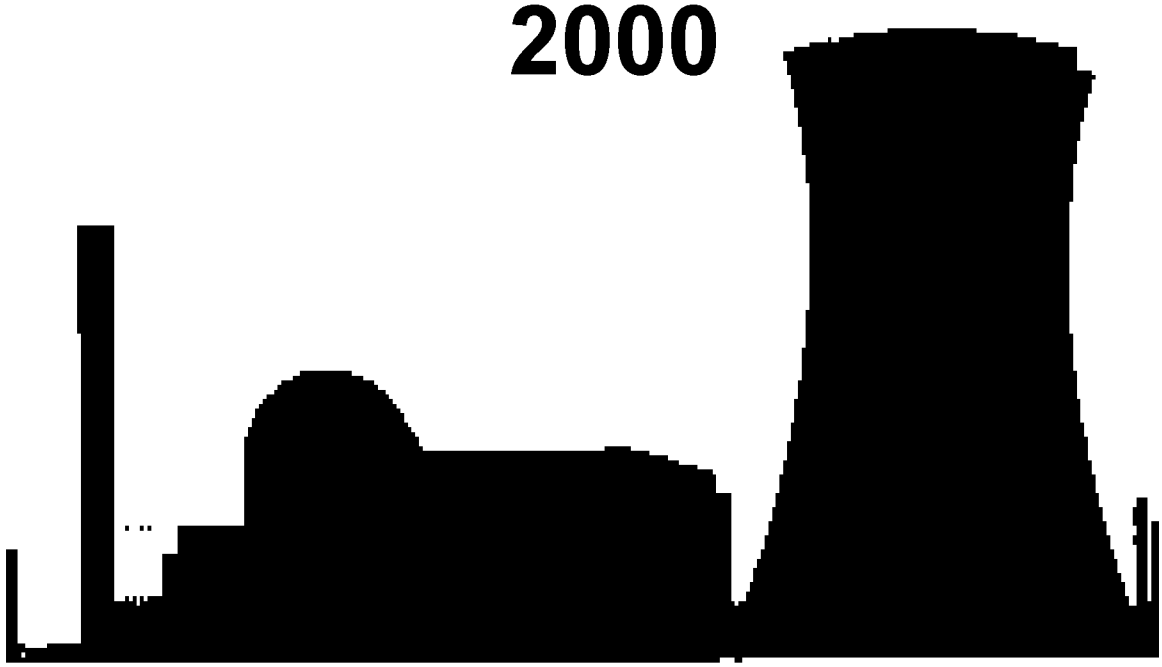
Ministry for Environment and Natural Resources of Ukraine

State Scientific and Technical Center on Nuclear and Radiation Safety

2000



Legal Aspects of SSTC NRS Activities

- The State Scientific and Technical Center on Nuclear and Radiation Safety (SSTC NRS) was established in the system of the State Committee of Ukraine on Nuclear and Radiation Safety by Ordinance of the Cabinet of Ministers of Ukraine No. 52 in February 1992.
- SSTC NRS is a specialized scientific organization based on the state ownership; it has a status of legal entity, keeps independent balance, has a settlement, dollar and other bank accounts, and seal with its name.

MENR  **SSTC NRS**

Goal, Tasks and Areas of SSTC NRS Activities

The goal of SSTC NRS activities is scientific, technical, analytical, and expert support to the Nuclear Regulatory Department as a State Nuclear and Radiation Safety Regulatory Authority.

Tasks and Areas of Activities

1. Development and improvement of normative and legal framework regulating activities in the field of nuclear power use in Ukraine:

- analysis and improvement of the system of regulatory documents;
- development of new regulatory, documents, guides and standards establishing basic and special procedures, qualitative and quantitative indexes, procedures and orders for their fulfillment as well as requirements to contents and composition of reporting, analytical, and information materials.
- review of the documents in force in Ukraine, and bringing them into consistency with the requirements of national legislation, IAEA recommendations, and positive international practice in safety regulation;

Since 1995 SSTC NRS Departments have been developed 16 regulatory documents on NRS which were approved and put in force by Ordinances of the Ministry for Environmental Protection and Nuclear Safety of Ukraine.

MENR **SSTC NRS**

List of Main Regulatory Documents Developed by SSTC NRS

1.	ND 306.608-95	Radioactive Waste Management. Casks for Final Disposal of Solid RAW. Requirements to Provision for Safety under RAW Management.
2.	NP 306.711-96	Reliability of NPP and Equipment. Extension of Useful Life of Control and Monitoring Means Included into Safety-Significant Systems. Overall Requirements to Sequence and Scope of Work.
3.	NP 306.205-96	Safety of Transportation. Order of Certificates Issuing on Safety under Transportation of Radioactive Materials.
4.	ND 306.205-96	Safety of NPP. Provision on Order of Investigation and Account of Nuclear Plants Operational Malfunctions.
5.	NP 306.1.2/1.007-98	Statement on Policy of Nuclear and Radiation Safety Regulation at "Shelter" Object at DD "ChNPP"
6.	NP 306.4.07.016-98	Rules on Account and Control of Nuclear Material at Facility.
7.	NP 306.2.02/1.004-98	General Provisions on Safety Assurance under Decommissioning of Nuclear Power Plants and Research Reactors
8.	NP 306.2.02/2.004-98	General Provisions on Safety Assurance under Decommissioning of Nuclear Power Plants and Research Reactors
9.	NP 306.5.02/3.017-98	Requirements to Quality Assurance Program at all the Stages of Living Cycle of Nuclear Facilities.
10.	GND 306.2.07.018-99	Provision on Inspecting of System for Account and Control of Nuclear Material at Facility..
11.	NP 306.1.02/1.034-2000	General Provisions on Nuclear Plants Safety Assurance.
12.	NP 306.5.02/3.035-2000	Requirements on Nuclear and Radiation Safety to Informational and Control Systems Significant for Safety of NP.

MENR **SSTC NRS**

The following regulatory documents on NRS were developed in 2000

1	Provision on Order of Investigation and Account of Nuclear Plants Operational Malfunctions
2	Methodology on Assessment of NPP I&C Systems Compliance with Requirements to Safety
3	Development of Concept for ND "General Provisions on Safety Assurance for Final Disposal of RAW in Geological Repositories"
4	Development of Rules on Keeping Systems to Accou and Control Nuclear Material at Objects which are no Nuclear Facilities
5	Development of Methodology on Identification of Content and Isotope Composition of Nuclear Materia in Articles which Contain Depleted Uranium and its Metrological certification at Regulatory Authorities
6	Revision of Document "Reliability of NPP and Equipment. Extension of Useful Life of Means for Monitoring and Control Included into Safety-Significant Systems. Overall Requirements to Sequen and Scope of Work". ND 306.711-96

2. <u>SSTC NRS Expert Activities.</u> Expert support in making regulatory decisions under established licensing procedures and supervisory activity (inspection):

- One of the main directions of SSTC NRS activity is expert assessments on nuclear and radiation safety (NRS) requested by the orders the Nuclear Regulatory Department of the Ministry for the Environment and Natural Resources (MENR) of Ukraine.
- Based on the results of expert assessments the Nuclear Regulatory Department of Ukraine makes a decision on issuing the license to the Applicant for all activities from construction to decommissioning of nuclear facilities designed for management of radioactive waste as well as permissions for certain activity (start-up of a NPP unit after a scheduled repair, replacement of elements in safety significant systems, reload of nuclear fuel, etc.).

MENR  **SSTC NRS**

Distribution of expert assessments performed in SSTC NTS in the areas of expert activity :

No.	*Areas of expert activity*	*Number of expert assessments performed*
1.	Operation of NPP safety significant systems	26
2.	Neutron & physical processes in nuclear facilities including radioactive material management	57
3.	Heat & hydraulic processes and probabilistic safety analysis	2
4.	Radiation safety and radiation protection	20
5.	Radioactive waste management	24
6.	Structural reliability of safety significant systems (elements)	72
7.	Control and monitoring systems for technological processes and reliability of electric power supply	200
8.	The "Shelter Object" facility	15
9.	Other matters	12
	Total:	**428**

From 1995 to 1999 SSTC NRS performed 954 state expert assessments on nuclear and radiation safety.

3. Research & development work (R & D) on improvement of engineering and operational safety of nuclear power facilities in Ukraine

R & D is one of the main SSTC NRS activities, which enables to establish the analytical and methodological basis for assessment of almost all aspects of NPP nuclear safety, nuclear fuel cycle facilities.

Examples of the main R & D projects carried out in 2000 are given in the following table:

1	Analysis of nuclear safety of VVER reactor facilities under refueling.
2	Safety study of spent nuclear fuel storage systems.
3	Analysis of reliability of basic NPP equipment in Ukraine on the basis of operational data and assessment of measures on improvement of NPP reliability and safety during the process of licensing.
4	Statistical and technological analysis of NPP in Ukraine operational malfunctions
5	Development of program complexes to assess strength and useful life of basic elements of MCC
6	Reliability of NPP and equipment. Extension of useful life of control and monitoring means included into safety-significant systems. General requirements to sequence and scope of work.
7	Development of Rules on keeping of system for account and control of nuclear material at objects which are not nuclear facilities
8	Development of Procedure on checking the status of nuclear facilities and physical protection of nuclear material, including its transportation
9	Development of Procedure for establishment of physical protection categories for objects and activities in the field of nuclear power use
10	Filling the data bank on failures, performances and predicted behavior of armored ropes of VVER-1000 power units containment at NPP in Ukraine and preparation of analytical materials for decisions making

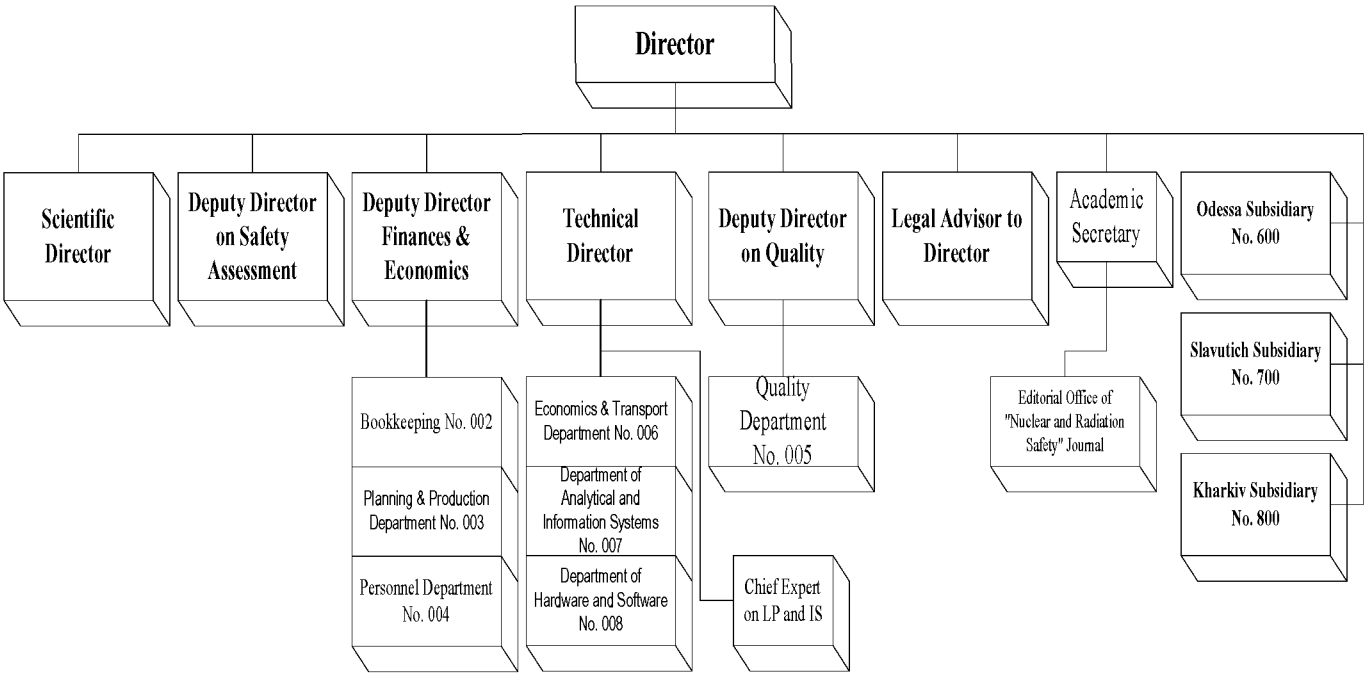
20 R & D projects were carried out in 2000 under internal (Ukrainian) contracts

Organizational Structure of SSTC NRS

- The main principle of the formation of SSTC NRS organizational structure is to provide effective management of SSTC activity and integration of the work results;
- The organizational structure presently has 5 profile Divisions, which include 14 Departments specialized in different areas of nuclear safety activity, 3 subsidiary in the town Slavoutich, cities Odessa and Kharkiv, scientific & technical documentation office, and editorial office of periodical journal “Nuclear and Radiation Safety".

MENR SSTC NRS

STRUCTURE OF THE STATE SCIENTIFIC AND TECHNICAL CENTER ON
NUCLEAR AND RADIATION SAFETY
THE MINISTRY FOR ECOLOGY AND NATURAL RESOURCES OF UKRAINE



DIVISION NPP SAFETY ANALYSIS No. 100
Head
Department Heat & Hydraulics and PSA No. 110
Department NPP Operational Event Analysis No. 120
Department NPP Control & Diagnostic System Reliability Analysis No. 130

DIVISION NUCLEAR SAFETY No. 200
Head
Department Neutron & Physics No. 210
Department Safe Nuclear Material Handling No. 220

DIVISION RADIATION PROTECTION No. 300
Head
Department Radiation Protection No. 310
Department Safe RW Management No. 320
Department Decommissioning No. 330

DIVISION STRUCTURAL RELIABILITY AND NF MATERIALS № 400
Head
Department Structural Materials No. 410
Department Strength and Reliability of Nuclear Facility Structures No. 420
Department Nuclear Facility Equipment & Pipe Strength No. 430

DIVISION COMPLEX R & D PROGRAMS AND PROJECTS No. 500
Head
Department Coordination of R & D Programs and NRS Expert Assessments No. 510
Department Normative Regulation No. 520
Department International R & D Projects No. 530

MENR **SSTC NRS**

International cooperation in the field of NRS.

SSTC NRS cooperates effectively on the permanent basis with the following international organizations:

- International Atomic Energy Agency (IAEA),
- Commission of the European Community (CEC),
- European Bank for Reconstruction and Development (EBRD),

and also with national organizations of USA, France, Germany.

Equipment and codes

- SSTC NRS Departments are provided with modern equipment in quantity required to perform their functions.
- The first turn local computer network is operated which has high computation capacities to perform complex calculations, provides its resources to distant users and gives the possibility to use global information systems, in particular, Internet.
- To provide expert support, SSTC NRS obtained a great number of western methodologies and computer codes (32) which are used for assessment both nuclear power facilities and other industrial installations using nuclear material or ionizing radiation sources.
- The received software is used for expert assessment of NRS substantiating materials and for performance of research & development work aimed at solving physical, technical and NRS problems, as well as protection of the facility, the public and the environment.

Most mastered foreign codes are related to the following areas:

1	Termohydraulic process and probabilistic safety analysis	CONTAIN, MELCOR, RELAP, ATHLET, CATHARE, etc.
2	Neutron-physical processes in reactors	NESSEZ-4, PYTHIA, RETINA, SCALE, NUKO, etc.
3	NPP operational safety	SAPHIRE, Simulator VVER-1OOO/v-320 CORYS
4	Radiation protection and safe management of radioactive waste	COSYMA, INTERRAS, HOTSPOT, etc.

Quality System

To ensure a high quality of work on scientific & technical and expert support of the state regulation of nuclear and radiation safety SSTC NRS has the following:

- skilled personnel;
- required financial and material & technical resources;
- required legal support.

The quality system implemented in SSTC NRS is based on principles of state standard on quality control and assurance DSTU ISO 9001-95 “Quality Systems. Quality Assurance Model for Design, Development, Manufacturing, Assembly, and Service".

Presently SSTC NRS is a competent scientific organization which activity is highly assessed both in Ukraine and abroad, and available skilled personnel and equipment allows to extend international cooperation in the field of safety assessment and regulation under use of nuclear power.