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PSImetals Planning from strategic to operational level

Integrated planning processes at Erdemir

Optimised and integrated supply chain management processes from strategic production planning down to operational level are a major challenge for integrated steel plants. The problem complexity is further increased when the production of several sites has to be balanced. The main business objectives are to improve customer delivery performance, while also reducing lead-times and stock levels, optimising the utilization of lines and maintaining competitive selling prices at minimum production and supply costs. Using PSImetals for all planning levels from strategic to operational level, significant improvements of these KPIs could be achieved at Erdemir, Turkey.

As an integrated steel manufacturer of flat and long steel products Erdemir operates at two production sites which are separated by 665 km. Products can be produced in both plants. To achieve a seamless integration for the planning and scheduling processes of the two

sites the following business processes need to be covered by an overall solution. This include Demand Forecasting to generate order forecasts based on historical data and customer requests;

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Newsticker

+++ PSIPENTA Receives Significant Contract from Chinese Railway Construction Group – State-owned enterprise CSR Sifang chooses PSIPenta
 +++ PSI Receives TÜV Certification in Accordance with SIL 1 for its Leak Detection System at Dow Chemical – PSIPipelines monitors ten pipelines in Germany
 +++ PSI receives major follow-up order from ThyssenKrupp Steel Europe – Additional logistics system provided for Duisburg-South location
 +++ Automotive supplier NEUE HALBERG-GUSS GmbH controls core moulding plant with PSI – PSImms manages warehouse processes at Leipzig location +++

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Editorial

Dear readers,

Where manufacturing companies are concerned, effective planning and control of production processes is a key factor in keeping up with international competition. In particular, planning over multiple levels and linking strategic and operational business presents a perpetual challenge. It is necessary to incorporate and harmonise different perspectives relating to processes, times and volumes. It is only through coordinated planning processes that decisions can be made quickly as to whether a potential customer order can be manufactured economically in consideration of the current production situation.

PSI's industry-specific planning solutions – for the automotive industry, machine and plant construction, logistics and metal production – cover the full spectrum of planning, from supply chain planning, through scheduling and capacity planning, logistics and transport planning to production planning and detail scheduling.

In this edition, PSI Metals presents some PSImetals planning solutions that have been used successfully at two different steel manufacturers. While the solution for Turkish steel producer Erdemir is based on the interaction between the different planning levels and the potential for optimisation resulting from this, the article about the planning solution offered to ArcelorMittal Fos-sur-Mer in France illustrates the significant cost savings that can be achieved with plant-specific optimisation solutions.

I hope you will enjoy an interesting and inspiring read.

Regards,

Sven Busch
 Managing Director Technology & Production,
 PSI Metals GmbH



► Continued from page 1

Sales & Operations Planning to find the most profitable order allocation plan while considering costs, capacities and slabs supply needs; Master Planning to deal with capacity and campaign optimisation; Order Scheduling to handle schedule synchronization and net order calculation as well as Line Scheduling to optimise operational scheduling involving campaign configurations and complex sequencing rules.

The implemented PSImetals solution consist of configurable planning modules covering above mentioned business processes and aiming at optimising the different planning and scheduling processes of Erdemir's supply chain.

Main Project Challenges

The main challenges to tackle with PSImetals within the project scope were:

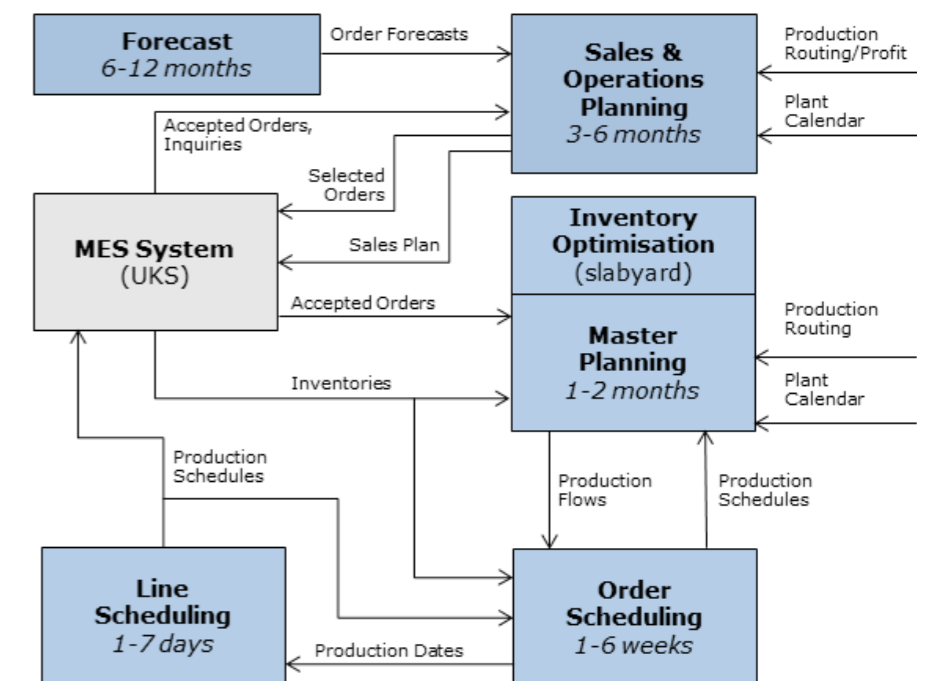
Sales & Operations Planning: At Erdemir site the hot mills total daily capacity exceeds the casters total capacity by 50 percent. To utilize the full HRM capacity additional slabs need to be supplied whether from the Isdemir site or from external suppliers. PSImetals shall determine the weekly slabs supply needs considering the dynamic demand needs and continuous casting capacities.
Master Planning: The daily material mix for each site need to be balanced according customer and production requirements and their impact on the material flow at upstream/downstream lines. For example backup campaigns at the hot strip mill at Erdemir site are created over a 15 day's period and the global width profile of coffins within should be decreasing. Very narrow material can therefore only be produced

at the end of this campaign while ensuring related delivery dates at the same time. At Isdemir site additional diameter campaigns need to be calculated at the wire rod mill as they have a direct impact on the billet casters schedules.
Order Scheduling: To increase the hot charging ratio at Isdemir site a high degree of synchronization between hot mill schedules and caster schedules is needed. A pull-push scheduling strategy ensures that within a first hot mill scheduling hot charge coffin opportunities are identified and their dates are propagated up to the casters ("pull"). Generated caster schedules respect those hot coffins dates. Finally, hot mill schedules are re-calculated based on WIP and forecasted material from resulting casters sequences ("push").

Well-Calculated Future Demands

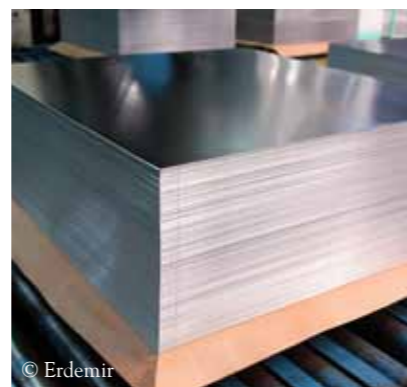
In order to obtain reliable quantitative forecasts, the PSImetals De-

mand Forecasting module generates collaborative forecasts based on input as contract ordering information coming from past and current orders, including customer, industry sector and product group information. Using forecasting trees and an advanced forecast aggregation/disaggregation the future demand volumes are distributed into monthly forecasts for the upcoming 6 months. These forecast orders consist in weekly demand volumes per families of product. Erdemir obtained an improved visibility over upcoming demands at different aggregation levels using PSImetals. Reliable forecast quotas form an improved input for the Sales & Operations Planning. The web-based application allows a simultaneous usage by many users while each key account manager being responsible for its own customers.



Overview of business processes and information flows at Erdemir covered by PSImetals.

Source: Erdemir



Most Profitable Production Selection

Based on forecast orders, accepted orders and order inquiries, the Sales & Operations Planning determines the most profitable capacity allocation plan for both plants, Erdemir and Isdemir. PSImetals balances capacities and costs against selling prices, decides on order selection and generates a 6 month weekly materials flow or capacity plan at a product family level. Modeling Erdemir's supply chain with PSImetals while taking into account lead-times and available capacities on all production units the on time delivery was improved and delivery dates are now more reliable. By optimising the capacity allocation considering production routing alternatives, different order/line production costs and selling prices and finally rejecting non-profitable orders the overall profit was increased.

Ensured Slab Supply

To utilize Erdemir's full HRM capacity additional slabs need to be bought from external suppliers. Before buying additional slabs all existing slabs need to be fully assigned to orders before. The inventory optimisation in PSImetals covers this slab yard stock allocation and provides optimal slabs to orders assignments. On a daily basis the re-

sulting assignments are given as input to the Master Planning, Order Scheduling and Line Scheduling processes. Using PSImetals steel is now allocated where it is needed and improvements for efficiency, transparency and due date performance could be achieved. The assignment/reassignment process was fastened and improved in its quality. Also non-assigned slabs in stock were reduced and the order fulfillment therefore amended.

Improved On-Time Delivery

Considering the committed orders demand of each plant, PSImetals generates a 1-2 month daily master plan by product family which optimises the load balancing of each plant/site separately, considering delivery performance, stock levels and lines throughput requirements. Other inputs are WIP inventories, frozen running production flows, product family routings, production specific constraints (end of month volume targets, shipment restrictions, etc.) as well as campaign calculations for specific lines. The resulting daily product flows on each production line are given as input to the Order Scheduling. Due to a better balance of available capacity on all production units and avoiding the creation of bottleneck situations lead times were reduced

and on time delivery were improved. Monitoring several KPIs upcoming problems can be detected earlier as for example inventory overload, capacity problems or due date problems for certain orders. As a result of better controlled stock levels for intermediate and final products the number of unplanned delays resulting from a lack of material or space was decreased.

Reliable Production Dates

Out of the daily product flow on each production line the PSImetals Order Scheduling generates 4 to 6 weeks rough schedules at piece level for each line, synchronized throughout the plant. High level technical constraints that can generate due date dispersion for periods larger than a few days (e.g. backup roll campaigns at hot strip mills) are also taken into account. The order scheduling provides a realistic projection of delivery dates for the complete orderbook, as well as reliable production dates for orders as input to the Line Scheduling. As PSImetals incorporates special process constraints of bottleneck lines, heavy processes or specific campaigns (e.g. casters and mills) the visibility on the HSM coffin sequence and on the moulds and tundishes sequences was increased. Furthermore the hot charging ratio was increased by iden-

tifying hot charge opportunities early and setting them as targets for the detailed scheduling. Finally the order follow-up process with the customer was improved.

High-Quality Line Schedules

To generate optimal detailed schedules at piece level for each production line for the next shift or days PSImetals considers all the technical constraints such as grade transitions, width jumps, etc., and tries to respect the target order production dates received from the Order Schedule. In practice, the schedules automatically produced by PSImetals algorithms are very close to being sent to production, only some manual edition is sometimes needed to tackle very specific scenarios. Line schedules can then directly be sent to production people for execution.

Due to the high automation level of generating line schedules with PSImetals the time required to build a schedule was reduced. In emergency situations a feasible schedule can be very quickly built to prevent a stop of the line. New schedulers can be trained very easily as all rules sets are standardized and in case of a rule's violation, graphical and textual warnings help to understand and fix the problem.

Integrated Supply Chain

All PSImetals Planning functionalities are successfully being used in daily business since fall 2011. The solution integrates Erdemir's entire supply chain, establishing clear interactions between the different business processes from strategic to operational level. Furthermore it harmonized the demand and sales planning process,

bringing increased profits and increased synergy between the two plants. Each plant can now be operated in a more automated, transparent and efficient way, providing increased visibility on upcoming events and leaving more time to the planning department for performing simulations and analyzing results. Human bottlenecks have been reduced as the technical knowledge was transferred into PSImetals available to all users. And finally Erdemir significantly increased its planning and scheduling KPIs, such as customer service, stock levels and schedules quality with the use of PSImetals. ☺

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This report is an extract. The complete report can be ordered scanning the QR code.



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The ErdemirGroup with its parent company Ereğli Demir ve Çelik Fabrikaları T.A.Ş. is the biggest industrial corporation of Turkey and the largest flat steel manufacturer of Turkey at the same time. The Group produced 7.5 million tons of crude steel and sold 6.7 million tons of finished products during 2011 and sales revenues reached Turkish Lira 8,921 million.

As an integrated steel manufacturer of flat steel and long steel products Erdemir operates at two production sites which are separated by 665 km. The site located in Kdz. Ereğli is producing flat products and plates. The Erdemir subsidiary Isdemir operates the second site based in Iskenderun and manufactures long products as billets and wire rods as well as flat steel products as slabs and hot rolled coils. The main production lines across the two sites are:

- 6 slab casters
- 2 billet casters
- 3 Hot Strip Mills
- 1 Wire Rod Mill
- 1 Plate Mill
- 1 Continuous Pickling Tandem Mill
- 2 Pickling Lines
- 1 Continuous Annealing Line

Erdemir supplies fundamental material to industries such as automobiles, white goods, pipes and profiles, rolling, general manufacturing, electrical and electronics, machinery and equipment, energy and heating appliances, shipbuilding and heavy industry, defense and packaging.



(1) BAT warehouse in St. Petersburg – PSIwms manages five physical storage areas with around 14,000 storage bins. (2) The transport control system integrated in PSIwms ensures fast operations in Itella's high-rack warehouses. (3) PSIwms coordinates both manual and automated processes at the distribution centres of Finnish service provider Itella

Source (Fig. 1,2,3): PSI Logistics

User report: Success in the Russian market thanks to PSI Logistics software

Russia's market leaders rely on PSIwms

High growth rates and a strong domestic economy mean that the demand for computer-aided process optimisation is rising in the Russian Federation. With the help of modern IT solutions such as PSIwms, manufacturers, commercial enterprises and logistics service providers are positioning themselves in the medium and long term as pioneers in the use of technological innovations and ground-breaking structures.

The Russian Federation is booming and ranks as one of the world's most dynamic economic regions. A rise in industrial production of some four percent, the lowest inflation of all time and consumption levels that are fuelling growth are ensuring strong demand and a thriving domestic economy. Large, modern transshipment centres are springing up all over the country to supply the big cities with food, industrial products and consumer goods. In this, the decision-makers responsible for software support are relying on future-proof IT systems from PSI Logistics.

PSI Logistics' local presence in Russia

With an office in Moscow, the Berlin-

based producer of logistics software maintains a direct market presence in the country and has provided the Russian market with sophisticated software solutions for national and international blue-chip companies. Another benefit besides the local presence: PSI software such as the PSIwms modular warehouse management system is fully localised. In other words, not only does it support the Russian language and Cyrillic script, its features have also been tailored to the specific needs of the Russian market. This ensures that projects can be implemented swiftly while providing for convenient modification of planned functions and interfaces or the addition of other required functions at a later stage.

This is what has prompted manufacturers and service providers to opt for software systems from PSI Logistics when fitting out their Russian warehouses and production plants. These companies include tobacco producer B.A.T., dairy products manufacturer Campina or Itella, the Finnish logistics provider, which uses PSI software in the majority of its 13 sites in the Federation. The result for the user: transparent processes that combine efficient use of resources with maximum flexibility.

PSIwms: For configuration by the customer

To ensure WMS software can achieve improved efficiency, flexibility and cost savings, an IT system should be perfectly tailored to its application and accommodate subsequent changes in business processes. Today, users therefore increasingly want to adapt their software to the constantly changing demands

of such processes – and where possible, to do so without outside help. For this reason, in addition to providing tried and tested software products, PSI Logistics also provides on-site training courses and programmes for IT users at the customer, teaching them how to perform configuration on their own. This transfer of expertise allows users such as the logistics service provider Itella to use the customising mechanisms included in PSI's standard software independently of the software company. This comes into play for example with the incorporation of new clients or the creation and configuration of storage areas, subareas and individual bins when changing or extending warehouse topology.

Customers in Russia


Itella is one of the biggest logistics service providers in Russia, with major clients such as Roche, Kraft Foods, Procter & Gamble, Wrigley, Shell and Philipps. The modern distribution centres of this service provider in the Russian Federation are managed using software from PSI AG. The warehouse management

system is not merely designed for user configuration, but for example also caters for the special functional requirements of customs and pharmacy warehouses or high-rack storage facilities with client-capable management.

It was the strategic partnership with PSI Logistics that prompted Itella at the beginning of 2010 to also base its distribution centre for its customer Marks & Spencer (M&S) on the tried and tested PSIwms warehouse management platform. The English company M&S is one of the world's biggest retail chains for textiles as well as household goods and food, with textiles accounting for 49 percent of its trading volume. It is just as big in Russia. To ensure a perfect solution, PSI Logistics based the WMS for Itella's logistics centre for M&S in Moscow on its standard system while customising it for the management and handling of hanging garments (dresses). Not only does this involve warehousing boxed goods in 20,000 storage bins: these hanging garments also require direct bin allocation at a special warehouse facility with 4,000 storage bins. Following this customising, the items of clothing can now be packed in accordance

with the customer's wishes. In addition, the PSIwms is designed for the automatic identification of different barcodes for the article, quantity and batch (cosmetics).

Itella also enjoys the benefits of the localised PSIwms system in the Russian city of St. Petersburg. Here, the service provider operates the production and distribution warehouse of British American Tobacco (BAT) using PSIwms. The facility consists of five physical storage areas, with a capacity for some 21 billion cigarettes. Some 10,300 storage bins are required to house the packaging materials alone. Raw materials, additives, finished products, semi-finished products and packaging all have to be put away and removed from stock at this warehouse and manufacturing facility. The flow of goods and materials managed by PSIwms at the new production site is therefore pretty complex. The system also caters for just-in-time production supply and disposal while ensuring reliable picking and preparation for dispatch.

The above examples demonstrate that, given the growth forecasts and the speed at which manufacturing and infrastructure is changing in Russia, the demand for computer-aided process optimisation is set to increase. With the help of modern software systems such as PSIwms, users are positioning themselves in the medium and long term as pioneers eager to exploit technological innovations and ground-breaking structures. 

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PSIPenta allows all processes in the planning level to be linked to the implementation level. Capacity planning provides for reliable and transparent delivery date estimates.

Source: E.I.S. Aircraft GmbH

User report: Aviation industry supplier and service provider E.I.S. Aircraft relies on standard PSIPenta

ERP/MES implementation project completed in just eight weeks

Safety and environmental standards are the be-all and end-all in the aviation industry. The traceability of manufacturing or maintenance processes, based on continuous business procedures is one of the key requirements for E.I.S. Aircraft GmbH. With the help of its software partner PSIPENTA, the supplier introduced a new ERP system with integrated MES modules in a record-breaking eight weeks. Against a backdrop of ever fiercer competition, it is thus equipping itself for the above challenges and a steady pace of growth into becoming an industrial mass producer and can already look back on impressive results.

E.I.S. Aircraft GmbH has made a name for itself worldwide in engineering and cabin components manufacture and also as a service provider to the civil and military aviation industry. The company has enjoyed continuous growth since its foundation and today employs over 200 staff at a total of eleven sites.

As a manufacturer and maintenance business, E.I.S. is regularly subject to strict quality monitoring by the national and international aviation authorities as well as audits performed by well-known customers. The company holds extensive certification in this regard, for instance recognition as a developer and manufacturer by Europe's air traffic safety body (European Aviation Safety Agency/ Europäische Agentur für Flugsicherheit) in accordance with EASA Part 21.

Its clientèle includes aircraft manufacturers as well as airlines and other suppliers, including such well-known firms as Airbus, Lufthansa, KLM, the TUI group or Recaro Aircraft Seating.

The search for an ERP system

Today, managing a rapidly expanding company and associated production processes is no longer conceivable without software support. In addition, many customers are increasingly considering continuous, transparent business processes supported by industry-specific software as a basic prerequisite for the awarding of supplier contracts. In 2010, the software solution that was being used by E.I.S., encompassing a

materials management and a purchasing module, had reached the limits of its capabilities. In an internal selection process, E.I.S. swiftly plumped for a system that, in addition to replacing the operational areas already covered, was also able to map both purchasing and production. However, following such a brief selection and implementation phase, its disenchantment with the solution was no less swift. At the beginning of 2011 – shortly after a change in the company's management team – the decision was then taken to switch to a new ERP system. The system that had just been introduced was quite unable to cope with the processes and rapid growth of E.I.S.

E.I.S. then asked Trovarit AG to start a new search for a suitable system. This firm is a big player in the field of neutral market analysts and consultants specialising in the selection of business software. Trovarit worked with E.I.S.'s ERP project team in various phases to finally narrow down the options to three systems from different suppliers that best met its requirements. "We were looking for a solution that allowed us to remain

close to the standard but at the same time was sufficiently flexible to cater for subsequent modification and would keep pace with future growth," said Mark Farny, Quality Manager, explaining two key requirements made on the ERP system. The choice fell on the ERP and MES specialist PSIPENTA Software Systems GmbH from Berlin. Besides the requirements involving the standard, PSIPENTA also offered integrated shop-floor data collection and personnel time management.

Introduction of PSIPenta ERP

The first step was the introduction of the standard PSIPenta ERP, the MES components Shopfloor Data Collection (SFDC) and Personnel Time Management as well as the document archiving system. This incorporated all processes from purchasing to dispatch while linking planning to the implementation level. Capacity planning, which is crucial with a large number of small-scale projects, is no less precise and automated than before, for example enabling the company to make reliable and transparent delivery date estimates. Thanks to the manufacturing focus of PSIPENTA products, the mapping and support of large volume orders is also possible.

Where Excel lists were once drawn up by hand with individual databases to support each department, the company now uses one centralised system to which every department and role within the company has access. Today, staff work with a shared pool of data. And the option of mapping other parts of the company in the system is already available thanks to the multisite structure and its mapping in the software.

The second step is a planned extension of the document archiving system to all include areas of the firm with the help of PSIPENTA partner's intex Informations Systeme GmbH, as well as introduction of the project management and product data management systems.

Go-live after just eight weeks

The tight schedule for introduction seemed virtually impossible to some of the people involved. The go-live was already planned for the system just eight weeks after the project kick-off – on September 03, 2012. Even today the Quality Manager cannot conceal his enthusiasm about the implementation project. "Unfortunately, nothing could be done about the fact that I was due to take three weeks' leave during this brief implementation phase – a period that was pretty short to start with and where every week was somehow critical. But when I came back a fortnight before the go-live and saw how far we had come with the project, I was really impressed." A motivated, ambitious team on both sides and the preconfigured standard system had made the almost impossible possible. This was also confirmed by André Kasper, Head of IT and Purchasing at E.I.S.: "We went live bang on schedule and are delighted with how everything worked out." Kasper is thus also one of the key users at E.I.S. who stand for "the way forward". In addition to

attesting to the satisfaction of the users, he also praises, in particular, the level of service offered by PSIPENTA: "I have been highly impressed by the professional approach shown by both the PSIPENTA project team and the hotline in Berlin. We always get a fast response that lets us solve our problem. You tend to have questions, particularly when you have a bad experience at the back of your mind, and software is being introduced at top speed. I really can't emphasise enough the importance of having reliable IT support without the gobbledygook."

In the long term, E.I.S. intends to use the complete system to develop and capture the company's KPIs. Even after this short time the effects of the system can be put into specific figures. Kasper was happy to enumerate them: "We have already cut process costs by 15%. We are saving a huge amount of time, for instance for the supply of materials, by doing away with manual processes and writing things on bits of paper. This also minimises the risk of error at the same time. Our customers get a professional service for their orders. And something else we shouldn't forget: IT only accounts for 20% of our workload. This was important to us: We didn't want to half-kill ourselves with admin; we wanted to continue manufacturing as before. And we've pulled it off. Our customers also greatly appreciate this step and will continue to place their trust in us in coming years. And that's the top priority for us." ☺

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Customer report: PSIMetals Caster Scheduling at ArcelorMittal Fos-sur-mer

Thanks to improved caster scheduling: All slabs can be sold!

Over a couple of years ArcelorMittal Fos-sur-Mer has optimised their scheduling processes for steelmaking and casting with two in-house solutions perfectly adapted to their special needs. Due to growing customer requirements for the on time delivery and increasing maintenance efforts the caster scheduling needed to be modernized to stay competitive. After analyzing the market solutions ArcelorMittal Fos-sur-Mer decided to implement PSIMetals Planning for Caster Scheduling. Main targets were to improve the synchronization with the up stream lines in steelmaking area resulting in a precised slab assignment and in improvements for the on time delivery and the completeness of ordered customer slabs but also to achieve a higher integration and automation level.

As production schedules for the complete liquid steel phase are created backwards starting from caster, a harmonization of the several production processes in steelmaking and continuous casting is a key factor. In particular the alignment and consideration of the specific quality requirements over the complete process ensures the production of only those steel grades that can be sold to customers. Potentials for improvements by scheduling are offered by an assignment of all slabs to customer orders, especially for those produced in the so-called transition zone in the tundish between two different steel grades where the characteristics of the slabs will deviate.

Before: Manual scheduling efforts run out of efficiency

The caster scheduling process at the production site of ArcelorMittal Fos-sur-Mer was previously supported by two independent IT-systems.

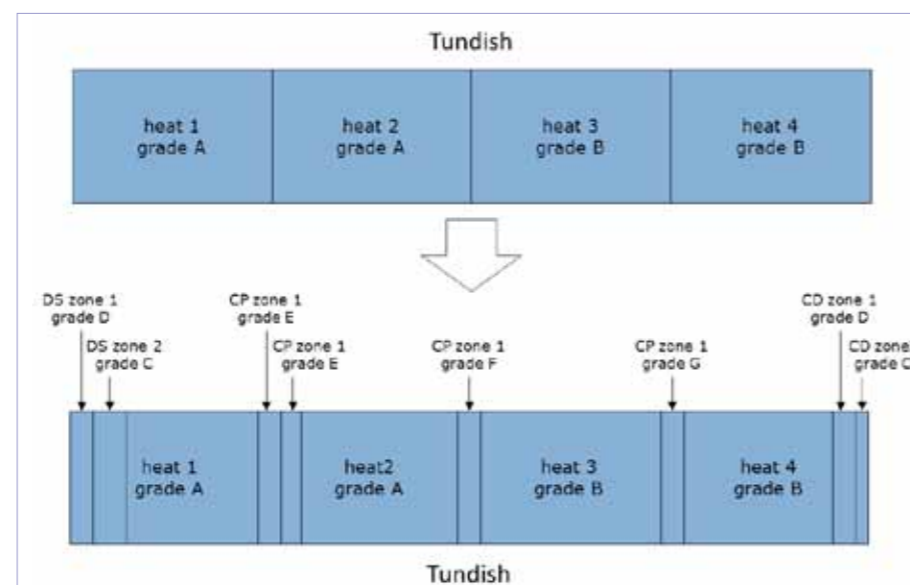
One was used to create heat sequences from the current order book: The planner selected a number of orders and their corresponding heats and created a so called "tundish" for that

selection. The tundish schedule, containing the proper sequence of all heats per tundish, was selected manually. Furthermore all associated quality requirements for the heats were managed scattered in many characteristics, tables and constraints within different sources. Out of that a lot of manual adjustments when creating a schedule needed to be done by the planner to ensure the achievement of quality targets. As tundish schedules were created independently from each

other neither previously planned sequences nor the actual production situation or the synchronization with the upstream lines in steelmaking was considered. The second functionality as part of the MES layer supported the synchronization of the two casters and real time production tracking. The first system is now replaced by PSIMetals Planning to optimise the Caster Scheduling and fully integrated with the MES layer for real-time production feedback.

After: Automated Caster Scheduling

PSIMetals models both continuous casters with multiple strands and handles all aspects of the steel casting such as grade transitions, dynamic width changes, quality upgrading, slitting, positioning, order due dates, etc., to optimise the sequences and while improving the overall efficiency of the casters.



Transition zones in the tundish can be assigned to appropriate steel grades and planned using PSIMetals. PSIMetals automatically generates tundish sequences and cutting plans. Source: PSI Metals



Caster sequences are built according to the grade rules (grade relations, tundish wear), the width change rules (width change direction, width change steps), and the logistics and process constraints (due date, inventory, customer specific constraints, caster properties, tundish wear). The grade transition model in PSIMetals ensures the assignment of all slabs in a transition zone to actual customer orders. As there can be one or more transitions between two heats in the tundish (at the start and at the end of the tundish), the optimisation algo-

Increased sequence length reduces tundish relining by 5%

The increased automation and integration of the caster scheduling processes also led to a higher velocity in building new optimised sequences (to face reliability problems) and in generating longer sequences with in average five heats per tundish instead of less than four heats before. The longer sequences finally resulted in a decrease of the tundish relining of 5 percent.

could be reduced by using PSIMetals to 33% fewer unassigned slabs on schedule.

Next targets: Sequence optimisation

As a result out of the independent systems and missing constraints in the former caster scheduling function the re-scheduling work at shopfloor level was very high to adapt all the schedules requested for the lines in steelmaking too. By the planned integration of the PSIMetals Caster Scheduling with the MES system in 2013 the scheduling constraints shall be aligned. Targets which ArcelorMittal Fos-sur-Mer will achieve are an improved synchronization of steelmaking and continuous casting processes as well as an improved schedule quality.

Emmanuel Chaput

Customer Relations Department, ArcelorMittal Fos-sur-Mer

"Summarizing all effects gained by optimising the caster scheduling with PSIMetals we expect cost savings of around 600.000 Euros per year. Therefore, the return of our investment is less than one year."

rithm in PSIMetals allows a tundish to be composed of a mix of transitions and heats as well as to schedule not only the heats, but also the transitions.

Based on the slab production orders PSIMetals automatically generates tundish sequences as well as a cutting plan for each caster taking into account the grade transition zones. The optimised schedules are sent to the MES system for execution.

33% fewer unassigned slabs in schedule

There are many reasons why a slab might not be assigned to a customer order (wrong steel grade, incorrect length, width or weight). The wrong steel grade was the main reason for an impossible slab assignment at ArcelorMittal Fos-sur-mer as there were no orders to complete the heat. This

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Products and solutions: Release 2.1 of PSI*l*u*m*s

Transparent and efficient warehousing with PSI*l*u*m*s

Release 2.1 enhances the successful PSI*l*u*m*s warehouse management system with a number of new functions and technical features that will help companies set themselves apart from the competition while offering them efficient administration, greater mobility and configuration without outside help.

PSI Logistics announces Release 2.1 of its tried and tested PSI*l*u*m*s warehouse management system. PSI*l*u*m*s offers users even greater flexibility and efficiency. The new Workforce Management system has been incorporated in the Resource Management module as an additional tool for forward-looking, needs-oriented personnel workforce. Reference applications demonstrate that monthly savings of up to 100 per employee can be achieved with functions designed both for short-term operational resource planning and long-term budget and capacity planning.

New features

With Release 2.1, touchscreen operation for dialogs has also been incorporated in the standard PSI*l*u*m*s system. Other new functions of Release 2.1 include additional options which allow users to configure PSI*l*u*m*s without outside help. This lets users, for example, create and configure storage areas, subareas and individual bins and so modify and extend the topology of their warehouses in the system by themselves. Where the management of serial numbers is concerned, Release 2.1 offers alternatives for the capture and control of these numbers when performing

goods receipt, picking and packing. In addition, the stocks of numbers can now be displayed individually or in consolidated form. The entry of entire ranges of serial numbers is possible. A two-stage control procedure for the stocks of serial numbers has also been incorporated in the inventory count. The revised billing system, which is used by PSI*l*u*m*s to ensure accurate invoicing based on precise figures input for each client, offers a more transparent overview including redesigned displays, default values and selection lists. These new features significantly reduce the effort involved in capturing this data.

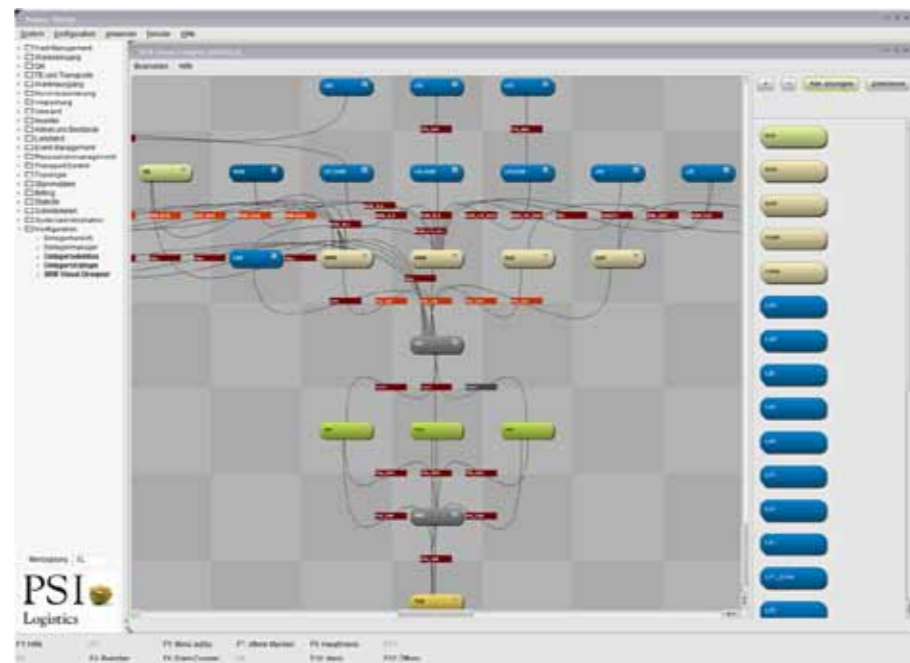
Technical innovations

One new technical feature offered by Release 2.1 of PSI*l*u*m*s is the KPI information display, which is incorporated in the cockpit functions

of PSI*l*u*m*s. It is now possible to access the key figures for production or the warehouse at any time, also using a browser. In addition, PSI*l*u*m*s 2.1 allows the filter settings for dialogs to be individually selected and stored for each user to enhance usability. This also applies to the orientation of PSI*l*u*m*s to Windows-based mobile data terminals (MDT). With Release 2.1 PSI*l*u*m*s is designed for character-based, Java-based and Windows-based MDTs. ☺

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Supply management provides for the simple graphical configuration of supply from different areas.

Source: PSI Logistics

Products and solutions: The Qualicision® Functional Decision Design Engine from F/L/S

Qualicision® data modelling based on PSI GUI technology

Qualicision® stands for qualified support with decision-making when optimising business processes. Qualicision® technology is based on fuzzy logic which has been extended to complementary effect and helps to incorporate decision-making expertise in business processes in the form of software. Fuzziness in business processes is not only the result of uncertainty regarding the process data used; it also results, in particular, from the variety of the data and interaction between the options for controlling these processes and the process goals; the 'key performance indicators' (KPIs) in other words.

When business processes are optimised with Qualicision®, such interaction is captured in the form of matrices (impact matrices) using the process data. These impact matrices are combined with mathematical conflict and compatibility analysis to calculate which alternatives should be selected for decision-making to come as close as possible to the process goals. In technical terms, conflict and compatibility analysis allows the so-called combinatorial variety of control options to be managed in relation to optimisation of the KPIs.

Optimisation and decision support technology

Any branch of industry can make use of Qualicision® for the purposes of optimisation and decision support. This may involve the optimisation of production sequences in the automotive industry and the management of transport processes and the optimisation of operations at transport depots, e.g. buses and trams. Other examples include maintenance management when managing electrical networks, logistics in underground mines for conveying raw materials, the optimisation of

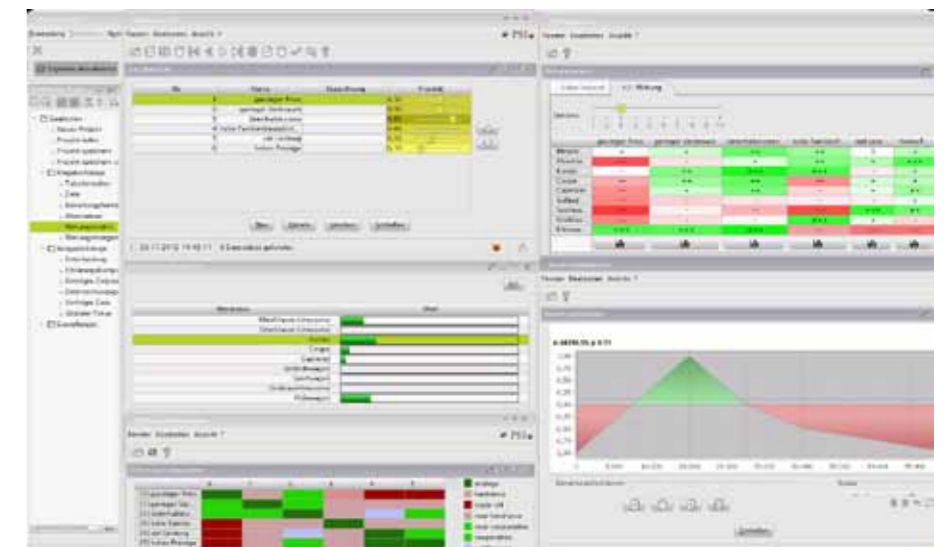
manufacturing control processes and forecasting.

Data modelling

Qualicision®-based data modelling is performed with the help of the Qualicision® Functional Decision

a release based on PSI GUI technology (see figure). This allows all elements of Qualicision® data modelling to be mapped, including KPI target functions, impact matrices, KPI relation matrices, editors, data tables and other visualisation functionalities. The new QFDD release will be presented at CeBIT 2013. A demo version is already available.

Founded in 1992, F/L/S Fuzzy Logik Systeme GmbH now offers in-depth consulting and project expertise in the field of optimisation, where it makes use of proprietary Qualicision® software. F/L/S became part of the PSI Group in 2008. ☺



Qualicision® Functional Decision Design Engine: modelling elements based on PSI GUI technology.

Source: F/L/S

Design Engine (QFDD). After modelling, QFDD generates a data format that is read by the Qualicision®-based optimisation processes and subjected to further processing. Until now, QFDD was a software tool developed using C++ technology. With support from the PSI convergence strategy, F/L/S is currently working on

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The majority of PSIPENTA users were of one mind regarding the workshops (Fig. 1: Heinrich Windhorst, PiSA sales GmbH) and the presentations in the plenum (Fig. 2). Source: PSIPENTA

Event: PSIPENTA develops its international business

Roadmap wins over user group at conference of customers

At the 26th annual customer conference of the interest group of PSIPenta users (IPA) in Salzburg, PSIPENTA presented a convincing strategy for internationalisation of the company and product development in coming years.

The plans described by Managing Director Alfred M. Keseberg to maintain the strategy of international expansion via other subsidiaries of the PSI Group met with great approval from the audience. This will allow PSIPENTA not only to expand into new markets, but to also offer its international customers from the manufacturing sector on-site support with services and product distribution. The organisation is thus consistently implementing PSI's corporate strategy of further boosting exports.

PSIPENTA also announced the schedule for issue of the latest versions of PSIPenta ERP Suite. Version 8.3 is scheduled for completion in July 2013, followed by release for distribution of the next major release,

Version 9, in the December of the same year. The focus of Version 9 is a new user interface based on the group-wide PSI GUI (graphical user interface). The first live demo met with an extremely positive response from customers.

To improve levels of productivity and ergonomics, PSIPENTA is planning to migrate all modules to the new standardised group JAVA software basis in the next few years. The Just-in-Sequence (JIS) module already programmed on JAVA and presented in spring is being initially followed by the MES components Shopfloor Data Collection (SFDC), Machine Data Collection (MDC) and Finite Capacity Scheduling. It is planned that all PSI software modules will be able to run and

interact on the same client, with the measure also being welcomed by the IPA. This independent interest group of PSIPenta users is organised into regional working groups, who meet up once a year at the conference. "We are extremely satisfied with the progress and results of this year's conference. We were delighted by the announcements made by our software supplier about its internationalisation and development strategy and the active participation of the IPA members in the various workshops," commented Andreas Liebe, Chair of the IPA and Head of IT at Felss GmbH, summing up the event. ☺

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Event: Third annual meeting of PLUG with plenty of first-hand news

Application options offering added value

This year, attention at the meeting of the PSI Logistics User Group (PLUG) was focused on application options offering added value. In his welcome speech, Wolfgang Albrecht, Managing Director of PSI Logistics, highlighted the importance of the user group for customers and PSI Logistics.

Apart from its vital involvement in research projects and the transfer of expertise within the organisation, the direct exchange of information with customers is in his view a key factor for the development of products catering for market requirements. The speech was followed by four presentations which showed the potential offered by WMS solutions for intralogistics.

Eurotape Media Service GmbH

First of all, Holger Michael, Works Manager at Berlin-based Eurotape Media Service GmbH, talked about the background and changeover/optimisation processes involved in implementing the PSIwms warehouse management system. During a visit to a new distribution warehouse owned

by the fulfilment service provider, attendees were able to get a look at the examples he described for the control of material flows when conveying hanging products.

Cosmetics company Avon

In addition, Dr. Maren Martens, Head of the PSI Logistics Competence Center in Munich described how cosmetics company Avon achieves intralogistical optimisation with the help of PSIwms. Efficient order sequences and uploading, systematic forecast planning, process engineering, including the visualisation of warehouse layouts and the consolidation of picking routes, were just a few of the options described that met with strong interest from the audience – particularly when



The audience was fascinated when Works Manager Holger Michael explained the functioning and benefits of the technique for conveying hanging product (Fig. 1) and the special features of the system for capturing and controlling labelling codes via PSIwms (Fig. 2) at a packing station in Eurotape's distribution warehouse. Source: PSI Logistics

they heard Avon has managed to slash picking times by as much as 50 percent using the mathematical algorithms of PSIwms.

Torsten Gaßner, Product Manager at PSI Logistics, then introduced the new personnel workforce tool in the Resource Management of PSIwms, before Martin Toepfer, Head of Product Development at PSI Logistics, provided the audience with a detailed overview of the most important of around 120 improvements and new features offered by Release 2.1 of PSIwms (see article on page 12).

The attendees had an opportunity for in-depth exploration of the topics and application options described at the event during breaks and in private conversations or group discussions. This allowed them to link this up with their own experiences and personal questions. "PLUG's annual meeting is a forum for the exchange of suggestions and interesting background knowledge," was the verdict of Albrecht. "The high level of communication between participants, including with each other, also underlines the importance of PLUG as a communications platform for everyone. The creation of PLUG has therefore proved its worth and has now become a fixture for us." ☺

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An interview with: Frank Osterburg, Head of QM, discussing quality management in the PSI Group

Continuous optimisation and development of processes

Mr. Osterburg, what role does quality management (QM) play in the PSI Group?

F. Osterburg: Quality management has traditionally been of major importance at PSI since the company's foundation in 1969. PSI has been successfully implementing software projects for 43 years. The experience we have acquired from projects has been documented from the very start and also serves as a basis for in-house and external training courses and seminars about quality and project management and software quality assurance. You could say that from the outset we have always focused on our core competence: optimising processes and ensuring their continuous further development. By harmonising all group-wide processes throughout the world, we are able to create a sound basis for supporting our customers in the optimisation of their business processes in order to maintain their competitive edge on a lasting basis.

PSI has practised quality management based on ISO 9001 since 1994. How is this implemented?

F. Osterburg: PSI decided to obtain ISO 9001 certification in 1993. Since 1994, operational implementation of this standard has been checked during auditing of our quality management system by the inspection provider TÜV Süd once a year. In 1999, the company started extending the QM system beyond the requirements of ISO 9001 with the aim of making it a comprehensive, integrated management system. This



© PSI AG: Frank Osterburg



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process has been based on the EFQM Model for Excellence of the European Foundation for Quality Management (EFQM). The guidelines and documentation specifying all processes within the organisation are incorporated in PSI's system of guidelines. The Executive Board sets the objectives and defines the processes involved in their implementation for all affiliated companies in this system. Certification of these companies is carried out within the framework of group certification.

What objectives does quality management pursue?

F. Osterburg: First and foremost, it is a question of satisfying our customers' requirements. We want to ensure that all processes are fully incorporated and optimised to guarantee their success with the help of the resulting products and services offered by PSI.

Is there a group of experts responsible for quality management?

F. Osterburg: The issues concerning the overall organisation are coordinated by the QM working group, which is made up of the quality management representatives from the individual business units. This group meets several times a year to share experiences and agree upon a uniform strategy to be adopted by the organisation as a whole.

How do you ensure that the quality management specifications are observed by the PSI Group?

F. Osterburg: Audits are routinely carried out through the organisation to make sure the guidelines are applied and continuously improved. Audits are essentially the most important element of quality management and are crucial given the role they play in risk management. Every year, system audits are held with the managers responsible for the individual areas. During these audits, implementation of the entire system of guidelines and management is discussed, reviewed and evaluated.

Are projects evaluated separately?

F. Osterburg: Yes, project audits are carried out in each PSI business unit every three months with the aim of spotting any problems or risks early on and instigating necessary measures using a defined escalation procedure. In parallel, regular project auditing of course also drives forward an internal improvement process which benefits both PSI and its customers. In other words, a clear win-win situation. A report is generated for each audit and this is used by the Executive Board and the managers in the business unit as the basis for process optimisation.

To what extent does quality management include software development?

F. Osterburg: We naturally pay particular attention to how software itself is developed and whether the relevant guidelines are being observed. Thanks to these strict procedures, our customers can be sure of receiving software solutions that have been developed and tested to optimum effect.

Mr. Osterburg, many thanks for an extremely informative interview.

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Gerd Krtitschka (right, VBG) presents Dr. Elmar Karlowitsch (left, PSI Metals GmbH) with the certificate for outstanding safety at work. Source: PSI Metals

“Systematic OHS” certificate

PSI Metals GmbH ensures health and safety

PSI Metals GmbH has been awarded the AMS “Systematic OHS” certificate by Verwaltungs-Berufsgenossenschaft (VBG), the institution for statutory accident insurance. VBG certification helps companies systematically introduce occupational health and safety within their organisation and incorporate it in their operational procedures.

PSI Metals submitted its OHS management system to examination by VBG according to national and international standards, thereby complying with the industrial safety criteria of this institution. The certificate was awarded to Dr. Elmar Karlowitsch, Head of Controlling at PSI Metals, by Gerd Krtitschka from VBG's district office for Berlin at the beginning of November 2012.

“It was our objective to formalise the measures for health and safety at work which we have been practising for years and so establish a comprehensive system within the group on a long-term basis,” said Dr. Karlowitsch, explaining the company's decision to organise health and safety in a systematic manner. This new approach to OHS has already met with a positive response from the workforce in the course of their everyday work. “We are delighted that our staff no

longer simply practise health and safety intuitively, but now act according to set rules. These protective measures include both work in-house on our own premises as well as external projects carried out on site for our many international customers in the metal industry,” comments Dr. Karlowitsch. Not only does the “Systematic OHS” certificate benefit the occupational health and safety of the PSI Metals GmbH workforce, it also sends out a positive signal to the competition.

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State-owned enterprise CSR Sifang chooses PSIPenta

Significant Contract from Chinese Railway Construction Group

PSI subsidiary PSIPENTA Software Systems GmbH has been contracted by CSR Qingdao Sifang Locomotive Co., Ltd. with the delivery and implementation of a comprehensive software package for the support of the manufacturing processes.

PSIPENTA will implement a planning execution control (PEC) solution for the integrated planning and control of the manufacturing processes interacting with SAP and an existing PDM solution at the corporate control level. Along with manufacturing execution system components

such as graphical production control as well as shop-floor and machine data acquisition, the specifications also include components such as order management and maintenance.

The solution will take over the scheduling, capacity and material plan-

ning and report relevant data to the leading ERP system. PSIPenta/PEC therefore assures transparency at all times and for all company units across the entire production process. Central cockpit and recording functions make it possible for Sifang to obtain an overview of all production processes. Initially, PSIPenta/PEC will be introduced in three company units at 488 working places. The implementation of additional solution modules and the rollout to other company units is already being planned.

Sifang, headquartered on China's east coast in Qingdao, belongs, with its ca. 10,000 employees, to the Chinese CSR Group. Consequently, Sifang is a part of one of China's 500 largest industrial companies and, as the largest producer for the Chinese railway industry, also one of the most important component producers for locomotive and rolling stock manufacturers. China South Locomotive & Rolling Stock Corporation Limited (CSR) is a state-owned holding to which, along with Sifang, another 25 companies belong that produce railway or other related goods. ☉

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PSI Industry and Infrastructure Business Still Strong After 9 Months

Group EBIT improves significantly

PSI Group increased its sales by 8 % to 126.7 million Euros in the first nine months of 2012. The EBIT was increased by 20 % to 7.5 million Euros, the Group net result improved by 65 % to 5.5 million Euros. New orders increased compared to the same period last year by 5 % to 145 million Euros, the order book volume as of 30 September 2012 increased by 6 % to 132 million Euros.

Sales in Production Management (raw materials, industry, logistics) increased in the first nine months by 15 % to 64.2 million Euros. The EBIT was improved by 25 % to 4.5 million Euros. The business units of metals and sequence optimisation again provided a major contribution to the earnings and obtained further orders from large international customers.

In Energy Management (electricity, gas, oil, heat) the electrical energy business currently brings the new control system core to the market and continues to invest into the expansion of international sales. The use of group resources in Poland and important acceptances in complex export projects had a positive effect. The development of smart tele-control units of a new type and reduced replacements of remote communication units caused encumbrances. The gas and oil business continued the good development and expects important orders in the 4th Quarter. Energy trading, which is only active in the German speaking countries, invested in its product base and has additional investment needs

(Energy Data Management) as well as cost reduction potential. Overall the sales of Energy Management dropped by 5 % to 44.5 million Euros in the first nine months. Despite the higher number of sales of licenses compared to the previous year, the EBIT for the segment was, at 2.1 million Euros, still well below the figure for the previous year.

Infrastructure Management (transportation and safety) increased sales by 26 % to 18 million Euros. The segment's EBIT more than doubled to 2 million Euros. The largest contribution to earnings in this segment was again provided by the international PSI subsidiaries in Poland and Southeast Asia. In Southeast Asia PSI won a number of important contracts and attained important acceptances in demanding pilot projects in the third quarter.

The number of employees in the Group increased to 1,577 as of 30 September 2012 primarily due to the expansion of capacity in the export markets. The cash flow from operating activities was, for project reasons, negative at -4.4 million

Euros, which is why liquidity decreased to 24.2 million Euros.

The German energy market is experiencing a growing investment backlog. PSI is strengthening international activities in the area of electrical energy so as to become less dependent on the German market in the mid-term. Production Management has a large order book volume and expects the dynamic development to continue despite the cool-down in the steel industry. To improve productivity and ergonomics, increased investments in the migration of software applications of additional business units to the new, group-wide uniform software basis will continue to be made in the coming quarters.

The management expects, as in the previous years, a strong fourth quarter and continues to aim for the annual targets of 190 million Euros for new orders, close to 180 million Euros for sales and about 13 million Euros for the EBIT. ☉

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We wish you and your family
a Merry Christmas and
a Happy New Year.



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