

# ***FNCA***

Forum for Nuclear Cooperation in Asia



## **COUNTRY REPORT**

### **Republic of Kazakhstan**

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2022

# Peaceful use of Nuclear Power and International Cooperation

Kazakhstan is a party to all basic international agreements in nuclear disarmament, non-proliferation and peaceful use of atomic energy.

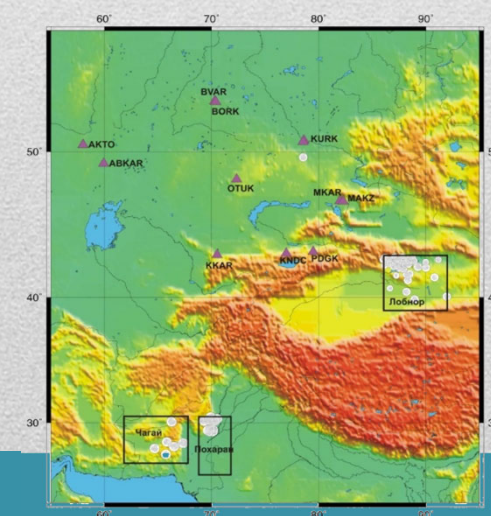
## Treaty on the Prohibition of Nuclear Weapons (TPNW)

- Ratification of the TPNW in 2019, when Kazakhstan was the 26<sup>th</sup> among the states to ratify the treaty, has become an important contribution to global efforts in creating nuclear weapon-free world.
- In 2022, Kazakhstan participated in the first meeting of State Signatories to the TPNW. On the margins of the First Meeting of the TPNW, delegation of the Republic of Kazakhstan has arranged a side-event to consider effective application of Articles 6 and 7 of the Treaty addressing victim assistance, environmental remediation and international cooperation.

## Comprehensive Nuclear Test-Ban Treaty (CTBT)

Kazakhstan consistently supports the CTBT and its verification regime.

- This year the National Nuclear Center of the Republic of Kazakhstan (NNC RK) celebrated its 30<sup>th</sup> anniversary, being the operator of five stations of the International Monitoring System in Kazakhstan, and the former Semipalatinsk Test Site.
- Director General of the NNC RK effectively chairs the Working Group B of the CTBTO.





## Non-Proliferation Regime Support at the Former Semipalatinsk Test Site



- The operations to upgrade physical protection system of nuclear-hazardous sites of IGR and “Baikal-1” Research Reactor Complexes were completed. ▲
- A project is commenced for building Emergency Technical Center. The project goal is to establish a centralized base to ensure security at the strategic STS sites to prevent any access to fissile and radioactive materials. ►

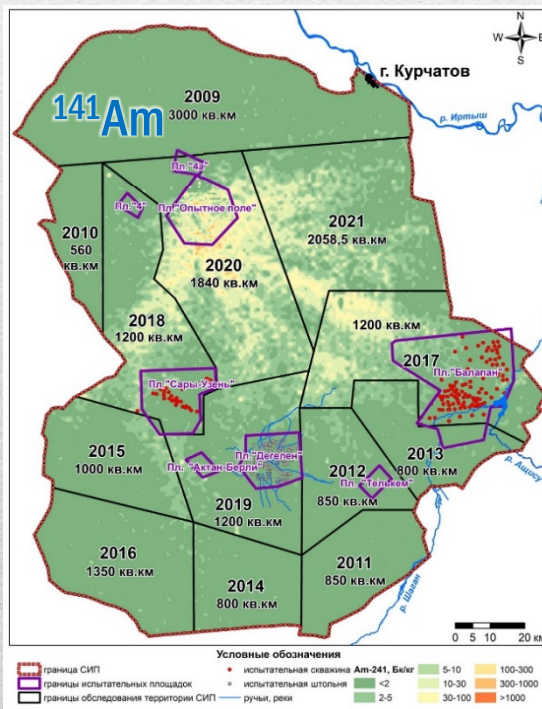
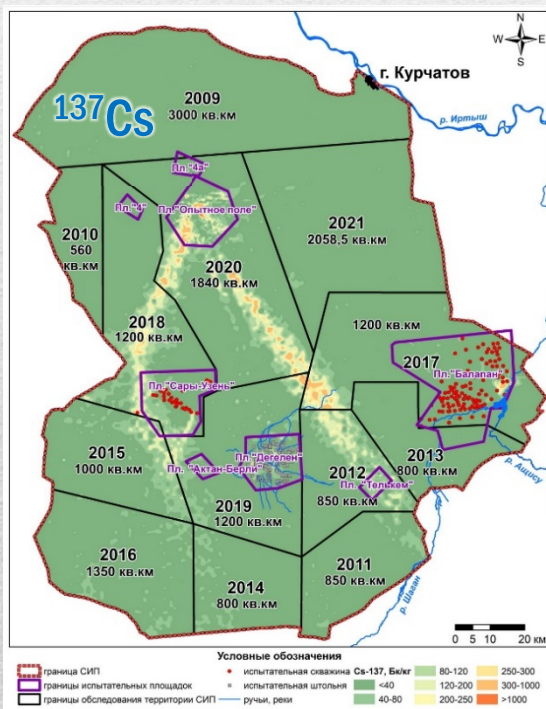




# Integrated Ecological Survey of the Former Semipalatinsk Test Site

In 2021, integrated ecological survey was completed for the entire area of Semipalatinsk Test Site:

- We express the appreciation for the detailed survey of nature, features and mechanisms of radiation situation.
- The survey provided actual evaluation scale and degree of radioactive contamination of the test site area.
- This data greatly contributed to elaboration of scientifically founded plan for the test site rehabilitation, to be implemented in the near future.



LABORATORY  
ANALYSES

3000

γ-spectrometry

500

$^{239+240}\text{Pu}$   
radiochemical

500

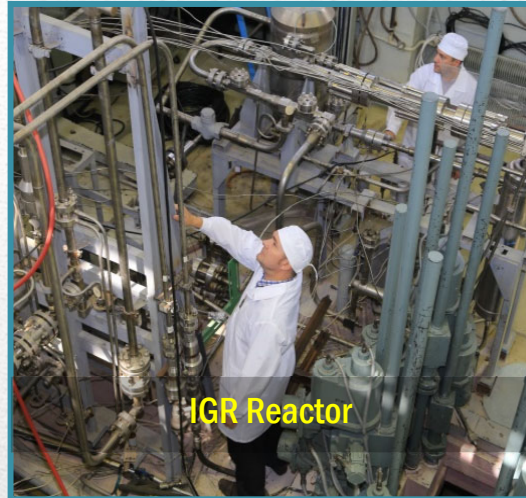
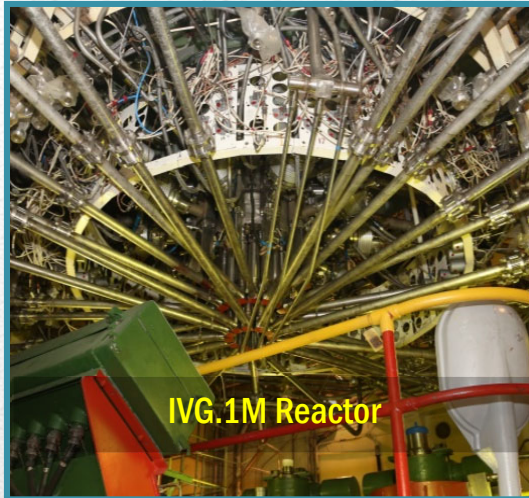
$^{90}\text{Sr}$   
radiochemical

200

$^3\text{H}$   
β-spectrometry

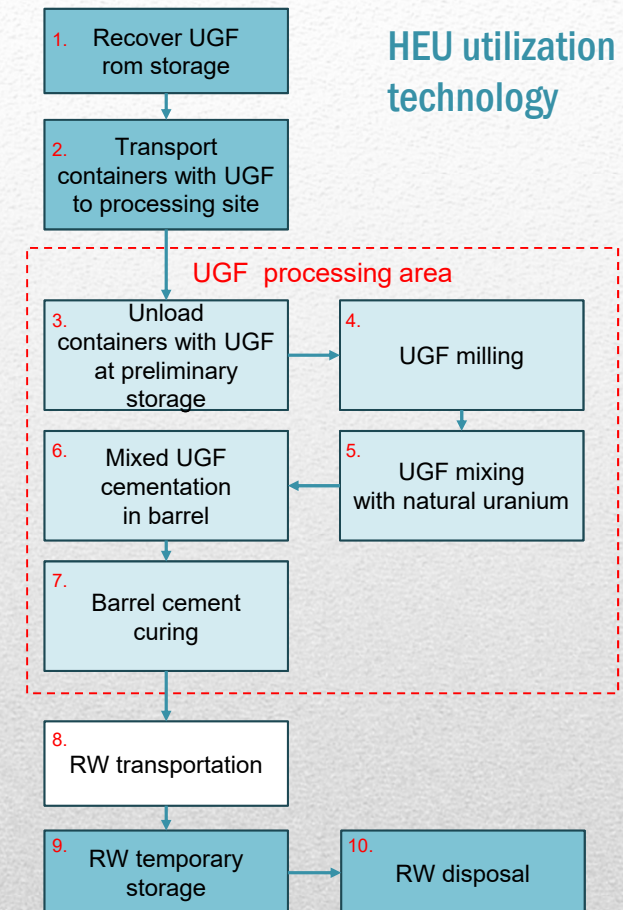


# Non-Proliferation and Nuclear Safety



Operations are actively ongoing to convert two research reactors to low-enriched fuel (LEU) and dispose highly enriched fuel (HEU):

- On May 5, 2022, physical start-up was performed for IVG.1M reactor with new LEU-fuel. Procedures are now underway to carry out power start-up of the reactor. Commissioning of the IVG.1M reactor with LEU-fuel is scheduled for 2023. Spent HEU-fuel is recovered from the reactor and then, shall be processed.
- Today, the down-blending of fresh non-irradiated graphite HEU-fuel of IGR reactor was completed.



- In order to dispose irradiated fuel of the reactor, Kazakhstan specialists have developed a technology of dry mixing, which in the future will solve the issue of irradiated graphite fuel disposition



# Nuclear Power and Nuclear Fuel Cycle

## Leading Positions in the Uranium Market

Kazakhstan holds leading positions at the world natural uranium production market, being among the suppliers to NPPs around the globe. Kazakhstan enterprises continue uranium production, including natural uranium oxides, powder uranium dioxide and fuel pellets.

In 2021, Kazakhstan produced 21819 tons of uranium that is for 12% more than in 2020. Given the current reality, Kazakhstan is actively exploring new routes for uranium supply to the world markets.

## IAEA Bank of Low-Enriched Uranium (BLEU)

Since 2019, the IAEA BLEU has been operating in Kazakhstan and plays an important role in implementing the provisions of the Joint Comprehensive Plan of Action.

Considering the current tense international situation, the Bank becomes more relevant. IAEA has a capability to provide assistance to states upon request in development of nuclear program and peaceful use by providing fuel from the Bank, off market, not pursuing of any financial profits from the fuel sales.





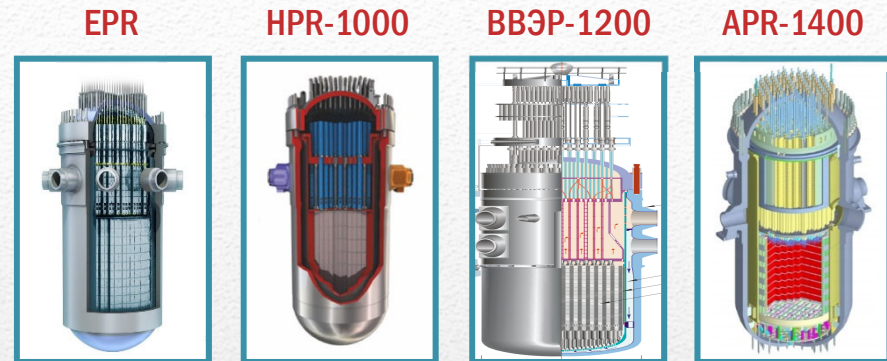
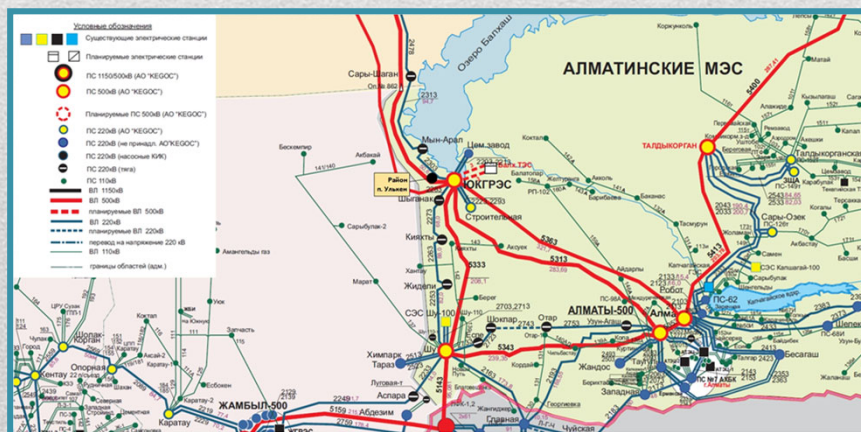
# Nuclear Power Development

With a view to the task assigned on achieving carbon neutrality by 2060 and predicted shortage of electricity, Kazakhstan is comprehensively studying the possibility for safe and environmentally friendly nuclear power development in the country.

For the first nuclear power plant, Kazakhstan considers time-tested reactor facilities with available operational experience.

In 2021, the Marketing Section on “NNP Construction Feasibility Study” was updated, in terms of clarifying the choice of NPP siting. Currently, Balkhash lake in the south-east of the country is considered as the primary site for the first NPP construction. Another prospective area for NPP construction in the future can be Kurchatov town that is located in the north-east of the country.

## Energy and grid infrastructure of the proposed NPP locations



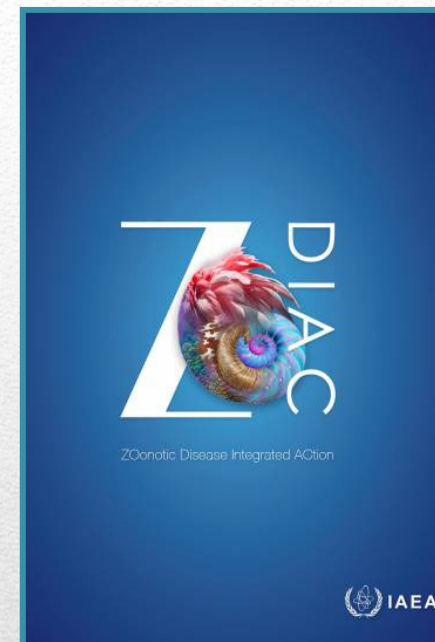
After studying all available options, a short list of four companies was made: the French EDF, the Korean KHNP, the Chinese CNNC and "Rosatom". All these companies are the leaders in the market of nuclear technologies. Kazakhstan delegation visited and studied the projects of these companies – which include nuclear power plants in operation or under construction.



# Nuclear Technologies in Medicine

## Radiation Oncology and Nuclear Medicine

- In the near future, the proton therapy that is the most preferable therapy to combat the pediatric oncological diseases, will be introduced in the country.



- Kazakhstan is an active participant within “ZODIAC” global initiative that promotes international efforts on prevention of diseases and pandemics breakouts.



**THANK YOU FOR YOUR  
ATTENTION!**