NUCLEAR
RESEARCH
INSTITUTE

Know-how and technologies for safe energy and nuclear medicine.



UJV Group, a member of CEZ Group

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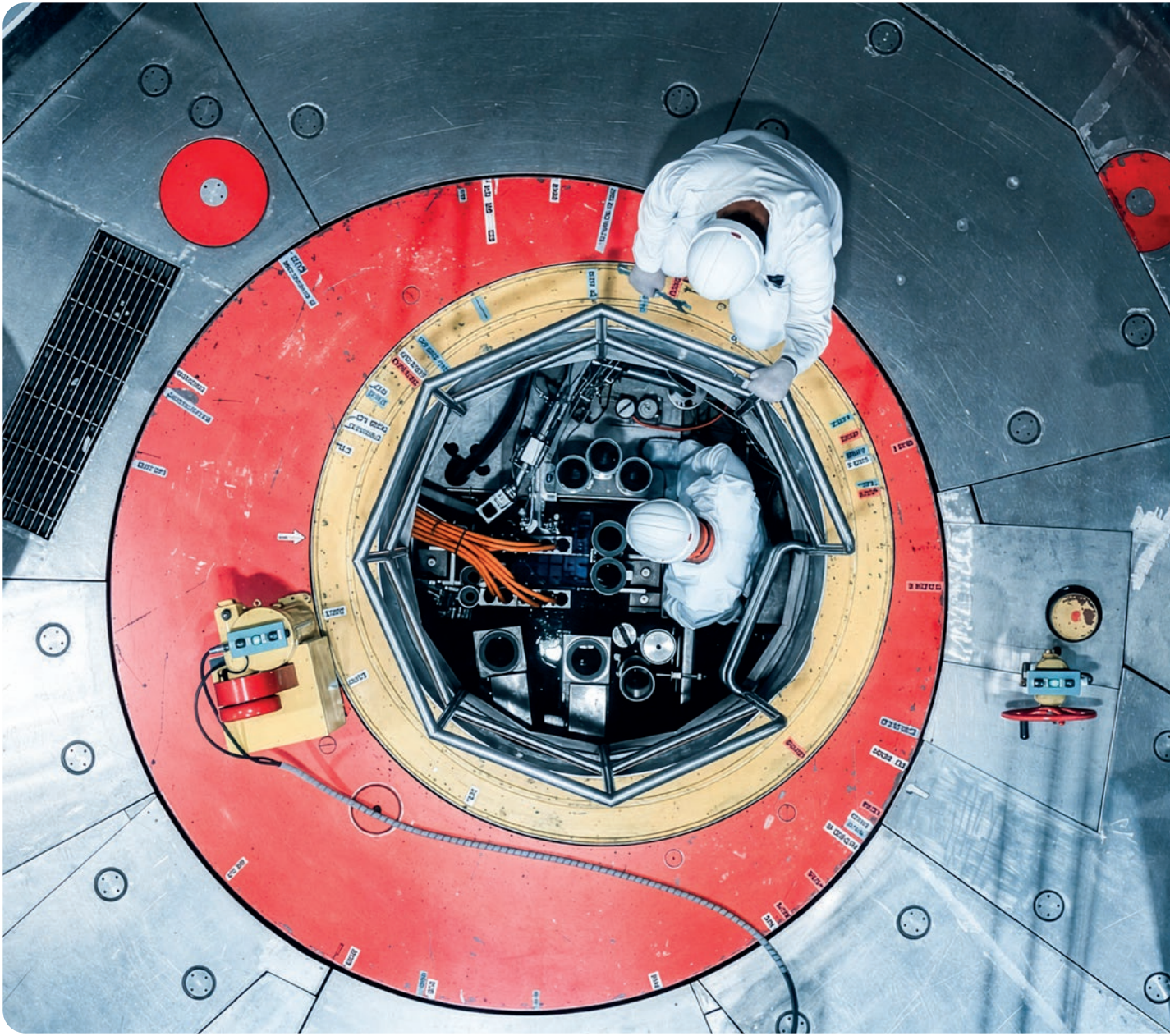
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ÚJV Řež builds on the more than 70-year tradition of a research institute established in 1955 to support Czechoslovakia's nuclear programme. Thanks to strong professional expertise and cutting-edge technological infrastructure, the company delivers solutions for the safety and reliability of nuclear energy in the Czech Republic, whilst also providing technical consultancy, services, and products for the energy sector across both developed and emerging markets. The company is also the largest producer and distributor of PET radiopharmaceuticals in the Czech Republic. ÚJV Řež is the parent company of the UJV Group, a technology group, and is also part of the strong CEZ Group.

ÚJV Řež at a glance

UJV Group

The parent company, ÚJV Řež, a. s., wholly owns four subsidiaries that synergistically cover research and services for the modern energy and healthcare sectors:

- Centrum výzkumu Řež s.r.o.
- Centrum výzkumu Řež Innovations s.r.o.
- RadioMedic s.r.o.
- NQ-Safe s.r.o.

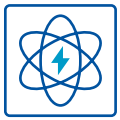
iCVŘ Research Centre Řež Innovations

CVŘ Research Centre Řež

NQ-SAFE

RadioMedic

UJV Group companies possess an extensive technological infrastructure, often unique not only within the Czech Republic, but also throughout Europe. They are active members of professional organisations and participate in both national and international projects.



Nuclear power

We support the safe and efficient operation of both existing and new nuclear power facilities, including small modular reactors. Our services cover the entire life cycle of power plants.



Radiopharmaceuticals

We are the largest Czech producer of radiopharmaceuticals for positron emission tomography (PET) imaging. We operate three PET production centres in Prague, Brno, and Řež.



Hydrogen technologies and energy innovation

We help transfer hydrogen and low-carbon energy technologies from research into practical application across the energy, industrial, and transport sectors.



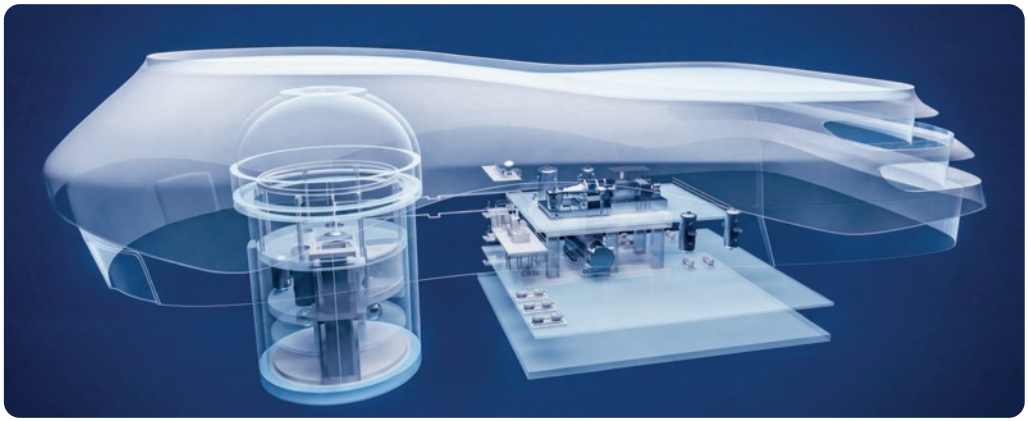
Radioactive waste and decommissioning

We are the only company in the Czech Republic to provide a complete range of radioactive waste management services, including the decommissioning of nuclear facilities.

Where we operate

Headquarters – ÚJV Řež, a. s.: Hlavní 130, Řež, 250 68 Husinec
Other locations: Prague, Brno, Plzeň, Ostrava, the Dukovany and Temelín Nuclear Power Plants in the Czech Republic, and the Mochovce Nuclear Power Plant in Slovakia.





Our work extends beyond the Czech Republic.
We are members of professional associations and participate in international projects. We are delivering major contracts in Slovakia, South Korea, Poland, Saudi Arabia, the United States and Ukraine. We work with investors, nuclear power plant operators, research organisations, and national regulatory authorities across multiple sectors and continents.

Our mission is to deliver the development plan for the peaceful use of nuclear energy by providing engineering and scientific support during both the operation and new construction of energy and nuclear facilities. We provide comprehensive, systematic scientific research services, particularly in nuclear energy and the application of ionising radiation sources. We aim to be a technical authority and a respected advocate for the safe use of these technologies.

Our values in practice
Our work is founded on expertise, openness, and a responsible approach. We draw on many years of experience, extensive know-how, and strict compliance with safety and quality standards. We build trust through fairness and respect, both within our company and beyond. We share knowledge across teams and divisions, encourage innovation and seek solutions that deliver value not only today but also in the future.

A responsible approach to people, society, and the environment
We see responsibility for what we do and for the impact our activities have on people, society and the environment as an integral part of our everyday work. We promote a safe and fair working environment, equal opportunities and the professional development of every employee. We are committed to sustainability: we use natural resources responsibly and actively engage with local communities, schools and the public.

Technologies and services for the energy sector and nuclear medicine

ÚJV Řež focuses primarily on supporting the safe and efficient operation of power generation facilities, fuel cycle chemistry, comprehensive radioactive and other waste management services, and associated engineering activities. In nuclear medicine, its activities include the production and distribution of radiopharmaceuticals, as well as the construction and operation of radiopharmaceutical production centres for positron emission tomography (PET).

- Comprehensive solutions for energy, industry, and healthcare
- Leaders in nuclear medicine and nuclear innovation
- Unique scientific and technical infrastructure and accredited laboratories
- Internationally recognised expert teams



Energy and industry

Nuclear power plant safety

Supporting the safety and reliability of nuclear power plants (NPPs) involves a comprehensive assessment of whether a nuclear facility is operated in accordance with its design and applicable national requirements, taking account of international experience and legislation. ÚJV Řež provides a wide range of support services covering both regulatory and operational aspects.

- Safety analyses and probabilistic safety assessments (PSA)
- Licensing support for new nuclear power facilities
- Radiation safety and emergency preparedness
- Validation of computer codes and models
- Assessment of operational compliance with design and legislation
- Support for regulatory authorities
- Support for the preparation of operating documentation and emergency procedures
- Support for personnel training

Cost-effective operation and maintenance

We provide nuclear power plant operators with a range of services aimed at improving the efficiency and cost-effectiveness of power unit operations. We have a track record as general contractor on comprehensive power uprate projects.

- Operational analysis and optimisation of VVER units
- Power uprate projects for nuclear power units
- Improving operational reliability
- Extending the operating life of nuclear power plant units
- Development of support tools for efficient NPP operation

Fuel cycle support

- Comprehensive licensing support
- Core loading pattern design and safety assessment: ANDREA and CycleKit software
- Fuel storage and utilisation in the reactor (including core monitoring using the SCORPIO-VVER system)
- Thermal-hydraulic behaviour of fuel and the reactor core
- Thermomechanical behaviour of fuel and the reactor core
  – Licensed codes (TRANSURANUS)
  – In-house models developed using ABAQUS
- Fuel monitoring at an inspection and repair stand
- Criticality and shielding analyses
- Back end of the fuel cycle and long-term disposal of spent nuclear fuel
- Interim storage of nuclear fuel

Structural properties of materials and ageing management

Our extensive experience and advanced infrastructure enable us to test the mechanical properties of irradiated and unirradiated materials, analyse damage, carry out environmental qualification of equipment and assess the extent of degradation in the properties of structural materials under demanding power plant operating conditions.

- On-site and laboratory diagnostics of electrically and pneumatically actuated valves using type tests or analysis
- Monitoring of flow-accelerated corrosion (FAC)
- Accredited testing of the mechanical properties of irradiated and unirradiated materials
- Design and implementation of advanced reactor pressure vessel (RPV) surveillance programmes
- Collaboration on RPV surveillance programmes (Czech Republic, Slovakia, Ukraine)
- Development and design of irradiation rigs for experimental reactors
- Development of electron beam welding equipment for hot cells
- Service-life assessment of safety-related electrical equipment and components in nuclear power plants, and qualification type testing
- Qualification of equipment and components for ageing (thermal, radiation, mechanical, vibration, wear, fatigue, etc.), including the effect of environmental conditions (LOCA, HELB)
- Monitoring of environmental parameters at nuclear power plants

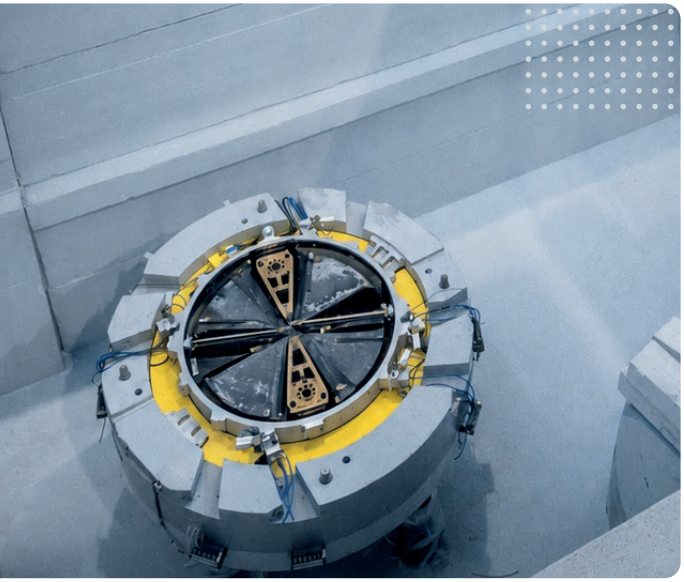


- Development and implementation of ageing management programmes, particularly for cables
- Irradiation services using cobalt sources; radiation sterilisation
- Assessment of the radiation and thermal resistance of non-metallic materials, service-life assessment of satellite components and support for the ITER fusion reactor project

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Radioactive waste and decommissioning

We are the only company in the Czech Republic covering the entire radioactive waste (RAW) management process, from detection and identification through processing to preparation for safe disposal. We hold the qualifications and licences from the State Office for Nuclear Safety (SÚJB) for all these activities.



Radioactive waste management

- Detection, identification, and characterisation of radioactive waste, including the response to the discovery of unknown or orphan sources of ionising radiation
- Collection, sorting, storage, transport, treatment and conditioning of institutional radioactive waste (taking over radioactive waste from industry, hospitals, and other facilities)
- Development and operational support for radioactive waste repositories
- Accredited measurements of radionuclide and nuclear material content
- Decommissioning of nuclear facilities and workplaces using sources of ionising radiation

Deep geological repository

We are the principal centre providing scientific and research support for the Czech Republic's Deep Geological Repository Project for the Radioactive Waste Repository Authority (SÚRAO).

International transport

We arrange international shipments of nuclear fuel from research reactors to their countries of origin.



Nuclear medicine and radiopharmaceuticals

Our three cyclotron-equipped PET production centres in Prague, Brno, and Řež, supply every nuclear medicine facility in the Czech Republic with at least one product from our portfolio. We focus on modern trends in the development of diagnostic radiopharmaceuticals.

Commercial production of radiopharmaceuticals

- Production, quality control, and distribution of PET radiopharmaceuticals
- Contract manufacturing (CMO/CDMO)
- Collaboration on the development of new radiopharmaceuticals

Cyclotron-based production of radiopharmaceuticals

- Turnkey delivery of PET centres, including commissioning
- Specialist consultancy for radiopharmaceutical manufacturing
- Training of specialised personnel
- Operational support (control software, transport packages, bespoke shielding)

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Hydrogen technologies and energy innovation

ÚJV Řež holds a leading position in Czech hydrogen innovation and provides engineering and development services focused on low-carbon energy and mobility. It is a founding member of the Czech Hydrogen Technology Platform (HYTEP).

Key competencies

To integrate hydrogen technologies into commercial practice, we provide interdisciplinary team coordination, pilot-scale testing, and support in electrolysis and fuel cells. Our specialist services cover the entire project life cycle:

- Feasibility studies and conceptual design
- Life cycle assessments (LCA) of energy processes
- Energy system optimisation using mathematical modelling methods
- Engineering services – collaboration during design and implementation
- Consultancy on the design, installation, and operation of designated technical equipment (pressure, gas, and electrical) pursuant to Section 2(1)(a) of Act No. 250/2021 Coll.





Small modular reactors (SMRs) – the future of energy

Our team has extensive experience in the design and development of small modular reactors, including in-house development of the HeFASTO high-temperature gas-cooled fast reactor and the Energy Well fluoride salt microreactor. We are applying this experience through our participation in the Rolls-Royce SMR project:

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- Support for studies and decision-making analyses
- Small-scale, standalone material testing projects
- Collaboration on site selection and regulatory framework analyses
- Consultations with Rolls-Royce SMR technical teams to optimise the deployment of ÚJV Řež's expertise and infrastructure
- Tender submission for the Engineering Delivery Partner call

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Accredited laboratories

ÚJV Řež ensures that one calibration laboratory and four testing laboratories accredited by the Czech Accreditation Institute under ČSN EN ISO/IEC 17025 operate independently. The laboratories operate in five areas, covering selected mechanical, physicochemical, electrical, radiological and radiochemical properties of materials, and carry out accredited measurements, tests, and analyses.

Central Analytical Laboratory

- Determination of radionuclides and toxic metals
- Water analysis
- Environmental monitoring and measurement of filter efficiency

Modern testing laboratory equipment for assessing material properties

- Autoclaves simulating operating conditions
- Electron microscopes
- Hot-cell facility for irradiated materials

Environmental qualification of equipment

- Cobalt irradiation facility
- Monitoring of material degradation

Mechanical properties testing laboratory

- Instron tensile testing machines
- Impact pendulums
- Microscopic failure analyses

Reactor services provided by Research Centre Řež

Our services are based on the operation of the LR-0 and LVR-15 reactors, each serving a different purpose.

LR-0 reactor:

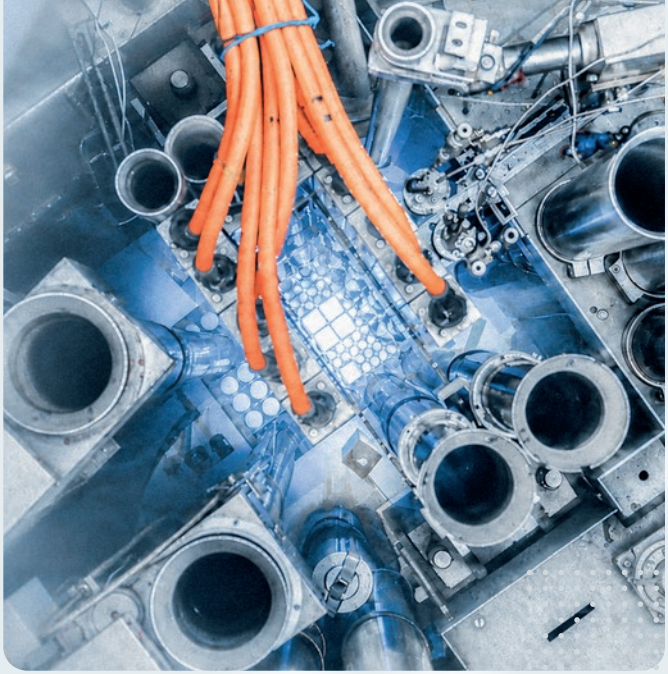
- One of the most versatile reactors in the world
- Used for modelling the neutron-physical characteristics of power reactor cores (both VVER and Western PWR types)
- Validation of codes for nuclear safety, shielding and fuel cycle optimisation
- Refinement of an internationally used nuclear data library

LVR-15 reactor:

- Materials research (irradiation of samples under high pressure and temperature)
- Commercial production of radionuclides (e.g. for nuclear medicine) and industrial irradiation (e.g. neutron transmutation doping of silicon)
- Neutron beam experiments
- Open Access programme – opportunities for student projects

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International cooperation



Extensive international cooperation at European and global level, our membership of leading professional and research bodies, and our involvement in international projects keep us at the forefront of expertise in the peaceful use of nuclear energy and ionising radiation sources.

Our technical cooperation is based on bilateral or multilateral agreements.

Multilateral cooperation

- International Atomic Energy Agency (IAEA), United Nations, Vienna
- Nuclear Energy Agency (NEA), Paris (an organisation of the most developed countries within the OECD)
- Framework programmes and projects under EUROPEAID, HORIZON 2020, and the Instrument for Nuclear Safety Cooperation
- SNETP (Sustainable Nuclear Energy Technology Platform)
- We are a founding member of the NUGENIA Association (the European association for science and research on Generation II and III nuclear reactors)

Bilateral cooperation partners include:

- French Alternative Energies and Atomic Energy Commission (CEA), France
- Institute for Radiological Protection and Nuclear Safety (IRSN), France
- Gesellschaft für Anlagen- und Reaktorsicherheit (GRS), Germany
- Czech-Russian Working Group on Nuclear Power (PSJE), Ministry of Industry and Trade / ROSATOM, Russia
- Scientific and Technical Centre for Nuclear and Radiation Safety (SSTC NRS), Ukraine
- Electric Power Research Institute (EPRI), USA
- Bhabha Atomic Research Centre (NPCIL), India (draft joint memorandum of cooperation)
- US institutions through agreements between nuclear regulatory authorities (NRC–SÚJB) and government departments (US DOE–Czech Ministry of Industry and Trade)
- IFE Halden, Norway

Key milestones in the history of ÚJV Řež

1955 – Establishment of the Institute of Nuclear Physics (ÚJF)

Construction of the Řež site commenced

1957 – First research reactor, VVR-S, commissioned

1958 – Research into radiation damage of materials launched

1964 – Operation of a unique hot and semi-hot cell facility commenced

1972 – TR-0 heavy-water reactor commissioned

1974 – First radiopharmaceuticals produced in Řež

1995 – Pressurised thermal shock (PTS) assessment of reactor pressure vessels launched

LVR-15 light-water reactor brought into permanent operation

1997 – Irradiation programme for EDF launched

First autoclave for working with active samples installed in semi-hot cells

1999 – Operation of the PET Centre Prague commenced

2000 – ÚJV Řež becomes a major processor of institutional radioactive waste in the Czech Republic

2004 – Equipment qualification and assessment of piping systems for Ukrainian nuclear power plants

First surveillance samples received from Temelín NPP Unit 1 (ETE1)

2005 – ÚJV Řež becomes the sole owner of ŠKODA VÝZKUM (now VZÚ Plzeň)

2006 – Registration of the radiopharmaceutical Fludeoxyglucose (FDG)

2007 – First shipment of spent highly enriched nuclear fuel from Řež to the Russian Federation

2012 – Clinical evaluation of the first non-fluorinated PET radiopharmaceutical launched in the Czech Republic

Company name changed to ÚJV Řež, a. s.

2013 – Operation of the Řež R&D PET Centre commenced

2015 – Commercial installation of a steam generator test stand at Temelín NPP

2016 – Preparation of a technical and economic feasibility study for the completion of Units 3 and 4 at Khmelnytskyi NPP (Ukraine)

2018 – THS-15 – an experimental facility for validating the in-vessel melt retention (IVMR) strategy during a severe accident – commences operation

2020 – ŠKODA PRAHA joins UJV Group

2022 – ÚJV Řež becomes one of the three founders of the South Bohemian Nuclear Park

Unique replacement and commencement of cyclotron decommissioning at PET Centre Prague

2023 – RadioMedic joins UJV Group

1975
First surveillance samples from the A1 reactor evaluated

1983
LR-0 reactor brought into permanent operation

1986
First surveillance samples received from Dukovany NPP

1992
Structural integrity calculations for nuclear power plant components commenced (Leak-Before-Break concept)

1993
Privatisation of the Nuclear Research Institute Řež into a joint-stock company

1994
IAEA Safety Issues for Dukovany NPP – assessment and proposed solutions

2002
IAEA Safety Issues for Temelín NPP – assessment and proposed solutions

Irradiation programme for EPRI/CRIEPI/ JAPEIC launched

Flooding at the ÚJV Řež site

Establishment of Research Centre Řež

ENERGOPROJEKT PRAHA division incorporated into ÚJV Řež

Development of the "Unified methodology for assessing the integrity and service life of equipment and piping in VVER-type nuclear power plants during operation"

2008
Feasibility study for the construction of additional Temelín NPP Units 3 and 4

Operation of PET Centre Brno commenced

2009
Technical support for the completion of Mochovce NPP Units 3 and 4

ÚJV Řež becomes the sole owner of EGP INVEST

2010
Feasibility study for the construction of additional units at Dukovany NPP

2011
Establishment of the UJV Group

2017
Steam generator test stand for crevice corrosion assessment awarded WANO Good Practice status

Completion of computational analyses to support the extended operation of Unit 3 at Rivne NPP (Ukraine)

Support for the Turkish nuclear regulatory authority (TAEK) during the construction of Akkuyu NPP

Research Centre Řež commences operation of the infrastructure developed under the SUSEN (Sustainable Energy) project

POWER-BOX 180W – prototype of a portable DC power supply with a hydrogen fuel cell unveiled

2024
A consortium led by ÚJV Řež unveils a hydrogen-powered truck built on a Tatra Force chassis

ÚJV Řež manufactures a containment prestressing tendon for Rivne NPP in Ukraine

2025
We produce the first commercial batch of a diagnostic radiopharmaceutical for Curium

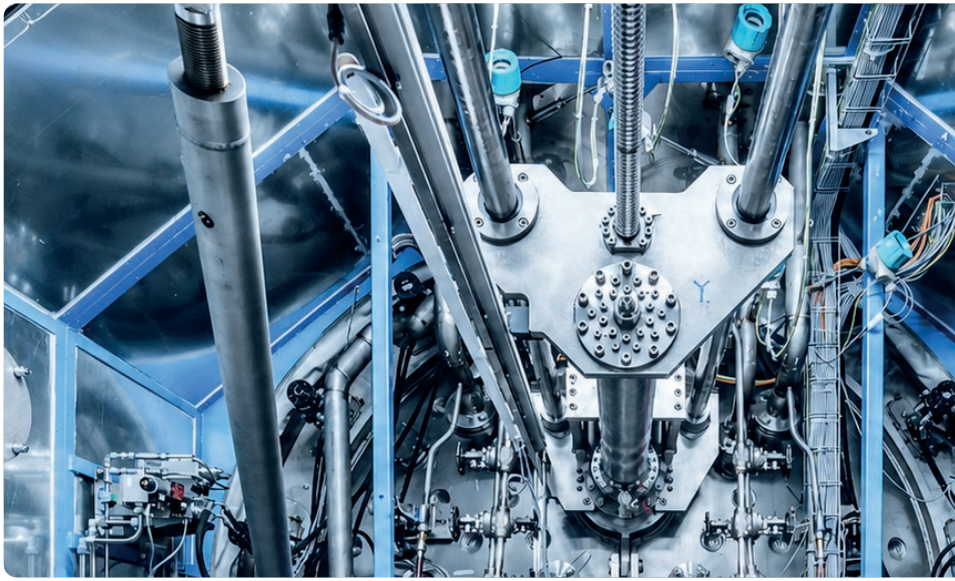
Contract signed with KHNP

2026
Work commences on new nuclear power facilities in the Czech Republic

Notes

Contact





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