



NIIAR

ROSATOM STATE CORPORATION ENTERPRISE

Research Capabilities of RIAR as the Basis of IAEA ICERR and Future Sustainable Development of Fission & Fusion Reactor Technologies

Alexander TUZOV

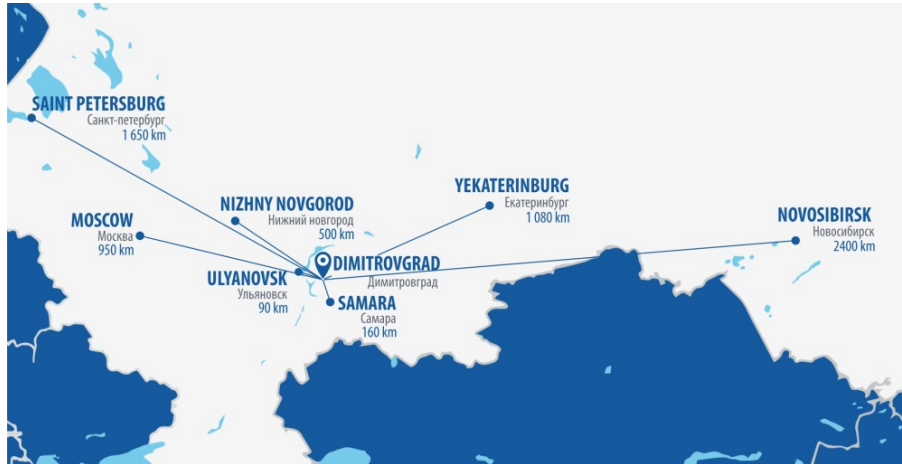
Director

ATOMEXPO-2018, Sochi

May 14th, 2018



General Information



Foundation: March, 1956

Destination: two closely-located airports connected by direct flights with main hubs – Samara (120 km) and Ulyanovsk (75 km)

Staff: 3 200 persons (incl. ~400 researchers)

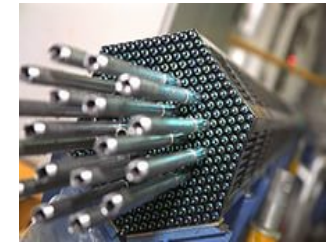
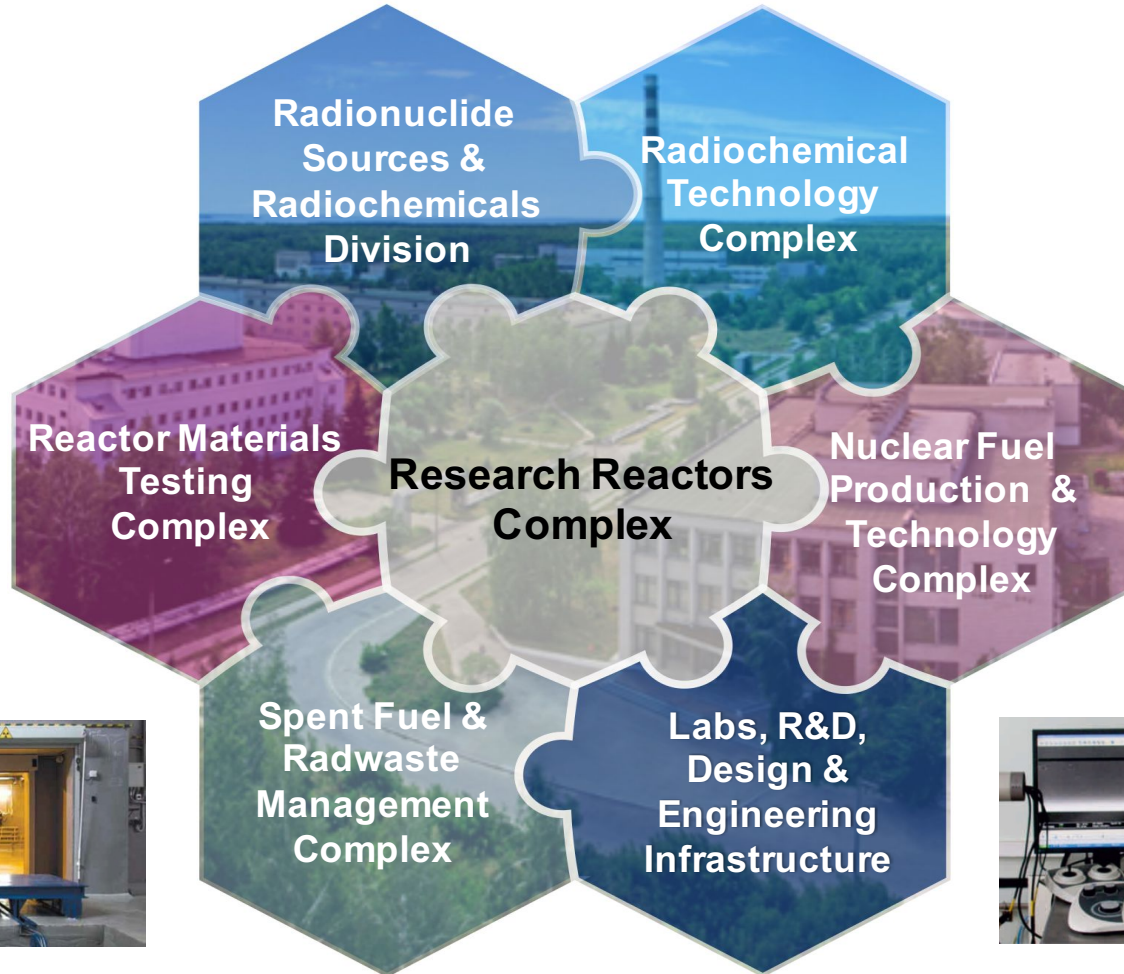
Customers from more than **25 countries**

Overseas Portfolio: more than **\$60M**

Main Activities:

- Reactor fuel testing including transients and condition III – condition IV
- Post-irradiation examinations including full-size fuel assemblies
- Closed NFC-related research studies
- R&D and production of radionuclides, radiation sources and TRU elements
- Nuclear fuel production, SNF and RA waste management, treatment of MA

RIAR: unique site with powerful research infrastructure



Self-sufficient R&D and production complex allows to provide our Customers with full-scale hi-tech services and meet all their requirements

Current International Cooperation



Signing of the long-term contract for irradiation of absorbers samples between RIAR and CEA (France)

- Development of international R&D cooperation and foreign activities is one of the top RIAR's priorities
- R&D services and high-tech production for Customers from more than **20 countries**
- More than **15 long-terms R&D contracts** and **more than 50 contracts for isotopes supply**
- RIAR's portfolio of R&D service and isotope supply contracts is **more than \$60M**

- More than **150 visitors** annually
- **Up to 5** International and Regional R&D Conferences annually arranged by RIAR
- RIAR's scientists represent the Russian nuclear industry on different high-level groups, expert panels and workshops (IAEA, NEA OECD, HOTLAB, CIS Research Reactor Coalition, Intergovernmental Commission etc.)



Visit of DG of NEA OECD, 2017

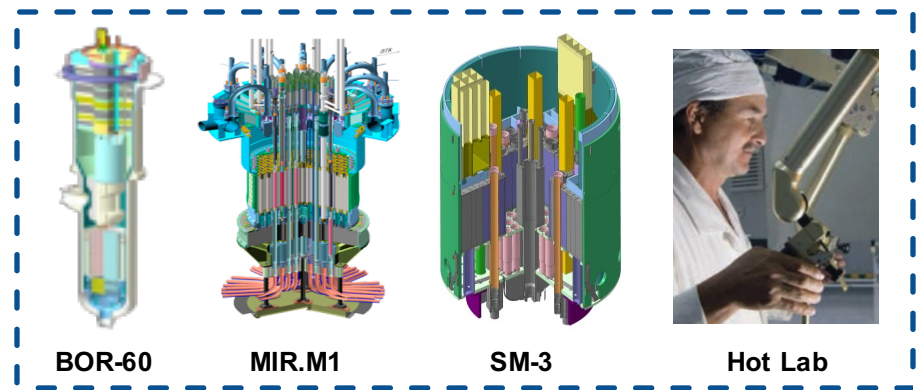


- Application to IAEA ICERR status was strongly supported by ROSATOM
- Designation of RIAR as the IAEA ICERR confirmed its worldwide recognition as a reputable research organization
- Facilitated access to RIAR's research infrastructure for Member States

Official ceremony of RIAR Designation as IAEA ICERR
(IAEA 60th General Conference, September 26, 2016)

Perimeter of ICERR:

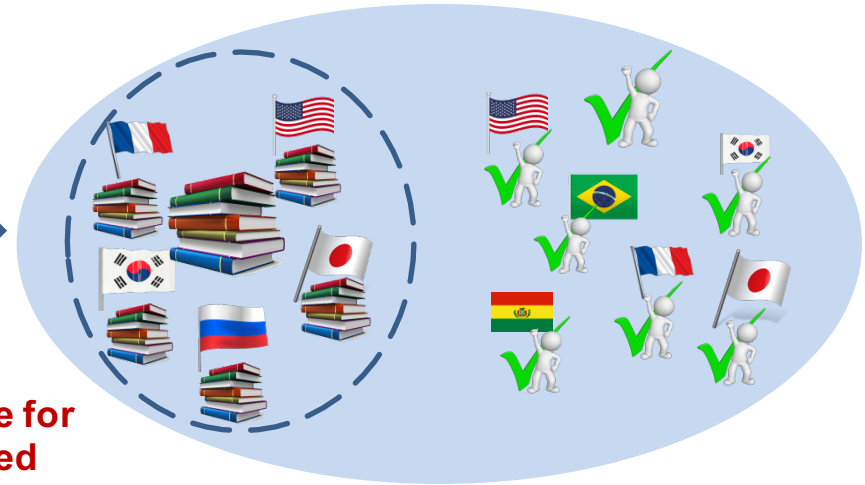
- Sodium-cooled Fast Reactor BOR-60
- Multi-Loop Reactor MIR.M1
- High-Flux Reactor SM-3
- Two critical experimental facilities
- Reactor Materials Testing Complex



From off-keys to opportunities



ICERR-labeled projects kick-off



+ permits in place for import of irradiated nuclear materials



- ✓ RIAR core competencies and expertise: nuclear fuel cycle support, reactor experiments, PIE, radiochemistry
- ✓ ICERR status

- ✓ Joining efforts: increasing impact of technologies through development and implementation
- ✓ Research collaborations for ATF substantiation with vendors and utilities
- ✓ Consolidated standards of in-pile and out-pile experiments, compliance to ASME standards, conformity to NRC techniques
- ✓ Increased safety requirements

Future prospects

- ✓ Bilateral commercial contracts for in-pile experiments & PIE of structural, fuel and absorbing materials **in support of innovative fission reactor technologies** (SFR, South Korea; TWR, TerraPower; ASTRID, CEA)
- ✓ Long-term research programs **for innovative LWR materials** under way based on national programs and bilateral commercial contracts (Accident Tolerant Fuel Concepts, radiation-resistant steels for LWR vessel and in-vessel devices, etc.)
- ✓ Reactor research & PIE of materials and elements of equipment **to be used in prospective fusion projects** (*first phase of irradiation research and PIE of piezoelements, piezoelectric motors and multilayer dielectric laser mirrors to be finished on 2018 within the ITER*);
- ✓ Long-term national research programs on **radioactive wastes, spent fuels and MA management technologies** and bilateral commercial contracts (MA properties, pyrochemistry, salt melts, vitrifications, etc.)

PROPOSALS & DEMANDS

- Pro-active promotion and support of RIAR infrastructure utilization for international R&D and infrastructure projects (NEA OECD, ITER, IAEA, ROSATOM's bilateral projects)



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Thank you for your attention!

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