

THE THIRD REPORT

THE NEXT REPORT IS A STUDY CASE ABOUT TWO ELECTRICAL PLANTS:

**Iron Gate I Hydroelectric Power Station
Bistra -Poiana Mărului- Ruieni- Poiana Rusca Hydroelectric Power
Station**

Iron Gate I Hydroelectric Power Station



The **Iron Gate I Hydroelectric Power Station** (Romanian: *Porțile de Fier I*, Serbian: Ђердап I, *Đerdap I*) is the largest dam on the Danube river and one of the largest hydro power plants in Europe. It is located on the Iron Gate gorge, between Romania and Serbia.

The project started in 1964 as a joint-venture between the governments of Romania and Yugoslavia for the construction of a major dam on the Danube River which would serve both countries. At the time of completion in 1972, it was one of the largest hydroelectric power stations in the world with twelve units generating 2,052 MW, divided equally between the two countries at 1,026 MW each.

The Romanian part of the dam was modernized and the nominal capacity of the six units was increased from 175 MW to 194.4 MW, thus giving an installed capacity of

1,166 MW and increasing the entire power generation capacity of the dam to 2,192 MW. On the Serbian part of the dam, modernization started in July 2008 and is still in progress; so far Unit 6 has been modernized, and revitalization of the remaining five is in the preparation phase. The units are being upgraded with the help of Russian company ОАО "Рязанский станкостроительный завод" (Ryazan Machine Tool Plant), as well as their subcontractors with the participation of eleven domestic companies. The Romanian side of the power station produces approximately 5.4 TWh annually, while the Serbian side of the power station produces 5.65 TWh.

The discrepancy in power output between the two halves is due to the generating equipment. While Romania's equipment is newer and thus more efficient (thereby generating more power), it is proving more unreliable; resulting in increased downtime for maintenance/repairs, and consequently lower annual power output overall.

The construction of the joint Romanian-Yugoslavian mega project that would finally tame the river commenced in 1964. In 1972 the Iron Gate I Dam was opened, followed by Iron Gate II Dam, in 1984, along with two hydroelectric power stations and two sluices.

The construction of these dams gave the valley of the Danube below Belgrade the nature of a reservoir, and additionally caused a 35 m rise in the water level of the river near the dam. The old Orșova, the Danube island Ada Kaleh (below) and at least five other villages, totaling a population of 17,000, had to make way. People were relocated and the settlements have been lost forever to the Danube.

The dam's construction had a major impact on the environment as well—for example, the spawning routes of several species of sturgeon were permanently interrupted.

That said, the flora and fauna, as well as the geomorphological, archaeological and cultural historical artifacts of the Iron Gates have been under protection from both nations since the construction of the dam. In Serbia this is done with the Đerdap National Park (since 1974, 636.08 km² (245.59 sq mi)) and in Romania by the Porțile de Fier National Park (since 2001, 1,156.55 km² (446.55 sq mi)).

The isle of Ada Kaleh is probably the most evocative victim of the Đerdap dam's construction. A Turkish enclave, it had a mosque and a thousand twisting alleys, and was known as a free port and smuggler's nest. Many other ethnic groups lived there beside Turks.

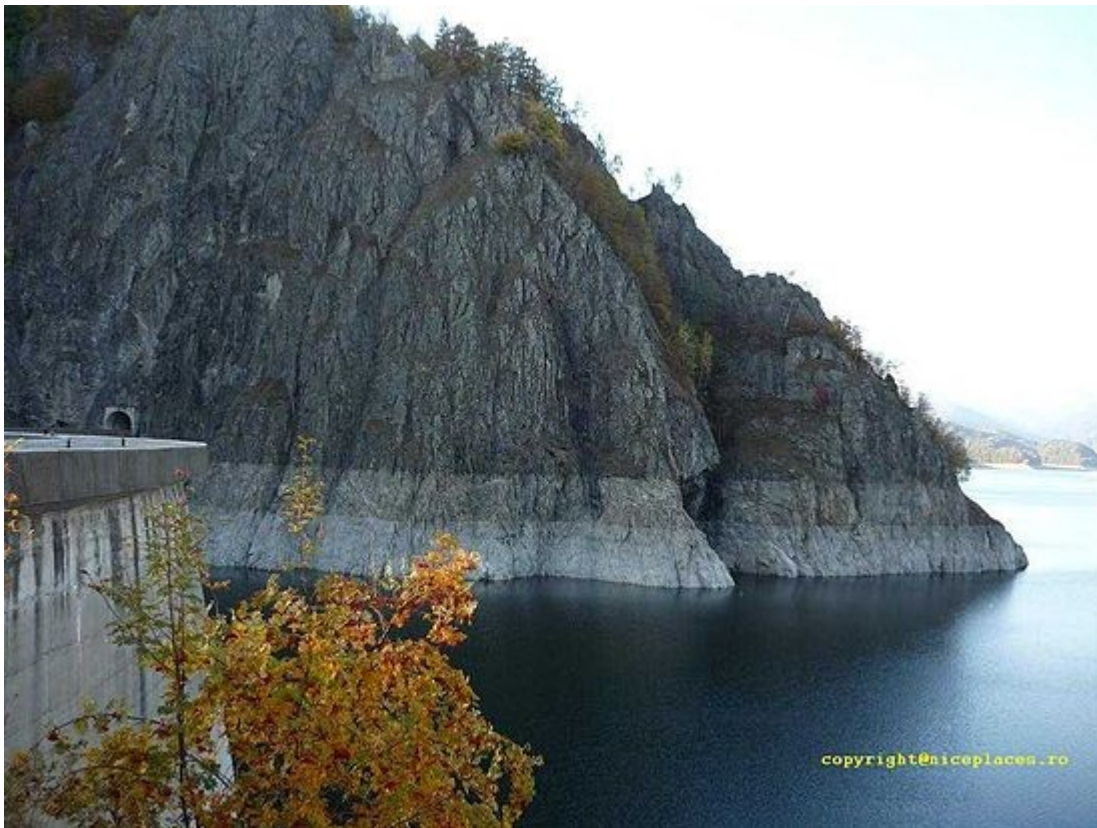
The island was about 3 km (1.9 mi) downstream from Orșova and measured 1.7 by 0.4-0.5 km. It was walled; the Austrians built a fort there in 1669 to defend it from the Turks, and that fort would remain a bone of contention for the two empires. In 1699 the island came under Turkish control, from 1716 to 1718 it was Austrian, after a four month siege in 1738 it was Turkish again, followed by the Austrians reconquering it in 1789, only to have to yield it to the Turks in the following peace treaty. Thereafter, the island

lost its military importance. The 1878 Congress of Berlin forced the Ottoman Empire to retreat far into the south, and the island came under the control of Austria-Hungary, though it remained the property of the Turkish sultan. The inhabitants enjoyed exemption from taxes and customs and were not conscripted. In 1923, when the Ottoman monarchy had disappeared, the inhabitants chose to join Romania.

The Ada Kaleh mosque dated from 1903 and was built on the site of an earlier Franciscan monastery. The carpet, a gift from the Turkish sultan, has been located in the Constanța mosque since 1965.

Most Ada Kaleh inhabitants emigrated to Turkey after the evacuation of the island. A smaller part went to Dobrogea, another Romanian territory with a Turkish minority.

2. Lake Vidraru Hydroelectric Power Station



Lake Vidraru is an artificial lake in Romania. It was created in 1965 by the construction of the Vidraru Dam on the Argeş River.

It lies in the shadow of the Făgăraş Mountains. A village lies submerged at the bottom of this lake.

Vidraru Lake is a lake, with 465 million cubic meters of water, with a length of 10.3 km and a width of 2.2 km, thus accumulating a total area of 870 hectares and maximum depth of 155 meters. Underground power station is situated in massive Cetatuia to a depth of 104 meters and can provide annual energy production of 400 GWh.

Vidraru Lake is a reservoir lake created in 1965 on the Arges River for electricity production.

Situated between the mountains and the Massif Ghitu brow, lake gathers the waters of rivers Capra, Buda and several direct tributaries (River Lady, and Valsan Cernatul, topology, Valea lui Stan and clear), with a total flow of about 5.5 m³ / s .

The total area of the lake is 893 ha, length of 10.3 kilometers, maximum width of 2.2 km in the Wolf Valley – mantis and a circumference of 28 km. Maximum water depth is 155 m high curved dam near 166 m with a length of 307 meters crown. Water volume is 465 million m³. The normal retention is 830.00 meters above sea level (mdM).

Vidraru dam construction took five years and a half starting in 1960 . For this achievement, it took 42 km of underground tunnels were excavated 1.768 million m³ of rock, of which about 1 million underground bands have 930,000 m³ of concrete of which 400,000 m³ underground and also were installed 6300 tonnes of electromechanical equipment.

On completion it was located, measured in height, approximately the 8th place in Europe and ranked 20th in the world.

In an average hydrological year, Vidraru hydroelectric power plant located underground, can produce approximately 400 GWh of electricity. It has an installed capacity of 220 MW.

The town of Curtea de Arges coming to DN1 (Cartisoara village, SB), the road passing through hydropower plant to Vidraru the dam, followed by right lake is spectacular Vidraru Transfagarasan (DN7C).