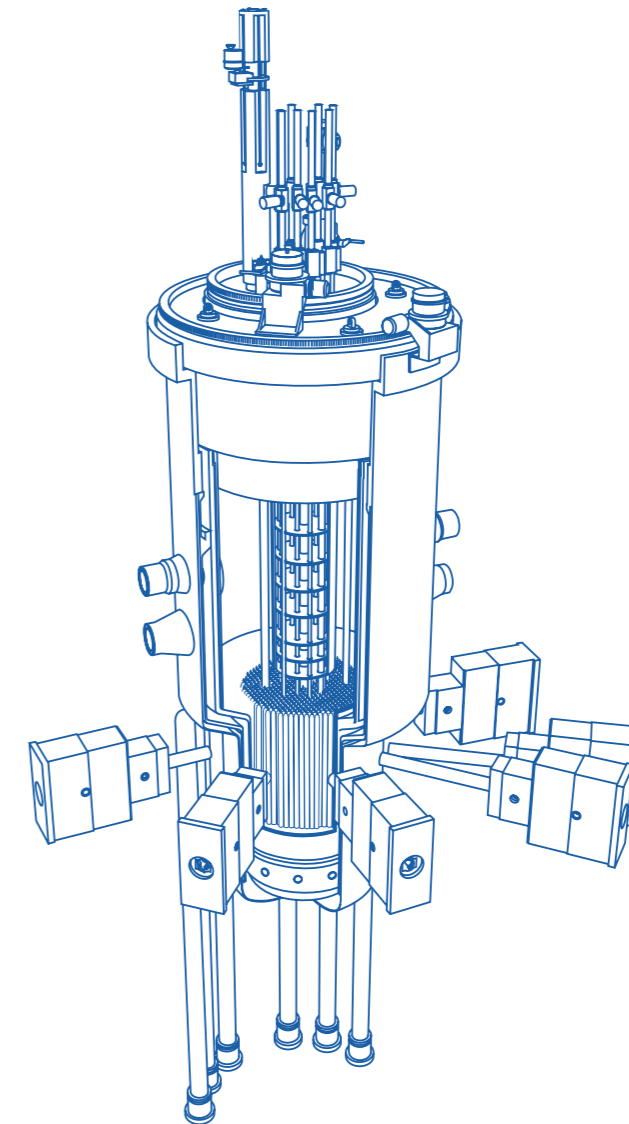
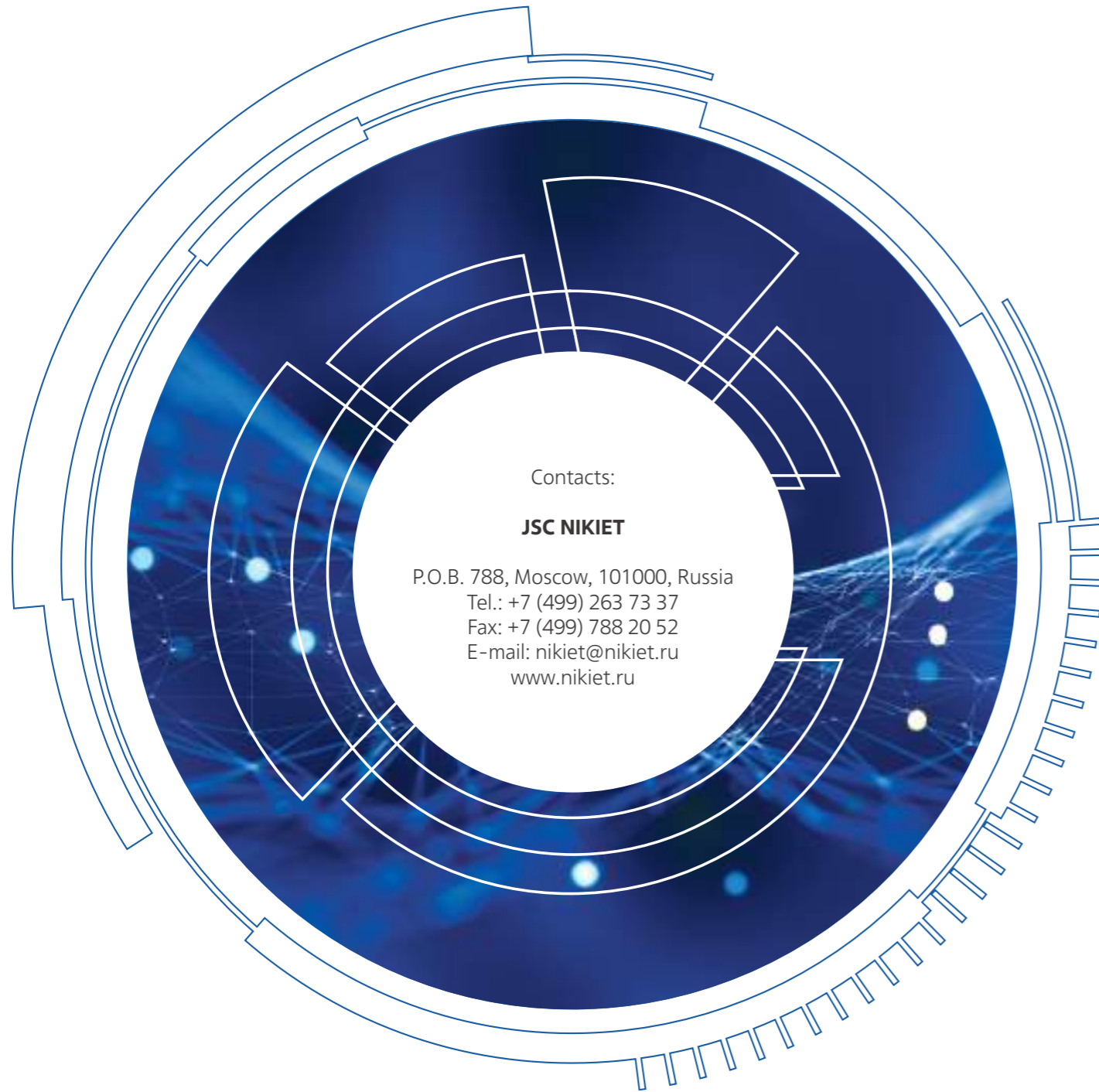




NIKIET  
ROSATOM

# MBIR MULTI-PURPOSE FAST RESEARCH REACTOR TO SUPPORT THE DEVELOPMENT OF INNOVATIVE TECHNOLOGIES OF THE 21<sup>ST</sup> CENTURY



# MULTI-PURPOSE FAST RESEARCH REACTOR MBIR

Thermal power, MW.....	150
<b>Electric power, MW</b>	
– district heating.....	no less than 40
– condensation mode.....	no less than 50
Maximum neutron flux, $\text{cm}^{-2}\cdot\text{s}^{-1}$ .....	$5.3\cdot 10^{15}$
Primary coolant.....	sodium
Heat transfer arrangement.....	three loops, two circuits
Fuel.....	mixed uranium-plutonium oxide
Service life, years.....	50

## EXPEREMENTAL DEVICES

### Loop facilities:

- with a loop channel in the reactor core center,  $\text{Ø}$  100 mm,  $\Phi_n$  up to  $4.9\cdot 10^{15} \text{ cm}^{-2}\cdot\text{s}^{-1}$
- with a loop channel in the reflector – 2 pcs,  $\text{Ø}$  100 mm,  $\Phi_n$  up to  $1.3\cdot 10^{15} \div 2.1\cdot 10^{15} \text{ cm}^{-2}\cdot\text{s}^{-1}$

### Working fluids in loop channels:

- liquid metals
- gas
- molten salts

### Vertical experimental channels

Outside the reactor vessel – 6 pcs, up to  $\text{Ø}$  350 mm, 2 pcs,  $\text{Ø}$  38 mm,  $\Phi_n$  up to  $0.5\cdot 10^{14} \text{ cm}^{-2}\cdot\text{s}^{-1}$

### Horizontal experimental channels

Outside the reactor vessel – 6 pcs, up to  $\text{Ø}$  200 mm,  $\Phi_n$  up to  $0.5\cdot 10^{14} \text{ cm}^{-2}\cdot\text{s}^{-1}$

### Experimental channels

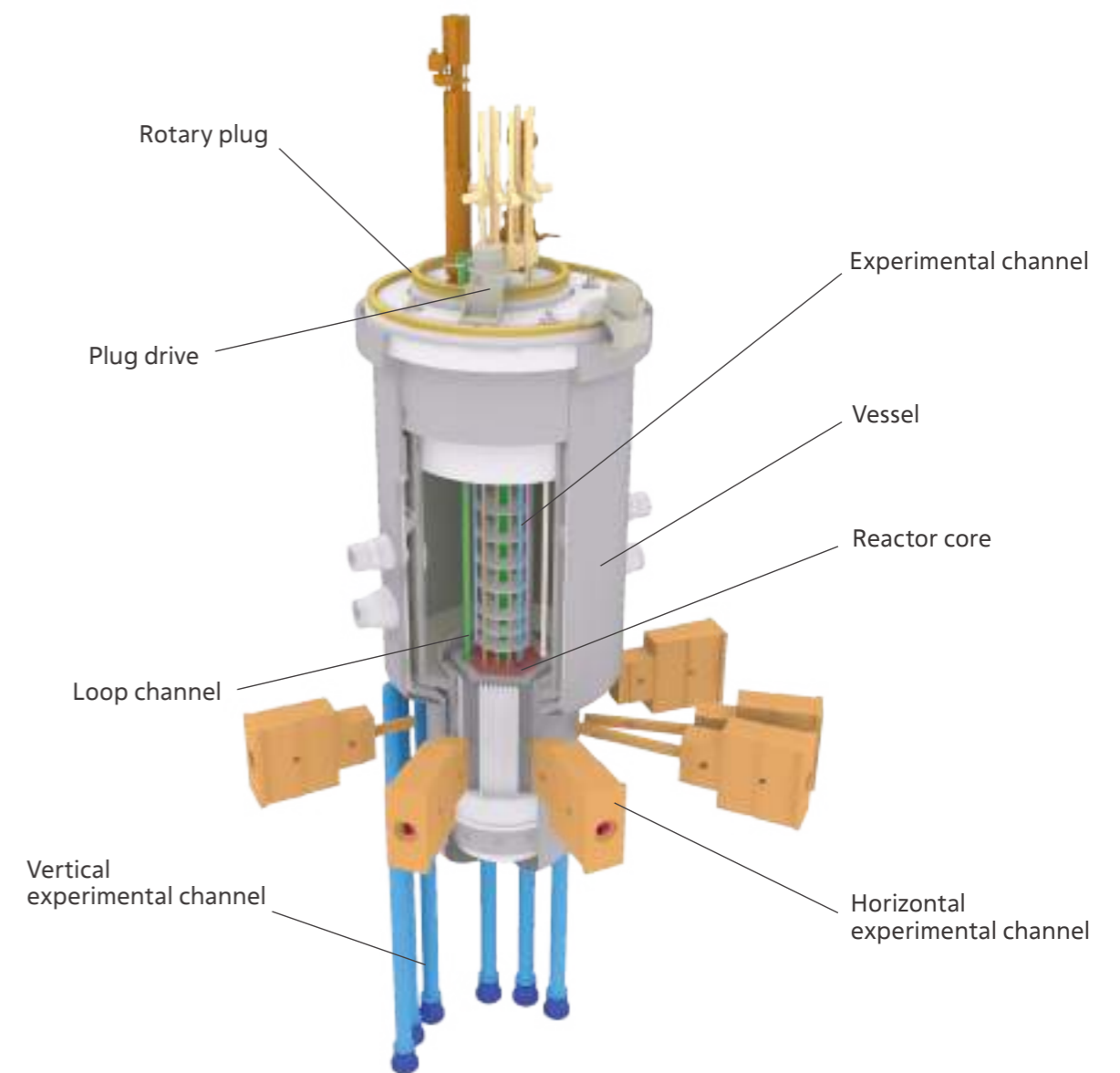
Inside the reactor core – 3 pcs, size across flats 72.2 mm,  $\Phi_n$  up to  $4\cdot 10^{15} \text{ cm}^{-2}\cdot\text{s}^{-1}$

### Material test and isotope producing assemblies

Inside the reactor core – 14 pcs, size across flats 72.2 mm,  $\Phi_n$  up to  $4.7\cdot 10^{15} \text{ cm}^{-2}\cdot\text{s}^{-1}$  (instead of ED mock-ups)

## APPLICATIONS

- Radiation testing of structural materials
- Study of nuclear fuel and absorbers
- Optimization of the reactor core component operation modes
- Transient, cyclic and emergency testing
- Study of liquid metal coolants
- Power generation
- Studies for verification of computational codes
- Testing and approval of new types of innovative instruments and tools
- Closed nuclear fuel cycle studies
- Production of radioisotopes and modified materials
- Use of neutron beams for medical purposes



Deployment site – JSC SSC RIAR, Dimitrovgrad