Background information

EXPORT OF NUCLEAR ELECTRICITY FROM RUSSIA TO FINLAND

INCREASES ENVIRONMENTAL RISKS IN REGION

Summary

The Russian company JSC Edinaya Energeticheskaya Sistema (Unified Energy System of Russia), in cooperation with the State Corporation on Nuclear Energy (Rosatom), is laying an underwater 1000 MW power cable from the new Leningrad nuclear reactor -2 (LNPP-2, under construction) on the south shore of the Gulf of Finland, to a point south of the city of Vyborg on the north shore. A public hearing of the environmental impact assessment (EIA) of the cable project was held in Sosnovy Bor in December 2011. On one hand the cable, according to the EIA, will increase the transfer capacity of electricity from Russia to Finland. On the other hand, the operation of the LNPP-2 (4×VVER 1200 reactors) has the chance to increase the risk of an accident for old LNPP (4×RBMK-1000 reactors), according to independent expert analysis. It will decrease the stability of the electricity transfer to Finland in winter time. The licenses of Rostekhnadzor (Russian regulator of nuclear safety) will provide the opportunity for the common operation of both old and new nuclear reactors at the Leningrad power plant from 2014 to 2026.

The new underwater electricity cable will increase the risk of accidents.

Increased electricity export from Russia will lead to environmental dumping, due to lower safety and environmental standards in Russia. It will also decrease environmental safety in the Baltic part of Russia by promoting prolongation of old and unsafe nuclear reactors.

For more information, please consult our web page www.decomatom.org.ru

Quick facts

Capacity

The cable will have a capacity of 1000 MW, and is capable of transporting electricity directly from 1 out of 4 units of VVER-1200 nuclear reactors of the New Leningrad NPP-2. The cable will bypass the limitations in the transmission lines around St Petersburg, and allow a more direct access to the international electricity market via Finland. In the last years Russian-Finnish transfer of electricity has been about 10-11 TWh/year. This is about the equivalent of the electricity production of the 2 oldest Chernobyl type reactors of Leningrad NPP. These reactors have received a license for the prolonged operation after reaching their 30 years design limit. This political decision was adopted without public participation and EIA.

Ownership

Russian JSC Edinaya Energeticheskaya Sistema (Unified Energy System of Russia) of the Ministry of Energy of Russia.

Location

The planned 1000 MW submarine HVDC[1] power link will go from Kernovo close to Sosnovy Bor in Leningrad Oblast (on the South side of the Gulf of Finland/Suomenlahti) to a point close to Vyborg on the north shore. The length of the cable is estimated to about 114 km, including 41 km on the bottom of the Gulf of Finland.

Investment needed

Total investment of the sub-sea cable alone is estimated to be 25 billions Rubles (630 million Euros).

Nuclear electricity export to Finland will increase the risk of accidents

The Leningrad nuclear power plant (LNPP) is located in Sosnovy Bor, the location of a nuclear site situated on the South Shore of the Gulf of Finland 40 km to the west from St. Petersburg and 100 km from Finland. There are no complete official analyses of the risk for the common operation of:

- 4 RBMK-1000 reactors of LNPP;
- 5 military reactors of the A.P. Alexandrov Research Institute of Nuclear Technology (NITI);
- Temporary LNPP wet storage, which has accumulated more than 40 000 units of spent nuclear fuel (SNF) rods. These fuel rods hold the equivalent of nuclear material in 25 RBMK-1000 reactors;
- Ecomet-S – the biggest (up to 10 000 t/year) plant for the melting of radioactive scrap metal in Europe;
- RosRao (former Radon) – the regional temporary radioactive waste storage, has accumulated 60 000 m^3 of low and middle radioactive waste;
- 4 units of reactors VVER 1200 in the new LNPP-2 with total capacity 8 700 MWe (under construction).
- Underground depository of (250 000 m3) of middle and low radioactive waste, (promoted by Rosatom to be constructed up to 2015), 1 km from the Baltic Sea.

One of the possible accident scenarios can be caused by the cooling system of the Leningrad NPP-2. The six cooling towers will emit daily 200 000 tonnes of steam. The steam condensation (including icing in winter time) on the transmission lines of respectively 750, 330 and 110 kV will seriously increase the risk of the destruction of the electricity transmission system from the old nuclear reactors of the Chernobyl type.. A failure in the electricity grid would cause emergency stops in all units of the reactors of the RBMK-1000 type. This will not only cause the loss of 4 GW generating capacity in winter time, but also risk of the loss of the outside electricity source to the cooling systems in the stopped reactors. This outside electricity source is provided by the Narva hydro power plant to the west of the LNPP, and is provided by a 110 kV transmission line.

The cooling towers of the new reactors under construction in LNPP-2 have an in-built risk to destroy one of the safety barriers of the old LNPP during electricity co-generation in winter time.

Several elements in the operation of Leningrad NPP make it possible to produce power at an unreasonably low cost.

The units of the Leningrad NPP are the oldest Chernobyl type (RBMK-1000) reactors in the world. Other newer reactors of this type in other countries are closed for safety reasons (3 RBMK-1000 units in Ukraine) or are now in the decommission phase (2 RBMK-1500 units in Lithuania). The reactors have a graphite moderator, which poses a fire risk, and does not have a complete secondary containment to prevent release of radioactive substances in the case of accident.

[1] HVDC = High Voltage Direct Current

All reactors at the Leningrad NPP reached their design time limit (30 years) of operation respectively in 2003, 2005, 2009 and 2011, but received, after retrofitting, licenses for continued operation for 15 more years.

The decision ofprolongation of operations was adopted without environmental impact assessment and public participation. This is in violation of Russian legislation and democratic standards.

Fresh fuel for RBMK-1000 is produced by reprocessing spent fuel from VVER-440 (Kola, Novovoronezh NPP) at the nuclear enterprise Mayak (Ural region of Russia). Liquid radioactive waste for reprocessing is discharged into natural water bodies. Radioactive contamination of aquatic ecosystems as a result of reprocessing is able to reach the seas of the Arctic Ocean through natural food chains, and will return with seafood to the tables of Europeans.

In the course of more than 39 years of the Leningrad NPP operation, a quantity of nuclear waste equivalent to more than 50 Chernobyl accidents has been accumulated in temporary storages on the Baltic shore. There is no reliable and economically justified technology for RBMK-1000 nuclear waste recycling.

Rosatom has started transport of the 40 000 spent fuel assemblies of the Leningrad NPP to the national dry SNF storage in the closed nuclear city ZATO Zheleznogorsk (Siberia). This is a policy of double environmental standard for one country. The double environmental standard means that the storage of nuclear waste that is considered unsafe in the western parts of Russia is forced upon the inhabitants of the eastern parts of the country, in the Ural region. This also represents a violation of human rights and is not based on a democratic system of decision-making.

During all the years of the Leningrad NPP operation, money for decommissioning of old reactors has not been allowed to grow as a separate fund. A reserve for decommissioning purposes was established some years ago, but the money is spent at once, with no accumulation.[2] Nuclear power plants do also not pay land rent for the area they use.

Despite Russian legislation, the water-intake facilities of the Leningrad NPP operate without fish protection devices. That is why hundreds of million Baltic fish die annually in the cooling system. The damage has been evaluated to represent millions of Euros (average) per year.

In conclusion, the planned nuclear electricity export from the South shore of the Gulf of Finland will have negative consequences and increase the environmental risks for different regions of both Europe and Asia.

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[2] For more information on decommissioning financing, please consult "Status of Russia's decommissioning fund": http://www.decomatom.org.ru/eng/Plans/index.htm