

# Pravda: Nuclear Power The Only Solution

V. Shilov's article "Light of the Atom," part one of which appeared in Pravda Aug. 4, is excerpted here in condensed form.

"History will dispassionately and justly record that the atomic bomb was born in imperialist America, and atomic light in the Soviet Union. Light versus destruction — what can be clearer or more eloquent than that fact!" "Remember this date. It will be defined as the start of a great industrial revolution, the significance of which is impossible even to imagine today."

That is how the foreign press commented on the news of the first atomic power station in the world, when it started up.

The era of atomic power began in the city of Obninsk, near Moscow, on June 27, 1954. A mere quarter of a century has passed, and now more than 130 atomic power stations (APS) are operating on earth....

The Soviet Union, although it possesses enough natural resources of oil and coal, is developing its atomic power industry at a surpassing rate. While the production of electrical energy increased 40 percent during the 9th five year plan (1971-75), APS electrical energy production grew seven-fold. In the 10th five year plan (1976-80), it will increase another five times.

Approximately 80 percent of electrical energy is consumed today in the European part of the country. The fuel resources here, however, amount to only a quarter of the nation's reserves. It is necessary to go farther and farther to the east and north. East of the Urals, new industries, mines, and quarries are being equipped and dams for hydroelectric power stations built. Day and night, hundreds of train-loads rush along thousands of kilometers of rail, a river of oil flows through steel pipelines, and the electricity from man-made waterfalls runs by cable — all from Siberia so that in the Ukraine, the central regions and the Baltic coast, factories can work and apartments be lit. More than 350 million tons of fuel (in standard units) annually is transported from the eastern regions to the western. All of this, of course, is not cheap. The cost of transport alone is billions of rubles. Yet the energy needs of our European industry continue to grow rapidly. A whole complex of problems in the national economy is presented. Where is the sword to cut this Gordian knot? Nuclear energy!

Just calculate: A one thousand megawatt(e) APS consumes 30 tons of low-enriched uranium in one year. For equivalent work, a thermal power station needs approximately 2.5 million tons of coal.... The economic effect (of putting to use new APS) is to save billions of rubles and free up hundreds of thousands of rail cars. The atom, in a manner of speaking, emancipates the power industry from the weaknesses of transport. Reactors can be built where it is best for the national economy, without worrying about the location of roads and resources.

Let us look at another aspect of the problem. Today petroleum products make up 60 percent of the national

fuel balance. Yet the expression "black gold" has ceased to be a casual newspaper phrase. On the world market its meaning is absolutely literal. And burning "gold" is an expensive pleasure. This is all the more so, because the successes of the chemicals industry have realized D.I. Mendeleev's dream of turning oil from fuel into an industrial raw material.

## *Ecologically Safe*

People do not forget (the atom's) first, malicious, profession. Strict control is maintained over it, and protective systems are constructed to guard against any unexpected events. At the fifth reactor under construction at the Novovoronezhsk APS, for example, the security system provides even for accidents whose likelihood is once in 10,000 to a million years.

Modern APS also have substantial advantages from the ecological standpoint. A one thousand megawatt(e) thermal power station emits hundreds of tons of combustion residue into the atmosphere and huge slag heaps rise beside it. Control measurements over many years show, on the other hand, that wastes from atomic reactors are a hundred times less than the permissible level and absolutely do not influence the environment.

Electricity is only the first and simplest step for the nuclear power industry. The 25th Party Congress set a number of tasks for expansion of this young branch of industry. First of all it is planned to use atomic reactors' capacity to heat cities and industrial plants. Today 25-30 percent of all fuel is spent on this. It is easy to see the economic and ecological significance of replacing boilers which run on coal and mazut with atomic heating.

The use of nuclear energy in metallurgy and the chemicals industry can be extremely beneficial. This opens the way to new, highly efficient technological processes. But first reactors must be created with heat conductors than can withstand 1000°C. This is a matter for the future, but the not so distant future.

## *The Next Generation — Breeders*

The potentials of the first generation of reactors are far from exhausted, but science is already proposing to go farther in practice. The next stage will be aggregates of a fundamentally new sort: using a fast-neutron chain reaction. They have tremendous advantages over the older reactors. The efficiency of fuel utilization will be tens of times higher. Previously inaccessible resources, such as the uranium in sea water, will be used industrially. These rapid reactors combine two processes: while burning fuel, they simultaneously breed new supplies of it.

In the Soviet Union, the Shevchenko breeder reactor on the Caspian Sea coast is already functioning. It produces not only electricity, but also heat, and is used for desalination of water. An even larger facility is under construction at the Beloyarsk APS. With the breeder, the atomic power industry has gotten its second wind.

In the twenty three years of the atomic power industry,

a huge scientific capability has been built up. Are we prepared in practice to implement the plans put forward?

"Unfortunately, not enough," is the opinion of A. Grigoryants, member of the directorate of the USSR Ministry of Power and Electrification. "We know the basic direction for the development of the atomic power industry... what to build and where to build it. But we must still proceed not so much from necessity as from what is possible. And that is limited. Having doubled the scale of its work, this branch of the industry is experiencing some difficulties with equipment for the APS. Some construction targets have had to be set back. Let me remind you: in the immediate future, no less than 10 thousand megawatts(e) capacity in nuclear reactors has to be built per year — more than in the entire 9th five

year plan. This means that the growth of atomic power capacity directly depends on machine building for the power industry."

The Minister of Machine Construction for the Power Industry, V. Krotov, says, "The program of atomic energy development requires an industrial base. Capital investments for this are growing over three-fold in the 10th five year plan. This is already giving tangible results. We place especially great hopes on the Volgodon factory complex 'Atomash', which will be the flagship of this branch of industry."

*Part II of Shilov's article will feature Atomash, the USSR's new plant for mass production of nuclear reactors.*