

# ОАО ТШЕЛЖАБИНСК (CHELPIPE)

The most modern large-diameter pipe mill in Russia



## PLANT DATA

Produced tubes	Diameters: 508–1,422 mm Wall thickness: up to 45 mm, length: up to 18.3 m Type: oilfield tubulars, line pipes
Capacity	600,000 to 900,000 t per year
Outstanding feature	One of the world's most modern large-diameter pipe mills. The complete new plant was erected by SMS group. The Manufacturing Execution System (MES) guarantees the quality at every process step. Two JCO® presses ensure high flexibility. A comprehensive service package from SMS group allows the full potential of the plant to be exploited.

## PROJECT DATA

Customer	OAO Tscheljabinsk (ChelPipe)
Location	Tscheljabinsk, Russia
Commissioning	2010

# SUSTAINABLE AND FLEXIBLE

## ChelPipe sets new standards in Russia

As you walk through the tube-shaped entrance to ChelPipe's "Vyсота 239" large-diameter pipe mill, you enter one of the world's most modern production facilities. ChelPipe is one of Russia's leading producers of steel pipes. The company supplies the pipes produced predominantly to the national oil and gas industry. At its works in Chelyabinsk, ChelPipe builds on the highest product quality, cleanliness and innovative technology under the motto "white metallurgy". The whole plant went into production in July 2010 and was supplied completely from a single source: SMS group.



### **AT 900,000 T PER YEAR, THE HIGHEST CAPACITY WORKS IN EASTERN EUROPE**

With an annual capacity of 600,000 t to 900,000 t, the plant has the highest capacity of any that SMS group has built in Russia to date. Longitudinally welded steel pipes with diameters from 508 to 1,422 mm and wall thicknesses up to 45 mm are produced on the mill. The maximum pipe length is 18.3 m. The finished pipes are used for the construction of oil and gas pipelines. They are also of high quality with steel grades up to K80 (770 N/mm<sup>2</sup>) and can even be employed for offshore pipelines. ChelPipe uses the JCOE® process developed by SMS group for the production of its large-diameter pipes. With two presses for different pipe lengths, ChelPipe can control the production flexibly and adapt it to the demand.

### **500 KM OF CABLE GUARANTEE CLOSE QUALITY CONTROL**

"Our customers expect the highest dependability and a strong partnership on which they build for the long term," says Valentin Tazetdinov, Director New Project Management at ChelPipe. The company leaves nothing to chance and employs the best available solutions for the equipping of the works. Data are continuously transmitted to the Manufac-



turing Execution System (MES) for optimum control of all the process steps. In order that this functions, the works has an electronic pipe tracking system for every single pipe. ChelPipe's customers can be sure: The large-diameter pipes keep their promise. Tazetdinov: "Outstanding delivery criteria are crucial. The high demands that our customers make on us are therefore the same as those we make on our suppliers."

**ALL STATIONS AND QUALIFIED SERVICE – COMPLETE FROM ONE SINGLE SOURCE**

SMS group supplied all the machining stations and the complete electrical and automation systems for the large-diameter pipe mill. ChelPipe also puts its faith in the many years of experience and manufacturing know-how of SMS group when it comes to service. In addition to the obvious support during the start-up of production, SMS group also drew up an all-embracing maintenance concept in advance – and later assisted ChelPipe also in its implementation: From the installation of the computer-aided maintenance management system through to the training of the customer's personnel. This integrated approach guarantees that ChelPipe can exploit the full potential of its ultra-modern plant right from the beginning.

And in order to enable ChelPipe to remain up-to-date in future, too, SMS group gave consideration to possibilities for expansion in the plant concept right from the project planning stage. Additional technologies can be easily integrated in future. "We chose SMS group because the employees think ahead and know our demands in detail. SMS group has supplied a solution with which we can hold a leading position on the market today and in the future," says Valentin Tazetdinov.



**CHELYABINSK PIPE ROLLING PLANT (CHELPIPE)**

ChelPipe is one of the leading Russian producers of steel pipes for the oil and gas industry and was founded in 1942. The works in Chelyabinsk in the eastern Ural Mountains is the largest works in the ChelPipe Group. The name "Vysota 239" refers to the works' prominent location. At 239 meters above sea level, it is the highest works in Russia. The group's headquarters is in Moscow. At the beginning of 2010, ChelPipe with all its subsidiaries had around 25,000 employees.

# NOTHING LEFT TO BE DESIRED

Fully equipped with optimized interfaces

“Vysota 239” is ideally equipped to meet the high demands on the market for oilfield tubulars and line pipes. All the machines are of the latest technical standard and linked to form an extremely modern process chain. The core components of the integrated plant include

- Plate edge miller
- Plate edge crimping press (of box-frame design)
- 18 m JCO® forming press with 10,000 t press force
- 12 m JCO® forming press with 6,500 t press force
- Two tack welding machines
- 5 inside and 4 outside welding machines
- Two mechanical expanders
- Hydrostatic pipe tester
- Facing and chamfering machines, and
- Stations for non-destructive testing

All the components come from SMS group.

## HIGH FLEXIBILITY WITH JCO®

The two JCO® presses are the heart of the plant and produce 18.3 m and 12.2 m long pipes. ChelPipe is therefore well-equipped to meet all current and future market demands: The advantage of the 18.3 m long pipes is the lower laying costs, as the number of connecting welds is lower compared with shorter pipes. Thanks to the use of the 12.2 m press, the shorter pipes can be produced with extremely thick walls, even with small diameters, and are therefore well-suited for use in offshore pipelines where they have to withstand higher pressures. The quality of the pipes meets all the international standards.

## CONTINUOUS OPTIMIZATION THANKS TO MES

An MES system (Manufacturing Execution System) forms the link between the superordinate ChelPipe ERP (Enterprise Resource Planning) system and the machine control level. Each pipe is given a barcode by means of which all production data can be individually allocated to the pipe. The quality of the pipe is inspected and documented after every process step. This Level 3 automation system guarantees a consistently high quality.

PLATE EDGE MILLER



CRIMPING PRESS



JCO® FORMING PRESS



TACK WELDING MACHINE



MECHANICAL EXPANDERS



HYDROSTATIC PIPE TESTER



STATION FOR TESTING



FINISHED TUBE





### **JCOE® AS NEW MARKET STANDARD**

In the JCOE® method, the previously edge-milled and crimped plate is gradually formed into an open-seam pipe. The parallel longitudinal edges then offer the best preconditions for the subsequent pipe welding. The method is very flexible and requires lower investments than other methods, and has therefore established itself very quickly on the market since its development by SMS group.

# STRONG SERVICE PARTNER

## Better organization and more efficiency

At the Russian large-diameter pipe mill in Chelyabinsk, ChelPipe profits from the benefits of the extensive service offered by SMS group. Seven experts from SMS group took care of the maintenance organization for a period of 1½ years. ChelPipe selected the required services for the large-diameter pipe mill.

The company thus relies on innovative and comprehensive holistic solutions from SMS group not only for the machines, but also for the maintenance. “SMS helped us to work innovatively, to focus our sights on the right areas and to take carefully and well-prepared decisions. We were thus able to make the organization of our technical maintenance and repair shop more efficient,” says Valentin Tazetdinov, Director New Project Management at ChelPipe.

### **INNOVATIVE THREE-STAGE MAINTENANCE CONCEPT**

The service partnership kicked off with a maintenance audit over several weeks. SMS group thereby analyzed the workshop capacities, the existing processes and the know-how of the personnel roughly one year before commissioning.

On the basis of the data gathered, a three-stage maintenance concept based on western European standards was developed and then implemented jointly.

### **STAGE 1: EMPLOYEE ASSESSMENT – IDENTIFICATION OF POTENTIALS**

In the first stage, the technical and personal qualifications of the employees were assessed. In a four-week assessment, SMS group tested the process know-how on maintenance, the technical know-how on the installed machines and the soft skills of 35 maintenance managers and 16 workers. The results went into the next stage of the maintenance audit.

### **STAGE 2: MAINTENANCE MANAGEMENT WITH EARLY WARNING SYSTEM**

With the Integrated Maintenance Management System (IMMS®), ChelPipe ensures a high plant availability – a major success factor in the growing competition on the tube and pipe market. SMS group tailored the system to ChelPipe’s requirements. The software provides support for maintenance management and contains plant-specific data sets

for the inspection and service. ChelPipe thus profits from SMS group's valuable manufacturer know-how. The plant condition is known at all times, so that the company knows where and when maintenance work has to be carried out. Maintenance management is thus far more efficient and can be planned well in advance.

### **STAGE 3: TECHNICAL SUPPORT ON SITE – PROMOTION OF POTENTIALS**

In the third stage, experienced SMS group experts assisted ChelPipe technically on site. They trained the employees practically and theoretically, and ensured the establishment of and compliance with new processes. Together with SMS group, ChelPipe introduced part stocking processes and defined the necessary stock of spare parts. The service partnership is rounded out by a new awareness among the ChelPipe employees for how important it is to continuously optimize all the processes. "With this new way of thinking, our employees are more motivated and identify themselves with the processes. They recognize potentials, develop ideas and achieve their own successes which promote the desired continuous improvement," says Valentin Tazetdinov.



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