

ENGINEERING

Dedicate World's Largest Power Plant in Russia

DNEPROSTROY was dedicated on August 25.

This hydroelectric power project exceeds similar undertakings in size and difficulty of accomplishment. It is on the Dnieper river in the U. S. S. R.

From an installed capacity of 756,000 horsepower, abundant electricity will be available to smelt iron and other metals and to operate chemical industries. Water is to be pumped to irrigate hundreds of thousands of hectares of rich but drought-affected steppe. Steamers from the Black Sea, 200 miles down the Dnieper, will be able to penetrate hundreds of miles farther inland because the dam, and locks built with it, overcome obstructing rapids.

The cost of the dam, power plant, locks and necessary bridges is approximately 220,000,000 rubles, or \$110,000,000. Three and one-half million dollars was spent for construction equipment alone. It is estimated that an additional 620,000,000 rubles will be consumed in developing the industries that will depend on the new source of power. The dam is the largest masonry structure ever built to impound water and was finished six months ahead of schedule.

American Methods Win

This project was a victory for American methods, because both American and European engineers submitted plans and actually tested them before the final contracts were let. The Europeans intended to use the most highly developed automatic construction machinery while the American estimate contemplated employing ordinary steam shovels, concrete mixers and railways built to Soviet standards. Foundation work on the dam was begun on one side of the river by the Europeans working as they preferred and on the other side by the Americans employing their methods. It took only a few months for the Soviet officials to decide in favor of the Americans, Col. Hugh L. Cooper and his organization, and to give them the remainder of the work. The rural Soviet laborers worked more successfully with the simpler American machinery.

Yet, there was a labor problem in

the Soviet Union just as there might have been in America. The Soviet government did not make the workers stick to the job. They constantly migrated between farm and industry and often several hundred would leave at one time to go where they had heard they could make more money. Thus the turnover was unusually high, being about sixty per cent. annually. In order to reduce this figure the workers were given houses and comforts superior to those found in most American construction camps. At times as many as 50,000 were employed on the project.

Women Work Overtime

Women worked, too, and were exceptionally efficient. They used surveying instruments and were machine operators, locomotive firemen and concrete placers as well as common laborers. They would often work half an hour after the whistle to perfect a task.

The dam is 3,350 feet long, including the frontage of the power plant, and 140 feet high to the crest of the spillway, above which water will rise as much as 30 feet during floods. This structure impounds a flow varying from 6,300 cubic feet per second during severe droughts to 835,000 cubic feet at times of large freshets. The latter figure represents the greatest flow ever encountered by a structure of this type, and the dam stood this test in 1931 before it was finally completed.

Six of the plant's nine power units,

the largest ever built, are now being installed. The turbines, rated at 84,000 horsepower normal capacity and 100,000 horsepower under a maximum head of water, were made in this country. Five of the generators were built in the United States and the remainder are being constructed in the Soviet Union.

While Dneprostroy's normal generating capacity is 756,000 horsepower, it has a maximum or high water capacity of 900,000 horsepower. On account of irregular water flow it will be possible to operate only three of the nine turbo-generating units during the entire year. The world's next largest hydroelectric power plants are Muscle Shoals with a capacity of 610,000 horsepower, 260,000 horsepower of which has already been installed, and Niagara Falls with 430,000 horsepower.

Science News Letter, August 27, 1932

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RADIO
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