

SSTC NRS

General overview and involvement in RAMP activities

RAMP 2021 Spring Users Group Virtual Meeting, April 12, 2021

Who we are

Legal Framework



March 1992

State Enterprise “State Scientific and Technical Center for Nuclear and Radiation Safety” started its activities to support the nuclear Regulator (currently - State Nuclear Regulatory Inspectorate of Ukraine, SNRIU)



November 2008

SSTC NRS acquired the status of dual subordination – to SNRIU and to the National Academy of Sciences of Ukraine

Mission

Providing scientific, engineering and expert support to the regulatory body to ensure safety, public health and environmental protection

Status

- state-owned commercial enterprise
- no shareholders
- comprises 250 employees

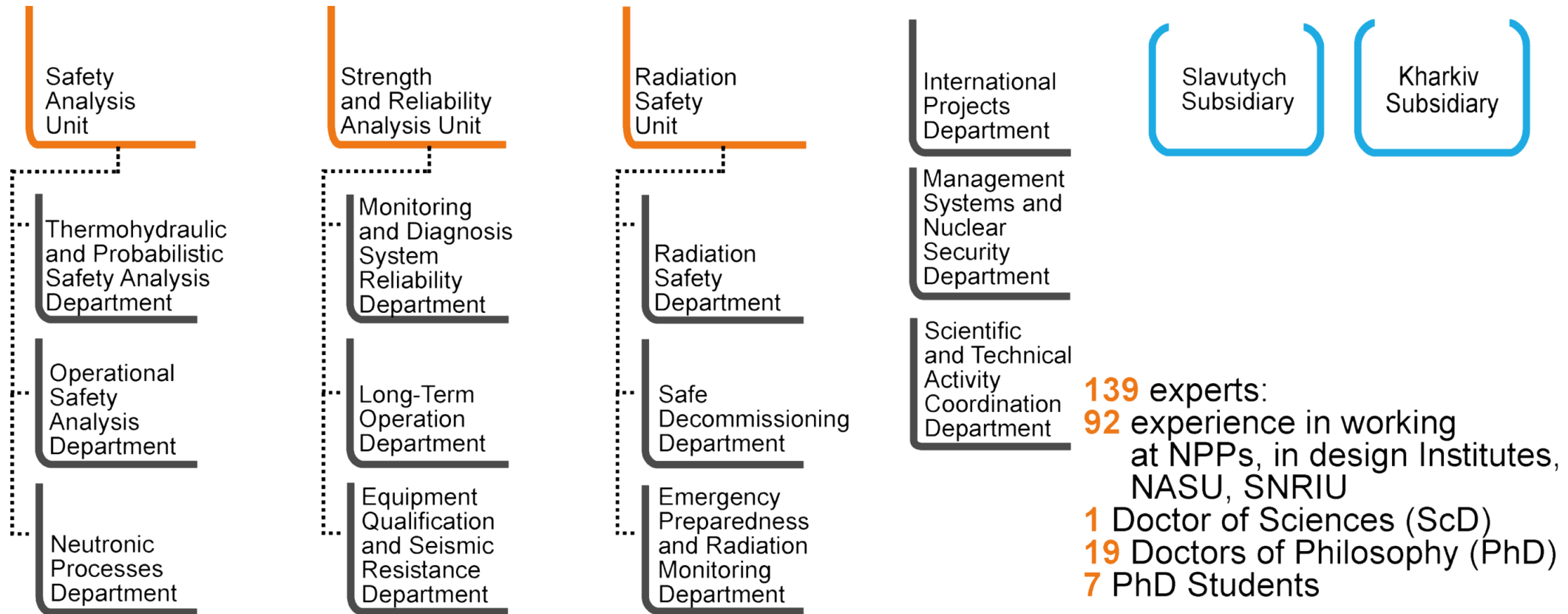
Main areas of activities

- Enhancement of national regulatory framework
- Comprehensive safety assessment under licensing process
- Support to the regulatory oversight activities
- Applied researches and developments
- Training and educational services in Ukraine and worldwide



Main office

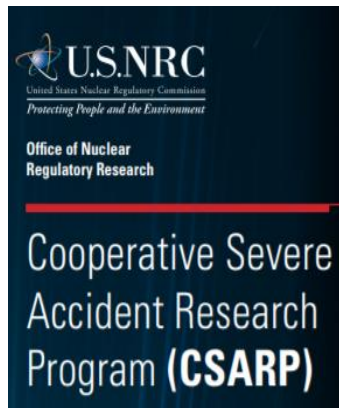
Organizational structure



Instruments for safety assessment

DETERMINISTIC SAFETY ANALYSIS	NEUTRON PHYSICS	RADIATION PROTECTION	SSC STRENGTH and SEISMIC RESISTANCE
<ul style="list-style-type: none"> ➤ RELAP5 (USA) ➤ MELCOR (USA) ➤ ATHLET (Germany) ➤ COCOSYS (Germany) ➤ TRACE (USA) ➤ ANSYS (FLUENT, CFX) (USA) ➤ TRANSURANUS (Germany) 	<ul style="list-style-type: none"> ➤ HELIOS (USA) ➤ Scale (USA) ➤ MCNP (USA) ➤ PARCS (USA) ➤ DOORS (USA) ➤ DERAB (Germany) ➤ DYN3D (Germany) 	<ul style="list-style-type: none"> ➤ MicroShield (USA) ➤ Scale (USA) ➤ MACCS (USA) ➤ VARSKIN (USA) ➤ RESRAD (USA) ➤ GENII (USA) ➤ MILDOS (USA) 	<ul style="list-style-type: none"> ➤ ANSYS Mechanical (USA) ➤ LIRA (Ukraine) ➤ 3D Pipe-master (Ukraine)
	PROBABILISTIC SAFETY ANALYSIS	EP&R	OPERATIONAL SAFETY
	<ul style="list-style-type: none"> ➤ SAPHIRE (USA) ➤ Risk-Spectrum (Sweden) 	<ul style="list-style-type: none"> ➤ INTERRAS (IAEA) ➤ RODOS (EU) ➤ HOTSPOT (USA) ➤ RASCAL (USA) ➤ RESRAD (USA) 	<ul style="list-style-type: none"> ➤ Management Oversight and Risk Tree (MORT) (USA)

Membership



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Participation in RAMP: 2019-2021 (activities)

Contribution to the RAMP codes' enhancement:

- Collection, structuring and submission of the information on Ukrainian nuclear installations for the RASCAL Database;
- Translation of the VARSKIN functionality into Ukrainian;
- Collection, processing and submission of the users' feedback on RAMP codes.

Specific activities carried out by SNRIU / SSTC NRS:

- Development of "Radiation Protection Computer Code Analysis and Maintenance Program (RAMP) In-kind Contribution. First-Year Experience in RAMP Code Usage"

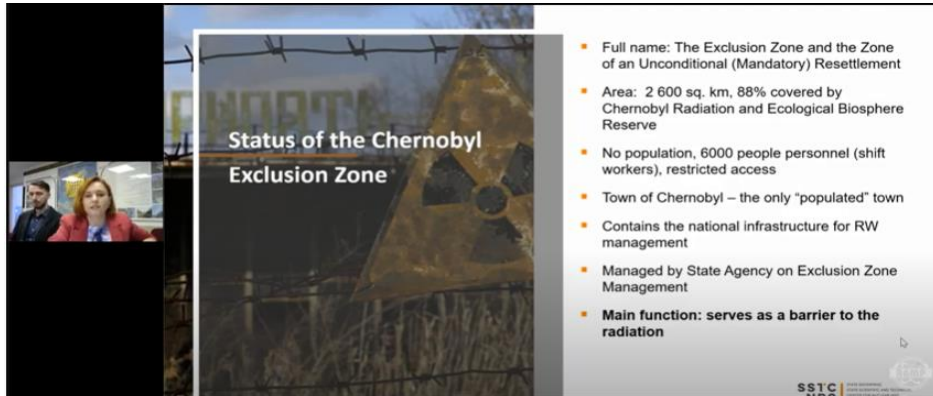


SNRIU/SSTC NRS joined the Program in June, 2019

Participation in RAMP: 2019-2021 (events)



2019 Fall RAMP Users Meeting



2020 International RAMP Virtual Summer Webinar



2020 Fall Virtual RAMP User Group Meeting

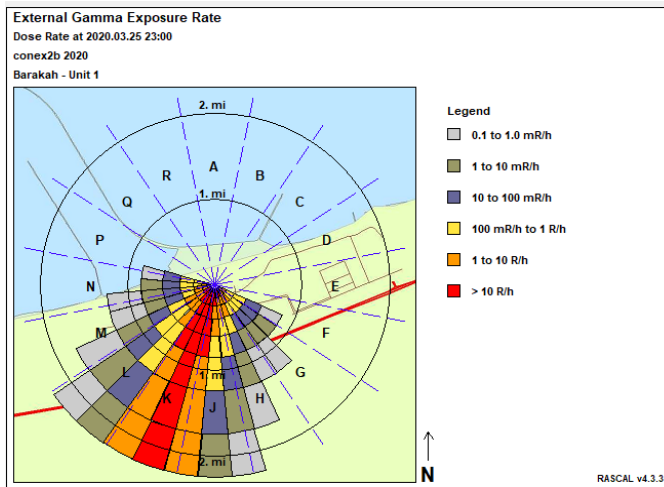


2021 Spring Virtual RAMP User Group Meeting

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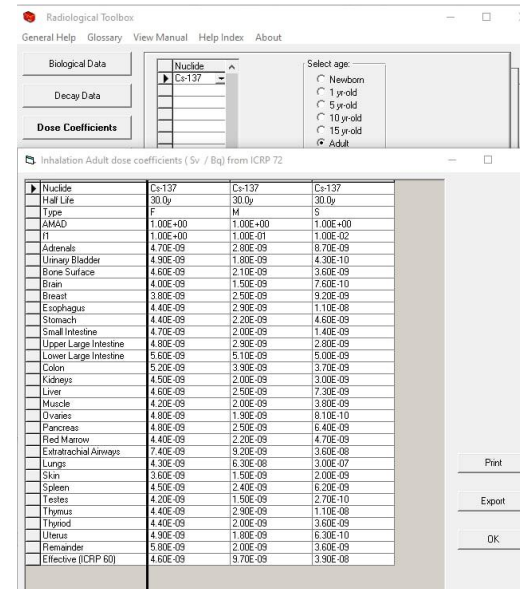
Application of the RAMP's codes (2020' examples)

Atmospheric dispersion and dose projection results were provided using RASCAL v.4.3 code under the IAEA emergency exercise ConvEx-2b (24 - 26 March, 2020).



RASCAL 1st Report: External Gamma Exposure Rate

Radiological toolbox was used for conservative dose assessments during wildfires in the Exclusion Zone between April 5 and 15, 2020



¹³⁷Cs inhalation dose coefficients (adult) from ICRP 72

RASCAL 2nd Report: Average I-131 Air Concentration

Further plans

- Testing and application of the new versions of codes: VARSKIN, RASCAL.
- Development of a short RASCAL's application course for the SNRIU IEC experts
- Extended Ukrainian translation for the new VARSKIN modalities
- Mastering and application of RADTRAN, MILDOS, RESRAD, GENII
- Development of instructions (courses) for domestic users

Thank you



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**SSTC
NRS**

STATE ENTERPRISE
STATE SCIENTIFIC AND TECHNICAL
CENTER FOR NUCLEAR AND
RADIATION SAFETY