

POWER PLANTS FOR NAVAL SHIPS, COMMERCIAL VESSELS & OCEAN ENGINEERING STRUCTURES

UNDERGROUND NUCLEAR THERMAL POWER STATIONS

The Krylov Institute has developed proposals for design of nuclear thermal power stations based on a ship reactor with underground placement of all radiation hazardous equipment. They are intended for the regions of Russian Federation with concentrated oil and gas development, trunk pipeline transport

systems for oil and gas transfer. Standard wells are supposed to be used as underground structures.

This power plant may consist of self-contained power units with electric and heat capacity of each unit being up to 75 MW and 100 Gcal/h, respectively.

Proposed nuclear thermal power stations with underground placement of radiation hazardous equipment ensure better

protection and environmental safety as compared to the above-ground NPS and TPS on organic fuel. These nuclear power stations possess the following advantages:

- ✓ No release of harmful products to the environment during operation;
- ✓ In case of internal accidents, hazardous substances are localized in the sealed underground compartments;
- ✓ At any external impact on the power plant site, all radiation hazardous equipment inside the well is protected similar to missile launching silo and remains intact.

The power potential of one nuclear fuel charge (lifetime of reactor core is 3-5 years) eliminates a necessity for regular delivery of energy carriers, which is crucial in case of organic fuel long-distance supply, or lack of all-year-round operating transport arteries. With respect to the trunk gas lines, conversion of gas compressors from gas turbine (when up to 20% of transferred product is consumed at gas transfer for thousand km) to electric drive enables to save tens of billion cubic meters of gas, which is of high value for export as raw material.

In the above regions the first cost of electric and thermal power for such NPS will be substantially lower as compared to the power received from organic fuel.

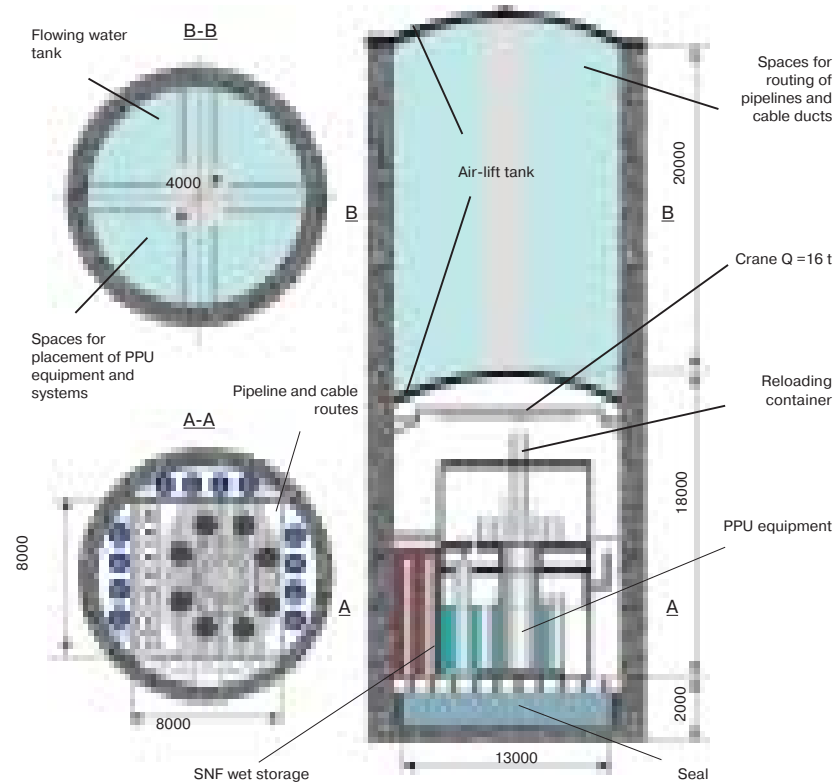
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AUTOMATIC EXPLOSIVE DETECTION SYSTEM "SOVA 01"

This system is designed for identification of suspicious objects and inspection of personnel and visitors belongings in the specially protected buildings aimed at detection of possible explosives. It may be used at entry checkpoints of government buildings, offices of major companies, banks, post offices, enterprises of nuclear industry (in the latter case, a channel for detection of fissionable and radioactive materials is additionally installed). The whole process is completely automated except for delivery of inspected objects to the measuring chamber. This system provides assessment of detected explosive mass and location in the object under check.



"SOVA 01" plant. General view



Layout of basic NPP PPU equipment