INTRODUCING SCIENTIFIC WORK ORGANIZATION TO
THE MAGNESIA PRODUCTS DEPARTMENT OF THE
ZAPOROZHE REFRACTORIES PLANT

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All-round mechanization and automation of production processes, improving the conditions and
boosting labor productivity and product quality on the basis of the use of scientific work organization
(NOT), ensuring the optimum use of labor and material sources with the aim of turning out high-grade
goods at minimum cost, is all very important for successful solution to the problems presented by the
23rd Congress of the CPSU at the September (1965) plenum of the central committee of the CPSU.

Successful operation of refractory plants largely depends on work organization in the pressing
sections, the extent of mechanizing the operations and the reliability of operating the pressing equip-
ment. Therefore, the efforts of the technical service departments of the Zaporozhe plant have been
directed at eliminating bottlenecks, mechanizing and automating processes in the pressing sections.

One of the bottlenecks in the magnesia refractories press section is the department handling the
batching and body preparation work. The manual batchers which are operated by 4-5 men per shift do
not provide accurately batched materials.

Rapid wearing out of the scrapers on the mixers means prolonged press down time and the expen-
diture of much manual labor on cleaning off the body that has stuck to the mixers and replacing the
scrapers.

The central factory laboratory of mechanization and automation together with the automation lab-
oratory of the All Union Institute of Refractories have developed and introduced a system of automatic
batching and body preparation, using tensometric weighing batchers. This has freed 20 workers, saved
about 16,000 rubles per annum, and eliminated abnormal variations in the batch composition.

If the manual batching method meant that the magnesite content in the batch for roof products did
not correspond to the norm in 2.1% of the samples, then with automatic batching the figure was only 0.6%,
for batch of standard brick the deviations from the norm dropped to 3.9% instead of 5%.

Deviations from norms in terms of the contents of 0.5 mm grain in the batch used for roof products
dropped from 11.8% with manual batching to 3.4% with automatic batching, and in the batch for standard
brick from 1.5 to 0.1%.

The use of reinforcement in the scrapers made from sheets of hard VK8 alloy as proposed by the
rationalizers at this factory, not only increased the service life of the scrapers in the mixers but re-
duced the downtime and labor spent on cleaning them.

A lot of work has been done to eliminate design drawbacks in the P-907 hydraulic revolving press.
We have changed the hydraulic scheme which has eliminated irregularities in mold filling; we have instal-
led devices for pouring finely milled powder into the molds which prevents the body sticking to the upper
stamps; the body storage bunkers have been equipped with agitators to eliminate sticking.

Another important measure aimed at mechanizing operations in the pressing section was the devel-
opment of a complex of units for removing green products from the presses and placing them on the shelf
drying cars. The installation consists of a stripper, fitted on the press cross piece, a pulsating belt
grouping device, and the setting unit. All these devices operate from hydraulic drives from a common
oil-pumping station, and are connected by a system of automatic devices. The stripper is fitted with a
carriage having 1, 2, or 3 pairs of clamps, depending on the number of articles being pressed at one time.
When large roof products are being prepared and the green goods are being removed by hand, the pressing team consisted of a presser and three strippers, and on other presses of a presser and two strippers.

The use of mechanization has reduced the teams at all presses to two men — a presser and an operator occupied on rolling the cars and setting out the drying frames. Mechanization of the removal and setting of green brick on the shelf cars at all ten presses in the department has freed 44 workers, which has saved 56,500 rubles a year.

Maintaining the required green brick thickness is a very difficult task with the use of P-907 presses.

Manual control of the height of the filled body specified by the design of these presses leads to frequent deviations in the thickness of the green product.

On the basis of an automatic control system developed by VIO, the factory central laboratories have completed automation for controlling the thickness of the green product on 6 presses, and in future this work will be completed for all P-907 presses. The automation laboratory of VIO in addition to installing the first prototype also made a control unit for all P-907 presses installed in the department.

This conversion has produced an annual saving of up to 55,000 rubles as a result of cuts in loss and the receipt of surcharges for more accurately sized products.

The collective of the TZZLAN has automated the supply of sulfite lye from the warehouse to the consumption bunkers in the department which has reduced the number of servicing personnel, eliminated loss of sulfite lye due to spillage and the resulting contamination of the workshop. The annual saving was 7500 rubles.

The introduction of research results carried out by the Zaporozhe Engineering Institute in combination with the factory aimed at increasing the life of molds is very important.

The poor life of molds made from 20 Kh steel led to frequent press stoppages, reduced the effectiveness of automation and disturbed the production cycle. A large number of workers were engaged on producing molds, assembling and replacing them.