multi-plant manufacturing process in Cisterna, Italy, around 60 kilometres south of Rome. The plant has a capacity of 130 000 tons

per annum, and focuses on supplying the local market.

In the last few years, the company has invested extensively in state-of-the-art systems technology and automation solutions to extend its capacity. The aim was to increase service competencies and quality, and in so doing to gain an advantage over the competition. The 4Production advisory team supported the process using sector-specific IT solutions and knowledge from the complex manufacturing processes at Hydro. After implementation of the



Line 1 smelting furnace in the Slim plant

Photo: 4Production

Manufacturing Execution System, a new high rack warehouse with intensive cooling and a new cold rolling mill was first integrated.

The next step was to include 50 additional systems in ongoing operation. All stations in the system, from the foundry to the adjustment stage, such as ovens, saws, milling machines and cutters, are now included. Some of the stations are new or upgraded and work manually or fully/semi-automatically, such as the uprated hot roll. The various starting materials including scrap, ingot and primary alloys also had to be taken into consideration.

The MES allows for optimal interaction between these extremely

different systems. Production know-how on the part of the 4Production team also ensured problem-free integration: The experiences of all those involved were of value as early as the engineering decision-making phase. The plant now operates with proactive material flow management and shop-floor-management; precision advanced planning and sequence planning are performed automatically


or manually. Intuitive user guidance shows the planner all work processes, material and order data. In the event of changes, restrictions and availabilities are checked and the effects on the delivery deadlines are shown. As various scenarios can be run through simply by clicking a button, flexibility and speed are increased. All important information such as set-up times and down times can be called up directly via the monitor.

Highlights

- Optimal utilisation of system investments
- Improved process security and reliability
- Transparent stock and production information
- Guaranteed company strategy right up to manufacturing level
- Implementation of group-wide IT strategies
- Highest availability due to bullet-proof system

Reports can be automatically generated and provide central operating figures in terms of capacity utilisation, quality and performance.

Integration of the systems at the Hydro Slim rolling mill plant in Italy was designed with a view to connecting it to the global standard Hydro SAP interface. Following a short integration test in Hamburg and after SAP became available in Slim, adapting the ERP interface was a quick and uncomplicated process. In addition, a technical hotline ensured continual support, thereby guaranteeing 24x7 availability.

Investments and optimisations in the Slim plant are continuing, as is the strategic partnership with 4 Production. As a next step the ribbon roller will be upgraded and fully automated. The new components such as cooling, control, measuring devices and automation systems will mean that the roller can supply valuable data to the MES. This will ensure that the most ideal presets for widely differing materials can be determined during the engineering phase. The optimal settings for the cold rolling process will then automatically occur during ongoing operation. The aim is for metal bookkeeping and accounting (ERP/SAP) and metal stock (MES) to also exchange their data with the Manufacturing Execution System in future. 

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Parking space management with Qualicision®

Photo: Stuttgarter Straßenbahn AG

Optimal processes in bus depots

Qualicision® technology in DMS

In 2007, PSI Transcom GmbH was commissioned by the Stuttgarter Straßenbahn (SSB) to supply a depot management system (DMS). Since the creation of a specification sheet and plant acceptance, the system has been rolled out to seven depots (bus and tram) with a total of 450 vehicles.

The DMS monitors and controls the entire company-internal operation, from monitoring entrances and exits to parking place management, right up to workshop information regarding impending repairs. Automatic parking place scheduling is an integral component of the depot management system. Vehicles must be parked in spaces and halls in such a manner that they can exit the following morning without

manoeuvring activities. In addition to other criteria, fuelling optimisation as well as temporal restrictions on the availability of vehicles and parking spaces must be taken into consideration.

In the past few years, PSI Transcom has installed DMS at STAWA in Augsburg, at Meoline in Essen and at RSAG in Rostock. In so doing they have acquired the corresponding process know-how.

The last significant update of the PSI *traffic* framework to a new main version number included a conversion of BMS from an object-oriented database to a relational database. This required numerous adaptations to the software. In this connection, the module for parking place management was also tested. For

this purpose, PSI Transcom not only worked on the further development of its own software but also evaluated external solutions, among them that of F/L/S Fuzzy Logik Systeme GmbH in Dortmund.

PSI Transcom finally decided to run the project with F/L/S, mainly because of its numerous references from different sectors but also because of the convincing presentation of its implementation within the DMS project.

Parking space management comprises two stages. The first stage entails preplanning for the following and additional days, and regularly takes place every night. In Stuttgart, this preplanning extends over five days. Scheduling for the following day is calculated based on the route plan and

fixed rules as to the use of vehicles on specific routes, as well as existing workshop orders for planned repairs.

In the second stage, the parking place management system compares the target plan with the current situation after the vehicles return from a round trip, performs a new calculation where necessary and allocates a parking place to the driver.

As it is rather the rule than the exception that vehicles return to the depot outside the planned sequence, because they often depend on current traffic conditions, the optimization is generally carried out after the arrival of each vehicle.

To prevent drivers having to wait at the gate until the software finds a solution, the customer sets a limit value of ten seconds for each calculation, a value

that has so far been adhered to in the tests that have been run with the F/L/S and PSI Transcom software.

Qualicision® is used as an optimisation module for automatic parking place scheduling in depot management systems. A distinction is made between firm criteria to be adhered to and qualitative criteria to be achieved. Firm criteria represent requirements for the optimisation result, which can largely be directly or indirectly derived from actual spatial or physical situations (for example the current topology of a depot in terms of available parking places). The qualitative criteria to be achieved include qualitative requirements for Qualicision® optimisation. A qualitative requirement is a quality the user expects from the optimisation result. Examples for qualitative criteria are the requirement that all lanes in the depot should be equally occupied by vehicles where possible or the above-mentioned equalisation of the kilometres travelled by the vehicles. Qualitative criteria can either conflict or co-operate with each another or behave neutrally. The current relationship among qualitative criteria depends on the current base data (actual situation of the depot and vehicles) and must be determined dynamically. By assigning relative priorities, schedulers can weight the qualitative criteria.

The Qualicision® optimisation recognises the conflicts resulting from the current base data and the



Automatic parking space scheduling

Photo: Jupiterimages

compatibility of the qualitative criteria, and calculates the best assignment of vehicles to parking spaces from a current point of view. According to the call-up mode, the Qualicision® optimisation either generates a complete occupation plan or determines the next best parking space for a vehicle entering the depot.

In less formalised business processes, quantitative and qualitative data must often be merged for optimisation decisions. The more formalised the business processes are, the stronger the requirement for systematisation of decision making or optimisation. It is surprising that even then modelling

is possible with the assistance of the Qualicision® technology. ☉

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Airport Solutions

PSIairport/BRS commissioned



PSIairport/BRS ensures end-to-end baggage loading at Hamburg Airport.

Photo: Michael Penner, Hamburg Airport

There is an ever-increasing demand for PSI solutions in the airport sector. At the beginning of the year Groundstars GmbH & Co. KG, a subsidiary of the Hamburg Airport operator commissioned the PSIairport/BRS baggage reconciliation system for

monitoring the handling of luggage in the baggage area. Now ten of the twelve largest German airports rely on PSI airport solutions.

The newly installed system enables employees to recognise and avoid

incorrect loading by means of clear visual and acoustic signals. Mobile hand-held units are used to control the loading of all relevant objects and to document these in detail without slowing down time-critical work processes. At the same time data is transferred online to

the airline, and is then used to provide up-to-the-minute information to its passengers as to the status of their luggage items by SMS, for example. PSIAirport/BRS complements the existing baggage handling systems in the baggage area and the flight information display in the non-public/public area at Hamburg Airport. Baggage handling at Hamburg consequently operates with an end-to-end PSI solution, from the central computer of the conveyor system and the system flow and material flow control at check-in right up to loading.

By now, ten of the twelve largest airports in Germany alone operate with IT systems from the leader in innovation. The Berlin company's airport software is considered one of the most comprehensive systems for airport applications with its components for flight plan management (PSIAirport/FPMS), automatic baggage sorting (PSIAirport/BHS) and baggage reconciliation system (PSIAirport/BRS), as well as for freight handling (PSIAirport/CARGO) and truck dock management (PSIAirport/TDM). The system becomes a complete solution by means of components for supporting all handling systems related to passengers (PSIAirport/DCS), loading planning (PSIAirport/W&B) and integrated maintenance planning for continuous 24/7 operation (PSIAirport/M&S). PSIAirport/EAI ensures efficient interface management, condensed integration of existing system environments and additional realisation of existing

optimisation potential. PSI's long-term goal is extensive networking, not only of airport systems at one location, but of airports with one another. The additional extension of PSIAirport/BRS allows current data from the departure airport to be made available to the destination airports in real time. Additional management functions facilitate onsite tracking of containers, which are also captured at the time of loading and unloading. The resulting cost benefits are obvious. Additional future-oriented developments will mean that PSI will offer an RFID base for corresponding solutions.

In parallel, a number of practical tests are under way, in which new, innovative system modules are being tested. For instance, PSI is adding convenient determination and calculation of weighting to loading planning (PSIAirport/W&B) together with Lufthansa and German Wings airlines. The optimised system is now being extended further. In future, a combination with the reconciliation system PSIAirport/BRS will be available, allowing currently determined weightings to be included in the planning and monitoring systems without format discontinuity.

Another central approach on the part of PSI lies in the development of value-add strategies for airport operators. The flight information display system PSIAirport/FIDS enables information systems such as overview, check-in and

gate displays to be used in a multimedia format, in addition to being used as dynamic advertising media, to generate additional sales options. The advertising messages appear either on a screen split as required or in a time slice together with conventional information. In addition, display systems that are currently vacant can be actively actuated and used for passenger information.

PSI's latest IT-developments and solutions for airports can be seen in October at Inter Airport Europe in Munich. ☺

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Photo: Jupiterimages

With Multisite to China

FELSS group with PSIa in the land of smiles



First steps in China with PSIa.

Photo: FELSS

Despite being aware of manifold difficulties, rotaform GmbH decided on a startup in the People's Republic of China – with ERP support right from the start. Detailed planning and the right system supplier as a partner with its tried and tested software meant that the company strategy could be implemented successfully.

The FELSS group has its headquarters in Königsbach-Stein, and offers its customers solutions for economic series production of lightweight construction components using a special cold extrusion process. The core processes include rotary swaging, axial forms,

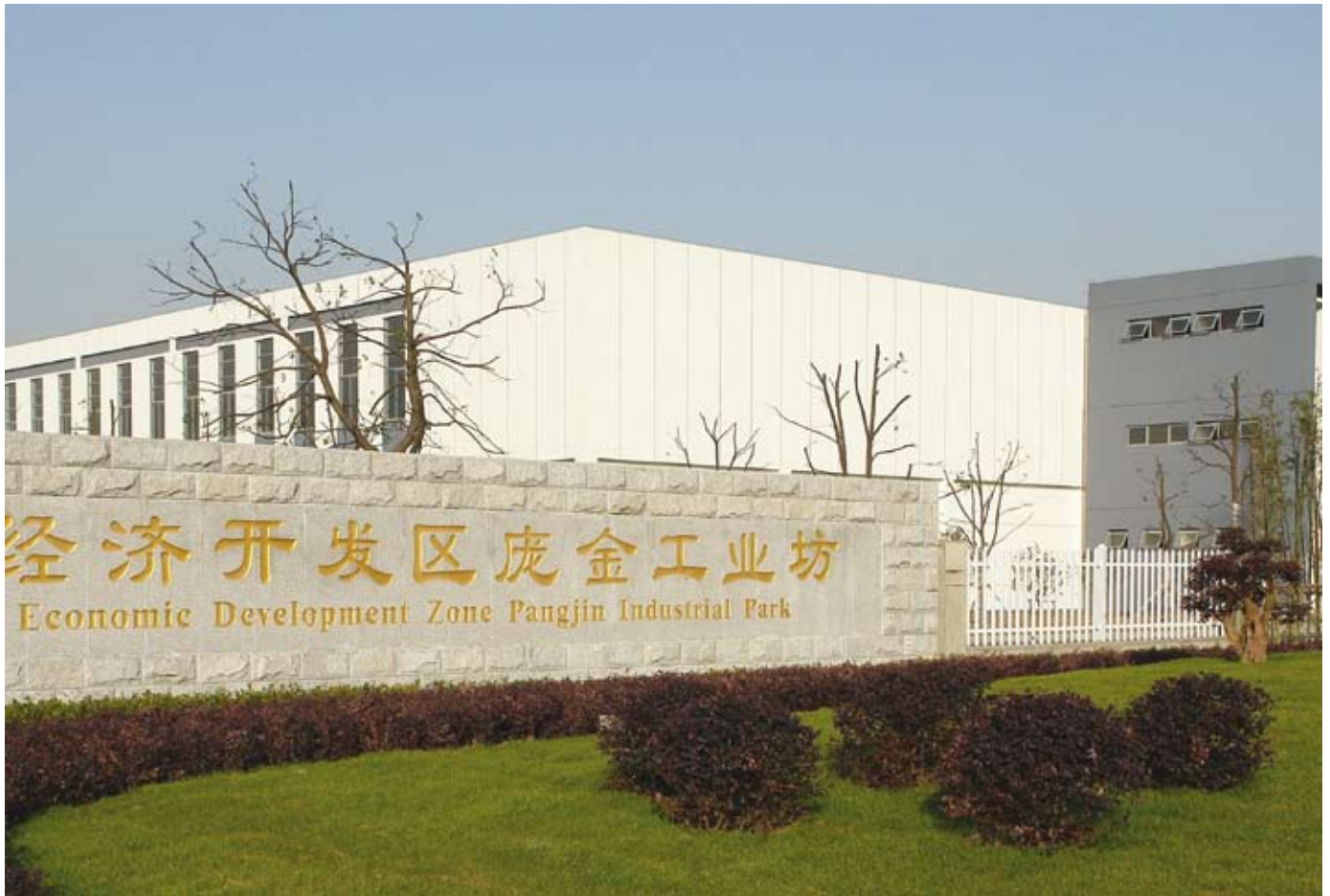
end forms and bending. The company group is made up of the companies FELSS and FELSS Burger in the machine construction sector and four companies in the component production area together with subsidiary rotaform in Germany, Switzerland, USA and since last year China as well. In 2007, around 450 employees achieved a turnover of more than 87 million Euro.

While FELSS and FELSS Burger develop and produce production systems configured according to customer specifications from a modular construction system for cold extrusion

in combination with machinable processes, rotaform plants use these systems for series production. The automobile industry in particular, but also all industry sectors which require both resource saving material usage and a high degree of precision and stability in components are the buyers. Typical products are steering shafts, shock absorbing struts and injection nozzles, as well as pump shafts, surgical instruments and components for drilling machines.

In 2007, international customers of the FELSS group enquired from rotaform GmbH as to whether it would be possible to produce items in China as well: Management immediately started intensive negotiations. Long-term contracts for the supply of steering components were concluded as early as the end of 2007. The agreed date for commencement of production at the beginning of 2009 meant that rotaform had only around one year to start a company, select a location, find and train staff, and set up production and IT.

Staff were resourced from within the promotion hierarchy of young employees of the FELSS group in Germany. Chinese students at German universities had the opportunity to complete practical training at rotaform or to write their graduate theses.



FELSS site Pangjin Industrial Park

Photo: FELSS

On being employed, they learned about manufacturing processes and internal company procedures. With their help, a suitable location in Wujiang was quickly found. They also assisted in searching for new employees, who were then trained for three months in Germany at rotaform and FELSS.

Production control in Wujiang was to be computer-controlled to a large degree from the beginning. Andreas Liebe, Head of IT/Organisation, knows his company: "IT is held in extremely high regard by the FELSS group. From process control to business applications and analyses, we are dependent on our ERP systems".

Since the beginning of the 90s, FELSS has used PSI's ERP system. "At the time, the throughput time for a large system was up to 18 months. However, we wanted a timeframe similar to the one we currently have – around half a year", said Liebe, explaining the problem at the time. The company was looking for software that, above all, provided optimal support for complete orders. They found Piuss-O, the precursor to the current ERP standard PSIPenta from PSIPENTA Software Systems GmbH. Besides the more classic PSIPenta variant for machine construction, the automotive sector today uses specialisations such as batch tracking, serial numbers, call-offs as well as EDI

communication with customers and suppliers. But not only the ERP system is used – graphic control stations, operating data and personnel time recording as well as the communications platform myOpenFactory are also used. "By using PSIPenta we cover both order fulfilment as well as series production. It is a great advantage to be able to do this in a single IT environment", concludes the IT manager.

The entire IT function is centrally located at FELSS Holding, including controlling and bookkeeping for multiple members of the group. It is noteworthy that all plant operation is performed using a 100% standard

installation: No adaptations whatsoever were performed by PSIPENTA. The IT organisation performs all updates, so that after a lead time of three to six months – depending on idle times in operational activity – the software is always at the current levels. Furthermore, the mature multisite functionality of *PSI_{penta}* has been in use for about two years, allowing problem-free central administration of all processes within the group. The system also supports processes between members of the group, so that common data can be used, such as item data.

From inception, the *PSI_{penta}* multisite contained all required data, including master data, item data, parts lists, work plans, cost centres and work centres. This means that not only the interfaces but also the master data can be set up in multiple languages. Expressions and analyses are created in English and Chinese. IT/Organisation also makes use of the option to store documents and photos in *PSI_{penta}*. "Images, contracts and internal and customer drawings can be associated with master data; this is extremely useful for new employees", acknowledges Liebe. However, Construction and Development management determine exactly which drawings, items and parts masters are released for China.

As part of the training, the Chinese colleagues, most of whom had never worked with an ERP system, learned the basic data structures and processes

in a system of this nature. The training was divided into two phases and extended over a period of four weeks in total. Firstly, the students learned and practised the basics of the ERP system to be able to subsequently consolidate the new skills by means of repetition and practical exercises. For this purpose, a model factory was used, in which all employees were first required to perform each process

Liebe was able to handle the entire preparatory phase of the project in Germany with three to four colleagues over a period of 12 weeks.

The ERP standard is now running in full production mode in China. Functions such as purchasing raw materials, booking input calculations, setting up and activating production orders (and modifying these using a different



Production at Chinese site Pangjiu

Photo: FELSS

without a computer: This included warehousing, goods input checking, inspection of raw materials, recording of time and volumes, and much more. The students then documented the individual steps on a pinboard and assigned the corresponding documents. Only then did they reproduce each step in *PSI_{penta}*.

quantity or deadline) have also been added, as have the compilation of orders, the creation of delivery notes and invoices as well as ex-post costing and preliminary costing. "We managed this on site in seven weeks, and were able to produce the first parts at the end of 2008. The optimal support in this regard was the high degree

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PSI  *Software for
Perfection in Production*

of flexibility and configurability of PSI^{pent}a", explains Liebe, adding that the PSIPENTA ERP standard version

8.0., which was introduced at CeBIT 2009 in Hanover, has been enabled for unicode. This means that all

templates, dialogues and messages can in future be supported in numerous European languages as well as in Chinese. As a result, the benefits of the software are again considerably enhanced, as it becomes possible to also employ Chinese colleagues who do not have English language skills. ☉

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News from PSImetals

Quality assurance and profitability in steel plants

The steel plant is at the start of the process chain when it comes to manufacturing steel. The composition of the steel is determined here, and its subsequent characteristics are specified. When up to 300 tons of high-grade material is treated in a steel ladle, a deviation of only a few kilograms in the alloying can make the difference between good and poor quality. The importance of the topic of quality can be seen in the demands for a high degree of process certainty from the perspective of the metallurgists as well as from the quality standards and proof required by the customers. The PSImetals production execution system combines qualitative and economic aspects of process control, and its comprehensive standard and extensions from customer projects in the last few years offer different approaches for quality assurance in a steel plant.

The production of complex steel qualities requires a high degree of process control, precise operator control as well as immediate response to changes and interferences during production. PSImetals meets these demands, as the production process is precisely modelled and the technological know-how for each process step is stored in the system. The treatment practices are at the centre: All process steps necessary for the production of a steel grade (e.g. charging, main blowing, deoxidizing, alloying, temperature measurement and sampling etc.) are stored in the form of a set of regulations, together with the associated aim values (analysis to be set, temperature, material restrictions, stirring durations etc.). All target values and regulations can be configured by the user. For actual process control, these values and regulations are transferred to sublayered systems as aim values and displayed to

the operating personnel in the pulpits in the form of detailed work instructions. This procedure allows for standardisation of all factors affecting the quality of a steel grade and for control of these factors by means of online monitoring and online feedback during treatments. The main target in the planning of casting sequences is the continuous supply of steel to the continuous casting systems, at the precise time and in the required grade and temperature. The online heat scheduler of PSImetals takes over the operative planning of the heats at the different facilities on the production route to the casting machine while taking into consideration the current production situation at all facilities and the required resources such as ladles and cranes.

Process optimisation with mathematical models are used to calculate the best possible sequence and production



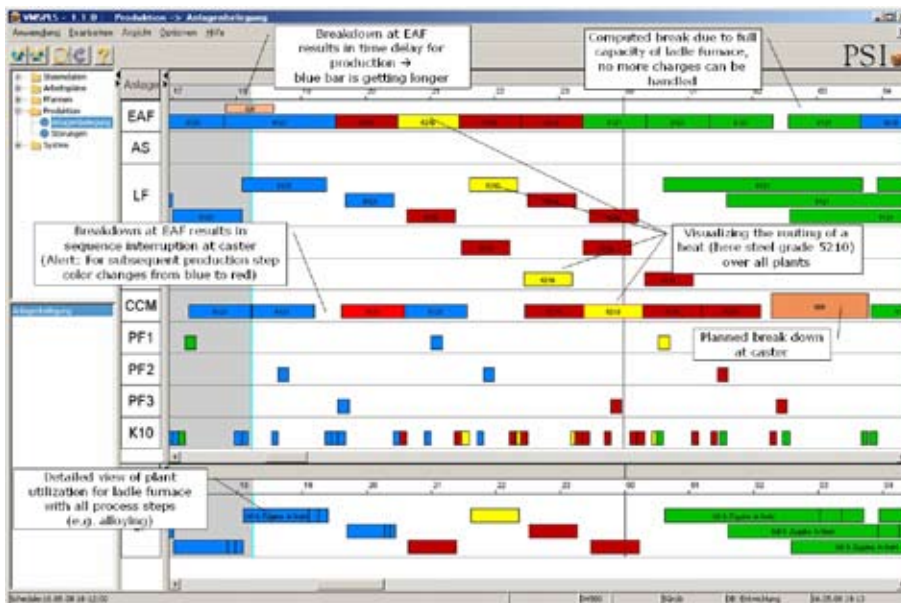
Overall process control in steel production

Photo: Jupiterimages

route for the heats in a sequence, based on planning restrictions (facility properties, treatment duration, resource availability etc.) and current facility situations (process steps already started with plan data in terms of completion, facility downtimes, repair times). This planning is constantly updated by means of online feedback from the process. In this manner, conflict situations can be recognised in advance and are graphically visualised. This allows for online modifications to the schedule by means of automatic exploitation of the given tolerances,

for example by selection of alternative facilities, modifications to the buffer times or casting speed. Thanks to the integration of the online heat scheduler and the line sequencing in PSImetals, it is possible to realise goals such as throughput optimisation, coordination of bottleneck facilities, consideration of ladle availability as well as energy usage optimisation in close association with quality goals. Economic optimisation of production processes in the steel plant can also only occur where qualitative aspects are taken into consideration. From a procedural point of view, the goal is

cost-optimised use of all materials such as scrap, alloys and additions while at the same time ensuring the quality of the steel grade. The charge and alloying optimisation of PSImetals ensures that all input materials in the steel plant are optimised for costs and quality. For every steel grade to be produced, the material types and quantities are optimally calculated taken into consideration material restrictions, handling specifications and other ancillary conditions. All materials required are checked for availability in the stocks. The integrated check for



Online Scheduling of heats with PSImetals

Photo: PSI Business Technology

analytical reliability makes allowance for the fact that delivery-based deviations in material composition do not lead to quality problems when manufacturing high-quality grades. The benefits arising from the application of charge and alloying optimisation include optimised usage and alloying costs, improved reliability of analysis and a greater transparency in the optimisation results by means of visualisation of all restrictions.

To be able to qualitatively control the production of steel from a metallurgical point of view, and to optimise it taking energetic factors into account, metallurgical-thermal process models from PSI partner VDEh-Betriebsforschungsinstitut are integrated into PSImetals. As a result, the dynamic process control calculates the current processing status e.g. for electric steel production (temperature, weight, steel and slag analysis) and controls the electrical and chemical energy supply.

Additional models for dynamic process control of BOF steel plants as well as for facility spanning process control in secondary metallurgy are available for setting required target values. The models are optimally adapted to PSImetals treatment practices and use the specifications defined there for analysis and temperature as well as the stored restrictions and regulations. In this manner, it is ensured that the technological know-how necessary




Process optimisation at steel plant with PSImetals

Photo: PSI Business Technology

for process control and specialist knowledge are centrally maintained at one location in PSImetals. Customers also profit directly from innovative model approaches derived from research projects when process models are included in PSImetals.

It is only the complete integration of PSImetals, process models and system automation – from scrap-yard right through to the casting machines – that allows for total process control from a qualitative and economic point of view. Whether it be standardised process specifications, model-based process control, online monitoring of deviations in a running production process, or taking into account documented experience values for steel qualities to be newly created – quality problems can be recognised early and charges qualitatively controlled, thanks to the overall process view. This ensures that a heat that has been transferred to the caster has optimally reached the defined standard of quality.

PSImetals in its standard configuration includes production management solutions for the entire supply chain in a steel plant, from the scrap-yard via BOF, electric arc furnace, secondary metallurgy and casters right up to remelting facilities. 

Since the beginning of 2007 PSImetals has been used in the meltshop at voestalpine Stahl GmbH. What has been your experience?

"With a current annual production of more than 5.1 million tons, LD-steel plant No 3 produces over 32 000 heats with over 300 different steel grades per year. A high degree of process control in production is a decisive factor in modern, complex steel qualities. This can only be achieved if all required process steps are transparently represented and production can respond immediately to changes and interferences during production. To this end, a new system for computer-aided quality control based on the PSImetals production management solution from PSI was successfully commissioned for primary steel production and secondary metallurgy at the beginning of 2007. The main tasks and advantages of this new CAQC-SM are quality assurance by standardisation of production of all steel grades, online quality monitoring during production by target-actual comparisons and online adaptation of procedure regulations, online feedback to the operator on current quality and determination of the treatment steps still required. CAQC-SM consequently forms the new kernel of process execution technology in the steel plant.

For example, we were able to reduce recastings as a result of analytical deviations by half. The reliability of PSImetals in daily use (99.96 % system availability) is extremely important to us".

Joachim Lehner,

Process engineer for smelting metallurgy, voestalpine

PSI Business Technology for Industries GmbH is Germany's leader for software solutions in production management for the metals industry. Customer relationships established over the course of decades and a host of MES projects have contributed to our staff's outstanding technological expertise in metals.

World-wide metals production is growing – and so are we. We are involved when our customers produce at various international sites. Headquarters are located in Düsseldorf and we have an additional office in Berlin. PSI BT operates its own subsidiary in China to serve the Chinese steel market. PSI China has activities in Shanghai and Beijing. Our global business also benefits from the infrastructure and locations of the PSI Group.

Traffic telematics in Austria

Monitoring and maintenance system

PSI supplies ASFINAG, the motorway and trunk road operator in Austria, with an operations monitoring system for monitoring and maintenance of all technical facilities for the telematic infrastructure for around 2 200 kilometres of road


The spectrum of monitored traffic telematic components ranges from simple traffic data recording via traffic control systems and video monitoring systems right up to systems for traffic information services. The basis for the system implemented is the tried and tested *PSIcontrol* standard system for all tasks in systems monitoring in real time (process coupling, fault and performance

management, etc.). *PSIcommand* is used for maintenance planning, and fulfils the specific needs and requirements of ASFINAG in terms of workforce management and adherence to contractual agreements with external maintenance companies. Because of its structured, modular design, the system can be functionally extended at any time. New road sections can be included and activated without interruption to the running operation.

The operations monitoring system has been used successfully by ASFINAG since autumn 2008. Extensions currently in progress will be completed in the first half of 2009. This will result in an



Operations monitoring Photo: ASFINAG

innovative project being completed on time and in budget. 

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Operating cash-flow tripled to 9.9 million Euros

PSI Increases 2008 EBIT by 50% to 6.2 Million Euros

The PSI Group more than doubled its group net result in financial year 2008 to 4.1 million Euros (2007: 1.9* million Euros). The earnings per share increased to 0.34 Euro (2007: 0.15* Euro). The EBIT increased to 6.2 million Euros (2007: 4.1* million Euros). Group sales reached 128.9 million Euros (2007: 123.2 million Euros), new orders, at 152 million Euros (2007: 132 million Euros), clearly exceeded the target and the annual sales. The cash-flow from

operating activities tripled to 9.9 million Euros (2007: 3.0 million Euros), liquidity at the end of the year rose to 23.7 million Euros (31.12.2007: 18.9 million Euros) despite the payments for two acquisitions.

PSI started 2009 with a very high volume of new orders of more than 25 million Euros in January. The focus of the new orders is on rationalisation investments in major industries and utilities. PSI foresees concrete opportunities in the

export business as a result of the speeding up of infrastructure investments with the stimulus programs in China, Russia and Eastern Europe. The management is optimistic, albeit cautious in view of the general climate, that this year's targets of 7.5 million Euros for the EBIT and 140 million Euros sales can be achieved and possibly exceeded. 

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ERP with scaleable CRM and service module

PSIPENTA Shows New Routes at the Digital Factory 2009


The PSIPENTA Software Systems GmbH, a wholly-owned subsidiary of the PSI AG, will be presenting new applications for the customer relations and service management during the Hanover trade fair at the Digital Factory from 20 to 24 April 2009 (Hall 17, Stand B50). In a concrete scenario, an integrated software and process landscape will be demonstrated which integrates all the aspects of corporate customer care.

With its new applications PSIPENTA takes up the central topic of this year's

leading international trade fair for integrated processes and IT solutions. Particularly in difficult times, it is necessary for manufacturers who only have corporate customers to guarantee quick reaction times, proper bids and deliveries and excellent service.

PSIPENTA provides a scaleable range of products from contact management to after sales modules for spare parts and service to integrated CRM solutions, covering all the operational areas. In this manner it is possible to avoid loss of information, improve information

flow, reduce costs and increase customer satisfaction.

In celebration of its 40th anniversary, PSI will be holding an exclusive gala event for invited guests of PSIPENTA on 21 April 2009 at 7 pm in the former Belgian Pavilion of the EXPO 2000. 



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PSIPENTA gains top manager


Thorsten Reuper is in charge of strategic product development



Since 1 February 2009, Thorsten Reuper has been responsible in his new position as Development head at PSIPENTA Software Systems GmbH for strategic product development for the ERP standard PSIPenta.

Until recently, Reuper was Vice President for Product Development at Infor Global Solution Deutschland AG and was responsible for the development of ERP products COM and XPPS/Xpert with a focus on the sectors of automobiles, discrete manufacturing, and machine, system and tool construction. He was previously Managing Director of Infor Global Solutions GmbH in Breisach for many years, a company that grew out of BRAIN International AG. Thorsten Reuper was one of the co-founders of Rembold & Holzer EDV Beratung in Hanover over 20 years ago,

and was Director in the technology division.

Reuper's appointment underlines PSIPENTA's claim to be the leading software producer for production businesses. The previous development projects for the PSIPenta ERP suite as well as the platform consolidation in the PSI group have enabled PSIPENTA to acquire a recognised expert and internationally experienced manager. 

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