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EDITOR'S PAGE

WHERE SHOULD THE OIL SHALE POWER ENGINEERING BE DIRECTED?

The Estonian Republic owns great primary energy resources in the form of the fuel reserves. The most essential of them is oil shale. Well over 95% of electricity is generated from oil shale. Due to economic as well as social problems we lack seriously taken alternatives to oil shale power engineering in the near future. We cannot prognosticate exact lastingness of oil shale reserves, not knowing the electricity consumption and conversion efficiency of energy containing in oil shale. Therefore we should consider our task to use such technologies that guarantee maximal energy conversion efficiency. At the same time we cannot forget economic aspects and protection of environment.

Operating oil shale power plants use pulverized firing (PF) at atmospheric pressure combustion technology. Energy conversion efficiency in that case is determined mainly by the parameters of the steam entering the turbine. Due to the high corrosion activity of the oil shale ash formed at PF technology on boiler heat transfer surfaces, the steam temperature in power plants is low which considerably allows to increase lifetime of pipelines and equipment. At the same time the net thermal efficiency of a power plant is low – 28-29%. This value cannot be essentially increased by using other oil shale combustion technologies based on atmospheric pressure.

Oil shale power plants are short of equipment for cleaning flue gas from sulphur dioxide. Sulphur dioxide binding rate with oil shale ash in boiler's gas passes is not sufficient to decrease SO_2 to permitted level. Due to the high dissociation rate of carbonate minerals in oil shale, the formed CO_2 amount will be added to the CO_2 that is formed at burning of carbon.

The efficiency of an oil shale power plant can be sufficiently increased, at least up to 42-46%, using the pressurized fluidized bed technology. We can see that this technology has found a stable place in the world because of the consistent growth of operating as well as ordered devices based on that technology.

Using the fluidized bed technology (atmospheric as well as pressurized) the need for additional SO_2 absorbent and its input devices will fall out.

Due to the behaviour of carbonates at combustion there are two essential differences at pressurized burning of oil shale. Due to high CO_2 pressure in flue gas the direct thermal dissociation of carbonates does not take place, but they would par-

tially decompose as result of chemical reactions between carbonates, sulphur and sandy-clay minerals in oil shale. Caused by that the oil shale heating value increases and CO_2 emission into atmosphere decreases. Consequently the oil shale specific consumption decreases not only because of the increase in thermal power equipment's efficiency but also because of the increase in fuel's heating value.

Thermal Engineering Department (TED) has quite a long-time history of the teaching of specialists as well as of solving of the scientific and technological problems connected with utilization of oil shale in power plants. TED has very big and rich data bank on utilization of oil shale as well as other similar fuels.

It is essential to pass the knowledge from generation to generation. Thanks to the enthusiasts it has been successful so far. The future success depends not so much on Thermal Engineering Department as on the external factors that influence the Department.

In the present "Oil Shale" issue the reader can find a short overview on Thermal Engineering Department as well as on the results of scientific and implemented works of the last years, especially in the field of new technologies for combustion of oil shale.

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