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Younger generations are to be the key

For some time it has been clear that the year 2012 will end with worse business result as it was expected. We daily receive information on reducing of steel consumption in Europe and on closing down of the excess steel production capacities.



However, it is encouraging that we have taken advantage of lower production for completing of transferring of the rolling production technology from the old rolling mill line onto the new, the continuous one.

We expect that the coming year will not be worse and continue with an intensive work on long-term development projects.

The Investment project for the new device for continuous casting of steel is ready to be realized – it is now on our owners to make the final decision. The new caster will assure us a longterm qualitative production of steel what mainly depends on casting conditions.

More attention is given to providing of technical

and business services to customers, what will be additionally supported with launching of an improved version of business and production information system.

We also develop some new approaches to training and transfer of knowledge and experience to younger generations who will be the key factors at the future development of the company.

We wish to us and to all our partners that the actual period of uncertainty ends as soon as possible what enables us more intensive focusing on realization of our visions.

Marjan Ma košek, Managing director

Above: The regular annual overhaul is an opportunity for our scholarship - holders and work - beginners to learn about structure of devices

A hidden factory is potential and opportunity

In times of limited financial resources it is there vital looking for internal potentials, elimination of losses and optimization of processes.



Viability is bound with a strategic view on longer time frame. Trends and fads directed many companies into extreme organizational forms by one-way ticket.

If outsourcing was the key to success in good times – it is in any case today very expensive solution for many companies. The companies that had not carefully studied the main advantages and disadvantages of outsourcing are today faced with shortage of technical knowledge which is crucial for production companies and therefore results in strong dependence on the partner companies.

Nowadays successful companies recognize their opportunities in insourcing (e.g.BSW and LSW) which has an impact on cost reduction of services. Searching of internal potential gives results when it is in a combination of three-level maintenance taking into account the knowledge of operators, maintenance specialists and external experts – especially in case of insufficient internal capacities during outages and major interventions. The actual maintenance trends so indicate greater use of internal resources in context of already established method TPM (Total Productive Maintenance).

In connection with organization and material management it is there also important further optimization and reduction of the number of stocks which lead to a reduction of stock level of standardized parts and to more optimal stockkeeping management, supported by an appropriate information system.

Among different maintenance strategies is the most effective maintenance which acts in accordance with the situation (predictive) and which in certain segments and together with development of information systems (Level 1, 2 and 3) provides the most cost-effective maintenance system.

This results in decreasing of number of production stillstands in recent years. And to this end also much contributed bigger investments into equipment overhauls and replacement of old equipment with new devices what in first period of time - during start time, because of adjustments and modifications needed, bring poor results, but long-standing enable surviving in the competitive struggle in the market.

Matej Ka, Head of maintenance

Transfer of rolling programs on the new line

Transfer of the existing rolling programs on the new rolling mill continuous rolling line was completed at the end of June 2012 and with this action was finally stopped production on the old 550 rolling line.



When in June 2010 started trial operation on the new rolling mill line we were aware of the fact that transfer of the existing rolling mill technology from the old 550 rolling line would be a pretending and lasting. Later this also occurred as our technology transferring coincided with a general need of production increasing in late 2010 and in the first half of 2011.

Instead of the previously defined deadline – end of first quarter 2011 - for mastering of all sizes was this process completed only in the middle of 2012.

This delay was a reflection of at that time higher marked demand which requested higher productivity and rolling reliability as well as an increasing range of different sizes and shapes of as rolled flat profiles which volume practically doubled in recent years. In years 2007 and 2008 was monthly rolled out a range of 100 to 150 various shapes and sizes and on annual basis from 200 to 300 ones. But today we roll monthly between 180 and 230 different sizes and shapes and the total volume of all sizes mastered has already exceeded the number of 500.

During the first months of trial operation – in a period from June 2010 to January 2011 - were there

transferred on the continuous rolling line rolling procedures for round profiles from rd 37 to rd 85 mm as well as those for wide and heavy duty flat profiles. The volume of material rolled on the continuous rolling line had in that time reached the amount of 50 %. The next important step was done in February 2011 when were to the new rolling line transferred round profiles from rd 26 to rd 36 mm. At that time the share of the continuous rolling line operating time reached a level of 90% of the total operating time.

During the year 2011 the process of transferring of sizes slightly slowed down. Except round profiles of diameters from 20 to 25 mm and square profiles were there no program transferring. On one hand was there necessary to consolidate and stabilize already transferred programs and on the other hand we had to be well prepared for transferring of the most complex rolling program – i.e. rolling of flat profiles of thickness less than 30 mm. This program is extremely complex because it represents a relatively small proportion of the overall rolling program – from 15 to 25%, but includes profiles of six various shapes according to DIN EN standard respectively more than 300 different sizes.

Above: The continuous rolling line



We started with transferring of this type of flat profiles in June 2012, firstly with sizes acc. to DIN EN 10092-1-A and in months of July, August and September also with dimensions of other shapes. At the end of August arose there - due to market changes – a need for a profile described as BS EN 10089 profile. And shortly after that was to the new rolling line transferred also the "ribbed and grooved" flat spring steel profile. From technological point of view are both profiles extremely demanding. Rolling of none of them could be simulated with a computer program Wicon, so we had to recalculate all rolling schedules manually, considering also experiences from the old rolling line.

In practice was the main effort invested into the special profile where was, beside the rolling schedules, the most problematic rebuilding of inlet and outlet guides. Production of this profile was difficult already on the old rolling line, but on the new one it is necessary to control even more parameters. At production of special profiles, such as DIN 10092-2 -'' ribbed and grooved '', it is very difficult to foresee all problems that may occur at trial rolling and this is the reason that we already work on further improvements of calibration and guiding of rolled pieces.

The last action before the final stop of rolling on the 550 rolling line was therefore transferring of the BS EN 10089 flat profiles and of the special " ribbed and grooved " profile.

The 550 rolling line operation was enabling - since its start in the year 1970 until its final stop on June 24. 2012 - to many generations of Štore workers to earn their living. It is estimated that there was on the line – together with its sister rolling lines 300 and 250 during this period rolled out a quantity of about 3.5 million tons of special types of steel.

However, the transfer of the whole existing technology of the old rolling line on the conceptually completely different modern continuous rolling line could not be possible without our skilled and enthusiastic people.

At this point we would like to express our gratitude and appreciation to all rolling mill employees and thus to both - to technology planners and to those who put it into practice. Many of them spent a lot of additional working hours and weekends near the line – all this with the aim to execute for the company Štore Steel and foremost for our customers as less as possible stressful transferring of the rolling technology.

In spite of this – to a great extent achieved success - we are aware of the fact that there is still a lot of work to do. Only after completed transferring of the entire rolling program it will be now finally possible evaluating of all essential advantages and disadvantages of the new equipment and planned technology. We already see some new tasks in the field of optimization and upgrading of equipment, optimization of technology as well as at consolidation of the acquired knowledge and acquiring of new skills. The ultimate goal is to establish a modern, reliable, efficient and economical production of hot rolled profiles and – to have highly satisfied customers, of course.

Matjaz Vrbek, Project leader

Boris Kumer, Chief of Rolling mill

Above: Device for assembling of rolling stands in the armature workshop

Computerisation of steelmaking processes

Our company Aioss was firstly engaged with problematic of steelmaking production processes in the year 2000. One year later we launched the first version of solutions for supporting of production processes at the Store ironworks.

The solution based on the Pantheon Datalab business system. It was found out very soon that the potential of IT solutions in this type of production was incredibly high.

There was recognized a number of small organizational and logistic challenges which can –if an appropriate solution is found - very quickly refund investment costs. This first version was followed by various developmental projects. We supported planning in the steelworks, introduced support for control measurements and developed final version of test certificates that are issued at delivery of final products. We were improving planning of certain key operations and the process of delivery of material.

In the year 2004 we above all improved the application base and suchlike architectural mistakes that had obstructed further development. This resulted in establishing of the SRS 2.0. system.

In the year 2008 was it estimated by us that the entry of Slovenia into the EU and with this associated major legislative changes, the introduction of the euro currency an increasing digital connectivity to governmental institutions and banks, more and more stable and powerful hardware and software, Internet, which has become self-evident as electricity in a socket, entirely new approaches to development of IT solutions and the knowledge acquired by our team and thus both, on the field of information and on the knowledge of business processes – all these facts told us that it was the right time to build some modern, comprehensive solutions to support business operations in steel industry what will be the basis for development in the next medium-term period.

With financial support from the Štore and Ravne steelworks we have already achieved and significantly exceeded the objectives planned. Firstly was there established a development environment called APS (Application platform services). This is a standardized development environment on which we built the second level ABS (Application Business Services). This supports the basic business processes: procurement, sales, material and financial flows. Above the ABS was built also the SRS (Steel rolling services) which is designed on basis of steel-connected and not on classic business information solutions.

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The new concepts provide more natural tracking of semi-finished products and products, offer better logistics support in production and support quality of products.

The SRS 3 system cannot be understood as a final product – it is a good base with a great potential for development of processes in steel industry and an excellent development environment where there can be included also internal developers of IT solutions.

Immediately after the start of construction of the new architecture occurred also the financial crisis. Steel producing companies were the first one that were faced with lack of orders. Due to this changed situation changed there also funding of our projects and we were afraid also of oversizing of the project.

Nevertheless, the situation delayed us, but the plan was realized. There have been also launching of the SRS3 in Štore postponed a few times, but now we are just about to start with it.

The steel plant will produce the first heats in January 2013 on base of documentation from the SRS3. The same will be followed at manipulation of billets, rolling of rolled pieces in the middle of January and production of cold products by the end of January when are there expected also first deliveries on base of the SRS3.

This is expected to be an intensive and nervous period which will be followed by a new era of ideas and new development steps. The invoices supported by the SRS3 will be transferred into the existing PANTHEON system where will still remain the solutions for bookkeeping and finance and this at least by the beginning of the year 2014.

In the first half of the year 2013 will be there transferring into SRS completed. By the end of February will be there fully launched three basic processes - the order processing, the production process and the process of delivery of products including all supporting documents.

After that will there follow a period when also supporting processes in other departments that are not directly involved in the processes of production will be included in the system. By the end of spring 2013 it is expected that the system will be fully launched.

In the year 2013 we will introduce some solutions for procurement, finance and accounting and will focus on processional part of production. It is necessary to be connected with processional part of the steelworks, the rolling mill and the cold finishing plant production.

It is estimated that support and insight into the processional part of a system is the essence of the further period of information solutions. The fact is that the SRS3 system was designed especially with the aim to be integrated with processional devices.

Marko Logar, Director of Aioss

Solar Power Plant

One of strategic business aims of the company Štore Steel is assuring of a complete managing of quality, environmental protection and occupational health and safety. All this is being developed on basis of the Štore region long lasting steelmaking tradition. Among these priorities can be ranged also our concern for a sustainable development of then whole society.



In terms of improvement of some significant environmental parameters we decided to build a solar power plant which is a clean and environmentally friendly technology for producing of electricity as it does not generate any emissions of greenhouse or other gases.

Before setting up of a solar power plant it was necessary to select a suitable location and to take into account the following conditions: the south-side roof orientation - preferably with a slope of about 30 °, without any shading of the roof surface or its vicinity, a static adequacy of the object which allows an additional roof burdening (about 25 kg / m2), a well preserved roofing as well as an assurance of fire safety and lightning strike protection.

Based on these conditions and on our demand that construction and operation of the solar power plant should not cause any disturbance in our production we decided to set up the power plant on the roof of the Rolling mill – Warehouse building (the hall extension). The whole project - from an idea to its implementation - was realized in cooperation with the company RETEH which has been engaged in design and construction of solar power plants for more than five years and already participated in planning and installing of the power plants having a total power of over 14 MWp.

After making of a draft project were there obtained all approvals respectively consents needed for installation of a solar power plant and production of electricity.

The whole process of construction of a solar power plant includes beside the draft project also a static assessment, a fire safety study, an assessment about lightning strike protection and a consent for connecting of the power plant to electricity distribution network. We established also a project company called SOLARTEH d.o.o. which is majority owned by our company and is registered for production and sale of electricity.

Above: Solar modules placed on the roof of the rolling mill anex



The investment into the solar power plant in the value of Ä 495,000 was financed by a credit. The company SOLARTEH signed with Štore Steel an agreement on establishing of a quasi-easement and a lease contract for the hall roof where are located photovoltaic modules and for the part of the north annex of the hall in which are placed network inverters, junctions and other switchgear and protection devices as well as the control system of the power plant.

The photovoltaic power plant of the 267.5 kW power consists of the following devices:

A photovoltaic generator which consists of 1.070 solar modules manufactured

by the company Canadian Solar which converts sunlight energy via photo effect into direct voltage and current.

An one-way junction with a built-in current and voltage protection of the photovoltaic generator.

Eight KACO inverters that direct voltage and current convert into alternating values and perform synchronization with the public low-voltage electricity distribution network into which is through a counter sent electricity.

An alternating junction which connects inverters and the measuring and disconnecting point.

A measuring and disconnecting point enables connecting of alternating side of inverters into public low-voltage electricity distribution network.

A control system, which is connected to the local Ethernet computer network enabling a remote monitoring of the solar power plant.

The company SOLARTEH concluded an agreement on access to the distribution network and on buying of the

electricity and obtained a consent for connecting to the distribution network. The solar power plant was on June 29th connected with the electricity distribution network.

After connecting of the solar power plant obtained the company SOLARTEH also a declaration of the Agencija RS za energijo (Slovenian agency for energy) and put in an application for granting of a subsidy at production of electricity over a time period of 15 years.

The expected annual output of the solar power plant is 295.183 kWh. Taking into account a degradation of the system in the value of 0,7 % it is planned that the income from sale of electricity and subsidy granted can enable return of the investment in less than 10 years.

We are pleased that our solar power plant was in the first four months operating without any disturbing and that its production has exceeded the planned one by 2%. This volume of generated electricity, what means a saving of 75 tons of CO2 per year, would be enough to supply 36 average Slovenian households.

Bojan Sen i , Assistant MD

Employee recruiting sources

Hiring of people who are properly technical and natural-science educated has always been a problem in industry, especially in companies with a strong development vision.



Therefore, the care for the employee recruiting sources has been among the most important tasks in our company. The crisis in Slovenian steelmaking industry and other metal branches in the nineties dissuaded many young people from technical and natural-science oriented schools. But in any case, we wanted to change that trend.

We have established a good cooperation with primary and secondary schools to encourage young people to educate and study for technical occupations. We have issued information that are relevant for career decisions of young people. We have enabled them to come into the company and to learn about its production procedures through organizing of school excursions, holiday work, trainee work and occasional hiring of students.

With offering of scholarships we have joined to the activities executed by the Chair of Materials and Metallurgy which has gradually succeeded in its attempt to increase the number of students. Metallurgy students are also encouraged to attend the annual competition "Virtual Steelmaking", organized by Worldsteel Association.

In the year 2010 we supported execution of workshops called "Innovation and creativity for young people" organized by the Štore training center

(Izobraževalni center Štore), where are pupils from primary and secondary schools involved in solving of concrete cases from particular companies under guidance of a mentor. Through some practical exercises in the field of mechanical engineering, ecology, chemistry, logistics, metallurgy and electrical engineering has met a group itself with "outside the box" thinking and has been developing creative ideas. At the same time learned the participants in the workshop about relationship between communication, innovation and the team and were encouraged for a positive action to complete the project.

The Štore Training Centre was for this workshop idea in the year 2011 awarded with the bronze award of Slovenian Chamber of Commerce and the Celje Regional Chamber of Commerce for innovation.

Among the conditions for ensuring of potential employee recruiting sources is also a stimulative working environment, improvement of working conditions and well-regulated employees' rights what affects into image and reputation of the company in the local area.

Positive information about our company has also an influence on decisions of job seekers and we manage an extensive database of potential employees who have on their own initiative submitted an application to employ themselves in the company.

Above: A metallurgy student is taking samples for his diploma thesis research





The company employed in the period from 01.01.2005 to 31.12.2012 a number of 276 new employees, of which 116 (42%) were compensation for retirement and 80 (29%) compensation for other leavings. To the 44 newly employed (16%) was employment not prolonged after trial work (selection) and the number of the employees increased in this period by 36 (13%) persons.

Compared to the year 2000 we had until today considerably improved the level of education of the employees. Proportion of employees with the fourth level of education increased by 22%, with the fifth level by 26 % but in the group of the seventh level or more the proportion at least doubled.

With developing of programs of introduction into work procedures and the mentor- supervision of work beginners we could employed young job seekers who had got their first working experiences in our company and had passed some tests in concrete work situations. The effect of employee recruitment and training of young people immediately after their completion of school resulted in normalization of the age structure of the company. This will in the future enable us a normal transferring of knowledge and experience to future generations.

Gorazd Tratnik, Assistant MD

Technical heritage "in situ"

Along the road that leads through the Štore 2 industrial zone are placed some devices that were used in former ironworks production. These are some examples of the preserved technical heritage of the former ironworks which is on view in the middle of an active industrial complex and serve as a demonstration of 160 year long industrial tradition to new generations.



"Štefka" the narrow-gauge locomotive Štore No. 2

"Štefka" was constructed in the year 1920 at the locomotive factory Henschel & Sohn in Kassel, Germany. The Štore Ironworks started in the year 1947 with building of an internal narrow-gauge railway network and begun with looking for suitable vehicles in the area of former Yugoslavia.

"Štefka" was one of the first two locomotives purchased at the Bor copper mine (Serbia) as scrap in the year 1947, but was than restored in Maribor (the Boris Kidri factory for repairing of railway vehicles). The narrow gauge railway transport system was in use in the ironworks from 1948 to 1980. From all narrow-gauge locomotives are preserved three of them and they represent an important technical heritage.

Above: the restored locomotive under the roof; below-left: schoolgirls are coloring the locomotive during their holiday work; below-right: The locomotive was serving for transport of material needed at earthwork for building the Štore 2 industrial zone;



Steam crane DEMAG

This steam crane was produced at Deutsche Maschinenfabrik AG (Demag) in Duisburg in the year 1912. Its steam boiler was renewed in the year 1965 at the Boris Kidri factory of railway vehicles in Maribor. In the certificate of the steam boiler with serial number 415 is noticed as the last one the technical checkup in the year 1974. The crane was after its cessation placed on the cul-de-sac railway of the old ironworks on the other side of the Voglajna river and was left to dilapidation.

In the year 2003 was it removed to the area of our company. Its housing as well as driving and lifting mechanism were restored in the workshop of the Store Steel railway transport department in the year 2004. Its operational capability was tested with compressed air in the year 2004.

Above: the steam crane is being temporarily placed on storage track, its display place is being prepared; bottom-left: a waggon is being loaded by the steam crane(year 1950, kept at Museum of Contemporary history); Bottom right: drawing from the technical archives of the Železarna Štore;



Transformer 36 MVA BBC

The BBC 36 MVA transformer which has been placed in front of the steelworks building since last year occupies a special place in our technical heritage. The transformer was installed to power our electric arc furnace EAF II which has been in operation since the year 1979. After its replacing with the new 40 MVA ABB transformer in the year 1996 we decided to keep it as a reserve. It was put in operation in years 1998, 2003 and 2007 when three major failures of the 40 MVA transformer occurred. And this was a solution for our production of steel at of that time uneasy occurrences.

Other devices installed on view

From the old rolling mill 1 which was placed in the factory hall of the primary ironworks and had started operating in the 19 century are there in the Štore 2 industrial zone exhibited rolling stands, the Wagner shears from Dortmund and the Eisengiesserei & Maschinenfabrik, Brückl, 1879 shears.

Marjan Ma košek Gorazd Tratnik

Above left: transformer, above right: Eisengiesserei&Maschinenfabrik shears; bottom left: Wagner shears; bottom right:rolling stand;





SQUARE BARS
WITH ROUND EDGES
DIN EN 10059



ROUND BARS DIN EN 10060



BRIGHT ROUND BARS DIN EN 10278



SQUARE		FLAT	
Dimension mm	Radius mm	Standard	Dimensions mm
40 x 40	6	DIN EN 10058	50-200 x 8-62
45 x 45	6	DIN EN 10092-1-A	60-150 x 8-36
50 x 50	6	DIN EN 10092-1-B DIN EN 10092-1-C	50-200 x 8-35 60-120 x 13-67
55 x 55	8	DIN EN 10092-1-C	120 x 12-20
60 x 60	10	BS EN 10092-2	60-120 x 27-42
65 x 65 70 x 70	10 10	B3 EN 10089	00-120 x 27-42
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extreme machinability

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