Chornobyl Exclusion Zone and Radioactive Waste Management in Ukraine
State Agency of Ukraine on Exclusion Zone Management is a central executive body responsible for strategic directions:

- **Realization** of the state policy in the area of management of the exclusion zone and the zone of unconditional (mandatory) resettlement.

- **Overcoming the consequences** of the Chornobyl accident.

- **Decommissioning** of Chornobyl NPP and transforming Shelter Object into ecologically safe system.

- **Implementation of state management** in the field of radioactive waste management at the stage of their long-term storage and disposal.
State enterprises and organizations in the sphere of SAUEZM management:

- **Ukrainian State Corporation “Radon”:**
  - SSE “CERWM”
  - SSE “Odesa SISC”
  - SSE “Dnipropetrovsk SISC”
  - SSE “Kyiv SISC”
  - SSE “Liviv SISC”
  - SSE “Kharkiv SISC”
  - SE STC DCRWM
  - SSE “MCCEZ”
  - Ukrainian Radiation Training Center

- **Enterprises**
  - SSE “Chornobyl NPP”
  - SSE “Ecocentre”
  - SE “COTIS”
  - SSE “Pivnichna Pushcha”
  - SSE “Cnornobyl SC”
  - SE “MPFO of ChNPP “

- **Organisations**
  - Chornobyl Center for Nuclear and Radiation Safety Problems
  - Chornobyl Radiation and Ecology Biosphere Reserve
  - Scientific Center for Cultural Heritage
EXCLUSION ZONE TERRITORY

Realization of the state policy in the area of management of the exclusion zone and resettled part of the zone of unconditional (mandatory) resettlement
By volume of radioactive waste (RW) Ukraine’s on the second place in Europe and on the 4th in the world (3.5 million m³):

- Russia: 24 mill m³
- Ukraine: >3,4 mill m³
- France: 2,3 mill m³
- Germany: 0,3 mill m³

The State puts an important role on the Agency in long-term storage of radioactive waste and its disposal.
ABOUT THE EXCLUSION ZONE

Exclusion Zone is divided into two main parts:

10 km Territory of special industrial use

30 km Chornobyl Radiation and Ecological Biosphere Reserve

Advantages:

- Will never be used for living and usage by people
- Placement of objects of alternative energy (solar, wind, etc.)
- Transformation of the territory into RW, SNF, SIRS storage facilities
TERRITORY OF SPECIAL INDUSTRIAL USE
Chornobyl Radiation and Ecological Biosphere Reserve

*area = 227 thousands of hectares*

Created within the 30-kilometer Exclusion Zone, the largest reserve in Ukraine is a basis for an extremely important and unique natural experiment not only in our country, but also in the world. It performs a barrier (buffer) function and provides the restoration of the ecosystem to its original state.

According to scientists, there are more than 400 species of animals, birds and fish in the Reserve, including the species from the Red Data Book.

To date, 300 species have already been identified, 19 of which are listed in the Red Data Book of Ukraine *the list of endangered species*

There were also found 1,228 species of higher plants, of which 61 species is rare and subject to protection.
CHNPP DECOMMISSIONING

- Construction of NSC fencing contour is completed (the certificate of the State Architectural and Construction Inspection of Ukraine about its readiness for operation has been received).
- Cold tests have begun on ISF-2*.
- It is planned to put into operation objects built at the expense of donor contributions (NSC, ISF-2, etc.) by the end of 2018.
- All financial liabilities related to ChFS and FRS have been met.
The world’s largest moving construction in the world – New Safe Confinement (NSC):

- The commissioning of the facility is scheduled for the end of 2018. The new facility will operate for 100 years

- The project of reinforcement and sealing of existing structures of the 2nd stage ChNPP is completed

The main steps in transforming the Shelter Object into an ecologically safe system:

- Urgent dismantling of unstable structures of the Shelter Object in order to ensure the security of further activities at the Shelter Object

- Ensuring reliable operation of the ChNPP facilities

ISF-2

- 08/01/2017 - "cold" testing of equipment and systems began

- "Hot" tests are scheduled to begin at the end of 2018

- The complete completion of the contract work is scheduled for February 2019
CHNPP DECOMMISSIONING

Industrial complex for solid radioactive waste management (ICSRWM)

- Modernization of the radiation control system - February 2018
- Carrying out the 3rd stage of “hot tests” – June 2018
- Obtaining a separate Regulator permission for operation – October 2018

Construction of a liquid radioactive waste processing plant (LRWPP)

- Construction and installation work is completed
- Start-up and adjustment works are being carried out.
- SACI has taken a positive decision to issue a certificate of completed construction
- After commissioning, production of 42 packages per day is planned.

"Complex for the production of metal barrels and ferroconcrete transport containers for the storage of RAW at ChNPP" (U4.01 / 04W)

All measures envisaged by the project are implemented, the results are achieved. The complex was put into operation and the production of primary packaging was started. 14 workplaces were created.

Products released:
- PUI-0,165 - 2 126 pcs.
- PUII-0,165 - 223 pcs.
- VUIII-0,2 - 92 pcs.
- MBIV-0,2 - 1 575 pcs.
- KZ-3 (3) - 12 pcs.
SSE «CERWM» - the only one national operating organization for the management of radioactive waste. SSE «CERWM» was also designated to be an operating organization at all stages of life cycle of radioactive waste disposal sites:

- «Buryakivka»;
- «Pidlisnyi»;
- «3rd stage ChNPP»;
- 9 RW temporary localization sites;
- Future deep geological repository (DGR).
The key aim of SSE “CERWM” is a creation of industrial complex on decontamination, transportation, reprocessing, storage and disposal of radioactive waste (so called “Vector” industrial complex). The capacities of “Vector” are as follows:

- Centralized Storage for Spent Ionizing Radiation Sources (CSSIRS), controlled storage of long-lived low - and intermediate level RW;
- Near-surface SRW-1 and SRW-2 storages (construction almost completed);
- SRW 2-1 – this storage is designated for low-and intermediate level short-lived solid RW (1 storage) to be built;
- SRW - 3 – long-term storage of LLW and ILW containing long-lived radionuclides, from 50 to 100 years of storage (2 storages) to be built;
- SRW-4 – for long-term storage of HLW, 50-100 years (1 storage) to be built;
- High-level vitrified RW storage to be returned from Russia according to Ukraine international obligations.
Coverage of 9 towers in the Exclusion Zone

Existing fire stations, which are planned to be repaired in 2018.

Fire stations, repaired in 2017

Stations planned for construction in 2019

Signal view 15 km

Signal view 20 km

Installed video surveillance systems

Planned video surveillance systems

Exclusion Zone border

Border of special industrial use territory
Radiation and ecological monitoring of the environment:

- The monitoring system in the regular mode is updated once an hour, in emergency situations every 2 minutes

- 22 regular receivers of information
- **Radiation and dosimetric control:** radiation safety of personnel

- **Ensuring work** of control-dosimetric points
- Carrying out individual dosimetric control
- **Restoration** of radiation doses

- **Water protection activities:** limiting the flushing of RN from the catchments of rivers and passing it beyond the boundaries of the EZ
According to the results of the calculation of the feasibility study, the French company ENGIE and state enterprise UKRENERGO concluded that from the technical and economic point of view, the construction of the SES with a capacity of 1.2 GW in the Exclusion Zone is possible.

The first pilot project with the implementation of a wind power station with a capacity of 40 MW. The project is at the stage of land allocation (7 ha).

State enterprises are developing projects for the construction of solar energy facilities with a search for further funding.

In order to optimize the cost of energy carriers, energy-saving technologies are being implemented (insulation of buildings, roof reconstruction, windows replacement, etc.).
Due to the creation of the Chornobyl Radiation and Ecological Biosphere Reserve, in order to reduce the anthropogenic load on the ecosystem, the following is being worked out:

- the project of replacement of motor vehicles on ecological / electric;
- a draft program for the placement of special electric refueling and service stations for electric buses.
VISITING EXCLUSION ZONE

citizens of Ukraine

2014: 3,349
2017: 5,055

citizens of other countries

2014: 14,920
2017: 34,838

49,758
Close cooperation with international organizations and countries to strengthen the non-proliferation regime of radioactive materials - IAEA, NATO, European Commission, G7 Global Partnership, USA, United Kingdom, Sweden, Japan etc.
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<th><strong>Public outreach campaign on the Program of Amnesty of orphaned IRS</strong></th>
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*Note: IRPs (International Radioactive Pondeurs) are non-nuclear objects, such as radioactive steel or pipes, which are used as raw materials in the production of nuclear materials.*
The Project Background

- Global reduction of nuclear programs and minimization of nuclear terrorist threat
- Formation of an appropriate system, allowing to reduce the nuclear threat
- Improving the level of public safety
The Project Tasks

**ELIMINATION OF THE TERRORIST THREAT**

- Collect and analyze the initial data of SRS in the pilot region
- Develop recommendations to the improvement of procedures of handling with orphaned SRS
- Develop and conduct the public outreach campaign
- Hold the pilot collection of orphaned SRS
- Form a mechanism for the further expansion of the Project
What has been already done?

• As of today... *according to the BOA

• **Task 1:** Analyze available information to identify potential sources outside regulatory control.

• **Task 2:** Analyze and test procedures for interagency coordination, identify the roles and responsibilities of each agency, and make recommendations for improving interagency collaboration and coordination.
As the deliverable of Task 1, there was provided the following:

1) The secured website (portal), dedicated to the Amnesty of IRS Project: [http://amnesty.uatom.org/](http://amnesty.uatom.org/)
   *restricted access*

2) The detailed report about (a) secured website, (b) database containing information on IRSs that have been or may be outside of regulatory control, and (c) interactive map
In addition

- The “Report on Radiation Sources Used in Dnipropetrovsk Oblast with Indication of Their Primary Characteristics and External Appearance” with Annexes was prepared
- The collected historical data on RS was presented
- The data on RS collected from the Register was presented
Task 2

• Following discussions, consultations and in depth analysis of functions of state authorities, draft joint orders were developed to improve the *Procedure for Interaction of Executive Bodies and Legal Entities in the area of Nuclear Energy in case of illicit trafficking of RM*
The obtained results demonstrate a full picture of the current situation with radioactive sources in the Dnipropetrovsk region and create a platform for public outreach and information campaign as it gives an understanding of the primary cities and towns for the communication with the public and what main types of RS have to be the subject of the communication.
The famous fox Semyon, lives in the Prypiat, Chornobyl Exclusion Zone. He approaches people and eats from hands. The legend.