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CURRENT STATUS AND PROSPECTS OF "SOUTH KURIL" ENERGY COMPLEX

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"South Kuril" energy complex of diesel power plants (DPP) provides electricity to urban village Kurilsk South, located on a peninsula Kunashir Island (South Kuril Islands) with a population of approximately 6,500 people. Block diagram of the energy complex DES "Southern Kurils," is shown in *Figure 1*.

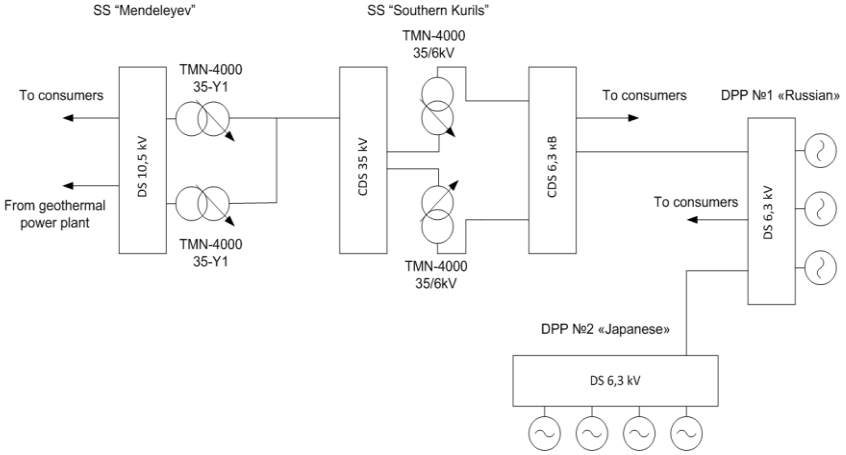

Figure 1. Block diagram of the energy complex "Southern Kuril"

Generating capacity of the energy complex DES "Southern Kuril" represented by two diesel power plants DES №1 «Russian" (2400 kW) and DES №2 «Japanese" (3200 kW) and two power module geothermal power plant GPP "Mendeleev (3600 kW).

In the energy complex also includes a substation: "Southern Kurils", "Mendeleyev".

At the substation "Southern Kuril" there are two switching substations (RU-10.5 kV and RU-35 kV) and two transformers TMN-4000/35/11.

PS "Mendeleyev" also has two switching substations RU-6.3 kV and RU-35 kV and two transformers TMN-4000/35/6.

PS " Mendeleyev" and PS "Southern Kuril" interconnected single circuit transmission line formed on a voltage of 35 kV steel rain-forced aluminium wire AS-120 length 12370 meters.

The total capacity of the load on the DES in the winter can put a 5000-kW.

To avoid interruption in the electricity supply to consumers in South Kurilsk by reasons of possible failure of outdated equipment, it is necessary to solve the problem of replenishment of the existing power complex new power sources electricity. This problem was solved in qualifying work for Bachelor's Degree.

In this paper we propose the construction of a diesel modular plant, the construction of which and its connection to the existing power system of South Kurilsk can be put into operation; in the shortest possible time. The proposed solution will provide maintenance electrical requirements village and the possibility of decommissioning worn, economically inefficient equipment power sector.

The following major decisions on design are made.

Considered three options for the construction of DES eight generators with a capacity of 315 kW, five generators with a capacity of 500 kW, four generators with capacity of 700 kW. The least-cited annual costs was adopted last option.

Summation of power generating set is carried out on the busbar projected unit RU-6.3 kV. The simplest and most reliable electrical circuit on the side of 6-10 kV is one busbar system [1].

Currently voltage switchgear 6 ÷ 10 kV are available as complete. Considered the following CRU: CRU series K-66, CRU series TEL, CRU "Classics" series D-12P [2]. The last device was taken into account.

The main advantage of CRU roll-out execution is fast interchangeability of devices mounted on the trolley, which is especially important for electricity generating and responsible plants [3].

Connecting the generator sets to the buses is provided by vacuum switches input cells generated voltage switchgear. In the CRU D-12P installed vacuum switches BB / TEL [4].

Switch BB / TEL has the following advantages: high mechanical and switching resource, small size and weight, low energy consumption for control circuits, no need repair during the entire period of service, reasonable price. After calculating the current regime and prolonged phase short-circuit currents are selected switches BB / TEL-10-12,5 / 630-U2.

The role of the bus and line disconnectors is to operate isolating contacts primary connections plug-in type, the fixed part which is installed in the body of the cabinet, and the mobile - on the trolley. Lack of disconnectors and use them instead of special sliding contacts plug type can increase the reliability and usability of their cameras engineering service.

Outdoor network 6 kV cable provided power lines routed from generators diesel generator sets of modular type to cells entering the generator voltage switchgear 6,3 kV, and two lines routed from the projected 6.3 kV switchgear assembly DES to 6.3 kV switchgear substation "Southern Kuril" in order to preserve the existing power connections energycomplex and in hut-content of overload feeders DES №2 "Japanese".

Block diagram of the energy complex DES "Southern Kurils," with the inclusion of its structure projected DES is shown in *Figure 2*.

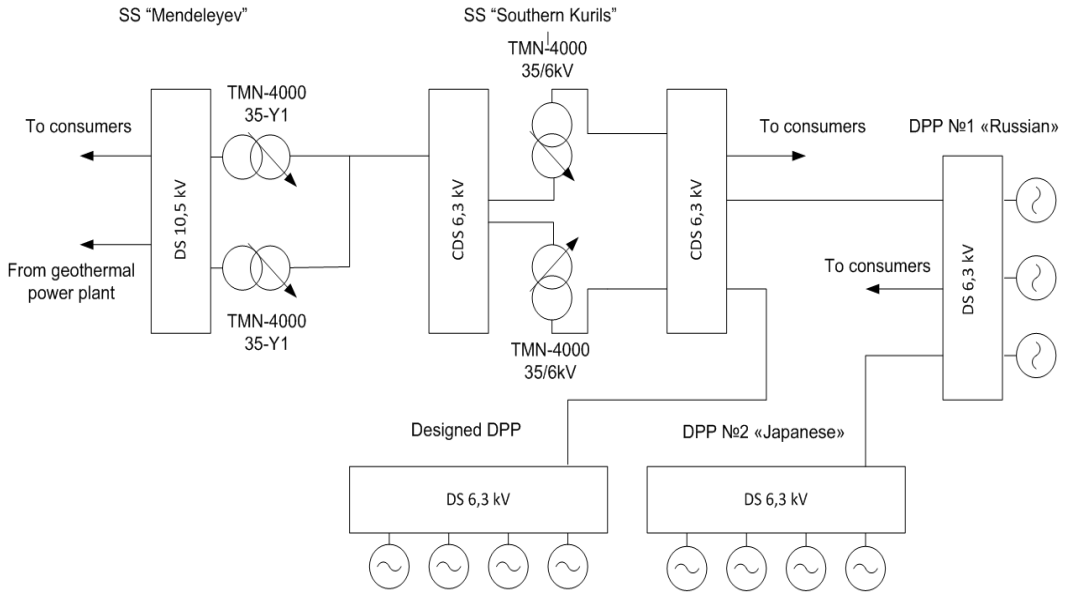

Figure 2. Block diagram of DES "Southern Kuril" designed with DES

Adopted solutions provide the possibility of extradition to the distribution network of the sum-total power projected DES and DES №2 "Japanese"; the possibility of extradition to the distribution network system power either of the two stations at the second off; the possibility of withdrawal from the network at any of the two half-sets designed DES, with the possibility of issue to the network 50% of rated power plant.

His solution allows providing systematic technical activities service station equipment and as a result, improving maintenance.

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CONTROL, MONITORING AND DIAGNOSTICS SYSTEM OF THE TRANSFORMER EQUIPMENT OF "PERESVET" SUBSTATION

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There is an active growth of electricity consumption in all areas of power industry. The increase influence of this economic factor at the used difficult and expensive transformer equipment resulted in need of maximizing use of its resource.

The transformer equipment is a responsible element of any electric network. Its work is influenced as external influences (storm and switching an overstrain, increase of working tension, seismic influences, overloads, etc.), and by the internal defects of a design formed as a result of its operation (burning out of rounds owing to is long not disconnected KZ on the party of NN, a core overheat at emergence of a contour of KZ, a contamination of tubes of a cooler, violation of contacts, etc.).

For continuous control of a condition of the transformer equipment and finding of these or those defects the set of methods of diagnosing is used [2]. For example,