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SELECTED ECONOMIC TRANSLATIONS
ON EASTERN EUROPE

(234th in the series)

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SELECTED ECONOMIC TRANSLATIONS
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INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and on geography. This report contains translations on subjects listed in the table of contents below. The translations are arranged alphabetically by country.

TABLE OF CONTENTS

| | Page |
|---|------|
| BULGARIA | |
| Higher and More Resistant Yields of Corn..... | 1 |
| CZECHOSLOVAKIA | |
| The Largest Producer of Nonferrous Metals..... | 8 |
| Improving the Technical Standards of Railroad Transportation in the Third Five-Year Plan..... | 12 |
| Czechoslovak Production of Medicines..... | 17 |
| Results of 1958 Economic Reorganization..... | 20 |
| Economic Briefs..... | 27 |
| EAST GERMANY | |
| New Insulating Materials for High-Tension Lines..... | 29 |
| Varieties of Transformers for 0.5 to 30 Kilovolts..... | 32 |
| Optimum Costs of Cable Installations in Industrial High-Tension Networks..... | 35 |
| Some Standardized East German Electrotechnical Products..... | 39 |
| Exchange of Experience Between Operations Sections of the VEB Transformer and X-Ray Works, Dresden, and the VEB "Karl Liebknecht" Transformer Works, Berlin..... | 54 |
| Cooperation of the Operations Sections of the Industrial Branch for Cables and Conductors..... | 57 |
| Problems in Fulfilling the Seven-Year Plan in Pig- Raising Ahead of Schedule..... | 59 |
| Ten-Year Survey of East German Shipbuilding..... | 74 |
| Ten-Year Survey of East German Machine-Building..... | 83 |
| Ten-Year Survey of East German Ship's Electrical Equipment Industry..... | 88 |
| Ten-Year Survey of Tasks of East German Technical Control Organizations of the Enterprises in Connection with Ship's Classification..... | 93 |
| Economic Briefs..... | 100 |
| RUMANIA | |
| Rumania Expanding Merchant Fleet and Shipyards..... | 102 |

BULGARIA

Higher and More Resistant Yields of Corn

[The following is a translation of an article by Dimitur Dimitrov of the Higher Agricultural Institute, Sofia, published in Kooperativno Zemedelie, Vol XV, No 3, March 1960, Sofia, pages 13-15; CSO: 4222-N]

In the struggle for higher and more resistant yields of corn, it is of great importance to sow the varieties and hybrids specified for each region, with high yield, suitable vegetative period, and good resistance to unfavorable soil and climatic conditions.

With the above object, several competitive type tests have been carried out during the last two years at the Pordim village, Pleven region, state variety-selection field, while production tests were also made in the test fields of numerous TKZS's [Cooperative Labor Farms] of the same okrug. They were made on a meadow black-soil type formerly sown in wheat by the standard chessboard method with four "repeats" of 100 square meters, one plant per nest, at a distance of 80/40 centimeters, and with three hoeings.

Table 1

| Variety | Yields Kilograms of Grain per Decare | | Average | |
|---------------------|--------------------------------------|---------|---------------------|-------------------|
| | 1958 | 1959 | Kilogram per Decare | Percent of VIR 42 |
| Pioneer 301 | 458.419 | 434.278 | 451.348 | 126.73 |
| VIR 42 | 319.314 | 392.444 | 356.129 | 100.00 |
| United 66 | 325.658 | 366.542 | 346.100 | 97.18 |
| Krasnoyarskaya 1/49 | 299.304 | 377.491 | 338.442 | 95.03 |
| Wisconsin 692 | 280.230 | 387.224 | 333.727 | 93.87 |
| Krasnoyarskaya 5 | 285.757 | 384.006 | 334.631 | 93.96 |
| Ohio C-92 | 351.356 | 305.164 | 328.260 | 92.17 |
| Nebraska 301 | 290.598 | 359.007 | 324.802 | 90.12 |
| Iowa 4310 | 238.133 | 391.580 | 314.856 | 88.41 |
| Wisconsin 641 | 285.257 | 312.463 | 296.860 | 83.91 |
| Pioneer 318 | - | 438.124 | 438.124 | 111.64 |

[Table 1 continued on following page]

| | | | | |
|-------------|----|---------|---------|-------|
| Pioneer 312 | - | 390.874 | 390.874 | 99.60 |
| Pioneer 345 | .. | 388.009 | 388.009 | 98.67 |
| VIR 281 | - | 385.380 | 385.380 | 98.20 |
| Pioneer 347 | - | 358.654 | 358.654 | 91.39 |
| Pioneer 332 | - | 350.295 | 350.295 | 89.26 |
| Pioneer 352 | - | 341.857 | 341.857 | 87.11 |
| Odeskaya 10 | - | 334.597 | 334.597 | 85.26 |

Investigations have shown the double row hybrid Pioneer 301 had the highest yield. It has been tested not only on the variety field but has also been massively sown on fields of the Pordim village TKZS (teh seeds were obtained from Rumania). Yields on these fields were a record for the village over 400 kilograms of grain per decare. The hybrid maintained its high productivity to a great extent even when sown in the second generation. It has large succulent leaves and very large cobs with numerous seeds; it ripens late, which fact conditions its high yield. The plants are characterized by slow development in their initial stages. Their main disadvantage when compared to the VIR 42 is a considerably longer vegetation period, which, in the case of a rainy autumn, hinders the harvesting and drying of grain and stubble. Because of a lack of seeds, this variety is not currently grown.

The next highest in yield is the hybrid VIR 42, which is not only highly productive but has a low main cob, is an early variety, and has a large number of cobs on one plant. Its high productivity is particularly noticeable in years of insufficient precipitation, when, with good care during the vegetation period, relatively high yields are obtained. Of particular importance is its late vegetation period, which permits an early freeing of fields. Observations at the variety section field have shown that harvesting should not be delayed, as the upper parts and leaves of plants break more easily than on other hybrids. Thanks to its late vegetation period, this variety can be utilized as a second crop.

In 1958, notwithstanding an exceptional drought during the entire corn development period, the hybrid Ohio C-92 took first place in yield. During 1959, with a normal rainfall for the field location, this variety gave the lowest yields as compared to all double-row hybrids tested. In localities with insufficient rainfall, Ohio C-92 was one of the leaders in grain yield. This demonstrates its value for arid regions, where it may follow VIR in extent.

Results obtained from a two-year test of double-row hybrids are incomplete, as the period was too short for a complete appraisal of their qualities. In evaluating test results, it should also be considered that the seeds sown were not produced in the test region, but were supplied from various USSR and USA localities, which influences the development and productivity of the hybrids.

In the 1959 tests, first place was taken by Pioneer 318, which has a vegetation period 27 days longer than VIR 42. With no apparent difference in the mathematical working out of data between Pioneer 318 and the hybrids Pioneer 301 and VIR 42, they were followed by Iowa 4316, Pioneer 312, Pioneer 345, Wisconsin 392, and VIR 281.

In order to complete the results of the state variety tests in 1958 and 1959, we include the production tests with the same and other double-row hybrids (Tables 2 and 3).

Table 2

A = kilograms per decare
B = percent of VIR 42

Results of Production Test
in 1958

| Variety | Belene Village TKZS | | Doyrentsi Village TKZS | |
|---------------|---------------------|--------|------------------------|--------|
| | A | B | A | B |
| VIR 42 | 411.3 | 100.00 | 273.2 | 100.00 |
| Wisconsin 355 | 440.0 | 107.00 | 222.1 | 81.29 |
| Wisconsin 525 | 363.9 | 88.47 | 154.2 | 56.44 |
| Wisconsin 641 | 461.0 | 112.08 | 162.6 | 59.51 |
| United 32 | 390.0 | 94.82 | 207.8 | 76.06 |
| United 66 | 445.9 | 110.81 | 153.9 | 56.33 |
| Iowa 4316 | 439.4 | 106.84 | 190.6 | 69.76 |
| Nebraska 301 | 337.8 | 82.12 | 203.8 | 74.59 |

Table 3

Results of Production Tests in
1959

A = kilograms per decare
B = percent of Ohio C-92

| Variety | Belene Willage TKZS | | Gorniya Dubnik Village TKZS | |
|---------------|---------------------|--------|-----------------------------|--------|
| | A | B | A | B |
| Local white | 441.0 | 87.67 | 307.8 | 101.35 |
| Ohio C-92 | 503.0 | 100.00 | 303.7 | 100.00 |
| Iowa 4316 | 539.0 | 107.15 | 379.8 | 125.05 |
| Wisconsin 641 | 519.0 | 103.18 | 367 | 120.97 |
| Wisconsin 692 | 598.0 | 118.88 | 384.9 | 127.73 |
| United 66 | 584.0 | 116.08 | 346.7 | 114.15 |
| Pioneer 318 | 636.0 | 126.44 | 345.3 | 113.69 |
| Pioneer 345 | 549.0 | 109.14 | 348.9 | 114.78 |
| Pioneer 347 | 445.0 | 88.46 | 335.0 | 110.30 |
| Pioneer 371 | 557.0 | 110.73 | 346.1 | 113.96 |
| Kansas | 671.0 | 133.39 | - | - |
| Nebraska | - | - | 381.0 | 125.45 |
| VIR 42 | - | - | 329.2 | 108.39 |

As Table 2 shows, the VIR 42 hybrid, in 1958--a very arid year, the Doyrentsi TKZS in the Lovech region exceeded in grain yield of the remaining double-row hybrids by 19.71 to 43.67 percent. In the TKZS Belene, Pleven region, VIR 42 was lower in yield than Wisconsin 355, Wisconsin 641, United 66, and Iowa 4316 by 6.84 to 12.08 percent.

The results of 1959 favor Pioneer 318, Wisconsin 692, United 66, Iowa 4316, Nebraska 301, etc., which results coincide, with certain exceptions, with those of the variety selection field. The basic reason for the differences in yields between various hybrids in the tests on the variety selection field and the farm tests is to be found in the different amount of rainfall; on the Pordim village TKZS it was nearly normal, while in Belene and Gorni Dubnik TKZS's it was very much below normal.

For a fuller evaluation of double-row hybrid corn qualities it will be necessary during this year, parallel to state variety testing, to increase the number of production tests on TKZS's, so that not a single enlarged landhold will remain without a test plot on its territory. The results obtained will furnish valuable material, necessary for a later micro-plotting of corn hybrids.

A Sufficient Number of Plants per Decare Guarantees Higher Yields

With corn, the number of plants per decare depends on the degree of productivity and fertilization of the soil, the climatic conditions of the sowing locality, and the biological characteristics of the variety.

In order to precise this problem, during the three last years (1957-1959) tests were made on the Pordim village, variety-testing plot Lom region, with the local yellow corn, which has a medium-long vegetation period, similar to that of the Wisconsin 641, Ohio C-92, Pioneer 318, etc. double-row hybrids. The height of its plants and the number of leaves are nearly the same as the above hybrids. It adapts itself well to the variations of climatic conditions in different years and seasons. In 1957 the plants developed under fully sufficient amounts of rainfall during the entire vegetation period and in great aridity in 1958. These two years may be considered to represent the utmost limits of possible maximum and minimum amounts for plain localities of the Pleven and Lovech Okrugs. This makes it possible to evaluate within what limits the number of corn plants should vary for these regions. The precipitation during the vegetation period of the plants--April to September in 1957--was 580.1 millimeters; in 1958, 128.7; and in 1959, 402.2, while during the most critical moment of their development, July to August, they received respectively 146.7, 27.1 and 113.2 millimeters.

During all three years the test were made in the following six variants:

Table 4

| | 70/50 | 70/60 | 70/70 | 70/70 | 80/80 | 80/80 |
|--|-------|-------|-------|-------|-------|-------|
| Number of plants per nest | 1 | 1 | 1 | 1 | 1 | 1 |
| Number of plants per decare | 2,857 | 2,380 | 2,040 | 3,067 | 1,582 | 2,347 |
| Percent of infertile plants: 1 plant per nest | 2.01 | 1.47 | 0.77 | 1.43 | 0.23 | 0.83 |

[Table 4 continued on following page]

| | 70/50 | 70/60 | 70/70 | 70/70 | 80/80 | 80/80 |
|----------------------------------|---------|---------|---------|---------|---------|---------|
| 2 plants per nest | - | - | - | 1.57 | - | 0.74 |
| Full-bodied cobs per 100 plants: | | | | | | |
| 1 plant per nest | 77 | 50 | 101 | 98 | 103 | 100 |
| 2 plants per nest | - | - | - | 81 | - | 90 |
| Grain yield per decare: | | | | | | |
| 1957 | 546.500 | 522.500 | 492.750 | 581.250 | 404.750 | 546.000 |
| 1958 | 222.500 | 212.00 | 246.75 | 246.50 | 742.25 | 247.50 |
| 1959 | 342.000 | 324.5 | 310.75 | 342.5 | 311.75 | 313.75 |
| Average: | | | | | | |
| Kilograms per decare | 370.333 | 353.000 | 350.083 | 390.083 | 320.583 | 369.583 |
| Percent | 94.93 | 90.40 | 89.71 | 100.00 | 82.18 | 94.81 |

In the humid year of 1959 the highest yield was obtained with 3,067 plants per decare. The difference in yields with 2,380 plants per decare, a density still quite commonly used was 59 kilograms of grain in favor of the denser sowing and 177 kilograms compared with the thinnest sowing of the test--1,562 plants per decare. During the exceptionally dry year of 1958, the yield of the 3,067-plant variant was nearly equal to that of the thinnest sowing of 1,562 plants--i.e., about half as many plants per decare. In 1959 the highest yield was also obtained from sowing with the highest number of plants per decare--3,067.

It can be observed from the data of many years that with normal precipitation and soil of average productivity, the number of plants should in no case be under 3,000, while with varieties of the VIR 42 type, which are low-stemmed and early-maturing, the number should reach to 3,200.

With the test variant of 1958, with square-nest sowing, we placed two plants in every second nest at a distance of 70 x 70 centimeters. Notwithstanding the severe drought, there were no essential differences in the percentage of infertile plants and the number of full-bodied cobs per 100 plants between variants with one or two plants per nest.

The data indicate that with denser sowing, when two plants are sown per nest, the percentage of infertile plants is

higher. There are more well-formed cobs per 100 plants in thinner sowings. This is a common phenomenon in all cultivations. But it is also observed that variations in the percentage of infertile plants is +1, while in the number of well formed cobs the difference reaches 26 percent.

It must nevertheless be taken into consideration that years similar to 1958 (very arid) are rare in our climatic conditions. Besides, even in this case, the yields of more densely sown fields are not lower than on the thinner ones, while in normal years this difference in the percentage of infertile plants and the number of well formed cobs per single plant is reduced to a minimum. Taking into account that the difference between the number of plants in thin and normally dense sowings is 50 percent, then in all cases, without exception, we must insure 2,800 to 3,200 plants per decare, depending on the natural fertility and the fertilization of the soil, precipitation data, and the variety sown.

A test was made with local yellow corn, which has a considerably longer vegetation period and a greater foliage mass, and thus requires greater amounts of nutritive area than the VIR 42 hybrid, which matures early, has a low stem, and may be sown more densely. Varieties of the double-row Ohio C-92 hybrid, Wisconsin 641 AA, Pioneer 318, and other types; which have a greater vegetation development, should be sown more thinly, but in no case under 2,800 plants, except in soil of low fertility, where the number should reach 2,500 to 2,700. The decrease of sowing to 2,500 [plants per decare] in all cases means large losses for both the TKZS and the national economy. This is why it is necessary that specialists concretely estimate the number of plants to be sown per decare. In hoeing, mechanics and cooperative farmers should take great care to maintain the determined density of sowings and only in exceptional droughts and under the direct supervision of specialists should they thin out the plants in the earing phase.

CZECHOSLOVAKIA

The Largest Producer of Nonferrous Metals

[The following is a translation of an article entitled "Najvacsi Vyrobcia Farebnych Kovov" by Karol Strnad, published in Hopodarske Noviny, Vol IV, No 14, 1 April 1960, Prague, page 5; CSO: 4102-N]

Response to an Article of the Minister of the Metallurgical Industry and Ore Mines entitled "A Serious Word to Miners," published in Hospodarske Noviny, No 38, 1959

* * *

The fulfillment of the great tasks scheduled by the Third Five-Year Plan will depend largely on the ability of our foundries to supply the engineering and construction industries with iron, steel, and nonferrous metals.

The Slovak "National Uprising" Plant (Zavod Slovenskeho narodneho povstania) at Ziar nad Hronom will have an important role in this program; it is our only producer of such metals as aluminum, nickel, copper, antimony, and electrolytic manganese. The production is small compared with the output of ferrous metallurgy, but it is growing in importance. Although some of these metals are being partially replaced by synthetic materials, the demand of the engineering industry for metals is increasing in proportion to the rising steel consumption. The indicator of aluminum consumption is rising even faster.

* * *

Our plant is now faces with the task of rapidly increasing the production of basic nonferrous and light metals. This applies in the first place to the production of aluminum. This Third Five-Year Plan schedules the construction of new productive capacities. The investment construction of aluminum foundries is costly and time-consuming. Even though

preparations for the construction are in full swing, we cannot expect any tangible production results before the end of the Third Five-Year Plan. Until then, we will have to increase aluminum production by utilizing the reserves available in our present operations and by reconstruction and modernization. As a matter of fact, the plant has been following this pattern for several years; without any substantial modernization we have succeeded in increasing the anticipated metal production quota by 35 percent; we expect to raise the output 50 percent during the first years of the Third Five-Year Plan. The project will depend on the ability of our heavy engineering industry to supply new and modern electric current rectifiers for a large output volume.

The modernization process led to some new production methods aimed at lowering production costs. Since 1950 we have introduced new equipment for continuous casting and rolling of aluminum wire up to a diameter of 8 millimeters and in coils weighing up to 1,500 kilograms. The new equipment makes it possible to produce the final product directly from the molten metal coming out of the electrolytic oven. The new process eliminates the former technique of casting the metal into rods that were first shipped several hundred kilometers away to plants where they had to be reheated before being rolled into wire and small coils weighing not more than 45 kilograms.

The new production method represents savings in thermal power, eliminates unnecessary shipping costs, streamlines handling, and permits a better utilization of the wire-processing equipment.

The Slovak "National Uprising" Plant has added to its 1960 production of silumin the production of another alloy, $AlMg_3$. We thereby achieve better economy and higher quality of production, because the metal does not have to be remelted and there is no danger of impurities contaminating the metal; we shall be able to reduce the use of thermal power, which is important in view of the high melting point of aluminum.

In conjunction with the production increase of aluminum, we shall increase the output of aluminum oxide. In the near future we will be able to depend on the efficient utilization of existing production facilities. We shall eliminate some serious shortcomings, such as the problem of evaporation of soda solution; we shall improve the quality of the oxide output, reduce the consumption of some precious raw materials (for example, anhydrous sodium carbonate), and cut production

costs. We are counting on the cooperation of our engineering enterprises.

* * *

The demand for nickel is also very active, because the production of special types of steel is rising. The Slovak "National Uprising" Plant is building a new nickel foundry at Sered, which will be our first nickel-producing plant. It will process iron-nickel ores from Albania according to methods using ammoniacal leaching and electrolysis. In addition to nickel production, the ore will be used to produce cobalt. The production method, unique in Europe, will require a considerable amount of research. This will complicate the tasks of our planners and suppliers in connection with the building of the foundry. The nickel production is scheduled to start in 1962 and the construction of the plant will therefore require special efforts on the part of the metallurgical as well as construction and engineering sectors.

Our copper production will also be expanded in the Third Five-Year Plan; copper production will increase twofold by 1965. The foundries at Krompachy are undertaking a major plant reconstruction and expansion of their operations. Copper production will depend on the expansion of domestic copper mining. The ore will be used for the production of copper and also for the production of amalgam and antimony concentrate; we also plan to use sulphur for the production of sulphonic acid.

In the foundries at Krompachy we are installing "zinc-escape" processing facilities this year; so far these vapors have escaped in large volumes into the air. They will now be processed into zinc sulphate with a lead-and-tin-alloy as a by-product.

This year the Slovak "National Uprising" Plant concludes research and the semi-operational production on electrolytic manganese gained from the ores of the Kisov-Svabov region. The output is being planned to satisfy the demand for the manufacture of special types of steel; a large output of nitrified electrolytic manganese is being contemplated.

The production is expected to be in full swing already in the first years of the Third Five-Year Plan.

Most of the plant's research is dedicated to the problem of mining and processing domestic ores in accordance with government and party directives for the Third Five-Year Plan. We are experimenting with the electrothermal production of an Si-Al alloy gained from East Slovakian haloids, which are plentiful but have not yet been exploited industrially. Once the problem is solved and production started, we shall no longer depend on imports of several thousands of tons of silica per year for our silumin production. The silica will also yield a quantity of aluminum according to a more economical method than the electrolysis of aluminum oxide.

Our research will concentrate on the production of aluminum oxide and of aluminum from domestic nonbauxite substances, especially from north Bohemian clay. The research project is important in view of the declining world supplies of bauxite; efforts are being made abroad to produce aluminum from second-grade bauxite and from nonbauxite substances.

* * *

We are facing great difficulties in the solution of these tasks. As the sole manufacturer of various metals, we have no partner to consult in technical matters and no one to exchange experiences with. The Slovak "National Uprising" Plant could therefore rely only on the cooperation of plants belonging to VTS [Scientific Technical Cooperation], especially those in the Soviet Union and Hungary. Unfortunately, the VTS does not have the facilities to offer assistance and therefore the development of this young and important sector of our metallurgical industry is somewhat handicapped.

CZECHOSLOVAKIA

Improving the Technical Standards of Railroad Transportation
In the Third Five-Year Plan

[The following is a translation of an article entitled "Za Zvyseni Technicke Urovne Zeleznicni Dopravy ve Treti Petiletce," by Vaclav Jungmann, published in Zeleznicni doprava a technika, No 4, April 1960, Prague, pages 98-99; CSO: 4224-N]

The directives of the Party and government on the Third Five-Year Plan, based on the decisions made by the Eleventh Congress of the KSC [Komunisticka strana Ceskoslovenska; Communist Party of Czechoslovakia], outline bold and complicated tasks unknown in our past five-year plans. This is because the Third Five-Year Plan must complete the socialist development of our country and create conditions for the building of a communist society. The fulfillment of these beautiful and bold goals will require a substantial improvement in the efficiency of our entire national economy, in particular of labor productivity.

Transportation must also contribute to the fulfillment of this task as much as possible. It has to secure a higher efficiency of work and improve the quality and safety of transportation. Therefore, the Third Five-Year Plan will be a turning point as far as the quality of transportation is concerned. Partial problems have been solved in the past, such as the introduction of new traction systems, mechanization, automation, new technology and techniques, and construction and maintenance of transportation media; now we are initiating a plan for a complex modernization and technical reconstruction of the entire transportation system.

Science and technology will contribute greatly to this complex modernization and technical reconstruction. Therefore, a wide application of technical developments in transportation has become one of the principal problems that was to be specified by our operational units, plants, enterprises, and railroads during their preparations for the Third Five-Year Plan.

Therefore, the creative initiative and activity of our workers, innovators, improvers, technicians, engineers, and the

entire collectives have been concentrated on the detailed implementation of the instructions outlined by the directives, according to which the technical development would achieve the highest possible capacity of the transportation media to meet the growing demand of the national economy; stimulate the growth and improvement of the technical standards, culture, and safety of travel; contribute to the improvement of labor productivity, reduction of the production cost, consumption of power and materials; and would, for all practical means, liquidate arduous, difficult, and dangerous labor.

Another important directive of the Third Five-Year Plan called for the concentration of means and forces on the decisive sectors so that the policy of technical improvement and investments would increase the efficiency of the available installations through the application of modern techniques and thus accelerate the returns of investments.

At present, we are completing the first stage of preparations for the Third Five-Year Plan; its results have been discussed, made more precise, and evaluated at the technical and economic conferences in enterprises and railroads.

These conferences have proved that the tasks of our railroad transportation outlined by the directives of the Party and government have been basically secured in the draft plans of the enterprises and railroads.

The majority of indices in the technical development sector have been fulfilled or even overfulfilled. For instance, the length of the railroad lines will increase by the following figures in 1965: electrified lines 1,000 kilometers; lines equipped with an automatic stop system (autostop), 900 kilometers; and lines equipped with an automatic point stop system (bodovy autostop), 2,200 kilometers. The number of automatic switches will increase by about 4,000 and 20 marshalling [shunting] yards will be equipped with rail brakes, of which more than 50 percent will have automatic setting of the ranging lines. The 51-percent share of the electric traction has been reached, but the problem of motor traction has not been worked out satisfactorily; also, the shunting operations are behind because the planned percentage of motor traction has not yet been reached.

The new technology, together with modern rolling stock, will increase the capacity of lines and railroad junctions and will secure the fulfillment of the planned tasks related to the transportation volume as follows: labor productivity

at roughly 70 percent, reduction of the production cost at 57 percent, reduction of car circulation at 56 percent, and the increase of the section speed at a full 100 percent.

The safety of transportation will be improved by the introduction of automatic block systems, automatic stop systems, and relay safety devices; by 1965, level crossings will be equipped with 300 more automatic barriers and 470 more light-signal units.

The technical and economic conferences also proved that the planned indices were fulfilled and sometimes even over-fulfilled where the outlined problems had been handled with full responsibility, using thorough analysis, and where it was possible to stimulate the interest of a large number of workers. For instance, this was the case in the re-evaluation of investments on the basis of the Vladimir Movement (vladimirske hnutí) and the case of the detailed preparations for the mechanization of heavy and difficult work: in 1965, the average mechanization of loading and unloading will reach 95 percent at the railroad station of Kosice, 90 percent in Prague, 89.9 percent in Plzen, 86.3 percent in Ostrava, and 86.2 percent in Bratislava. This task was not solved by the technical and economic conference of the Usti Railroad (Ustecka draha), where it reached only 57.2 percent.

Very good results have been achieved in the planned development of the rail system; by the end of 1965 the length of welded rails will increase by 5,600 kilometers, 20-ton axle load lines by 2,700 kilometers, concrete-tie lines by 3,800 kilometers, and heavy S65 lines by 400 kilometers, and the work will be 87 percent mechanized.

The weak spot as far as the new technique is concerned is the application of wireless systems in moving locomotives and switch engines by the car recorders and repairmen, and the application of television. This type of new technique has been underestimated by the technical and operational workers as well as by the technical and economic conferences; they have not paid enough attention to this question. They have been satisfied with what has been offered to them--i.e., test operations only. Therefore, only eight line dispatching units and 20 station dispatching units, 43 local portable wireless units, and 38 television sets are scheduled for installations. It will be necessary to re-examine the application of this new technique and to secure its mass introduction during the Third Five-Year Plan.

The technical and economic conferences discussed, besides technical development, a large number of problems concerning the quantitative and qualitative work indices and related problems. For instance, problems were discussed concerning changes in the manpower structure, better qualification and training of workers, shorter working time, and the two-shift system in connection with the introduction of new techniques, particularly the new traction systems, mechanization, and automation.

Several conferences also discussed the problem of the attitude toward the solution of various questions and the thinking of workers who underestimated either the technique or the economy, and tended to forget that it was impossible to solve technical problems without taking into account their economic aspects, and vice versa.

The technical and economic conferences of the engineering and construction enterprises of the railroads were also successful. For instance, in 1965 the mechanization of railroad construction will double, and the railroad workshops will be 75 percent mechanized. The technical and economic conferences also discussed standardization, normalization, prefabrication, and specialization of production and repairs, problems of the spare-parts exchange system, utilization of machinery, equipment, and work space in connection with the two-shift system, management methods, etc.

Again, the technical and economic conferences demonstrated that they have become as important a form of workers participation in management as the technical and economic councils.

We are now starting to prepare the second stage in the drafting of the Third Five-Year Plan. During this stage we have to prepare all technical and organizational measures necessary for the successful fulfillment of the Third Five-Year Plan. Also, it will be necessary to solve, as soon as possible, some problems, ideas, and proposals that could not be ready for the technical and economic conferences or for the draft of the plan.

As far as technical development is concerned, the main problem is to accelerate its pace. Therefore, it will be necessary to re-examine the possibility of accelerating the technical development and expanding its range. It will be necessary to make a complex analysis of the share, insurance, and place of the plane of technical development within the framework of other railroad plans, and to work out more pre-

cisely the timetable of the individual stages in research, development, production preparations, deliveries, and introduction of new technique in order to shorten as much as possible the time elapsing between research and application.

Our railroads and enterprises must play a decisive role during this stage in preparing plans for the application of modern technological methods. They will secure the acceleration of the circulation of the rolling stock, extension of the branches (rameno), acceleration of the section speed, improvement of the dispatching control, etc.

Analyses should be concluded by a computation of the technical and economic indices, showing the contribution of the new technique toward fulfilling the qualitative and quantitative indices of the plans of the railroads and enterprises.

In order to achieve our goals, we have to improve work at the enterprise technical development units and equip them with politically and professionally trained personnel. The propaganda for the new techniques should also be improved by organizing "Days of the New Technique" and meetings with improvers, innovators, and brigades of socialist work, and by expanding the "improvement movement" and the "everyone-an-innovator movement."

The second stage in the drafting of the Third Five-Year Plan can be concluded successfully provided that we are able to engage, under the leadership of the KSC and close cooperation with the ROH [Revolucni odborove hnuti; Revolutionary Trade-Union Movement], broad masses of workers whose wisdom and initiative will be a sufficient guarantee of success.

CZECHOSLOVAKIA

Czechoslovak Production of Medicines

[The following is a translation of an article entitled "Nase Vyroba leziv" by Josef Plojhar, Minister of Health, published in Hospodarska Noviny, Vol IV, No 15, 8 April 1960, Prague, page 1; CSO: 4110-N/b]

The beginning of the industrial production of medicines in Czechoslovakia dates back to around 1930. Medicines were made only by large pharmacies and production laboratories were only copies of foreign drugs. Until 1945 our production depended on pharmaceutical chemicals imported from Germany, Switzerland, and France.

Research on new medicines was unknown until 1939. That year, when the universities were closed, some manufacturers formed research groups made up of former university students and scientists. After 1945 these groups supplied the first workers to research institutes and the pharmaceutical industry. The manufacture of pharmaceutical chemicals had a very slow start and did not go beyond laboratory and semi-operational production. Production was rather primitive, but when it was nationalized it was subject to radical changes.

After 1948 the Czechoslovak pharmaceutical sector developed the processing of pharmaceutical chemicals into medicines and started building the basic industry. We restricted the use of obsolete drugs so that in 1949 the number of drug types manufactured dropped from 2,500 to 638. This reduced amount of drugs filled only 30 percent of the domestic demand for medicines and the rest had to be imported. We gradually eliminated production under licensing agreements and started introducing modern drugs. We built two plants for the manufacture of antibiotics, two plants for the manufacture of vaccines and serums, a plant for the manufacture of sulphonamides, and a plant for the manufacture of organic drugs. We also set up plants for the manufacture of medicinal end-products and certain pharmaceutical chemicals. We established a plant for the purchase and processing of medicinal plants, opened four research institutes (for pharmaceutical chemicals, antibiotics, immunization-biotic drugs, and medicinal plants), and two farms for experimenting with animals. While

production rose rapidly, the demand for medicaments grew even faster. The reason was the institution of national health insurance.

Since 1948 the production of medicines has increased tenfold, while the number of workers rose fourfold. The growth of production was not uniform in every year; in 1953 and 1954 the rate of growth was slow, although basic chemical production was up. In the subsequent years the output rose steadily as a result of the development of antibiotic production. In the last years of the Five-Year Plan another development took place--namely, that of vitamin production.

The number of drug types declined to 540; only 272 of them are from the original list; most of them carry only the old name while their composition has changed in the course of time. In the past ten years, 268 new and modern medicaments have been added. The quality has improved and unstable ingredients have been substantially reduced; complaints were very frequent in 1948, more than one percent, but in 1957 their occurrence dropped to 0.14 percent.

Imports are declining because of the rising production and expanding manufacture of basic substances. After nationalization, our pharmaceutical industry still depended on imported basic chemicals (amidopyrine, antipyrine, phenacetine, salicylates, sulphonamides, antibiotics, hormones, vitamins, etc.). Domestic production satisfied only 10 percent of the medicinal consumption. In 1950 our production started on its upward trend. The 1957 manufacture of medicines was 8.7 times as high as in 1948.

We had to contend with such problems as lack of faith in our new domestic drugs on the part of the public and physicians. The suspicion was partly justified until 1946, because products were not regularly controlled and their stability and effectiveness were not guaranteed. Even later, the demand continued to be strong for medicaments that had a world wide reputation only because of heavy advertising. We sometimes had trouble in explaining that, for example, our own product called Sulfathiazol was equal to the Swiss Cibazol in quality and effectiveness; as a matter of fact, the "Swiss" Cibazol was made in Czechoslovakia from our own ingredients. We still run across people who are convinced that foreign products are far better than ours. We can mention one ludicrous situation: one of our citizens asked our commercial attaché in Switzerland to procure a medicine that was prepared in Switzerland from ingredients imported from Czechoslovakia.

The declining import is compensated for by a rising basic domestic production of pharmaceutical chemicals. In 1948, imports were eleven times as high as in 1960. Our domestic production also helped to expand our exports, which rose significantly in 1956-1957. Exports amounted to 1.5 percent in 1949; in 1958 they rose to 20.5 percent of the over-all production of medicines. The mechanization of pharmaceutical operations has favorably affected the growth of our production since 1955.

Back in 1951 the range of imported medicines comprised 600 different types, while in 1960 there were only 100, of which 15 were antibiotics and 85 were other medicines. We must state, however, that we shall continue to import some medicines, because it is uneconomical, impractical, and even at times impossible to manufacture small amounts, especially when a product has patent protection. We had to give up the manufacture of several medicines, because we concluded that importing them was less expensive than making them domestically. We therefore subject each new production and research to economic analysis to determine the profitability of the operation. We should encourage cooperation with other people's democracies and set up specialized production on the basis of mutual economic assistance.

The fact that Czechoslovak production has gained a good reputation in the world will increase our responsibilities. Our pharmaceutical production will endeavor to enlist the support of scientific medical institutes and physicians to maintain its good standing in the world and to join the ranks of the best known manufacturers of medicines.

Photo Caption

The pharmaceutical production is fulfilling its tasks again this year. In the first two months of 1960 the gross production plan was 101.4 percent fulfilled and exports reached 115.3 percent. The above photo shows a labeling machine operating in the Bratika plant at Slovenska Lupca near Banska Bystrica.

CZECHOSLOVAKIA

Results of 1958 Economic Reorganization

[The following is a translation of an article entitled "Po Dvou Letech Nove Organizace," by Josef Krosnar Minister of State Control, published in Hospodarske Noviny, Vol IV, No 10, 4 March 1960, Prague, pages 1-3; CSO: 4285-N]

Next month it will be two years since the reorganization of industrial and construction management was begun. The results at hand point in general to a successful outcome of the reorganization. Some of its provisions will have to be improved, however, in order to attain the goals that the Party and government have called for. Today's editorial is dedicated to these problems.

The Ministry of State Control [Statni Kontroly] has recently been making inquiries into the fulfillment of the Party and government resolutions on increasing management efficiency in industry and construction, particularly the activities of associations and supplier-consumer relations. On the basis of the results obtained from our inquiries I would like to point out some facts and draw some conclusions for provisions that will eventually have to be adopted.

Reorganization and Departmental Management

In accordance with the principle of departmental management, we established two years ago, in the form of enterprises or associations, the basic organizational structure for economic production units. On this basis we have to continue building and consistently applying the principles of departmental management in the organizational structure as well as in the management proper.

The production schedules for the next Five-Year Plan and the outlines of our long-range goals are becoming clear to us today; we must therefore complete the organization of our departments by integrating into them those enterprises that

by the nature of their production should but do not yet belong there. This applies to the machine-building industry, because much of its production is still scattered. It also applies to ministries where proper integration of industries is badly needed. We must also have more efficient management, eager to carry out its responsibilities concerning individual sectors and within the ministries.

We have not yet been able to make the principle of departmental management work in the field of technical development. Enterprises and associations, which are the managing elements of individual departments, have so far ignored the fact that the development of new techniques must proceed under a unified management. The technical development is thus neither properly evaluated nor are the necessary creative facilities available for its future potential. The enterprises and associations are too slow in fulfilling their task of supplying economic production units with research and development facilities. We are still up against duplication in research and development.

We have come across instances where research on and development of electric welding is done by research institutes subordinate to the Ministry of Heavy Machine-Building as well as to the Ministry of Metallurgy and Ore Mines. The responsibilities of the two institutes are not clearly defined and coordinated; the efforts toward technical progress are dispersed, and the development of new machines and equipment is very uneconomical. We also have duplications in the development of consumer goods: metal kitchens are developed by the Ministry of General Machine-Building as well as by the Ministry of Consumer Industries.

The improvement of the system and organization of management requires precisely a more efficient reorganization of the apparatus that manages technical development. It will therefore be necessary to define more accurately the technical and economic scopes of the departments. This will require a specification of products manufactured by other economic production units; improvement, streamlining, and better division of production schedules within the unit; and standardization and specialization of production within economic units to improve the cooperation existing between socialist countries. We must centralize and establish, if necessary, research and development laboratories and experimental stations that would serve an entire economic production unit (except for instances where decentralization of them would be more economical).

Consumer-Supplier Relations

The reorganization is designed to improve consumer-supplier relations. According to the resolutions and directives of Party and government, all economic production units are responsible for supplying the national economy. Provisions regulating distribution are designed to make sales more efficient, to streamline consumer-supplier relations, and to shorten the channels through which products are routed from manufacturer to consumer. We are endeavoring to stabilize relations between production, distribution, and consumers and to cut the costs involved in the circulation of products.

In some instances it is difficult to reach objective conclusions, particularly regarding the stabilization of relations between production, distribution, and consumers; the fulfillment of the distribution plan, particularly for the metallurgical industry, is presently complicated by the fact that productive capacities are inadequate to meet the demand for metallurgical products; these are specific cases, but as to the general picture there has been no marked improvement in the organization of consumer-supplier relations.

For example, under the Ministry of Heavy Machine-Building and the Ministry of General Machine-Building, the distribution of some electrical engineering products is effected by Electroodbyt, distributor for the High-Voltage Electrical Engineering Plant as well as by other distributors, such as Technomat, Mototechna, Agrotechna, and often even by supply organizations, such as the KZMH [Regional Centers of Local Economy], etc. A product is consequently often channeled through several sales organizations and the state wholesale price sometimes increases as much as 24 percent.

After several years of negotiations between the Ministry of Heavy Machine-Building and the Ministry of General Machine-Building, it was agreed to define the distributing channels. The agreement was not carried out and the entire problem is now under consideration again. Consequently the distributing costs have not been reduced. According to a recommendation made by the Technical and Organizational Machine-Building Research Institute (Technickoorganizacni vyzkumni ustav strojitensky), in 1959 a larger volume of direct shipments could have saved about 15 million koruny in distribution costs.

Distribution channels are also quite complicated in the industries subordinate to the Ministry of Fuel. We refer to the distribution of brown coal to the electric plants at Komorany and Tisova.

The supplier-consumer relations have not been significantly streamlined in other departments either, according to inquiries made; we refer particularly to the need for shorter channels through which products are distributed. Supplier enterprises pay little attention to the demand and they often by-pass their responsibilities by delaying their bidding and delivery schedules. Time limits for bids, orders, and deliveries, covering particularly metallurgical and machine-building products, have not become as short as required by government decree. In industries subordinate to the Ministry of Heavy Machine-Building, the above schedules range between 8 and 10 months prior to the shipping quarter for electrical engineering products; they amount actually to 11 to 13 months if we take the shipping quarter into consideration. The ordering schedules for electrical engineering products have practically not changed since 1957, although the products are needed for the completion of electric turning machines manufactured by the High-Voltage Electrical Engineering Plant; the delivery schedules of finished products are therefore affected quite considerably. The situation has not improved in spite of an analysis made back in 1957 by TOVUS [Technical and Organizational Research Institute on Machine-Building] and the criticism written in a 1958 report of the Ministry of State Control on the fulfillment of Government Decree No 804/57 by industries subordinate to the Ministry of Heavy Machine-Building. The associated Machining Equipment and Tool Factories (Tovarny obrabecich stroju) also have bidding schedules for tools and instruments ranging between 3 to 6 months prior to the supply quarter; their products are typified and mass-produced and should be supplied directly from stock. Industrial equipment requires schedules for bids ranging from 12 to 13 months, while in other countries deliveries are made within 3 to 6 months.

The Ministry of Light Machine-Building took several measures, in 1955, 1956, and 1958 that were designed to make delivery schedules shorter. They still have not become significantly shorter, because measures neglected to take into account the reserves available in the prefabrication stage of construction and technology, in the organization of production, and in technical administrative procedures for the processing and execution of orders.

The machine-building industry is not the only sector where this situation prevails. The Association for the Distribution of Tar Paints [SODB], subordinate to the Ministry of Chemical Industry, has not yet been able to stock up on current types of paints that would make it possible to expedite at least export shipments; they require several months before they can make a shipment; for this reason exports sometimes have to be canceled.

In other departments, the associations do not have an adequate supply of products in stock and there is a tendency toward decline in comparison to the established norms. Thus, most products cannot be supplied to fill operational demands. It is therefore impossible to ship finished products from stock to cut delivery schedules.

Efficient measures devised for the stabilization of supplier-consumer relations and for making production and distribution of products more economical are the capacity agreements enacted by Law No 69/1958 Sb. Inquiries made into the activities of associations revealed that in industries subordinate to the Ministry of Metallurgy and Ore Mines and the Ministry of Construction there are no capacity agreements at all; and that in industries under other ministries such agreements are very sporadic. One of the reasons that so few capacity agreements are made is that the Third Five-Year Plan has not yet been sufficiently prepared in all its details; another reason is the conflicting interests of suppliers and consumers. Suppliers tend to close capacity agreements for "large size" products for which they find a ready market, whereas consumers are interested in "small size" products to satisfy their needs.

These are some of the problems of supplier-consumer relations that merit closer attention. It will be necessary to make plans on the economic production unit level to conform more consistently with the needs of distribution. It will also be important to reduce and abolish, if necessary, all schedules for bids, orders, and deliveries; to expand the range of products planned by enterprises for prompt delivery from stock; to complete the advisory and technical service to organizations of distribution; to draft measures that would eliminate shortcomings in distribution.

Participation of Workers in Management

The reorganization of industrial and construction management increased the opportunities for workers to participate in the management of the national economy. The participation has been considerable in connection with inquiries made into the efficiency of operations, with the reform of wage systems, with annual plans and drafts for the Third Five-Year Plan. Workers have also made important commitments in honor of the fifteenth anniversary of the liberation of our country by the Soviet armies. The cooperation of workers cannot be limited to individual acts only; they must be enlisted to participate consistently in management affairs. Pertinent organs have been created to fill this need. We refer primarily to the technical economic councils, although they have not been very active so far.

The trouble is that the constitution of such organs has often not respected the principle defined by the Government Decree according to which technical economic councils must have a corresponding number of delegates representing workers, innovators, and inventors, as well as Party, trade, and youth organizations. The present set-up of the council is just another form of the conventional management system which certainly does not fill the basic purpose of having workers participate in management. Directors of enterprises are thus deprived of the opportunity of checking systematically the good order and efficiency of their measures with the recommendations and critical comments offered by production workers, especially where solutions of essential technical economic problems are involved. The situation of the councils is aggravated by lack of planning, by an orientation toward less important problems, and by neglect of basic issues; this is precisely the area where the managing economic staff, and in the first place the directors of enterprises, should step in and give serious thought to the work that has been so far done by the technical economic councils and make improvements in cooperation with Party and trade organizations. We shall make every efforts to train members of the councils, especially workers, Party, and trade officials, as well as lower level economic workers; in order to qualify them better for their responsibilities in the technical economic councils and for the sometimes intricate tasks.

The above-mentioned shortcomings exist in almost all departments. Departments subordinate to the Ministry of Construction do not realize that the technical economic coun-

cils offer permanent and constant assistance to the directors. The District Association of Construction Enterprises at Usti nad Labem made no effort to call a meeting of the council between January and October 1959; the council convened only once during 1959 at the Association for Mortar and Asbestos Cement Plants and at the Surface Constructions at Usti nad Labem; no council was formed at the Stone and Gravel Works at Litomerice. These do not participate in either the associations and associated enterprises subordinate to the Ministries of Food Industry, Domestic Trade, Transportation, and Consumer Goods, or their economic, technical, and organizational problems; the reason is that the councils lack adequate planning, are never prepared for negotiations, and make no effort toward systematic control of resolutions and their fulfillment and extensive recesses between their sessions are commonplace, etc.

The technical economic councils are by no means the only means available to workers desiring to participate in management. They can do so through production councils. Here, too, a lack of method is apparent, mainly because the economic management staff has never made any effort to communicate regularly with workers in order to get acquainted with their opinions and avail themselves of their comments on current matters concerning the management of an economic unit. But workers have another big opportunity of participating in management in the sector of controls. Here again there are many soft spots because workers are seldom asked to concur in matters of controls, in spite of the fact that experience with the cooperation offered by the workers in this sector has always been very rewarding.

* * *

We still have a long way to go on the road toward improvement of the three basic issues: reorganizing the management of technical development, streamlining consumer-supplier relations, and ensuring the participation of workers in management. We must actively pursue the principles of the economic reorganization; we must never accept its shortcomings or fail to live up to its challenges. We have to make every effort to improve the reorganization and to apply its tenets in accordance with the provisions set forth by the Party Central Committee and by the government.

2076

CZECHOSLOVAKIA

Economic Briefs

In the past fifteen years our engineering industry has made rapid progress. In 1948 we reached the production level of 1937. Today we manufacture six times the prewar volume of engineering products. The rate of growth of our engineering industry exceeds by far the rate of growth of our entire industrial production, as listed in the following comparison table:

| | 1948 | 1950 | 1952 | 1955 | 1957 | 1958 |
|------------------------|------|------|------|------|------|------|
| Industrial production | 100 | 132 | 177 | 224 | 270 | 333 |
| Engineering production | 100 | 156 | 260 | 368 | 464 | 597 |

We are tempted to compare the period prior to Munich [1938] in which we relied heavily on western monopolies that were interested in keeping our industry from becoming self-sufficient and complex. Our industrial structure was then dominated by the textile, glass, and fine ceramic industries, while our engineering sector was of secondary importance. Our engineering production depended on foreign products to finish its output. Heavy engineering was altogether stagnant, and our raw materials basis was therefore unable to grow. The percentage ratio between the engineering sector and the total industrial production reveals the following pattern:

| 1937 | 1948 | 1952 | 1955 | 1958 | 1960 | 1965 |
|------|------|------|------|------|------|------|
| 18.7 | 18.4 | 25.3 | 28.0 | 30.4 | 32.5 | 36.2 |

Our engineering industry is presently engaged in the manufacture of traditional consumer goods, food, power plants, and hydroelectric plants; it now produces roller bearings in a variety of specifications, baggers, trubines for high river cascades, powerful electric and gasoline engines and locomotives, mining equipment, equipment for the chemical industry, automatic machining equipment, automatic threshers, regulating and automation devices, semiconductor and low-voltage equipment, radio and television sets, new types of streetcars, buses, trolleybuses, passenger cars, trucks, and many other products. The Brussels World Fair acknowledged the highly developed engineering standards of our country: all of the 175 engineering products exhibited received top ratings and prizes.

(Hospodarske Noviny, Vol IV, No 15, Prague, 8 Paril 1960,
page 1; CSO: 4110-N/a)

2076

EAST GERMANY

New Insulating Materials for High-Tension Lines

[The following is a translation of excerpts from an article entitled "Zu Neuen Isolationen in der Hochspannungstechnik," by Engr H. Lasch, Chamber of Technology, Berlin, published in *Elektrie*, Vol XIII, No 11, November 1959, Berlin, pages 406-407; CSO: 4021-N/a]

Acceptance of New Technology

A number of design engineers already working with the insulating material, casting resin, have developed experimental designs from test samples available. But what is missing here is the drive necessary to follow through on the most advanced technology, to reach a level competitive on the world market. It must finally become clear that the execution of even our best industrial reconstruction plans--without maximum technological conversion of production by available means--will be only half successful.

A very large sector of new developmental activities under the heading of economic reconstruction still cannot meet the above requirements. Most of the equipment is still made by conventional means--in this particular case insulators made out of porcelain.

The reasons for this are, first, the insufficient amount of casting-resin material made available by the chemical industry (an amount insufficient even for conducting tests of a general nature) and second, a fact well-known among design engineers: that the epoxy resin supply problem will reach critical proportions by 1960-1961--that is, if counter measures are not taken at once.

Under the present circumstances our urgent need to match leading products on the world market is [practically] sabotaged. It is not the design engineers who are to blame for this but rather a pattern for action fixed without any prior broad discussion with technical experts in the field.

The result of the prior consultation suggested would have been decisions made on a substantially different level, because then the requirements for insulating material needed in the future would have been a known factor with a degree of acceptable accuracy. To liquidate this state of confusion and indecisiveness is a high priority task. Everything must be done, quickly and by cutting red tape, to support our design engineers in trying to work in the newest technological medium. The general feeling of insecurity regarding the possibility of production conversion of new research developments of this kind--a feeling based on the insufficient amount of casting resin on hand--must be liquidated, and soon.

Problems of Demand and Planned Production

An agreement put to a preliminary vote by the Council for Economic Mutual Aid has provided for the supply by Czechoslovakia of all socialist states with epoxy casting resin. An exception is the Soviet Union, which is self-sustaining in this respect.

At the present time the chemical industry of the GDR has available an epoxy resin-pilot plant with a capacity of 200 tons per year. An unconfirmed reconstruction plan proposal made by the chemical industry provides for a plant capacity of 1,000 tons per year. This is about the level on which to handle tomorrow's demands for brackets made of epoxy resin alone.

Czechoslovakia will not be able to start deliveries before 1962. Anyway, the volume to be delivered until 1965 is expected to cover only our industrial requirements for lacquer. This makes for a very obscure, even quite contradictory, outlook. Accordingly, the GDR future requirements for epoxy resin will not be covered. Even 1,000 tons produced yearly by the GDR cover only part of our requirements. This leaves out completely the production requirements for heavy-duty switches, lead-throughs, current and voltage transformers, and particularly the whole range of high and low-voltage cable plus mounting equipment. For the production in 1965 of modern transformers alone 200 tons of type EG-1 epoxy resin are needed not to mention impregnating and lacquer spray resins.

Particular attention must be paid to the supply problem of hardeners and so-called fillers--in this case fine quartz powder--of which considerable quantities (about 150 percent of the epoxy amount) are needed.

It follows that immediate requirements of our electrical industry alone call for either the setting up of an epoxy-casting resin plant production of about 2,000 tons per year or for a timely arranged import of necessary supplies.

EAST GERMANY

Varieties of Transformers for 0.5 to 30
Kilovolts

[The following is a translation of excerpts from an article entitled "Variationsauswahl fuer Stromwandler der Reihenspannungen 0.5 to 30 kv," by Engr K. Richter, Dresden, published in Elektrik, Vol XIII, No 11, November 1959, Berlin, pages 410 and 412; CSO: 4021-N/b]

No electrical engineering product can be said to be as multi-interpretable as the test transformer. While over the years certain power and type standards have been established for correspondingly rated voltage transformers, the production requirements for current transformers continue to expand in scope.

The following are all series voltage ratings according to VDE 0414 and DIN 42600 specifications:

| | |
|--------------------|------------------------------------|
| Primary current | 5 to 30,000 amperes |
| Secondary currents | 5 and 1 amperes |
| Rated power | 5, 10, 15, 30, and 60 volt-amperes |
| Tolerances | Types 0.1, 0.2, 0.5, 1, 3, 10 |
| Overload values | $N < 5, < 10, > 5, > 10$ |
| Short-time ratings | J_{therm} and J_{dyn} |

The above specifications can be applied theoretically to a million one- and two-phase transformer types. This excludes requirements for types with the same electrical rating but varied short-time ratings. Even after subtracting the number of practically useless type combinations, there remain more than 5,000 current transformer types put out during the past few years by the VEB Transformer and X-Ray Equipment Works. A major reason for this output is the short circuit protective feature, the growing and manifold demand for which corresponds to the growing accumulation of power generation, particularly in the field of medium-tension power lines. Demands for, let us say, series voltage transformers rated at 10 kilovolts, 30 amperes primary current, J_{therm} kiloamperes, and J_{dyn} 50 kiloamperes short-out are no rare occurrence. With J_{therm} , this makes for a short-time rating of about $650 I_n$.

All these requirements force the engineering industry to limit its output to single and short-run series production. They complicate and raise production costs in tooling and developmental staging.

To cover the future steadily increasing demands of the power economy, it was necessary to sharply reduce the variety of current transformer types put out. In cooperation with representatives of the Institutes for Power Engineering (Energetik), the VEB Power Planning in East Berlin, the VEB Power Supply in Leipzig, and the VEB Electrical Engineering Maschinenwerk in Niedersiedlitz, colleagues from the VEB Transformer and X-Ray Equipment in Dresden discussed means of reducing their plant's variety of types that can be produced according to VDE 0414 and DIN 42500 specifications to a serviceable level of necessary engineering requirements. To use transformers, if possible without any limitation in features, the problem was the selection of types for which there was numerous technical data. The limitation in variety was applied first to the 0.5 to 30 kilovolt current transformer series (which is used in large numbers per unit in general purpose electrical systems), because this transformer in particular needs a boost in output and reduction of delivery time. This operation was handled by the collective in an exemplary and intelligent way. At a final meeting, the selection made from a variety of types was confirmed by representatives of the Power and Light Engineering Plants, the Power Supply Plants, and the Compound Power Line Plants. A report on some of the [meeting] high lights follows below.

Rated Output

The scope of this article prevents the writer from going into details regarding the selection from a variety of types-- for instance, what short-time ratings are assigned in each case to rated primary current outputs. The current transformer series (0.5 to 30), specifications VEN 303 10, 303 15 to 18, and 303 25, list transformer types plus pertinent technical data. This has resulted in a reduction to about 450 standard type power transformers, which in a large measure benefits the national economy. The previously single-run major part of the now serialized production results in a better utilized industrial capacity and in turn a substantial production boost and advance of delivery dates. Pertinent discussions also touched on means of furthering the development of

test transformers. For instance, soon to be tested is an experimental test transformer model, which will be used for long-range relay purposes by means of controlling short-out voltage surges one hundred times higher than primary currents. A more detailed description is scheduled for publication right after conducting a series of tests. The transformer specifications made available to consumer plants provide them for the first time with a complete working range of output ratings, which will eliminate much consultation work and time. The project engineer is thus given a chance to further substandardize production. The special purpose types not included in the above selection as generator-relay [sic!], or magneto and intermediate transformers, etc. have been scheduled by now for functional reduction and standard type production.

EAST GERMANY

Optimum Costs of Cable Installations in Industrial
High-Tension Networks

[The following is a translation of an article entitled "Die Kostenoptimierung von Kabelanlagen in Grossen Hochspannungs-Industriennetzen," by Dipl Engr F. W. Kloeppel, Chamber of Technology, and Engr E. Wuttke, Chamber of Technology, Markkleeberg, published in Elektrik, Vol XIII, No 11, November 1959, Berlin, page 413, CSO: 4021-N/c]

Electric power losses sustained by major industrial networks range up to 10 percent of the industrial plant power balance. The cable networks are to blame for a major part of these losses. The fact that over 70 percent of the electric power produced in the GDR is used for industrial purposes puts a particularly strong emphasis on the importance of this high work-loss factor. The network power losses in the GDR amount to several 100 megawatts. Work lost not only costs money but neutralizes corresponding power generating and raw material capacities, which in turn are lost to other production cycles. Thus the network losses are doubly detrimental to the national economy.

The function of electric power transmission systems is to furnish a cheap and uninterrupted supply to all subscribers. But the reaction between safe supply and low-cost subscription on the one hand and investment expenditures on the other hand is of a contradictory nature. High investment costs improve the safety of supply, of course, but put a heavy load on system and plant maintenance costs. To keep power costs low, it is important that safety requirements and investment expenditures do not exceed certain limits. In the following study, this opposing tendency of costs involved will be analyzed, and a way will be shown to arrive at an economical engineering optimum. The basic conditions examined will be those of high-tension lines of major systems which exist, for instance, in the chemical industry.

Prime and construction costs constitute the bulk of operating expenses. The prime costs are fixed by the cable price. The following analysis relates exclusively to aluminum cable metal market quotations at the beginning of the year on the

basic costs of lead at 1.10 DM per kilogram and of aluminum at 4.00 DM per kilogram.

Table 1 lists the price orientation values for cable system construction costs, which differentiate between [cable] laying and excavating labor costs. These mean values apply to a clearly surveyable line section, with ditches of cross-sectional sizes between 0.4 and 0.7 square meters, worked over medium-heavy terrain. Different cable-cross sections and types (three and one-wire cable used on multiphase or rotary-current systems) are listed. Where copper conductors are used, a 50-percent extra charge must be added to the laying costs because of the increased weight factor.

Table 1

Construction Costs of Cable Systems Using Aluminum Conductors

| Cable type | Cross-Section in Square Milli-meter | Laying Costs in DM per Kilogram | Excavating Costs DM per Kilogram |
|---|-------------------------------------|---------------------------------|----------------------------------|
| Three-wire cable | 10 to 50 | 1,300 | mean 9,000 to 14,000 |
| | 70 to 95 | 1,500 | |
| | 120 to 150 | 2,100 | |
| | 185 to 300 | 3,000 | |
| One-wire cable (Rotary-current system) | 95 to 150 | 4,000 | 9,000 to 14,000 |
| | 185 to 300 | 4,500 | |

The figures listed in Table 1 include surcharges, which in each case cover a corresponding rise in miscellaneous wage, engineering testing, construction-site maintenance, construction job organization costs, and other expenses. The laying costs apply to 6 kilovolt cables; for 30-kilovolt-cables there is a 25-percent extra charge, which, however, causes no appreciable increase in the total costs because of the minor share assigned by total cost estimates to laying costs.

Construction costs make up over 20 percent of the prime costs. Therefore, in case of cable systems--as opposed to the case of transformer stations--they must absolutely be taken into account.

The prime and construction costs show up in operational expense accounts as deductions. Their amount is fixed by the service life of the cable. These deductions are legalized

and in case of cable systems amount to 5 percent at a service rate of 25 years.

Occasionally this deduction rate has to be adjusted to special industrial conditions. Corrosion, for instance, can cause a considerable reduction in the service life of industrial cables. A similar effect results from the intense heat developed near industrial furnaces, boilers, etc. In such cases as these, a higher deduction rate is permissible.

In cases of electrical power transmission material other than cables, repair and maintenance costs must be taken into account. However, concerning cables this type of cost plays such a minor role that it can be disregarded. For instance, the cost of repairing or refitting flexible sleeve couplings is negligible.

Ne investment type systems are insured in the usual way. This type of insurance requires the writing off of 0.2 to 0.3 percent of the investment capital, the same percentage of which can be used expediently for deduction purposes.

No industrial interest rate is levied under socialism. If conditions (in not only the national economic but the political and sociological senses) are ripe for investments, then means are made available without interest. Therefore, interest rates can be disregarded in computing operating costs.

All the above-discussed expense components belong to the fixed budget costs. Also included in this group are power costs (DM per kilovolt-ampere).

Another very important component is the cost of cable conductor losses. They vary in square proportion to power loads and can therefore be classified as variable costs. Conductor losses are listed on the operating cost sheet under the heading of operating costs (DM per kilowatt hour).

Figure 1 [not reproduced] shows graphically the main development of both groups of charge accounts in the test case of a 30-kilovolt-rated type NAHKA [not identified] single-conductor cable having a cross-section of 150 square millimeter. Operating costs involved are $p = 0.025$ DM per kilowatt hour, while the operational time factor is $t = 5,000$ hours per year. The 100-percent load coordinate point corresponds to the maximum permissible cable load per VDE specifications. Line a, representing variable costs and Line b, representing fixed-budget costs, make up the specific trend of total costs, c, which reach a minimum value of 53 percent of the rated load.

This minimum value represents the lowest possible operating costs. Accordingly, optimum costs are reached in many cases, not at the point of work loads rated (N_B/N_N [work-load percentage] =) 100 percent but at percentage points reached earlier, often substantially earlier than that. It follows that the economic load peak is not identical with the engineering load peak of the cable system. This must be kept in mind at the planning and operational stages.

The following chapter is devoted to computing the optimum cost grand total of annual losses and investments. A proper optimum cost estimate can eliminate many loss accounts and release electric power for other production cycles.

EAST GERMANY

Some Standardized East Germany Electrotechnical Products

[The following is a translation of an unsigned article entitled "Lehrschau der Standardisierung," published in Elektrik, Vol XIII, No 11, November 1959, Berlin, pages U109-U113; CSO: 4021-N/d]

Model Exhibit of Standardization

Socialist reconstruction plans for large-scale standardization include the field of power economy. Standard types have been and are being developed from a multitude of various voltage-rated types of electric power generating, transmitting, and distributing systems. Some of these standardized types which are representative of the East German Power Economy are shown now in actual operation at the model exhibit.

By applying the druo-finished parts assembly method to inside switchboards rated at series voltages of 10 and 20 kilovolts and breakdown voltages up to 200 megavolt amperes, the assembling time has been reduced from 28 work days in the old VEM-standard way to 12 days. A reduction in weight per switch element from 1,590 kilograms standard weight to 937 kilograms also favors the finished parts assembly method.

The switch elements, put together according to the interchangeable parts system to make up a switch board, consist of 30 millimeter thick plaster panels, each having an all-around enclosing ridged, press-formed metal lining. The dielectric strength guaranteed for a 30 millimeter-thickness is 36 kilovolts.

Futhermore, the finished part cell (unlike the VEM standard cell) can be transposed without any danger of power dissipation.

The finished-parts assembling method (in contrast to the capitalist practice abroad) also increased the volume of production by building from "exposed components" (offenen Bauweise). The stockpiling of specialized components of switchboard grids at a central finished-parts station makes series production possible which in trun results in increased

labor productivity. A further economic feature of this assembly method is the elimination of any structural engineering work.

Manufacturer: VEB Switchboard-Grid Construction, Sperenberg.

The new inside switchboard brackets scheduled for standardized production have been developed from new VDE O111 specifications, which have deleted the strict spark-gap requirements in effect until now. This makes it possible to try some new constructive approaches to reducing the height of bracket mounting. Simultaneously, the new specifications for stepped breakdown voltages have been limited to a functional minimum. The new standard brackets can be used on switch unit and board assemblies. The space and therefore considerable money-saving feature of these brackets can be broken down to a 60-percent reduction in weight of cast-iron and ceramics used and to a 30 to 35-percent cost reduction (in comparison with brackets produced in 1959) by implementing a new technology and specialization. Furthermore, while system manufacturing plants equipped with these new inside brackets are now able to put out uniform type, smaller-size power supply systems by space-saving and clear-cut assembly means; the resulting reduced costs match the lowered assembling input.

Manufacturer: VEB Ceramics Works, Neuhaus.

The use of the photo composing method results in a considerable saving in designing and drafting work. A prerequisite for the application of this method is an extensive standardization of the product in question. Much effort is expended at the design offices of high-voltage equipment plants on the graphic rendering of switchboards, wiring diagrams, etc. Although they are of standardized dimensions, these pieces of equipment are continuously revised and redrawn according to individual project requirements. For the usual highly involved method of tracing originals on transparent paper, the photoprint method can be substituted as follows:

A careful draftsman's reproduction of component parts (such as junction boxes, etc.) is made on tracing paper. A negative obtained by photocopying means can be used for unlimited reproduction of prints. The component parts are available for continuous re-use. By separating these copies at the

cutting line, component parts are obtained to make up, for instance, a low-voltage plant of any cell amount and reassembling combination of type variant, which can be pasted on a mounting base. From this base a photo copy is made. On this paper negative, any spots to be changed can be covered by brush and screening paints (the paper negative is re-suable several times).

From this negative a positive photocopy is made, on which any additional or inscriptive details can be added. This original can be photostated.

The savings on designing and drafting work involved are 75 percent of the time used previously for this purpose.

User plant: VEB High-Voltage Equipment Plant, Erfurt.

The advantages of the metal-lined bus-bar canal system over the conventional power installation or wiring systems are as follows:

- Elimination of assembly work done by skilled technicians;
- Minimum input of assembly work done in case of production changeovers;
- Production losses kept down to a minimum;
- Material savings in case of production changeovers;
- Structural elements available for re-use in case of production changeovers.

The new installations system is applicable to voltages ranging from 500, 380 down to 220 volts. Its maximum shock voltage resistance is 34 kilovolt amperes. Its maximum load sustained at each junction point is 60 amperes. Zero-conductor bus-bar canals one and two meters long can be used to bridge unprotected machine and conveyor space.

Manufacturer: VEB High-Voltage Equipment Plant, Magdeburg.

In contrast to the conventional way of single-finishing types of standard-reactance control panels, the new method eliminates the need for system planning and layout. It represents an engineering package composed of all pieces of equipment necessary for the fully automated controlling and monitoring of capacitor systems. The only production type includes all switching variants. It is thus possible to increase the unit finishing capacity and plant production.

Engineering specifications:

Type: allsheet-metal construction

Dimensions: Width 800

Height: 1,000

Depth: 300

Mounting data: wall attachment

Working voltage: 380 volts, 50 Hertz

Regulating voltage: 220 volts, 50 Hertz

Shielding: P 30 [not identified]

Maximum number of connectable capacitor sections: 7 (same size)

Changeover facility: from manual to automatic operation by Yarley type switch.

Manufacturer: VEB Electric Planning.

The special features of small size phase-shifting capacitors include small dimensions, standard typed constant base area, and provision for variable height of housing, and also universal operational use. With the standardization problem solved, a working base will have been created (particularly after the centralization of production scheduled for 1964) for the mechanized mass production of small size phase-shifting capacitors by keeping the use of milling, die, and stamping press tools at a minimum. This results in a major saving of 85 percent of the costs of manufacturing machine tools used on a certain capacitor series type with variable base dimensions. The consumer profits from the uniform mounting and connecting facilities since it results in simplified construction and assembly of machines, equipped with a small-size phase-shifter.

Manufacturer: VEB Capacitor Works, Gera

With the standardization of inside circuit-breakers, there are only 52 types compared with the 220 types used previously.

The advantageous features of the standard circuit-breaker are:

- Assembly-line production
- Smaller uniform type
- Savings on copper consumption
- Simplified storage and spare parts supply
- More reliable operation
- Streamlined planning of contact panels

The time to produce 1,000 standard breaker contact parts has been reduced from 26,130 minutes to 8,151 minutes. The finishing time for 1,000 knife-switch parts has been cut from 10,826 minutes to 4,250 minutes.

Manufacturer: VEB Switching Equipment Works, Werder.

The type reduction of cable and conductors from 52,000 to about 10,000 types makes it possible for our cable plants to produce continuously and at a considerably higher rate of productivity; it also facilitates cable and line storage in power breakdowns and catastrophic emergencies. It is planned to submit this first step undertaken by the GDR to the Council for Economic Mutual Aid and to propose the uniform carrying out of these standardization measures.

The type series of standardized cable terminals consists of four sizes, which correspond to voltages rated at 10, 20, 30, and 45 kilovolts. Each of these sizes can be used for 10 conductor cross-sections as well as for Cu and Al conductors merely by exchanging a single part (connecting pipe or bolt). Several serial numbered sizes have identical component parts, which fact simplifies production and facilitates assembly.

The outstanding feature of these cables which benefits our national economy most is the interchangeable application of an engineering principle of strict economy. Additional advantages are derived from projecting the installation of these cables.

Together with the terminals, the testing specifications for terminals have been standardized.

Manufacturer: VEB Cable Works, Oberspree.

On the basis of scientific research done and operating data collected on the mechanism of foreign layer-sparkover, the specifications for the Standard HVEW 115 range have limited the amount of long-rod insulators to six, to be used in corresponding zones of industrial pollution. To avoid foreign layer-sparkovers (that is, to a large degree), the above types will have to meet insulator requirements for areas of different degrees of pollution.

These standardized insulators represent a reduction in the production of tools, jigs, and auxiliary materials. They guarantee a higher rate of automation and plant productivity. The consumer profits by a reduction in spare parts supply.

Manufacturer: VEB "Margaretenhuetten" Electric Porcelain Plant.

The typing of test transformers was one of the most important tasks, considering the fact that the total number of current-transformer type variants producible at the VEB Transformer and X-Ray Equipment Works in Dresden alone was about 60,000. After working out variation limitations for the test transformer, series 0.5 to 30, only about 500 typed transformers remained.

The typing of the bracket-test transformer, series 60 to 220, developed by the VEB "Karl Liebknecht" Transformer Works, was accomplished by adjusting (at required transformer ratios) the theoretical and operational current-transformer resistance particularly to the maximum short-circuit currents which occur in power lines. In the case of previously manufactured pot-type current transformers, this adjustment applied only to moderately high primary currents. Accordingly, a standard type for series 110 was created--that is, a combined current and voltage transformer--with only eight variables possible.

In this way almost the entire transformer finishing program was standardized. This standardization has primarily a technical interpretation aspect. Therefore any newly developed designs are guided by the standardized data, which already specify the kind of construction to be accomplished. This, in turn, substantially simplifies the construction part.

The test-transformer standardization results in a mechanical and automated production which increases plant productivity 290 percent.

Manufacturers: VEB Transformer and X-Ray Equipment Works,
Dresden;
VEB "Karl Liebknecht" Transformer Works.

The standardization of inside and outdoor lead-throughs up to 50 kilovolts has reduced the number of types from 150 to 24. A new ingenious construction eliminates any metal parts, which is equivalent to a saving per 1,000 units of 1.5 tons of

brass, 0.5 tons of aluminum, and 0.6 tons of gray cast iron.

Further advantages are derived from:

- Increase of sparkover and dielectric strength by elimination of metal flange
- Quick and simple assembly by using plastic panels with screw-hole facilities
- Little space required
- Assembly and exchange of lead-throughs facilitated by non-cemented design

Manufacturer: VEB United Ceramics Works, Koepfendorf.

The standardization of air-break contactors from 16 to 200 amperes represents a saving potential up to and including 1965 of 9.5 million DM. The typed air-break contactor series is distinguished by:

- High switching efficiency, long service life, high switching frequency, miniaturization, advanced design, easy assembly and maintenance, no flexible connections and better spare parts supply.

This serialized type is built for attaching to and installing in machinery of any kind; it can be used on motor voltage regulator-relay elements, solenoid light and heating circuits, as well as on control relays.

From the viewpoint of standardization, this air-break contactor series has the following advantages to offer:

1. To manufacturer:

- The chance for specialization
- Mechanization, savings passed on to labor
- Supply of uniform material
- Advanced technology
- Reduction of finishing times
- Better inter-plant transportation

2. To the consumer:

- Little space required
- Time, tools, and payroll savings
- Easy combination possibilities
- Uniform training of operating personnel

Manufacturer: VEB Electric Switching Appliances, Oppach.

The basic serialization of three-phase asynchronous motor types put an end to the existing confusion of types and resulting disadvantages, and the number of type variants could be limited to about 50 percent.

The standardization made it possible to convert from the usual series production to up-to-date large-scale mass production. The resulting production time savings are very impressive; for instance, the previous machining times have been reduced to the following figures (in percent):

| | |
|---------------------|----|
| Shafts | 8 |
| Trunnion sockets | 30 |
| Housings | 45 |
| Punch-pressed parts | 5 |
| Windings | 14 |

The savings on material (for about 500,000 basic type motors produced) amount to about 2.2 million DM annually.

Pertinent information is available from the VEB Scientific-Engineering Office for Electric-Powered Machinery (Wissenschaftlich-technisches Bureau fuer Elektroschienen), Dresden.

The target date is 1965 for the reduction of the various elements of 100 now produced relay types from 26 to 16 and for the reduction of their housing variants from 14 to 7. These basic parts or elements are already complete units by themselves, as intermediate relays, directional relays, solenoid-trigger armatures, etc. In this respect the newly developed design of plug relay RH 95 has provided our industry with a relay which is used with increasing frequency in the field of automation.

The previous type BM cut-out switch and type SM 1 control cut-out switch had basically different individual parts. The new type BM 2 and SM 2 switches are made from identical parts by means of a standardized Yaxley type switch. Thus the number of different parts used is reduced from 104 to 47.

Manufacturer: VEB Electrical Instrument Works, (Elektro-Aparate-Werke), Berlin-Treptow

The new standardized interchangeable parts system for cast iron boxed low-voltage distributor stations eliminates all of the drawbacks of the three different distributor systems so far produced at various plants of the GDR. First of all, it is now possible to centralize plant production of single parts by operating cycle means, which at least triple piecework production. Further advantages of the system are interchangeability and much simplified supplying of parts.

The 630-ampere distributor station consists of seven bus-bar boxes having identical heights of 350 millimeters and varying widths of 250, 350, 502, and 702 millimeters. The same station has a short-time rating of 80 kiloamperes of high rate discharge current. Its one-second cut-off current rating is 30 kiloamperes. It is equipped with aluminum or copper bus bars but can be extended by or combined with single bus bars to make up independent units. In this case the bus bar current is 350 amperes with a short-time rating of about 60 kiloamperes of high-rate discharge amperage and a one-second cut-off current rating of 20 kiloamperes. The bus bars are suspended in barrier-reinforced pods or ball-bearing sleeve boxes.

The 250 amperes station consists of six bus bars having identical heights of 250 millimeters and varying widths of 250, 350, and 502 millimeters. The short-time rating is 30 kiloamperes of high-rate discharge current; the thermal (one-second) cut-off current rating is 10 kiloamperes. This station comes with aluminum bus bars or (as a tropicalized version) with copper bus bars. It can either be extended with bus bar cross-section and with amperage reduced to 100 amperes or operated as an independent 100-ampere station. The cut-off current ratings of the latter are 15 kiloamperes (running) and 6 kiloamperes (one-second).

Only three standard-flange sizes are used on all stations--namely:

| | |
|----------|-----------------------|
| Flange 1 | 190 x 120 millimeters |
| Flange 2 | 290 x 120 millimeters |
| Flange 3 | 360 x 200 millimeters |

The 250-ampere station is equipped with a side flange version of flange 1; the 630 ampere station with a side flange version of flange 2. Upper and lower flange mountings are used as required, which also makes available bus bar boxes equipped with two small upper or lower flanges.

The new utility boxes having flange sizes 1, 2, or 3 are attachable directly to the new bus-bar boxes. However, during the transition period the about to be replaced utility box equipment can easily be attached to the new bus-bar boxes by means of recess fitting adapter pieces.

The new distributor system standardization process includes all equipment sizes down to dimensions smaller than the smallest type of bus-bar box. The latter type is attachable to the bus-bar systems by means of adapters--that is, by accommodation of two small-size housings side by side on flange 1 or 2 of the bus-bar box. The dimensions of these small size housings still fit the interchangeable parts system. Because the smallest bus-bar box flange is too big for 25 and 60 ampere equipment, a flange each for 25 ampere (40 x 100 millimeters) and 60 amperes (70 x 150 millimeters) was made standard equipment.

The shielding type of this new equipment is P44.

Pertinent information is available from: VEB Electrical Instrument Works, Berlin-Treptow.

Both standardized designs of the motor switch rated at 10 amperes, 500 volts, with thermic overload circuit-breaker and the heavy-duty switch rated at 25 amperes, 500 volts, with thermica and magnetic or solenoid overload circuit-breaker represent a base for production specialization by means of the most advanced plant technology, mechanization, and automation.

A comparison with previous designs favors the motor switch with a timing range of 10 settings, from 0.16 to 10 amperes, with a 1/1.6 ratio.

The principal features of the heavy-duty switch are its motor protection elements such as adjustable thermic overload cut-out (0.4 to 25 amperes, 1/1.6 ratio) and solenoid overload cut-out; but it also functions as a selector cut-out switch to be set as an under-running voltage, zero voltage, or working current interrupter.

Pertinent information is available from: VEB ZEK [not identified] Electric Instruments, Dresden.

The standardized parts interchangeable system for servo units is a structural element or stepping stone for the automated production of machine tools and assembled plants. An important feature of this servo-unit program is the basic differentiation it makes between mechanical and electrical component parts. This is a prerequisite for simplified base-plate and front-panel mountings. In this way, with only a few programmed elementary types, a large number of assembly and switching variants can be produced. Furthermore, this program spells the end for nonuniform switchboard and console equipment.

Manufacturer: VEB Electrical Control Equipment (Elektroschaltgeraete), Goerlitz.

The standardization of power plug devices makes possible not only the interchanging of entire units of different make but of component parts. For instance, a male plug of ESG-Grimma make fits into a female plug or socket of EAW-Treptow make.

The socialist reconstruction of our industrial plants requires the production of only one system for the whole industrial sector. This ensures the success of automated production, particularly of component parts. This standardization rule also applies to current loads. The previous plug-load ratings increased from 15 to 25 amperes and from 25 to 40 amperes respectively, with change in dimensions. The national economy will profit from this rule starting in 1960 with savings of 1,360,000 DM annually.

Manufacturers: VEB Electric Instruments, Berlin-Treptow
VEB Electrical Control Equipment, Grimma.

Electric stoves will be equipped from now on only with the new LKAN[not identified] design 457 hot plates having overlapping edges to accommodate a press-fit type heater and/or a conventional stone-insulator type heat conductor. Cooking-stove plates equipped with press-fit heaters require a high consumption of tool machinery but make up for that by their high-rate thermal conductivity and long service life. Therefore, it pays to make them only by mass-production means.

The following comparison chart clearly favors the cooking stove plate with press-fit thermal conductor.

Stove plate with stone insulation:

| | |
|--------------------------------------|----------------|
| Material including damping plate | 1.35 DM |
| Wages (without general expenditures) | <u>0.32 DM</u> |
| | 1.67 DM |

Thermal conductor load, 4.6 heat transfer coefficient per square centimeter (W/cm²)
Pressure weight, 16 grams.

Plate with pressed-in heat conductor:

| | |
|--------------------------------------|----------------|
| Material | 0.60 DM |
| Wages (without general expenditures) | <u>0.23 DM</u> |
| Tooling costs | <u>0.11 DM</u> |
| | 0.94 DM |

Thermal conductor load, 10.9 heat transfer coefficient per square centimeter
Pressure weight, 5.5 grams

Other uses for these standardized heat conductors are flat irons and hot water cookers.

Manufacturer: VEB Electric Heat, Soernewitz.

The standardization of 500-volt rated power fuses creates better conditions not only for the mechanized and automated large-scale mass production of porcelain parts but for their assembly and simultaneously for a possible substandardization of component parts and savings on polychrome metal.

The success of the component part standardization is emphasized by the type reduction of fuse sockets alone to 35 percent, with the reduction of various porcelain parts amounting to 73 percent and that of various metal parts amounting to 61 percent.

Manufacturer: VEB Electric Installations, Sondershausen.

The interchangeable parts system for industrial fluorescent lights, shielding type P 20, provides for a large number of various fluorescent light types, of which the parts make-up is balanced in such a way as to permit any kind of assembling combination. These combinations offer extensive possibilities for lighting-engineering and architectural space adjustments and simultaneously ensure rational production and economic consumption of material.

The light fixtures can be used to make up to five fluorescent light variants. They can be used as ceiling and suspended lights.

Added reflector variants and lighting engineering plug extensions result in new combinations, which again satisfy in a flexible way (functionally and operationally) any specific illumination requirements.

The interchangeability of these lighting types equipped for both single and spectrum band application is another big improvement; particularly the spectrum band feature is sure to lead to a new lighting technique.

Manufacturer: VEB Light-Fixture Designs, Leipzig.

The development of a standard series of miniaturized electric motors reduced the existing number of various types to a minimum. According to TGL 582 GDR-Standard Specifications for miniature motors (ball-bearing, 8,000 revolutions per minute maximum, only the normal characteristics of these motors have been standardized, such as rated voltage, speed, direction of rotation, frequency, and power; type of operation, insulation, elimination of radio interference, wiring, dimensions, shielding, construction, etc.

The geometrically progressing power standard series TGL 3033 "Miniature Motors, Power Series" is built on the above parameters, with the dimensional standardization of these motors and their sheet-metal frames.

A streamlined arrangement made it possible to grade attaching and mounting dimensions such as base, shaft, height of shaft, threaded and tapped holes, hole diameters, etc.-- these dimensions to match the recommendations made by the IEG-Committee.

Manufacturer: VEB Electric Motor Works, Hartha.

The increasing importance of the sub-level and flush-level wiring system applied to the Seven-Year Plan for apartment buildings based on the fact that this system meets perfectly the industrial production requirements for electric wiring installations.

However, the different types of apartment construction still in use require the production of different wiring systems. The systems to be used during the next few years are covered by standard specifications. With industrialized construction of apartments increasing, the use of uneconomical wiring systems will drop.

The key to further development in this direction is the flush-level wiring system equipped with central distributor and impulse relay; its use results not only in reduced manufacturing costs but a considerable increase in industrial productivity.

The TGL 3955-GDR standard specifications cover a series of 12 nicke-cadmium cell batteries typed over a capacity range from 20 to 750 ampere hours. These series consist of three subseries, each having a dimensionally different parts makeup.

The uniform parts design results in a higher number of parts produced and therefore makes the use of up to date production methods feasible. Accordingly, the automated production of bridges has reduced the number of operations from three to one. This alone results in savings of 90 percent machining time and about 85 percent production costs.

Furthermore, the electrolyte filling operation by hand has been semi-automated. The typing of these NK batteries will make it possible to reduce them to three production designs which will cover all practical requirements. These are:

- Fully enclosed design, with frontal type connection
- Open design
- Trolley-lighting battery design

Manufacturer: VEB Mining Lamps Equipment, Zwickau.

On standardizing automobile signal horns it will be possible to make them according to modern technology, that is, to put them into large-scale mass production. For instance, the use of standardized contact breakers on signal horns of four different sizes results in savings of 57,000 DM per year. The standardization of the previous two types of contact parts, reducing them to one type, now serves signal horns of all sizes with annual savings of 32,000 DM and 647 kilograms of various metals.

Consumer: VEB Automotive Electrical Equipment, Ruhla.

Up till now the lack of standardized windshield wiper devices necessitated the individual installation of units according to special car space requirements. The windshield wiper typing process is expected to be completed by the end of 1960 and to put an end to the situation as it exists now. This is a threefold task.

1. Standardization of windshield wiper motors
2. Standardization of wiper equipment
3. Engineering specifications to be fixed for the quality controlled delivery of windshield wiper components

Consumer: VEB Automotive Electrical Equipment, Ruhla.

Standard series-developed automotive generators mean power increases up to 50 and 100 percent (by keeping external dimensions unchanged) plus type reduction and savings in production. The elimination of two diameter series makes production by mechanized or automated means feasible. For instance, armature coils can now be produced by means of automatic winders.

To economically justify the production of standardized generators, it is necessary to specialize and concentrate production at a single plant. Generators with power ratings of over 300 watts are expected to be imported from the People's Republic of Hungary under the mutual economic assistance agreement.

The standardization of automotive-electrical equipment has brought about a considerable reduction of DIN listed types. Using uniform equipment on cars of different makes puts the spare parts supply on a safe basis and considerably facilitates repairs.

EAST GERMANY

Exchange of Experience Between Operations Sections of
the VEB Transformer and X-Ray Works, Dresden, and the
VEB "Karl Liebknecht" Transformer Works, Berlin

[The following is a translation of an article entitled "Erfahrungsaustausch Zwischen den Betriebssektionen des VEB Transformatoren- und Roentgenwerk , Dresden und des VEB Transformatorenwerk Karl Liebknecht Berlin," signed Wilfling, published in Elektrik, Vol XIII, No 11, November 1959, Berlin, page U115; CSO: 4021-N/e]

Since 1958 the Chamber of Tehcnology operations section of both the GDR's biggest transformer plants have regularly exchanged technical data. The first two meetings dealt substantially with general problems centered around the inspection of the workshops. Meanwhile, the 400- kilovolt project for the GDR power supply has increased in importance to such a degree as to require the active concentration of the operations sections of the participating plants on this task. Both plants are prominently represented at this 400-kilovolt project by way of heavy-duty transformer switch, test transformer, and high-tension line designs. This tremendous project can be accomplished in the right way only if the participating industrial plants have a running mutual exchange of data with corresponding action taken on it. This is also why the problems to be discussed at the third meeting were expected to contribute to a speedier solution of the 400-kilovolt project. For this purpose, 40 colleagues of the operations section of the "Karl Liebknecht" transformer Plant visited on 16 September 1959 the operation section of the Transformer and X-Ray Equipment Works in Dresden.

Even in advance of the official meeting, debates and conferences took place between individual representatives of both plants, who worked out the following three problems which had dominated the previous meeting.

The Use of Epoxy Resins

In this field the VEB Transformer and X-Ray Equipment Works in Dresden had already amassed a wealth of experience. This plant uses epoxy resin for making casing-resin transformers. The data collected on this application are of particular interest to the "Karl Liebknecht" Transformer Plant, which is expected to use epoxy resin not only for switch but for shunt designs. The interesting fact is that the most valuable data were collected in the vacuum casting field. These data, which could be passed on to the technicians of the VEB "Karl Liebknecht" Transformer Plant will enable them to bypass the usual initial difficulties. Another item of interest to the colleagues from the VEB "Karl Liebknecht" Transformer Plant was the impregnation of transformer coils by means of casting-resin even before the recasting process itself takes place. The group of participants which were particularly interested in the problem of applying epoxy resins had a chance to pick up a wealth of practical experience by means of a very close inspection of the Transformer production.

The Use of Cold-Rolled Transformer Sheets

The use of these sheets on peak transformers is becoming increasingly important. For the past few years both plants have designed experimental transformer series. Pertinent data collections were mutually exchanged by way of a lecture and subsequent discussion. Here the bulk of experience lies with the engineers and technicians of the VEB "Karl Liebknecht" Transformer Plant. The discussion participants found a large area of agreement on facts of experimental research. For instance, on the fact that yoke reinforcements have no appreciable value and that the most favorable induction value is 1.7 Vs/M^2 [Voltsecond per square mutual inductance or Henry] ($17,000 \text{ G}$ [Gauss]). Other specialized topics of discussion were core-sheet perforation and deburring problems. Also in this field researched facts were mostly agreed upon; however, a recommendation was made to find an even better solution of the sheet deburring problem.

Testing Glow Discharge Voltages

The extensive data collected in this field by the VEB Transformer and X-Ray Equipment Works in Dresden is based on the published works of colleague Koenig. Dresden now has the know-how to test transformer glow discharge by applying a testing voltage or by means of self-excitation. The decisive accomplishment here is the successful differentiation made between separately excited and transformer made glow discharges. A further accomplishment of the Dresden Plant is the plotting of the phase of dangerous discharge characteristics or that at which discharges against iron parts occur. In this respect, an interesting discussion topic was the interpretation of characteristic curves of noise-level changes occurring as a function of time. To get more conclusive results, more research is to be made in this field.

The data exchange based on a candid kind of discussion, has given both plants significant clues. After each lecture and discussion the participants split up into corresponding groups to translate discussed points into experimental workshop practice. This resulted in additional problem complexes to be solved at later meetings.

The participants agreed to make the data exchange a planned and regular part of their operations section work. Particularly the latest meeting showed that if need be, the collective inter-plant type of data exchange could be extended to include elektrotechnical plant representatives of friendly neighboring countries. The need to solve industrial key problems by voluntary engineering collectives makes this kind of data exchange a major factor of our industrial socialist reconstruction.

EAST GERMANY

Cooperation of the Operations Sections of the Industrial Branch for Cables and Conductors

[The following is a translation of an article entitled "Zusammenarbeit der Betriebssektionen des Industriezweigs Kabel und Leitungen," signed Herms, published in Elektrik, Vol XIII, No 11, November 1959, Berlin, page U116, CSO: 4021-N/f]

Colleague Hube, section chief of the VEB Cable Works in Oberspree being aware of the fact that the operations sections (if they want to live up to their socialist reconstruction task of being the conscience not only of the plant but of the industrial engineering branch) cannot limit their activities to a single plant but must center them around the tasks and perspectives of the entire industrial sector-- has invited all operations section chiefs of the cable industry for joint consultations.

At the first meeting, each operations section chief made an initial report on the developmental stage and type of the work of his particular operations section.

The key job of the Oberspree Cable Works is--aside from the working up of engineering accounts--being done by the four existing operations groups, "Plant Economy," "Young Engineers," "Machine Design," and "Power Economy." "Plant Economy" was the first operations group to invite operations sections of other cable plants [to meetings] which resulted in mutual benefits for all concerned.

The Koepenick Cable Works have developed an extensive work schedule for 1959. The plan is, according to the production schedule set up, to establish a series of operations groups to absorb such already existing collectives as "Copper Collective" and "Population Requirements." The 12 planned groups include "Conductor Materials," "Insulating Materials," "Waste Materials," "Engineering Design," "Technology," "Standardization," "Miniaturization," "Power," "Organization and Planning," "Socialist Automation," "Industrial Work Relief and Safety," and "Population Requirements." The solution of key problems requires the formation of operations groups made up of competent plant veterans, who after accomplishing their

task, are dissolved again. To facilitate the transformation of these operations groups into permanent and initiative taking collectives, the recruitment for a "Hundred Club of Socialist Reconstruction" was started. Conditions for acceptance into this Hundred Club include the signing up for at least one plant or industrial branch task as a permanent active or participating member. The task must be defined concretely and accurately. Socialist Reconstruction Hundred membership is open to engineers as well as to high efficiency or automation workers, in the same cooperative way that workers and engineers work together at a certain plant section on numerous Engineering accounts.

The Meissen Cable Works setup also includes such operations groups as "Galvanics," "Lighting Engineering Problems," "Plastics," and "Copper and Aluminum Scrap Recovery," which are occupied with work pertinent to over-all plant requirements.

The Adlershof Cable Works operations groups, "Granulation Machine," "Lacquer Machine," and others are also busy with local tasks of technological improvement.

At the second meeting, the rest of the cable and conductor plant-representatives made similar reports. Worth mentioning at this point are the usual lectures organized according to operation sections on technical and social topics political conversations, round-table discussions on dialectic and historical materialism, etc.

At the conclusion of the second data exchange, the setting up of a collective work schedule was discussed, to be guided by the role of selecting tasks which concern all plants if possible, so that all operations sections have a chance to share in the work at hand. Secondly, the rating of plants involved was to be put on an acceptably fair basis in order to have plants leading in current projects assist any lagging plants. For comparison purposes, the subjects suggested were waste product recovery, a practical industrial cable-capacity testing method, an automated way of checking the effect of type changes on planning, the best way of comparing identical operations conducted at different plants a uniform computing scheme, a plan of uniform material supply, etc.

After completing the first draft of reconstruction plans and starting action on immediately realizable measures, the remaining task is to execute the tasks listed first on the collective work schedule.

2084

EAST GERMANY

Problems in Fulfilling the Seven-Year Plan in Pig Raising
Ahead of Schedule

[The following is a translation of an article entitled "Probleme der Vorfristigen Erfuellung des Siebenjahrphanes in der Schweinehaltung," by Dr agr habil G. Ness, Institute for Agronomic Economcis of the Germany Academy of Agricultural Sciences in Berlin, Vol XI, No 4, April 1960, Berlin, pages 161-165; CSO: 4193-N/a]

The fulfillment of the main economic task decreed by the Fifth Party conference requires that the national economy be so developed that the superiority of the socialist social order over that of West Germany can be unequivocally shown. To do this, we must soon considerably increase agricultural production in order to supply our people with animal husbandry products from our own sources under our growing consumption.

The Seventh Plenum established on the basis of development in agriculture in 1959 that we must also increase our stock of pigs and the production of hog meat in addition to the important expansion of our cow stocks.

The work lying before us, proceeding from the present development in pig raising and taking into consideration the connections between stocks, breeding results, fattening periods, and production, is to investigate the possibilities and requirements for the expansion of stocks and for increasing their outputs and thereby also going into the problem of supplying animal albumin as a prerequisite for improving fattening results.

Many economic organizational, and technical measures must be carried out in enterprises for improving production. This requires, however, very great efforts and full utilization of all workers in agriculture. This main problem in fulfilling this task is thus the convincing and winning over of workers to this assignment. It is worthwhile to expand the elan achieved by the Seventh Plenum for exceeding the plan goals in all villages into a mass movement and to make constant use of mutual help, performance comparisons, and exchnages of ex-

perience. We will then succeed in exceeding the production level of West Germany and in reaching the world level (Table 1).

Table 1

1958 Stocks and Production of Hogs and Cattle

A = hogs
B = cattle
C = together

| | | GDR | GFR | 7-Year Plan Goal | Denmark | Nether- lands | Bel- gium |
|---|---|-------|-------|------------------------|------------------|------------------|------------------|
| Stocks heads/ 100 ha LN* | A | 116.4 | 102.6 | 135.4 | 173 | 111 | 83 |
| | B | 64.3 | 84.8 | 78.0 | 104 | 139 | 151 |
| Meat produc- tion ¹ , kg/ ha LN | A | 116.1 | 126.3 | . | 168 ² | 1173 | 127 ⁴ |
| | B | 27.8 | 63.7 | . | 81 ² | 803 | 113 ⁴ |
| | C | 143.9 | 190.0 | . | 24 ⁹ | 197 | 240 |
| Percent- tual share | A | 81 | 67 | . | 67 | 59 | 53 |
| | B | 19 | 33 | . | 33 | 41 | 47 |
| Market pro- duction ⁵ , kg/ha LN | A | 107.4 | . | 135.5 | | | |
| | B | 41.4 | . | 72.7 | | | |
| | C | 148.8 | . | 208.2 | | | |
| Percent- tual share | A | 72 | . | 65 | | | |
| | B | 28 | . | 35 | | | |

Source: Information of the Ministry of Agriculture and Forestry.

¹Slaughter weight ²1957 ³1956 ⁴1958 ⁵live weight

*LN [not identified]

The ratio in the production of pork and beef is at the same time to be altered in favor of the latter. This, however, should not be done in such a way that hog and cattle raising are further developed simultaneously and that the former is neglected in any way whatsoever. The consideration shown here for cattle stocks must be balanced out through increased pork production.

In increasing production, first of all hog stocks must be increased, the absolute development of which was as follows (livestock count of 3 December):

| | <u>Heads</u> |
|------|--------------|
| 1956 | 8,325,600 |
| 1957 | 8,254,500 |
| 1958 | 7,503,600 |
| 1959 | 8,283,000 |

Goal for the Seven-Year Plan--8,700,000 (135.4 heads per 100 hectares LN).

The cause of the now overcome lag in hog stocks up to 1958 lies in the following reason: the justified decrease in the very high purchase price for hogs in 1956 and the simultaneous increase in cattle prices called forth a positive development in cattle raising but at the same time a retrogressive development in hog raising, because the latter was left to run on its own and was not sufficiently planned and controlled.

According to cost research conducted by the Institute for Agronomic Economics, pork production was considered more profitable at the present prices than beef production.

From the considerable increase in the hog count in 1958 of 779,000 heads, it can be concluded that the stocks required in the Seven-Year Plan for an equal increase in 1960 were surpassed, since for strict numerical plan fulfillment an increase of only 417,000 heads are necessary. This also results from the alteration in the composition of the stocks (Table 2).

Table 2

Development of Hog Stocks

| | In Percent of Total Stocks | | | | Absolute Stocks Increase & Decrease (1958 = 100) in 1,000 Heads | |
|--|-------------------------------|------|------|------|---|-------|
| | 1956 | 1957 | 1958 | 1959 | | |
| Breeding sows, total | 7.5 | 7.5 | 8.8 | 9.2 | +100.6 | 115.2 |
| Young pigs under two months | 16.5 | 17.3 | 17.3 | 18.3 | +284.3 | 126.2 |
| Young pigs from 2-3 months | 14.4 | 14.8 | 14.2 | 16.3 | +214.9 | 116.6 |
| Young hogs Slaughtering and fattening hogs; 6 to 9 months | 26.6 | 26.9 | 27.3 | 27.5 | +228.5 | 111.2 |
| 9 months and older | 22.2 | 22.9 | 22.2 | 21.2 | + 88.9 | 105.3 |
| Total | 12.5 | 10.2 | 9.3 | 7.1 | -140.2 | 80.8 |
| | 100 | 100 | 100 | 100 | - | 110.4 |

The increase in the number of sows, young pigs, and young hogs last year--and also breeding animals in a corresponding ratio among the latter--expanded the breeding foundation and assured a further expansion of the stocks.

An earnest effort can also be seen in the bezirks to expand hog raising, as the thorough increase in young pigs indicates.

If favorable conditions exist for stock expansion, these should not be allowed to run their own course. The common goal of the fulfillment of the Seven-Year Plan ahead of schedule requires much greater efforts. This is indicated by the decrease in the number of fattening hogs as well as the amount of young gos last year and, depending on the former, the decrease in production of hog meat by 9 percent. This is not only an effect of the retrogressive stock development in the past but also rests on the fact that runners (Lauefer) were utilized in an increasing degree for stocking up on breeding stocks and, in accordance with the demand for this, also animals from fattening stocks.

An investigation of the situation in the various forms of farms shows that considerable efforts are necessary in the LPG's as well as in private livestock farms to increase the number of heads, although the stocks in the second half year of 1959 developed favorably; this is shown by the increase in the number of heads in animal husbandry enterprises as a whole.

The number of heads still lies under the plan goal. Here it is worth while to surpass the plan goal in order to assure a sufficient meat supply, in spite of the prohibition of slaughtering utilitarian and breeding cattle, and in order to balance out the still unsatisfactory breeding results in young pigs. The unsatisfactory number of head in the LPG's rests on small stocks in regard to their formation or on the unsatisfactory bringing in of hogs, in private animal husbandry farms on price alterations, which were still effective to the middle of 1959.

The good development in hog raising in the VEG's was obtained through the appreciable pig purchases while cattle raising was neglected. The number of sows developed favorably, above all in the LPG's, and it can be expected that they will catch up to the leap ahead in the VEG's by 1961 at the latest.

The following are the requirements for surpassing the goals of the Seven-Year Plan resulting from these considerations: sow stocks are to be increased if possible to 15 to 16 heads per hectare LN to balance out in the LPG's their still existing below normal number of heads, and also for this to utilize animals from fattening stocks and to eventually purchase runners and young pigs. Economically weak collective farms (LPG's) should be given increased support through the conclusion of fattening contracts. Special attention should be given to building up drove stocks (herdbuchbestände) in order to improve the productivity of sows. The VEG's are making all efforts, in spite of the increased build up of laggin cattle raising, to reach the world level and to improve systematically their total stock so that it will correspond to drove accounting conditions.

It is worth while on private animal husbandry farms to fight against the still existing tendency to limit hog raising, to increase sow stocks in the same manner as in LPG's, and to supply collective farms with young pigs who cannot be fattened because of an insufficient odder base, which latter is to be correspondingly organized through the VEAB. An eventual decrease in stocks is to be prevented by means of occasional monitoring of livestock counts and the bringing in of a stipulated number of hogs, especially sows, in LPG's is to be assured by this monitoring. In the economic management of the Type III LPG's, which have about seven percent of all the hogs of the GDR, it is worth while to increase the stocks of breeding sows temporarily--i.e., until full development of hog raising in the collective farms--in order to avoid separate purchase of animals for fattening and to give up all young pigs, which are not needed, to the LPG's for fattening.

Table 3

Development of Hog and Sow Drovers
(Heads Per 100 Hectares LN)

| Livestock Count | Total Hogs | | | Increase & Decrease | Sows In-crease | |
|------------------------|------------|-------|-------|------------------------|----------------|------|
| | 1958 | 1959 | | | 1958 | 1959 |
| 3.6 enterprises, total | 116.6 | 112.1 | +4.5 | 9.7 | 11.9 | +2.2 |
| 3.6 of these LPG's | 98.8 | 102.5 | +3.7 | 8.8 | 12.2 | +3.4 |
| 3.6 of these VEG's | 149.2 | 150.7 | +1.5 | 12.6 | 14.2 | +1.6 |
| 3.6 of these private | 119.2 | 111.5 | -7.7 | 10.1 | 11.6 | +1.5 |
| 3.12 total enterprises | 116.4 | 128.8 | +12.4 | 10.3 | 11.9 | +1.6 |

The number of hogs differs greatly in the bezirks, and this holds true of its development.

Table 4

Development of Hogs and Sows per 100 HectaresLN

| Bezirk | Total Hogs Increase to 1958 | | Sows Increase to | | Hogs per Hectare of Geographic |
|---------------------|--------------------------------|------------|---------------------|-----------------|--------------------------------------|
| | 1959 | in Percent | 1959 | 1958 in Percent | |
| Rostock | 118.1 | 9.5 | 10.1 | 18.8 | 10.6 |
| Schwerin | 106.5 | 5.8 | 9.0 | 8.9 | 9.9 |
| Neubrand- enberg | 114.8 | 14.6 | 9.5 | 14.7 | 6.1 |
| Potsdam | 116.5 | 13.7 | 9.9 | 16.2 | 8.7 |
| Frankfurt | 118.6 | 9.8 | 9.8 | 15.3 | 8.3 |
| Cottbus | 137.7 | 11.2 | 10.8 | 14.8 | 9.6 |
| Magdeburg | 134.5 | 11.8 | 11.3 | 13.3 | 11.1 |
| Halle | 152.3 | 14.1 | 11.1 | 18.0 | 13.1 |
| Erfurt | 142.4 | 4.3 | 10.0 | 18.0 | 12.5 |
| Gera | 147.7 | 3.7 | 11.5 | 12.2 | 12.7 |
| Suhl | 107.7 | 3.7 | 6.0 | 13.3 | 11.3 |
| Dresden | 127.6 | 12.7 | 10.8 | 13.0 | 10.4 |
| Leipzig | 161.0 | 14.1 | 13.0 | 18.2 | 13.6 |
| K-M-Stadt | 116.6 | 8.9 | 9.5 | 21.1 | 10.8 |
| DDR | 128.8 | 10.7 | 10.3 | 15.5 | 10.8 |

*[continuation] Cultivation Surface 1959

Halle and Leipzig Bezirks are approaching the world level. On the other hand, the number of heads in the northern bezirks and in Potsdam, Frankfurt, Dresden, and Karl-Marx Stadt are not satisfactory, although the herds have developed well in Neubrandenburg, Rostock, and Dresden. However, the available fodder base in potatoes still makes possible an essential expansion in hog raising, as reference to the potato cultivation area indicates, in spite of the higher crops in the northern bezirks. The same holds true for Potsdam and Frankfurt. All conditions exist for overcoming this lag in the LPG's. We cannot trace these lags alone to the fact that in these areas before 1945 large land holdings predominated which produced alcoholic beverages from potatoes and neglected hog raising. The fact is that there are essential differences between the northern and southern bezirks in regard to the fodder base as a result of a lag in the former in the production of potatoes and grains with a simultaneously small purchase of fodder, as investigations of the Institute for Agronomic Economics indicates.

That the number of heads required in the Seven-Year Plan is to be reached in 1960 and is to be considerably surpassed in the coming years is indicated by the growth of hog stocks in 1959. The question now arises as to whether and how far the latter is necessary for fulfilling the plan goals in market production. This depends on many factors.

The Seven-Year Plan, for example, requires a market output of 135.5 kilograms per hectare for a hog count of 135.4 hogs per 100 hectares LN and a breeding result of 15 pigs per sow. This means that the market output is surpassed under the above-mentioned conditions insofar as, in assuring the people a supply of fats, 30 percent of the hogs are fattened to an age of about 11 months and a weight of 135 kilograms and 70 percent to 9 months and a weight of 110 kilograms.

Table 5

Possible Meat Production With a Hog Count of 135.5 Heads per 100 Hectares LN and a Breeding Result of 15 Pigs Per Sow

| | | |
|--|---|---------------------|
| 680,000 sows at 15 pigs per sow | = | 10,200,000 |
| 25 percent of the sows to be replaced | = | 170,000 |
| 25 percent of the boars ¹ to be replaced | = | 5,000 |
| For fattening | = | <u>10,025,000</u> |
| Meat production (in tons of meat): | | |
| 70 percent of the pigs fattened to 110 kilograms = 7,018,000 heads | = | 771,980 |
| 30 percent of the pigs fattened to 135 kilograms = 3,008,000 heads | = | 406,080 |
| Old sows and boars fattened to 175 kilograms = 175,000 | = | 30,600 |
| Total yield | = | <u>1,208,660</u> |
| 20 percent farm slaughtered | | 188 kg/ha LN |
| Market production | | <u>241,730</u> |
| | | <u>966,930</u> |
| Annual average stock of hogs | | |
| Sows 680,000 | = | 10.6 per 100 ha LN |
| Boars 20,000 | | |
| Fattened hogs to none months 5,264,000 | | |
| Fattened hogs to 11 months 2,757,000 | | |
| Total stocks <u>8,721,000</u> | = | 135.5 per 100 ha LN |

1Stocks, 20,000

Market production amounts to 150 kilograms per hectare and the plan goal set for this area is thus considerably surpassed. It can be calculated that this plan goal for market production--ie.e., about 135 kilograms per hectare LN at a sow count of about 11 per 100 hectares, a breeding result of about 12.4 pigs per sow and an average slaughtering age of fattened hogs of 11 months--can be reached with a total hog count of about 132 per 100 hectares.

These factors open the possibility for fulfillment ahead of schedule of the goal of the Seven-Year Plan in the production of hog meat. This can come about by means of suitable efforts by the end of 1963, because on the average for the GDR, the above-mentioned breeding results as well as the decrease in the slaughtering age and the increase in the count from the present approximate 128 to 132 per 100 hectares is reached. The close connection between count, breeding result, and production must be observed in socialist large-scale enterprises, kreises, and bezirks in the constant supervision of the development of hog raising and in the planning of production, as this calculation indicates. In addition to determining the number of hogs, it is also necessary to determine exactly the pig birth and breeding results, the slaughtering age, and the fattening duration in all farm enterprises and to evaluate this in the administrative areas. At the present time there is still considerable confusion regarding this, even in many agricultural enterprises. As already mentioned, the pig birth and breeding result strongly influences production, and we shall therefore go into this factor here. It is worth while to set through the twofold covering (Decken) of sows during a brimming in order to increase the unsatisfactory birth results of 8.4 live, born pigs per sow on the average of all enterprises at the beginning of 1959. This requires one boar for each 30 to 40 sows. The total boar stocks are sufficient for this, but the number of boars differs for the type of farm.

Table 6
Boars on 3 December 1959

| | Sows for One Boar | Share of Sows in the Total Stock of Sows |
|-------------------|-------------------|--|
| Total Enterprises | 28.3 | 100 |
| LPG | 23.2 | 38.2 |
| VEG | 15.7 | 7.6 |
| Private farming, | 63.7 | 44.7 |
| 1-20 hectares | 87.2 | 36.4 |
| over 20 hectares | 28.6 | 7.7 |

The sows in private farms are thus covered partly in large farming enterprises with a high boar count, which makes available sufficient number of boars. It appears necessary to re-examine and regulate the regional distribution of boar raising so that a boar station can be quickly reached for private enterprises in order to assure double litters (Doppelsprung), a timely covering to decreasing the time interval between two litters, and the temporary use of sows from fattening stocks for breeding. In Magdeburg and Schwerin Bezirke, which have about 53 and 50 sows per boar respectively, the number of boars must be increased in order to obtain a rapid development in hog raising; in Leipzig and Halle, on the other hand, the very high boar stock--26 sows per boar--decidedly contributes to the development of hog raising; the first named bezirke must accelerate the development of boar raising. In all others there are 27 to 36 sows per boar, and this number is sufficient.

It is worth while to decrease breeding losses in order to improve production. They were statistically indicated in March 1959 at 19.2 percent; they are therefore very high and are predominantly due to choking (42.3 percent of the loss), pig gripe (16.9 percent), and stomach and intestinal diseases (9.7 percent). They must above all be essentially decreased by means of care in giving birth, forced confinement of the sows during bearing, the use of protective posts; the erection of sufficiently large pens for pig bearing in stall buildings, pig incubators, and balconies; the procurement of infra-red rays, eventually by means of stall heating; inoculation, prophylactic application of effective substances--for example, ferkopan--and avoidance of fodder changes for sows. At the same time the number of litters per sow should be increased to two per year. At the present time, 1.35 litters per sow per year is the case; this rests, however, on a high share of young sows resulting from the stocking up of stocks and on a single covering of animals from fattening stocks.

The breeding result per litter amounts to 6.8 animals according to the above-mentioned birth results and pig losses [due to illness, still births, etc.]. Per sow per year 9.2 raised pigs result for the reasons set forth. The goal must be 15 to 16 animals and more. The VEG in Deetz, Zerbst Kreis, for example reached a birth result of 22.9 and a breeding result of 20.2 pigs in 1959; the LPG in Prenzlau, Waren Kreis, noted in their herd account breeding (Herdbuchzucht) 24 pigs per old sow at two litters per year, and 18 pigs for each young sow. The utilization period of sows, which at the present

time can be accepted at about 2.5 to 3 years, must be increased to at least four years. Good sows as well as boars are to be used for breeding purposes as long as possible.

Yields can also still be extraordinarily increased. An increase in breeding results has again a very great influence of the expansion of production and of stocks. The following table, which proceeds from the sow count on 3 December 1959 and the meat production in this year, shows this:

Table 7

Influence of Increasing Breeding Results on Production

| Sows per 100 ha LN | Pigs Bred per Sow in the Year | Meat Yield, kg/ha LN | Market Production, kg/ha LN | Pro-Hog Count, Heat per 100 ha LN | Sows in Percent of Total Stocks |
|--------------------|-------------------------------|----------------------|-----------------------------|-----------------------------------|---------------------------------|
| 12 | 9.2 | 125 | 100 ¹ | 121 | 9.9 |
| 12 | 10 | 136 | 109 ¹ | 131 | 9.2 |
| 12 | 11 | 150 | 120 ¹ | 143 | 8.4 |
| 12 | 12 | 163 | 131 ¹ | 155 | 7.7 |
| 12 | 13 | 177 | 141 ¹ | 167 | 7.2 |
| 12 | 14 | 190 | 152 ¹ | 179 | 6.7 |
| 12 | 15 | 204 | 163 ¹ | 191 | 6.3 |
| 12 | 16 | 217 | 174 ¹ | 203 | 5.9 |

¹Intra-enterprise consumption equals 20 percent of the yield.

Production also increases sharply with increasing breeding results, although much fewer sows are maintained. Pig requirements and the costs of sow raising and thereby for meat production are decreased considerably.

It is thereby urgently necessary to exhaust all possibilities for improving breeding results and, as an important condition for this, to constantly improve the qualifications of animal husbandry workers.

The shortening of fattening time also has a decisive influence on production.

Table 8

Influence of Shortening Fattening Time on Production and Count

| Sows per 100 ha LN | Age of Slaughter Hogs in Months | Meat Yield Kg/ha LN | Market Production kg/ha LN | Hog Count per 100 ha LN | Sows in % of Total Stock |
|--------------------|---------------------------------|---------------------|----------------------------|-------------------------|--------------------------|
| 12 | 12 | 125 | 100 | 121 | 9.9 |
| 12 | 11 | 136 | 109 | 131 | 9.2 |
| 12 | 10 | 149 | 119 | 142 | 8.5 |
| 12 | 9 | 164 | 131 | 156 | 7.7 |
| 12 | 8 | 184 | 147 | 173 | 6.9 |
| 12 | 7 | 209 | 167 | 196 | 6.1 |

Here we proceeded from the mean age of the slaughter hogs of 12 months in 1959. The decrease in fattened hogs thus affects production in the same way as does the increase in breeding results. It makes it possible to decrease the costs. The slaughtering age in all enterprises should be exactly recorded and statistically evaluated in the kreises as an important index. The goal must be to obtain a weight of 110 kilograms from birth onwards calculated in seven months in regard to rapid fattening (fattening period: 4.5 to 5 months) and a weight of 135 kilograms in about nine months for economical fattening. The latter is required to assure fat goods supplies within a certain scope, in addition to predominantly rapid fattening.

Fodder consumption stands in close connection with the length of the fattening period and can be estimated at an average of 6 to 7 GE per dt [not identified] of meat increase and frequently an additional 8 to 10 GE for an 8- to 10-month fattening period.

The following consumption, resulting from exact experiments, should be the goal:

Table 9

Fodder Consumption per dt of Meat Increase

| | Potato Rapid Fattening up to 110 kilograms | Grain Rapid Fattening up to 110 kg | Economic Fattening up to 135 kg |
|-------------------|--|--|---------------------------------------|
| Grain (dt) | 1.20 | 3.5 | 1.3 |
| Skimmed milk (kg) | 455 | 380 | 380 |
| Fish meal, (kg) | 0.30 | 0.25 | 0.25 |
| Potatoes, (dt) | 10 | - | 12 |
| GE Total | 4.2 | 3.9 | 4.7 |

Fattening to over 110 kilograms requires a somewhat higher fodder expenditure because of the greater fat formation. It has been successful in practice to maintain the given consumption norm, as for example in the Schulenburg LPG, where fodder consumption amounted to only 4.4 GE per dt of meat increase, and in the Baasdorg LPG and Weferlingen LPG, with an expenditure of 4.1 GE in seven months. Good fodder utilization is achieved at 3.7 to 3.8 GE, as fattening performance tests indicate; this corresponds to the highest world level, which is represented at 3.5 to 3.6 GE in the Netherlands.

Such good results can be brought about by correct fodder composition, according to nutrient materials, vitamins, and mineral salts, as well as through constant weight control, the selection of good growing and "fodder-thankful" animals, correct foddering techniques, and hygienically suitable sheltering.

A decrease in fodder consumption from the present approximately 6.5 GE on the average in the GDR to 4.5 GE, which can be reached through out, would make possible a considerable increase in the production of hog meat. This ran up to total of 800,000 tons, for example, in 1959. At a fodder consumption of 6.5 GE per dt, the total fodder expenditure amounted to 5,200,000 tons GE; on the other hand, at 4.5 GE it was only 3,600,000 tons GE; the savings of 1,600,000 tons of GE of fodder would make possible an increase in production of 355,000 tons of hog meat--i.e., 44 percent.

Fodder consumption and the fattening period depend above all on the content of the fodder in regard to animal albumin. This holds true for breeding sows, calves, and poultry. The albumin question is therefore an important one in hog raising.

They can only be investigated in connection with each other. For this purpose the need of all animal species for annual fodder norms was determined by rough estimation, and the calculated quota of skimmed milk and whey, as well as the amounts of albumin fodders allocated to agriculture in 1958 were compared. In the same manner, the need and need coverage for animal albumin was established for the Seven-Year Plan fulfillment, whereby the albumin yield was partially evaluated insofar as the actual gain is still open [to question].

It was indicated in this estimated need calculation, which was taken as a basis for the livestock of the GDR in 1958 and/or for the stocks required in the Seven-Year Plan, that almost two-thirds of the total requirement for animal albumin was in the hog raising area.

The total requirement for animal albumin in fulfilling the Seven-Year Plan increased more than double (about 140 percent) owing to the essential higher number of livestock and the increase in meat and egg production as compared to 1958.

The estimated calculation for covering the requirement for animal albumin shows that the latter was not guaranteed in 1958, and this in turn showed itself in unsatisfactory fattening and breeding performances in hog raising, and a small slaughtering weight for calves and laying performance of hens. Albumin production can, however, be considerably increased and will then assure a meat and egg production which will not only correspond to the goals of the Seven-Year Plan but will also exceed them.

Skimmed milk and whey are the chief sources of albumin, as the calculation of the requirement coverage indicates. We must then do everything to increase the yield. For this we should initiate full milk-saving calf-breeding by using effective substances such as kaelpan, in all enterprises. Sufficient amounts of kaelpan can be produced. Therefore, no more than 249,000 tons of "fodder milk" with two percent fat is needed for the total calf stocks, which is the calculated result for the goal of the Seven-Year Plan for cattle raising (about 700,000 breeding calves per 120 kilograms, about 1,650,000 fattening calves per 100 kilograms); this is equal to 2.7 percent of the full milk yield from about 9,135,000 tons (about 2,610,000 cows per 3,500 kilograms of milk). The former intra-enterprise milk consumption can be decreased to about 266,000 tons, which equals 2.9 percent of the milk yield (estimation: presently available number of cow raising

private enterprises and domestic managements, per enterprise three persons, per person and day, 0.5 kilograms of milk), as the milk is delivered and the butter exclusively is supplied by the dairy. The total intra-enterprise consumption runs to about 6 percent of the milk output under the above-conditions.

The example of the Kauren LPG, where it was already decreased to 9 percent, shows that this decrease is possible. A competition for the smallest intra-enterprise consumption can contribute here, with the goal of thereby increasing the full milk supply and thus again assuring a maximum increase in skimmed milk redelivery as an indispensable fodder source. In order to achieve this purpose, we should also examine whether skimmed milk redelivery cannot be increased by a further improvement in milk output as the requirement for skimmed milk in human nourishment decreases, and above all in the production of dairy productions.

They can very essentially contribute to closing the albumin gap. In this case it covers about 13 percent of the requirement for animal albumin, as one estimate shows. Here full redelivery must be assured, and yield, distribution, and whereabouts of the whey regulated or controlled. Not the smallest amount must be lost. Skimmed milk and whey together can cover about 66 percent of the requirement for animal albumin; skimmed milk alone about 52 percent. An additional main fodder source besides fodder yeast, whose production according to the Seven-Year Plan is to be increased to 55,000 tons, is above all fish meal. It is to be expected that by organizing a special fodder fish catching fleet, the residual utilization of fish wastes, and eventually the construction of processing ships, which will go to sea with the fishing fleets, that this yield can still be essentially increased. The full requirement for animal albumin can be covered through all these measures.

Summary

Investigation shows that the goals of the Seven-Year Plan in hog raising in regard to the hog count can be fulfilled ahead of schedule. For this it is necessary to increase sow raising in LPG's and private farms, to organize socialist aid between the bezirkds, and to re-examine the regional distribution of boar raising in order to improve rutting results

as well as to decrease breeding losses through many measures. The required market output for the Seven-Year Plan can be reached ahead of time by consideration of the close connection between count, breeding results, fattening period and meat production.

Finally, we discussed the albumin problem and the estimate determination of animal albumin was compared with the requirement coverage. Skimmed milk and whey are the most important albumin sources for improving production in hog and poultry raising.

EAST GERMANY

Ten-Year Survey of East German Shipbuilding

[The following is a translation of an article by Engr H. Mueller, entitled "10 Jahre Technische Bauaufsicht durch die Deutsche Schiffs Revision une Klassifikation," published in Schiffbautechnik, Vol X, No 4, April 1960, Berlin, pages 170-172; CSC: 4201-N/a]

Shipbuilding

With the development of large shipyards on the territory of the German Democratic Republic, the necessity arose for the creation of a classification institute which would be in a position to supervise shipbuilding and classification of the ships built in these yards in accordance with international regulations. The tasks devolving upon steel shipbuilding were especially marked by the rapid rate of development in the field of welding technique. With the rivet construction method previously in vogue; the application of the welding technique in shipbuilding, in its initial stages, concerned only the welding of rivet constructions. This means that the advantages given by welding techniques in weight reduction through increased resistance properties in the application of welding construction were utilized only with reference to the principal fastenings, such as bulkheads, beam supports, etc. Consequently, it was necessary to enter new paths for the development of modern construction elements with very close cooperation between shipbuilding and welding technology. At the same time, it had to be taken into consideration that semi- and fully-automatic welding must be introduced on as broad a scale as possible in the shipbuilding process. The DSRK [Deutsche Schiffs-Revision und Klassifikation; German Ship Inspection and Classification Institute] regulation issued in 1954 for electric welding in shipbuilding was of great assistance to our construction and development bureaus. However, not only the development of construction principles according to the new aspects of welding technology has been of influence in the development of shipbuilding in the GDR. The application of new methods of calculation has permitted better designing of

ship-hull construction with reference to static and dynamic loads. On the basis of the application of such methods of calculation, self-supporting decks have been constructed for 760-ton coastal motor ships, which made possible the elimination of bulkheads and thus resulted in expanded space for cargo. This construction may be characterized as one of the most modern designs, and it forms the basis for the application of similar calculation methods in the designing of other objects, such as the 11,000-ton freighter. Simultaneously, on the basis of theoretical calculations, a Seebeck-Oertz rudder was installed in the above-mentioned coastal motor ships. The results prove the unequivocal conformity of theoretical calculations and practical performance. It may therefore be said that, through the application of modern calculation processes, an over-all development in shipbuilding is feasible, such as a combination of longitudinal frame and bulkhead angle-bar construction. Since construction regulations of the DSRK are fundamentally based on calculation procedures, there are consequently on hand all possibilities, in the connection between classification and construction, for an unhampered development under observation of the requirements for the safety of man, ship and cargo.

DSRK Regulations for Construction Materials with Reference to the Application of Cold-Resistant Shipbuilding Steels

Another important point to be considered in shipbuilding is the utilization of suitable construction materials. This problem, however, has been largely clarified through the issuance of construction material regulations, which enable the designer to use the required materials in all cases, according to the areas to be traveled by the ship and the purposes of the ship. Beyond that, directives are being prepared on the use of construction materials. These directives state that shipbuilding steel of class K I may be utilized only for inland navigation and for ships of the "small coastal trade" traveling range. On the other hand, shipbuilding steel of class K II may be utilized for weld joints outside of the "small coastal trade" range, provided that no special demands on the construction elements or materials are made. These special demands have reference to the thickness of hull plating

in excess of 18 millimeters in the area of 0.5 length amidships at machine installations amidships or of 0.6 length amidships (at machine installations in the rear) and to flange deck, shear strade, bilge strade and flat keel. Furthermore, they have reference to all plating of a thickness in excess of 25 millimeters. For this, shipbuilding steel of class K III is to be used on principle. For ships with the supplementary classification (ice), shipbuilding steel of class K IV is to be used for platings thicker than 10 millimeters in the area of 0.6 meters above the load line and down to 0.6 meters below the no-load (empty-ship) line from the front to 0.2 length from the stem. Furthermore, in fully welded ships, the passage in the flange deck next to the large hatches, the deck stringer as well as the shear strade and bilge strade must be of class K IV shipbuilding steel if plates above 10 millimeters are used. For ships with the supplementary classification "ice" steel of class K IV is also to be used in the area of 0.6 meters above the load line down to 0.6 meters below the empty-ship line, but over the entire length of the ship. For fully welded ships, and beyond the requirements for ships with the supplementary classification (ice), the flange deck within the area of 0.6 length amidships is to be constructed of the above-mentioned steel.

For ships with the supplementary classification "Icebreaker," the entire hull plating and the flange deck must be constructed of shipbuilding steel of class K IV.

Beyond that it is, of course, necessary that in designs where a high concentration of stresses or discontinuity of bracings are used, steel of class K IV is required. Furthermore, it is recommended that shipbuilding steel of class KV ($\sigma_s = 3,400$ kilo-pounds per cubic centimeter) be utilized for bracings in which the mechanical construction material properties can be utilized to the utmost as, for instance, in longitudinal bracings in the area of 0.5 to 0.6 length amidships.

But not only steel as a construction material plays a part in the problems of classification, since new problems are posed by the advancing development of plastics as construction materials. The possibilities that are to be utilized in this field in the future require an exact knowledge of the properties of the corresponding plastic construction materials, so as to ensure true national

economic and safety-engineering improvement in the use of these construction materials. A long-range utilization of these construction materials merely as substitutes for wood and as insulating materials will not be possible; they influence elements of construction, so that certain construction elements will be made of plastic materials even in the very near future. For this reason it will be necessary to establish close cooperation, beyond the existing work circles, between the manufacturing enterprises, and the development and construction bureaus of the shipyards, as well as of the DSRK in order to solve, by way of good socialist partnership work, all the questions and problems arising in this connection.

Stability and Freeboard Regulations in the
Spirit of Safety Requirements for Man
Ship, and Cargo on the Seas

Proceeding from the development of steel-ship construction, the creation of unequivocal theoretical ship data was an additional requirement for the maximum safety of man, ship and cargo.

The DSRK was thus confronted with the problem of developing its own stability regulations in the shortest possible time. For this purpose, the stability characteristics and stability ratios of a number of ships in international shipbuilding were analyzed and evaluated. This analysis and evaluation resulted in the stability values given as minimum recommendations in the stability regulation enacted in 1956. For ships of normal construction, the DSRK recommended that they not fall short of certain values determined therein. Thus, as to the degree of stability, 60 degrees was recommended for normal cargo-load situations, and 50 degrees was recommended in case of glaciation. The maximum of lever-arm curves at 30 degrees should not exceed 45 degrees, whereby the lever arms should be within the range of 30 degrees $\bar{\approx}$ 0.25 meters. For ships with deck loads, the statical lever arms $\bar{\approx}$ 0.15 meters should be within a range of 30 degrees. The metacentric initial heights should be positive, except for ships that carry deck loads, the metacentric initial heights should be determined in such a manner that if a list occurs it should not be greater than 5 degrees.

Fillings of the tanks, etc.--i.e., the existing free liquid surfaces--were taken into consideration if their influence on the initial stability was more than 10 percent or more than 0.08 meters. A diagram was used for listing through wind pressure, in which the wind pressures are given in dependence on the distance of the center of gravity of the entire wind incidence area from the flotation water line for the traveling ranges "B," W, W, K, KNO, and unlimited travel. The field of application of this regulation extended to all types of ships.

Thanks to the simultaneous building of freighters for Soviet customers, there has been a good opportunity for comparison between the stability regulations of the DSRK and those of the Register of the USSR of 1948. These comparisons justify the recommended stability values of the DSRK. The existing stability regulations are being revised and expanded on the basis of the experiences gathered thus far. Because of the current building of combined freight and passenger ships, fishing and processing vessels, and other special vessels, supplements are being added to the regulations concerning leakage stability and the designation of the waterproof lower compartments of these ships. On top of this, there is the indispensable demand for information from ship captains, the extent and contents of which, depending on the type of the ship, are being currently brought up and discussed by the Shipbuilding Subcommittee within the framework of the Chamber of Technology.

Furthermore, the regulation for freeboards of seagoing ships of the DSRK went into force on 1 January 1960. In this regulation, the table for minimum freeboards has been extended to a ship length of 303 meters in consequence of the steadily growing ship sizes. In addition, this enactment includes the regulations for determining the bulk-head loading line of combined freight and passenger ships in accordance with international agreement of 1948 for the protection of human life on the seas, the regulations for determining freeboards of ships of 80 gross register tons up to 150 gross register tons, as well as the regulations for determining the freeboards of ships of less than 80 gross register tons, and the regulations for determining the freeboards of special ships.

Together with the stability regulation for seagoing ships, which is currently being revised, and the stability

regulation for inland vessels, the first draft of which has been submitted, the freeboard regulations concerning ship safety constitute a substantial part of the now existing regulation work of the DSRK.

Development of Loading and Unloading Installations on Seagoing Ships

Another essential part in shipbuilding is the ship's equipment, since it is of decisive significance for the economy of operations and the safety of human life on the seas and of the ship itself. The supervisory function and the testing of the equipment entrusted to the DSRK, has reference principally to technical safety and the functioning of individual parts of the equipment.

Although, for instance, the safety of the loading equipment does not directly affect the safety of the ship, economy of operations and safety of the service personnel are of primary concern. At the start of the activities of the DSRK, the loading equipment was fashioned in a manner which had been accepted for many decades. Ordinary masts or poles served as supports for derricks and the topping lift was mostly fastened to the deck by a chain. Some of the standards for the individual parts and derricks were obsolescent, and they were not uniform. The dimensions of the parts were frequently in excess of the required values. One was often under the impression that the purpose of making a calculation to obtain--on the basis of assumptions based on true facts--minimal dimensions under consideration of required safety, with a simultaneous saving in materials and weight, had been lost sight of. With the participation of the DSRK, a change has now taken place within the last few years. The utilization of construction materials has improved through more advantageous calculation methods. Standardization has advanced by a decisive step, so that designs, building processes, and testing can be carried out much more economically. The 3,000 deadweight ton freighters built in the VEB "Neptun" Shipyard in Rostock may be cited as examples of the progressing development. The old series, to which our freighters "Rostock" and "Wismar" still belong, was built in the conservative manner, while the modern motor freighters are equipped with bipod masts, topping-lift winches, and

much additional improved equipment. In addition to this, the board whipping crane has been used to an increasing extent to replace the former loading gear. No doubt, these cranes have brought about an improvement in the loading technique and thus an increase in the turnover of shipments. However, the more complex construction of these cranes compared with the loading gear at times involves more frequent breakdowns. In other words, some setbacks have been experienced too. At the present juncture, however, one may regard the electro-mechanical board whipping cranes as dependable for operation, so that at this point they do not lag behind the loading gear and thus, from the over-all viewpoint, the advantages predominate. In this connection it may be worth mentioning that the DSRK has taken over for supervision all the cranes on ships and floating bodies. So far this has been done by the Technical Supervision Organ of the GDR. The legal foundations for this were made public in Gesetzblatt, 53/I of 1959. Beyond this, the revised loading gear regulation of the DSRK will be issued in the near future. This new regulation will be based on all the usable and tested DIN [Deutsche Industrie-Normen: German Industrial Norms] regulations and other appropriate norms. This will assure a maximum utilization of construction materials and construction parts, with consideration for the required safety.

New Perceptions and Their Application in Ship Equipment

Quite in contrast to the loading gear, the steering device of a ship is of decisive importance for the safety of the ship and its crew on the seas and in river traffic. For this reason, special attention is given by the DSRK to safe construction and irreproachable functioning of this device. As a result, it may be stated that no damage worth mentioning that may be attributable to faulty design has so far appeared in the steering devices of ships of the GDR in operation. As to the development of rudder types, it may be stated that in single-screw and twin-screw ships the tendency is in the direction of fully balanced equipment. At the same time, the shaft inside the rudder housing is being replaced more and more by corresponding steel-sheet construction. Almost all the rudders are of streamlined form, so that a calculation

of rudder movements [steerability] and rudder power is possible with good approximation. This fact is also reflected in the rudder regulations of the DSRK. These regulations also contain, as do the loading gear regulations, the experiences of the past 10 years and will be published shortly.

The anchor and warping equipment has already been partly embodied in the regulations. However, it is being planned to carry out a revision and supplementation in this field, too. So far, the determination of the required measurements and layouts has been based on well established regulations, such as the regulations of the register of the USSR. The standardization of individual parts has also been pushed ahead with the cooperation of the DSRK but has not yet been concluded. Apart from winches and other mechanisms, a revolutionary development cannot be expected, as this is not in the nature of things.

In salvage and rescue equipment, the situation is an entirely different one. Here good progress has been registered during the past few years. While at the start of the DSRK activities principally spindle davits, common lifting davits, and rotating davits were used, the heavy-duty davit came to the fore with the enlargement of ship units. Respective constructions were further refined in order to save weight and to avoid unnecessary stresses. The determination of the size of these installations is subject, in part, to the requirements of the navigation safety agreement. All the principles not embodied in any kind of regulations are agreed on jointly with the manufacturer; in order to arrive at generally binding arrangements, the norms of 1958 for the equipment of ships with lifesaving apparatuses of the register of the USSR have been declared obligatory for the DSRK as of 1 February 1960. The life-saving equipment proper, such as boats, rafts, etc., have also followed the general trend of development, and today the metal boat cannot be dislodged from its leading position. As to inflatable rafts, work for their perfection is steadily going on. The fact that the DSRK has adopted binding regulations concerning life boats and other lifesaving equipment which correspond to the international regulations has had a beneficial influence in this case.

The towing installations of our ships have so far been equal to any requirements. These are mainly trade (gewerbliche) installations, but well functioning towing

equipment can offer assurance that ships in distress at sea can be brought into a safe harbor. In towing equipment also, improvements have been effectuated here and there in order to make the towing equipment, and especially the critical point of the towing equipment, the slip device, equal to all requirements.

Also, in some cases tow winches are replacing the customary hook fittings. The already existing directives for towing equipment, which will be embodied in the regulations on equipment, have facilitated the construction and testing of the equipment.

In conclusion, it may be stated that the work of the DSRK in the field of equipment has not been without influence on the design of new ship construction in the German Democratic Republic. Although the successes of this work are not immediately apparent, they will become evident during a longer period of operation. In spite of this, the DSRK is endeavoring, as in the past 10 years, to see to it that also in the future our ships and the ships intended for export are provided with equipment that conforms to safety requirements and guarantees satisfactory functioning.

Photo Captions

- Figure 1. 3,000-ton freight of the VEB "Neptun" Shipyard, Rostock, built under the supervision of the DSRK.
- Figure 2. Icebreaker for inland waterways built by the VEB "Ernst Thaelmann" Shipyard, Brandenburg, under the supervision of the DSRK.
- Figure 3. 10,000-ton motor freight of the VEB Warnow Shipyard, Warnemuende, built under the supervision of the DSRK.

EAST GERMANY

Ten-Year Survey of East German Machine-Building

[The following is a translation of an article by Engr B Schroeder, entitled "Schiffsmaschinenbau," published in Schiffbautechnik, Vol X, No 4, April 1960, Berlin, pages 173-175; CSO: 4201-N/b]

The development of shipbuilding in the German Democratic Republic has confronted the ship machine builder, too, with new tasks. A machine-building supply industry for shipbuilding hardly existed in the German Democratic Republic. Also, experience concerning the construction of these machines was scanty. Therefore, it devolved upon the DSRK to exert its influence on this construction, so that the interests of ship safety could be complied with.

In order to guarantee the safety of a machine, it is not sufficient merely to examine its construction. It is also necessary to see that the construction materials selected by the designer or demanded by the DSRK are used in the construction of the machine, and that these materials possess the properties required. Ultimately, the installation of the machine in the ship is to be supervised, and a test of the functioning of the whole machine aggregate is to be carried out.

The power machine is one of the most important machines of a ship. Development and testing of this type of machine have always involved problems. High-speed engines and aggregates of low power could be tested quite satisfactorily rather early since the required water-whirl brakes or generators were available for the tests. The initial difficulties in the use of our instructions lay predominantly in synchronization with delivery terms and in the shortcomings still present in these machines, either due to the material utilized or to defects in construction. That good and excellent results were nevertheless obtained within a short period of time bears testimony to the understanding cooperation between the enterprises, the designers, and the DSRK.

The low-speed diesel engines of high power, on the other hand, required a considerably greater expenditure of energy,

and not infrequently the test-stand examinations had to start in the manufacturer's plant and be finished on board the ship, the construction of which had been completed in the meantime; this was the situation at the start of the DSRK activities. This called for a frictionless cooperation between the staff members of the DSRK in the shipyards and in the suppliers' plants. The reason for all this was the unsatisfactory equipment of the test stands, which, in the first place, lacked suitable brakes or generators.

A special cause for worry was the testing of the control functioning of the machines under these conditions. The injection pumps and jets were also suffering from some defects at that time and contributed to the difficulties of testing. Time and again, the DSRK had to intervene, either by proffering its assistance or by presenting energetic demands in order to remove these difficulties. It was absolutely essential that in the evaluation of defects in construction materials, for instance in crankshafts, a uniform directive also be established so that the subjective factor of evaluation will be excluded and so that, first of all, a quick decision can be made. The path of cooperation with outstanding scientists, designers, and the leading manufacturing plants taken by the DSRK also quickly led to successes in this field and created premises for devising our own regulations. If we are today in a position to test complete ship-propulsion installations on satisfactory test stands with modern measuring instruments or to subject certain types of installations to the toughest months-long stresses, examinations, and measurements, this is, to a decisive degree, due to the work done by the DSRK in its initial period of activities.

In the field of steam engine construction, the requirements were also very high, both for new constructions and for reconstruction of ships largely intended for export. These problems had to be solved, although even sufficient steam capacity was lacking in important machine-building plants of this branch of industry. It was possible here to create methods for testing the machines by way of comprehensive cooperative measures. With few exceptions, it soon became possible to carry out tests of individual machines in accordance with the conditions of the orders on hand, and even testings of the exhaust steam turbines and some of the transmissions were carried out. The testing of several aggregates in parallel operation was especially difficult, since not only did sufficient

quantities of steam have to be available but also the demands of the DSRK for proof of faultless functioning of the required safety installations of the machines had to be enforced rigorously.

The construction of the main ship transmission gears rose from modest beginnings, along with shipbuilding, to a respectable volume in numbers as well as efficiency. The required test stands in the manufacturing plants had to be created.

Up to then, testing done under the supervisions of the DSRK had to be carried out mostly on shipboard, even though these tests could take place only under difficult conditions. This situation was improved only within the last few years, since now some important types of machines can largely be tested in the manufacturing plant, under load.

Some improvements are still to be made in this important field, and additional efforts are called for.

As to the construction of deck machinery, we can look back on a satisfactory development. The machines, designed initially only to cover specific needs, have been thoroughly typified by now. This was done by way of close cooperation between the manufacturing enterprises and the DSRK and through the work of the Deck Machinery Operation Committee of the Chamber of Technology, in which representatives of the DSRK also actively participated. In the creation of our regulations in this field we may also refer to the fine cooperation between the institutes, enterprises, and operation committees.

Development of hydraulic deck machines has also been started. Initial successes in this field have been achieved. Here we may point to the new development of a high-pitch steering device, which has already shown good results.

The specialization of some plants in the deck machinery field also simplified the establishment of suitable testing equipment.

In this connection, the Berlin-Lichtenberg Foundry and Machine-Building Plant is to be prominently cited; this factory has created for itself faultless test stands, all great difficulties notwithstanding. The good work of some enterprises had made it possible to transfer the acceptance of the machines to quality control sites.

In this connection, the VEB Winch Construction Plant in Wittenberg is to be especially mentioned.

Ship pumps and condensers have been further developed under the active cooperation of the DSRK. With the high-pressure steam condenser series, machines are available that conform to all requirements of shipbuilding. The development of gyrostatic stabilizer pumps for ships has progressed far by now. Our demand for an established suction capacity of the Lenz rotary pumps denotes a fundamental new trend.

This makes either redesigning or new development of horizontal pumps necessary.

The development of vertical ship piston pumps has been started. Here too, directives were proffered by the DSRK. After these requirements have been given consideration, production can be started.

Many enterprises, in cooperation with the DSRK, have been making efforts toward quality improvement of shipbuilding products. Since 1958 it has been possible for us to a growing degree to conclude consent (Anerkennungs) agreements with these enterprises and thus give them the possibility of accepting shipbuilding products through their technical control organization. Through this measure, gratitude is to be expressed to the enterprises for their past cooperation; at the same time, it made it possible for the technical personnel of the DSRK, trained over long years of extensive employment, to utilize its experience in other important technical fields, especially in view of the anticipated expansion of international cooperation in the classification organs. Of the valuable assistance in this task is the publication of the DSRK regulations, which has just started and is to continue in an emphatic manner. The experiences of the past decade and the interests of shipbuilding and its most important supplying industries are given consideration in these regulations. Special attention has been paid to the anticipated development of shipbuilding and navigation, and prerequisites have been created for further fruitful collaboration of all the shipyards and enterprises concerned.

Photo Captions

Figure 1. Propulsion installation for 3,000-ton freighters on the test stand in the Institute for Measuring and Testing Technology of the German Academy of Sciences in Berlin, built and tested under the supervision of the DSRK.

Figure 2. Main transmission gear for the machine installation of a 10,000-ton freighter on the test stand of the VEB Machine-Building Plant and Iron Foundry in Dessau, built and tested under the supervision of the DSRK.

EAST GERMANY

Ten-Year Survey of East German Ship's
Electrical Equipment Industry

[The following is a translation of an article by Engr H. Engelhardt, entitled "Schiffselektrotechnik," published in Schiffbautechnik, Vol X, No 4, April 1960, Berlin, pages 175-177; CSO: 4201-N/c]

At the end of the last World War, a supply industry for the products of electrical ship equipment in the territory of the German Democratic Republic was practically non-existent, if one disregards the very few production installations that were still left over at that time.

In the course of the reconstruction of our national economy, the simultaneous development of the shipbuilding industry and the electrical equipment industry was begun.

The activities of the DSRK [German Ship Inspection and Classification Institute] in the technical field of the electrical ship equipment industry did not become noticeable before 1951.

The main task in the technical field of the electrical ship equipment industry was, at the start, to make contact with the existing electrical industry and to acquaint these enterprises with the special requirements that are called for in electrotechnical equipment for installation on ships and other floating equipment; this was not always easy in view of the absence of regulations of our own.

At this juncture it must again be acknowledged that the Soviet Union, with its then existing inspection of the sea register in the German Democratic Republic, played an outstanding part in transmitting regulations and operational and technical experiences to our industry.

Apart from that, the DSRK had to lean heavily on the special knowledge and experience of the few staff members have had mastered their problem by their unselfish devotion in this period of development.

Thanks to the untiring activities of these workers, it was possible to enlist, even at that early stage, the collaboration of a large part of the enterprises of our electrical industry for the important tasks of producing electro-technical devices for installation on ships. Special mention must be made here of the energetic assistance of electrical machine-building enterprises, of cable works, and control equipment and switch-gear manufacturing enterprises.

A great problem in this instance was that the products of our electrical industry for land-based installations were in most cases not up to the requirements called for in equipment and installations for ships. This inevitably resulted in a demand for special designs for shipbuilding and, moreover, mostly in small quantities compared with the quantities of similar equipment of the customary land-based type. Since a certain two-track condition in storage, manufacture, testing, and documentation resulted from this fact, most of the enterprises approached this problem with reluctance. A comprehensive activity of persuasion on the part of the representatives of the DSRK was necessary to win over the hesitant enterprises to the shipbuilding industry.

The success of this activity becomes apparent if one compares the present situation in the output of electro-technical products for the shipbuilding industry with the situation as it existed 10 years ago. This should not be interpreted, however, to mean that the problems that have been raised have already been fully solved.

The recognition which our young shipbuilding industry has gained even during the brief period of its existence led to the conclusion of an ever-increasing amount of export orders, and not only with the socialist countries allied with us but also with foreign countries in the West, such as for cutters for Iceland, motor freighters for West Germany, etc. In order to comply with the wishes of the customers and to further strengthen the reputation of this young branch of industry, great efforts were required to keep in step with modern technology. Prerequisites had to be created very rapidly for a transition from the old-established direct-current board installations to modern rotary-current installation, which resulted in entirely new conditions in the field of propulsion of deck machines in particular, and of all other drives in general. In this connection, the new developments of rotary-current constant-voltage generators, and rotary-current machines for control

drives for deck machines of flood-protected design, to which the DSRK made its contribution as consultants in the technical committees and work groups, should be cited. During the same period, rotary-current standard engines and the corresponding gear-shift equipment was developed and approved for installation in ships by the DSRK. The development of induction couplings for large ships had to be accomplished in a brief period of time. The construction documents produced by the VEB Electric Motor Works in Dessau were examined by the DSRK and approved. Representatives of the DSRK carried out constant supervision and conducted tests and measurements as well as acceptance of the induction couplings on the testing ground and on shipboard. These products were first installed on an icebreaker and later on a 10,000-ton motor freighter, which were constructed under the supervision of the DSRK. The switchboard industry had to design central switchboards, parallel with the development of the induction couplings. The examination of designs, the supervision over construction in the VEB Electric Project (Elektroprojekt) in Berlin-Lichtenberg, and the testing and acceptance were also carried out by representatives of the DSRK. Improved cables and circuits for ships emerged, partly based on plastic construction materials, in which the electric engineers of the DSRK took a substantial part.

In the field of control and communications installations, modern equipment has been created, such as the new type of steering desk on the GDR coastal motor ships of a 760-ton carrying capacity, or the electric steering device of the feathered propeller arrangement on medium-sized trawlers for the Soviet Union.

All these products and installations have been processed by the technical department, "Ship Electrotechnology," of the DSRK.

Installation materials, measuring instruments, relays, and other electrical control and safety equipment must be added to this.

In recapitulating, it may be said that the DSRK has made its contribution to all these new developments and improvements through its participation in the individual technical committees and through consultations with the industry.

With the increase in export volume and the construction of ships of an unlimited travel range for the people-owned

fleet which includes the traversal of tropical climatic zones, the demand for shipboard installations with equipment protected from the tropical climate becomes acute. In this field, despite maximum efforts, no satisfactory status has as yet been reached. This matter will be the point of emphasis for the further development of ship electrotechnology. In looking back over the decade since the establishment of the DSRK, it may be stated that the ship electrical engineering industry, as one of the youngest in the GDR, has been developed, with the assistance of the DSRK, to such a degree that it has become equal to all the demands placed before it by modern shipbuilding in most aspects. This is attested to by the ships built in the GDR on all the world's seas and in all the world's harbors, and these vessels at the same time demonstrate the reconstruction efforts and the diligence of our workers.

Worth mentioning in this connection are the 10,000-ton motor freighters of the VEB German Seagoing Shipping Company (Deutsche Seereederei) in Rostock, as well as the "Sassnitz," railroad ferry--all of them ships which have been built under the supervision of the DSRK and have been classified by the DSRK.

In spite of these successes, the DSRK must and will pursue the goal of making still greater long-range efforts, toward steadfast improvement in the quality of the products of our shipbuilding industry and the further development of all the products of the electrical ship equipment industry to the highest technological level.

The first step in this direction will be the issuance of its own regulation code for the electrical ship equipment industry in 1960. This regulation code, which is being worked out by the DSRK with the participation of extensive technical circles and a variety of technical committees of the electrical ship equipment industrial branch, will be based on the newest concepts and experiences and on international recommendations. This regulation is designed to bring us closer to the goal of conducting operations as a rule, in accordance with these regulations with respect to all ships built in the GDR. The resulting economic advantage will be of benefit to this entire branch of industry, inasmuch as the DSRK, by means of this regulation code, will put into the hands of the manufacturing plants a clear concept for designing and construction; this will eliminate many discrepancies in production which have been caused in the past by conducting work according to a variety of regulations.

The DSRK regards the issuance and the purposeful adoption of the new regulation code as a further improvement of the work of the entire electrical ship equipment industry of the GDR, the ultimate goal of which is to attain the highest technological level with simultaneous observation of maximum safety.

Furthermore, the DSRK will limit, to an increasing extent, the volume of acceptance by permitting individual products to be submitted for acceptance, and thus will strengthen the responsibility of the manufacturing plants in quality control.

For the purpose of listing some products and basic raw materials which under all circumstances require improvement or call for new development, we may mention surface-leakage current-proof insulating materials possessing good mechanical and electric properties, which by means of simple technological processes can be made into carrying agents of current- and voltage-carrying parts, heavy-duty ship cables based on plastics, reliable refrigeration installations, cranes and loading winches with cage-rotor rotary-current engines, etc.

In order to attain these envisaged goals, the DSRK must be able to rely on the cooperation of all the enterprises and institutions concerned and it is therefore desirous of close mutual support, which alone can ensure success.

Photo Captions:

Figure 1. Main switchboard of the 8,000-horsepower combined freighter and passenger ship (built in the VEB Electric Project in Berlin, under the supervision of the DSRK).

Figure 2. Rear view of the main switchboard of the 8,000-horsepower combined freighter and passenger ship.

EAST GERMANY

Ten-Year Survey of Tasks of East German Technical
Control Organizations of the Enterprises in
Connection with Ship's Classification

[The following is a translation of an article by Von E. Stichling, entitled "Die Aufgaben der Technischen Kontroll-Organisation der Betriebe im Rahmen der Schiffsklassifikation," published in Schiffbautechnik, Vol X, No 4, April 1960, Berlin, pages 177-179; CSO: 4201-N/d]

The rapid development of our comparatively young shipbuilding industry within the past 10 years since the establishment of the DSRK [German Ship Inspection and Classification Institute] and the sudden rise in our high-seas navigation, especially within the past three years, serve as a complete corroboration of the correctness of the independent establishment of ship classification in the German Democratic Republic. The development of the DSRK could, under the then given conditions, be accomplished only in closest contact with this development in shipbuilding and navigation. To the extent to which after the completion of our large shipyards, our shipbuilding output rose, the classification problems that had to be mastered also rose. These tasks could be solved only in steadfast and close cooperation with the shipbuilding industry and with the shipping companies. In this task, the main concern of the DSRK was always the demands for highest quality in all shipbuilding products for the purpose of attaining maximum safety for our ships. However, at no time did the DSRK consider as its sole task the control of the compliance with the construction, the testing, and acceptance regulations, and the rejection of insufficiently perfected shipbuilding products. On the contrary, it has always striven to assist shipyards through factual criticism, helpful hints, and advice, and to create all the prerequisites for the attainment of the highest quality, in accordance with the existing level of shipbuilding technology and the technical safety regulations, indispensable for shipbuilding. Here it was unavoidable that more or less sharp disputes with individual shipyards and enterprises occurred, primarily with supply enterprises

which initially had too little experience in the manufacture of shipbuilding products, and whose managements apparently did not realize the stresses to which a ship was subjected. These arguments, however, in most cases led to a complete compliance with the conditions laid down in the regulations, or to equivalent substitute solutions.

Mutual Relations Between the Technical Control Organization and the DSRK

The DSRK, in its struggle to attain the highest level in shipbuilding and the maximum possible safety of the vessels, received energetic and consistent support from most of the Technical Control Organizations (TKO) of the enterprises and shipyards. The responsible managers and also the staff members of the TKO's of these enterprises at all times followed the regulations and enactments concerning the "Execution of Quality Control and Improvement in Quality of Industrial Products in the Enterprises of the Ministry for Machine-Building" of 30 September 1954. In accordance with the wording and meaning of paragraph 36 of this regulation, defects discovered were eliminated by the manufacturing plants prior to the acceptance of the article by the representative of the DSRK, and no article or product was listed or presented for acceptance without prior acceptance by the respective plant organs. The plant acceptance protocols also serve to document the exact condition of the product on acceptance by the DSRK. There are, however, some individual enterprises the TKO's of which did not always comply with the above-mentioned regulation and therefore did not fulfill their tasks to their full extent. They sometimes permitted themselves to be placed under pressure as to terms of delivery, shied away from the required discussions with the production managements, and followed the path of least resistance by regarding the DSRK as a sort of "big brother" and, because of their own weakness, attempted to use the DSRK to support them. For instance, they permitted products to be submitted to the DSRK representatives which did not conform to the technical conditions and therefore had to be rejected. These weaknesses of the TKO's of necessity had a harmful influence on the enterprises themselves--i.e., they could neither achieve the required quality nor could they meet the delivery terms agreed upon. The responsible management

personnel in these enterprises must realize that plan fulfillment, compliance with delivery terms, attainment of highest quality, and strict compliance with all the technical conditions are not unbridgeable opposites but are merely different parts of one and the same thing, and that all contradictions and difficulties that result from the realization of these tasks can be overcome by means of close cooperation, mutual criticism, and assistance--i.e., by means of truly socialist collective work in all fields. Of course, this also has reference to further improvement and perfection of the classification work. The DSRK, too, has repeatedly received critical hints and proposals in the past few years from shipyards and supply plants, which have resulted in an improvement of its work and its regulations. These criticisms contributed to the fact that, in a variety of cases, rigid and one-sided interpretation of the regulations and routine methods of operation by the DSRK were prevented, that old or obsolescent views and concepts were replaced by new ideas, and thus necessary assistance was rendered to technical progress.

The DSRK Must Concentrate on the Main Tasks of Classification

The development of shipbuilding and navigation envisaged in the Seven-Year Plan also calls for a rapid and successful realization of socialist reconstruction in these branches of the economy, for the purpose of fulfillment and over-fulfillment of the economic plans. Since an increase in production and an output of products of highest quality at the lowest possible costs affect classification and building regulations to a substantial degree, a further development and qualitative improvement of classification work is also necessary. The DSRK must be enabled to concentrate, more than heretofore, on its main tasks of classification. These main tasks consist, first of all, in a more rapid development of a comprehensive and complete code of regulations and of its steady further development, in a strengthening of international work, especially closer and more intense cooperation with the classification institutes of the socialist countries within the framework of the Council of Economic Mutual Aid. In conjunction with the growth of our high-seas fleet, problems of fleet maintenance should be accorded special attention by means of working

out and adopting a progressive classification systematology with the aim of reducing the lay-off times for repairs and detention in shipyards.

Methods for the Simplification of Testing and Acceptance

A solution of these principal problems presupposes that the DSRK detach itself, step by step, from the still very voluminous testing and acceptance of materials, semi-finished products, individual parts, and machines that are of secondary importance for the safety of a ship. Testing and acceptance of such products should become the responsible task of the Technical Control Organizations of enterprises and shipyards. The Technical Control Organizations, on the other hand, must be enabled to assume full responsibility for compliance with the regulations and to enforce all the well-founded technical requirements against all possible resistance and obstruction, even without DSRK support. The prerequisites for the measures required for this purpose were lacking during the first years of DSRK's existence. The reasons for this are connected with the development difficulties of our young shipbuilding industry and need not be dwelt upon here in detail. Our shipbuilding output has attained a level, qualitatively as well as with reference to manufacturing methods, which not only permits but makes imperative a relaxation of the entire acceptance system and a simplification of the testing methods. In the main, this simplification is to be accomplished in two ways. One way is the licensing of types so as to rid ourselves of the acceptance procedure of individual products, and the other way is the transfer of the testing and acceptance of shipbuilding products, which continue to be subject to individual acceptance, to the TKO's of the enterprises. If construction regulations have been determined for a type in serial production, and if tests have established its suitability for shipbuilding, the whole series can be released. Testing and acceptance of individual products will then be up to the TKO's of the enterprises only, who will issue a plant certificate for them, which is to be recognized by the DSRK as a fully valid classification document. Such products are marked by a new special DSRK stamp. The DSRK itself, in these cases, exercises only periodic spot-check controls and supervision over manufacturing in the enterprise in order to ensure and/or improve

the quality level. Up to the end of 1959, approximately 100 types with about 1,950 variations were licensed in order to do away with individual acceptance.

The second means of simplifying the classification work and concentrating it on essentials is an intensified application of the principle of self-control and acceptance of products through the TKO's of the enterprises. The DSRK has begun, especially during the past year, to transfer the testing and acceptance of products which are subject to acceptance by the DSRK to all enterprises that have been manufacturing shipbuilding products of best quality for years and have always meticulously complied with the construction regulations. In 1957, three enterprises, for a start, were accorded the right of testing and acceptance on behalf of the DSRK. These three enterprises were:

VEB Winch Manufacturing Plant, Wittenberg
VEB "Hein Fink" Pressing and Forging Works, Wismar
VEB Harz Works, Blankenburg (Harz)

The extraordinarily favorable results of this measure induced the management of the DSRK to publicize the knowledge gained and to include other qualified enterprises in this category. While at the end of 1957 there were only three such enterprises, their number had risen to 46 by the end of 1959; their TKO's test and accept the shipbuilding products on behalf of the DSRK, either in full or in part. In none of these enterprises has there occurred a drop in quality or noncompliance with the technical regulations, and rather the opposite has been the case. This has reference to the products themselves as well as to the corresponding acceptance certificates. While previously, for instance, the granting of DSRK acceptance certificates by the enterprises had given cause for complaint, the number of invalid acceptance certificates after transfer of the acceptance to the TKO has dropped to a fraction of one percent. Beyond that, testing and acceptance on its own responsibility has extraordinarily strengthened the position of the TKO in the enterprise in many instances

An Admonition to the Enterprises

The transfer of the testing and acceptance of shipbuilding products to the TKO brings to the enterprises not only

ideological but also material advantages. If a supra-plant state control organ such as the DSRK concedes the right of testing and control to the enterprise itself, this undoubtedly constitutes a recognition of good and acceptable quality work. The majority of the enterprises that have found recognition in this way have placed this side of their obligation in the forefront at the conclusion of the contract. These enterprises have a greater mobility with reference to the manufacturing process, compliance with terms, and the handing over of the products. They can carry out acceptance at any time and do not need to wait for the appearance of a DSRK representative authorized to effect acceptance. Also, test stand testings, which formerly had to be made separately, once for the Technical Control and a second time for the DSRK representatives, can now be carried out in a single procedure. The DSRK itself makes substantial savings in the form of salaries, daily and overnight allowances, etc. Since the DSRK is not a people-owned enterprise but a budget organization, these savings accrue in their full amount to our joint state budget.

Transfer of the DSRK function of testing and acceptance to the TKO is done by way of a contract, signed by the director of the DSRK, the director of the enterprise, and the manager of the TKO. The technical details for testing and acceptance by the TKO are determined in the agreement in accordance with the individual character of the enterprise. One of the most important parts of the contract is the personal obligation of the TKO manager or of the staff members of the TKO respectively, who are assigned for the testing and acceptances. The right of self-acceptance is tied to individuals. The people under this obligation are handed a numbered DSRK special stamp and are regarded, with respect to this activity, as "examiners by order of the DSRK." For the reasons mentioned, the DSRK will in the future designate types for licensing to an increasing extent and will undertake transfers of testing and acceptances to the TKO of the enterprises. All the enterprises are being invited to make applications, via the authorized branch office, to the DSRK central office. If the investigation following the application has the result that all the required prerequisites are on hand for self-acceptance, recognition follows. In enterprises where these prerequisites are not yet in existence, they must be created, for which purpose the DSRK is ready at any time to render its assistance. The measures of the VEB Pump Plant in Karl-Marx Stadt may serve as an example. The "Quality" socialist work collective was

established in this enterprise at the initiative of the plant manager. Its task is to create the prerequisites for independent testing and acceptance of its shipbuilding products for domestic needs and for export by 31 December 1960, by means of improving the organization of the manufacturing process and control. The authorized DSRK representative is also active in this socialist work collective, and with his cooperation, a plan of the measures to be taken has been decided upon. Beyond that, the authorized branch and the central office of the DSRK will render every possible assistance to the VEB Pump Works in Karl-Marx Stadt in reaching its goal.

The management of the DSRK and the management of the Party Organization of the enterprise are inviting all the enterprises in question to follow this example of the VEB Pump Works in Karl-Marx Stadt. Also, the managements of the Party organizations of the enterprises should take advantage of the possibilities offered by the DSRK of assistance in their struggle for the production of articles of highest quality at lowest possible cost. The DSRK will fully and thoroughly support all efforts in this direction made by the enterprises.

EAST GERMANY

Economic Briefs

It can be said that 1) in supplying all livestock with corn silage on the basis of the required count of the Seven-Year Plan in enterprises with better soils, as also in those with sufficient grazing possibilities, an average of 10 percent silo corn cultivation will exactly suffice, not, however, under conditions of the small yield capacity of sandy soil;

2) that intermediate winter fruit-growing in all enterprise types cannot be neglected in any manner and must also reach 15 percent of the acreage surface in order to have many types of fodder available;

3) that the cultivation of silo corn and not that of green corn is the most important factor. Mark stem cabbage (Markstammkohl) belongs in the place of green corn, which, however, in the future cannot be planted in the 10 percent silo corn area, as it yields much more, directly as well as indirectly, and moreover makes possible green foddering and thereby vitamin supplies by the end of the year and forms foddering in many ways;

4) that it is now already possible to lay on reserves through the planned silo corn cultivation where, at the moment there is still no high cattle count available.

(Die Deutsche Landwirtschaft, Vol IX, No 4, April 1960, Berlin, page 167, CSO: 4193-N/b, from "Maize Cultivation and Fruit Sequence Problems," by Prof Dr H. Kress, Director of the Research Center for Agrobiology and Plant Crossing, Guelzow-Guestrow, of the German Academy of Agricultural Sciences in Berlin)

* * *

The artificial drying of green fodder has become a necessity in socialist large-area agriculture because of the increase in livestock and the thereby necessary decrease of the still high recruiting (Werbungs) and storage losses of field fodder crops. New roads must be traveled, however, in the erection of green fodder drying plants in regard to the selection of location, the drying facilities, and the operating economics.

Several large collective farms with a total area of 8,000 to 10,000 hectares LN [not identified] will form a drying association and will utilize a green fodder drying plant with a capacity of 5 tons per hour based on the high amount of livestock. Thus the artificial drying of green fodders cannot be branched out from agriculture. A machine stock for the automatic harvesting and transport of the green commodity will be made available to the drying plant by the large farms. The director of the drying plant is the organizer of the entire drying process. The personnel are members of the LPG and are interested in the full utilization of the plant. The large farms will have to orient themselves to the drying plant in their fodder cultivation and assure the plant the largest possible utilization through the green [fodder] assembly line.

Drying costs can be considerably decreased:

- 1) as the installation costs per ton of drying output in a 5-ton drying plant are about 40 percent lower than in a 2-ton drying plant;
- 2) as the personnel costs through the higher automation of the larger drying plant per ton of dryer output are still about 60 to 70 percent as compared to the 2-ton dryer;
- 3) through good organization of the green fodder transport with its own machine stock;
- 4) through a higher utilization of the drying plant by realization of the green fodder flow line.

It is further proposed that a grain drying installation, a power fodder mixing installation, and a village management house be annexed to the green fodder drying plant, whose location shall be a town or central village with railroad connection, in order to make use of structures and power sources.

(Die Deutsche Landwirtschaft, Vol IX, No 4, April 1960, Berlin, pages 191-192; CSO: 4193-N/b, from "Long-Range Plans in Artificial Green Fodder Drying in Socialist Large Area Agriculture" by Dipl Agr B. Schneider, Institute for Agricultural Machinery of the University of Rostock. Director: Dipl Engr Poehls)

RUMANIA

Rumania Expanding Merchant Fleet and Shipyards

[The following is a translation of part of an unsigned article entitled "Rumaenien baut Handelsflotte und Werften aus, " published in Schiffbaut-technik, Vol X, No 3, March 1960, page 142; CSO: 4201-N/e]

The merchant fleet of the Rumanian People's Republic of seagoing vessels of more than 300 gross register tons each amounted to a total of 14 ships of altogether 41,618 gross register tons, 23,431 net register tons, and 51,500 tons deadweight. In addition to this, there is a much larger number of smaller units of less than 300 gross register tons for coastal shipping, and there is also a rather important fishing fleet, so that the over-all fleet comprises more than 100,000 gross register tons. The present tonnage of the Rumanian merchant fleet is inadequate for the requirements of seagoing freight traffic and is totally obsolescent, especially with respect to the smaller units. The average age of the ships was 22 years last year.

For this reason, an expansion and modernization of the fleet, the ports, and shipyards is to take place. Unconfirmed reports state that the Rumanian merchant fleet will be strengthened by 1962 by four standard freighters and one dredge for the coastal service from Poland, and eight smaller units from the USSR. The harbor of Carmen Sylvia is to be improved to a water depth of 10 meters by 1961 and is to receive new pier installations. New shipyards are planned by 1961 in Mangalia for the building of ships of a length up to 80 meters, and near Mamaia for ships up to 1,500 gross register tons.

The voluminous new construction program decided upon by the government for 1959 includes the building of tugboats, of 1,500-ton barges, 2,000-ton and 4,500-ton motor ships, as well as, for the first time, combined passenger and freight ships for high-sea and inland shipping.

The reconstruction and expansion of the Galatz shipyards in the Rumanian People's Republic have progressed to such an

extent that the shipyards are in a position to build ships up to 12,000 tons. At the moment, a 10,000-ton ship is being constructed by Rumanian shipbuilding engineers.

The installations of the Constanza shipyard have been expanded for repairs on ships up to 25,000 tons.

Control and regulation of the Moldavia River have been decided upon for the purpose of improving inland water traffic.

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