We offer a complete production cycle: from designing to fabrication at our own plant, fitting out with automatics, mounting and rendering maintenance service.

Our products are developed and fabricated in compliance with international standards and regulations for the use of nuclear energy.

Our primary goal is to provide high-quality custom-tailored products within the specified deadlines.

SOSNY R&D Company was set up in 1992 in Dimitrovgrad, Ulyanovsk Region

The Company's main activities are development of equipment and provision of services in the area of nuclear industry and technologies.
What do we offer?

Equipment and automated systems for nuclear facilities including:

- equipment for nuclear fuel fabrication,
- equipment for spent fuel reprocessing,
- VVER SFA inspection and repair stands,
- non-standard equipment and systems for research reactors,
- radiation monitoring and criticality accident alarm systems,
- automated equipment for non-destructive examinations of spent nuclear fuel.

Nuclear and radiation safety analysis, design and thermal calculations of the equipment and technologies.

Technologies and equipment for handling the spent fuel including non-conforming and damaged one.

Nuclear material shipping arrangement including development and justification of safe transport plans. Equipment for the spent fuel loading and transportation.

Services for decommissioning of radiation-hazardous facilities.
The Company has a staff of 320 people, 225 of them having a university degree. Of those, two are doctors of technical sciences, seven are PhDs and eight are research fellows. The average age of the staff is 42 years.

**Design Engineering Department**
- development of design documentation,
- the developer's supervision of equipment fabrication,
- participation in mounting, adjustment, testing, start-up activities,
- the customer's personnel training in operation of equipment

**Automatics Department**
- development and fabrication of automated systems for process/equipment monitoring and control, radiation monitoring, emergency alarm, communication and video surveillance

**R&D and Safety Analysis Department**
- research and engineering support to equipment development,
- nuclear and radiation safety analysis of equipment and technologies,
- design analysis of equipment,
- thermal and hydraulic studies,
- experiments to verify calculation models

**Engineering Support Division**
- general arrangements of contractual work,
- preparation and implementation of equipment tests, delivery and integration of the equipment into the customer’s production process,
- development of process documentation for equipment,
- radioactive material shipping arrangements
The Pilot Production Facility (PPF) was set up in 2014. The total production area is 3150 m², the staff is 125 persons. The PPF includes Engineering Service, Procurement Department, Machining Workshop, Non-Standard Equipment Fabrication Workshop, and Process Support and Repair Department.

The manufacturing quality of the products are monitored by the Quality Control Department throughout the process with non-destructive methods (visual examination, dimensional measurements, penetrant flaw detection, ultrasonic and radiographic analysis, gaseous and liquid leak detection, optical emission analysis of chemical compositions of metals and alloys).
SOSNY R&D Company furnishes services to nuclear energy sector enterprises almost at all stages of the nuclear fuel cycle, i.e.

- nuclear fuel manufactures,
- nuclear power plants,
- research reactor facilities and scientific centers,
- the industry's transport infrastructure,
- spent nuclear fuel reprocessing facilities.

Among our customers are ROSATOM State Atomic Energy Corporation, ROSENERGOATOM Concern, Mining and Chemical Combine (MCC), Siberian Chemical Combine (SCC), TVEL Fuel Company, National Research Center "Kurchatov Institute", Bochvar High-Technology Scientific Research Institute for Inorganic Materials, Khlopin Radium Institute, Mayak Production Association, Institute for Physics and Power Engineering, IAEA, U.S. DOE, ČEZ a. s. (the Czech republic), CNEIC (China) and many other Russian and foreign enterprises.
SOSNY's quality management system meets ISO 9001:2008 requirements and is confirmed by International Certificate of Registration 22739 issued by National Quality Assurance Limited (NQA), Great Britain.

In addition, SOSNY R&D Company has introduced:

- an Environmental Management System as conforming to ISO 9000 series requirements. Certificate E 844;
- an Occupational Safety and Health Management System as conforming OHSAS 18001 requirements. Certificate H 5475;
- Safety Culture Policy.

SOSNY R&D Company has all necessary licenses for development and fabrication of equipment for nuclear facilities.
References:

Equipment for Nuclear Fuel Fabrication

Shielded glove boxes for MOX fuel fabrication complex at the Mining Chemical Combine, Zheleznogorsk

Pressure – 200 Pa
Oxygen and moisture concentration below 50 ppm

Minimum in-box vacuum pressure – 200 Pa

Inert atmosphere glove boxes for nitride fuel fabrication

The equipment was developed for the Fabrication/Refabrication Plant of the Pilot Demonstration Power Complex at the Siberial Chemical Combine, Seversk
Pressing units for pressing fuel discs and pellets

Operating furnace temperature - 1650 °C

References:

Presses jointly developed with CHAMPALLE SAS, France

The pellet pressing unit is equipped with a pneumatic gripper, scales and a laser micrometer for pellet weight and height measurements

Pusher furnace for sintering nitride fuel pellets

Operating furnace temperature 1950 °C. Three-zone gas atmosphere

Horizontal-type pusher sintering furnace for carbothermal synthesis of U and Pu nitrides

Furnaces jointly developed with GKMP R&P Company, Russia and ECM Technologies, France

The equipment was developed for the Fabrication/Refabrication Plant of the Pilot Demonstration Power Complex at the Siberial Chemical Combine, Seversk

Equipment for Nuclear Fuel Fabrication

The equipment was developed for the Fabrication/Refabrication Plant of the Pilot Demonstration Power Complex at the Siberial Chemical Combine, Seversk

Pressing units for pressing fuel discs and pellets

High-temperature furnaces
References:

Equipment for Nuclear Fuel Fabrication

The equipment was developed for the Fabrication/Refabrication Plant of the Pilot Demonstration Power Complex at the Siberial Chemical Combine, Seversk

Equipment for incoming control and preparation of fuel rod components

Equipment for heat treatment and leak testing of fuel rods

The equipment includes vacuum dryers to dry the pipes and components, equipment for assembling the fuel rods, tables and racks, boxes for cold and hot leak tests by mass spectrometry in a vacuum chamber, equipment to receive and accumulate the fuel rods, the equipment to transfer the fuel rods for heat treatment and leak tests, vacuum chambers, a local control system, etc.

Equipment for automated fuel rod assembling line
Equipment for VVER Spent Fuel Reprocessing

References:

Equipment for FA cutting cell in the line of research cells

Fuel rod cutting facility

SFA knock-down facility

FA chopping and fragmentation facility for FA Chopping and SNF Voloxidation Division

The equipment was developed for the Experimental Demonstration Center at the Mining Chemical Combine, Zheleznogorsk
Voloxidation facility for FA Chopping and SNF Voloxidation Division

The facility accommodates all fragments of one VVER-1000 SFA

Centrifugal extractors for the Extraction Cycle 1 Division

The extractors can operate either in the parallel or serial modes

The division comprises an annular pulsed reciprocating plate continuous extraction column, assemblies of mixer-settlers, separators, catalytic uranium recovery columns, various tanks, heat-exchangers, dispensing and force pumps, a control system.

The equipment was developed for the Experimental Demonstration Center at the Mining Chemical Combine, Zheleznogorsk

References:
Equipment for VVER Spent Fuel Reprocessing
References:
Equipment for VVER Spent Fuel Reprocessing

This equipment ensures a full cycle of continuous RW treatment during the period of up to 300 days per year.

The equipment was developed for the Experimental Demonstration Center at the Mining Chemical Combine, Zheleznogorsk.

SRW drying facility
SRW welding facility

Transport system elements

Equipment for SNF and RW treatment
References:
Equipment for VVER Spent Fuel Reprocessing

- Decontaminable and remotely controlled manipulators
- Bridge-type manipulator
- Ancillary tools to extend capabilities, i.e., an electric wrench, power cutting pliers, an angle grinder, etc.
- Manipulator with a protective enclosure
- Three-jaw grip of the manipulator arm
- Power manipulators for maintenance of in-cell equipment

The equipment was developed for the Experimental Demonstration Center at the Mining Chemical Combine, Zheleznogorsk.

www.sosnycompany.com
References:

Equipment for Nuclear Power Plants and Research Reactors

- Inspection and repair stands for non-destructive examinations of the spent nuclear fuel in NPP storage pools
- Measuring system
  - Visual examination and video recording, dimensional measurements of SFA and its elements, cladding leak detection, extraction of a leaky fuel rod, its examination and EC flaw detection
- Automated system for non-destructive examinations of BN-800 fuel and absorber rods
- Measurements of cladding OD, gamma emission rate distribution throughout the fuel rod, EC flaw detection, cladding thickness measurements
- Automated system for O.D. measurements and eddy-current flaw detection of fuel rods up to 1500 mm in length
- Equipment for non-destructive examinations of fuel elements from fast reactors
References:

Equipment for Nuclear Power Plants and Research Reactors

Equipment and systems for Neutron Source Facility at Kharkov Institute of Physics and Technology, Kharkov, Ukraine

Subcritical assembly tank

Neutron generation target

Beryllium and graphite reflectors

Storage pools for irradiated fuel assemblies and targets

Transfer casks for irradiated SFA and targets

Fuel handling machine

ARMS and CAAS
References:

Equipment for Nuclear Power Plants and Research Reactors

TK-S-PIK packaging for fresh FA transportation

Type A package

Air-tight and ventilated canisters for SFA
Equipment for handling the canisters
Baskets for TUK-19 casks

Irretrievable cans for HL SRW

Cans for IL SRW and a handling grapple

Reprocessable together with SFA

Container for LL SRW

Equipment for transportation of TUK-19 packages

Transfer cask for IL SRW

Capacity – 350 kg

Non-standard equipment for the PIK research reactor complex,
Petersburg Nuclear Physics Institute of NRC Kurchatov Institute,
Gatchina, Russia
References:
Procedures and Equipment to Prepare SNF for Shipment

Working platforms with video surveillance, lighting and radiation monitoring systems

Equipment and tools for handling the SNF and canisters

The set of equipment includes grapples, tilters, drills, saws, water suction units, manipulators, etc.

Working platforms are designed with account taken of the site peculiarities
The SNF-containing canisters are dried up with electric heaters installed in the heating modules. Configuration of the heaters corresponds to the type of the canister.

Automated transfer casks for top loading of RR SFAs, liquid spent fuel canisters and the MNSR core into TUK-19 and SKODA VPVR/M casks, etc.

References: Procedures and Equipment to Prepare SNF for Shipment

SNF drying facility

Transfer casks and ancillary equipment
References:
Spent Fuel Transportation Equipment

In designing canisters for interim storage and transport of non-conforming spent fuel, the fire and explosion safety receives particular attention.

Canisters, ampules and baskets for interim storage and transportation of spent nuclear fuel.

Type C package for transportation of radioactive materials including liquid SNF with no activity limits.

TUK-145/C for transportation of radioactive materials by conveyance

The rail transporters were fabricated in cooperation with Tver Central Design Bureau of Transport Engineering (TSKB TM), Moscow Rail Research Institute (VNIIZHT), Moscow and Bryansk Machine-Building Plant (UK BMZ).

The TK-E-140 rail transporter has the European-standard bogie 02-BM.

TUK-140 and TUK-1410 casks for VVER SFAs and on-site transfer of TK-13 or TK-13/1 casks.

Railway transporters for transportation of TUK-140 and TUK-1410 casks.
References:

Technologies for Decommissioning of Radiation-Hazardous Facilities

Comprehensive engineering and radiation survey of Radiation-Technological Complex at Foton JSC

Dismantling of the INN-3M reactor vessel, its removal from the building using dedicated supports and a ramp, pouring with concrete before disposal

Cutting of oversized equipment, clearing off contaminated surfaces of the walls and floor.

SRW fragmentation and packaging, characterization of SRW packages

The work was done in cooperation with the Institute of Nuclear Physics of Academy of Sciences of the Republic of Uzbekistan

Management of decommissioning activities at FOTON Radiation-Technological Complex housing the INN-3M reactor in Tashkent, Uzbekistan

In 2018, the RTC site was released from regulatory control
Knowledge of properties and behavior of the spent fuel from research and power reactors.

Experience in developing technologies and procedures for handling spent nuclear fuel of various types and health including the damaged one.

Experience in design and manufacture of equipment and automated systems for NPPs, research centers and other nuclear fuel cycle facilities.

Experience in design and manufacture of equipment and automated systems for the nuclear fuel fabrication and SNF reprocessing.

Production capabilities, up-to-date equipment and skilled personnel.

Services for the full cycle of equipment development, manufacture, commissioning, and after-sales services.
Thank you for attention!

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