ISTC
INTERNATIONAL SCIENCE
AND TECHNOLOGY CENTER

Annual Report 2024

International Science and Technology Center

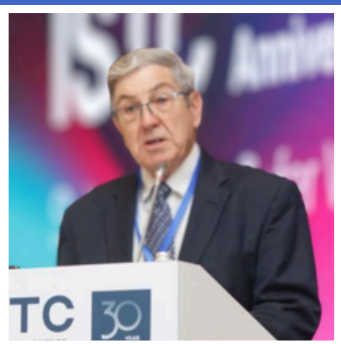
CONTENTS

MISSION

Advancing global peace and prosperity through cooperative CBRN risk mitigation.

Enabling civilian science and technology partnerships that address worldwide security challenges and promote non-proliferation

Building constructive, knowledge-based collaborations for a safer, more secure, and sustainable world



STATEMENT FROM THE CHAIRMAN OF THE GOVERNING BOARD OF ISTC

Ronald F. Lehman
Chairman of the Governing Board
International Science and Technology Center

In the years since its founding, the International Science and Technology Center has remained faithful to its original mission—to reduce the risk that knowledge might be diverted to dangerous ends—while steadily evolving to meet the needs of the Parties and the challenges of an ever-changing world. The ISTC was born out of uncertainty and forged in cooperation. Today, it stands not only as a platform for science but as a model for consensus, competence, and common purpose.

In 2025, as we mark over three decades of operation, the ISTC continues to demonstrate the value of multilateral engagement in the management of scientific risks and opportunities. Our Secretariat operates with professionalism, integrity, and responsiveness, earning the confidence of both the Parties and the Partners. Its work is peer-reviewed, independently audited, and constantly refined. In a time when many institutions struggle to justify their relevance, the ISTC has quietly but clearly affirmed its own—through results.

Our mandate, as renewed and expanded under the Continuation Agreement, is not static. It encompasses more than the legacy of weapons science. It includes the responsible governance of emerging technologies, the strengthening of biosecurity and biosafety, the support of peaceful research and innovation, and the cultivation of science diplomacy as a means of preventing conflict. This is not only a mandate to prevent harm—it is a mandate to create benefit.

The world continues to change around us. New threats emerge in biological security, artificial intelligence, and dual-use research. Geopolitical divisions have grown sharper. Scientific collaboration is often caught in the crosscurrents of mistrust. And yet, the ISTC endures—not because it ignores these challenges, but because it was designed to face them. It does so by building trust through transparency, by advancing competence through cooperation, and by securing peace through science.
Hope for the future of the ISTC does not lie in optimism alone. It lies in performance. It lies in our ability to serve the interests of all Parties—faithfully, efficiently, and without favoritism. The Center succeeds when it remains accountable to all, when it reflects the highest standards of both scientific and ethical conduct, and when it provides a trusted platform where technical excellence and international security meet.

There will always be challenges—budgetary, political, and strategic. But as long as science remains both a source of concern and a source of hope, the need for institutions like the ISTC will persist. And as long as we remain united in purpose, the ISTC will continue not only to meet expectations, but to exceed them.
On behalf of the Governing Board, I extend my thanks to the Parties, our Kazakh hosts, the Secretariat, the scientists, and the many partners who make this endeavor possible. Your trust and your contributions remain the foundation of our collective success.

STATEMENT OF THE ISTC EXECUTIVE DIRECTOR

Karina Anguelieva
Executive Director
International Science & Technology Center

It is an honor to present the ISTC's 2024 Annual Report and reflect on a year of continued progress and meaningful scientific and technological collaboration. This past year has been especially significant as we proudly celebrated the 30th anniversary of the ISTC—a milestone that underscores our enduring commitment to fostering international S&T cooperation for peace and security.

In 2024, ISTC officially launched the implementation phase of its Strategic Roadmap 2030, focusing on advancing global collaboration in critical areas such as CBRN risk mitigation, peaceful use of advanced and emerging technologies, and sustainable development. ISTC is more than an international organization, uniting principles and values of its Parties and Partners. It is a leading platform for multilateral research, technology and innovation engagement, enabling regions, countries and institutions to respond proactively to evolving global threats while reinforcing transnational, cross-border and international non-proliferation S&T efforts globally.

Another major area of focus this year has been the ongoing preparation for ISTC's participation in the EXPO 2025 in Osaka, Kansai, Japan. This global event presents a unique opportunity to showcase our contributions to science diplomacy and to promote international cooperation in research and innovation. Our presence at EXPO 2025 will highlight the positive role that scientific partnerships can play in strengthening global peace and security, in line with ISTC's mission and values.

Looking ahead, we see a future where ISTC continues to grow as a strategic hub for excellence and cooperation. By strengthening our relationships with ISTC Parties and Partners, expanding our outreach to non-member countries, and building new partnerships across science, government, and industry, we aim to broaden our impact and remain at the center of the global S&T collaboration. Our work in areas such as nuclear safety, public health, disaster risk management and environmental protection remains vital to addressing today's most urgent challenges through peaceful and inclusive approaches.

I sincerely thank the ISTC team, the Parties, and our partners for their persistent dedication. We are building a safer, more secure, and sustainable future through science and technology.

Ms Anguelieva has been appointed as an ED of the ISTC on February 1, 2025. She has taken over the position previously held by Mr. David Cleave, who has served as Executive Director of the organization since 2014. Under his leadership, the ISTC has achieved significant milestones and made important contributions to the fields of responsible science, safety and security.

2024 YEAR FOR ISTC – BUILDING ON THE SUCCESS

ISTC FY 2024 PROJECT ACTIVITIES

97 NEW PROJECTS INITIATED

Addressing emerging priorities and strategic opportunities.

34 PROJECTS SUCCESSFULLY COMPLETED

Providing tangible outcomes and releasing resources for new priorities.

80 PROJECTS CONTINUING BEYOND FY 2024

Will continue beyond the fiscal year, demonstrating our commitment to long-term strategic initiatives.

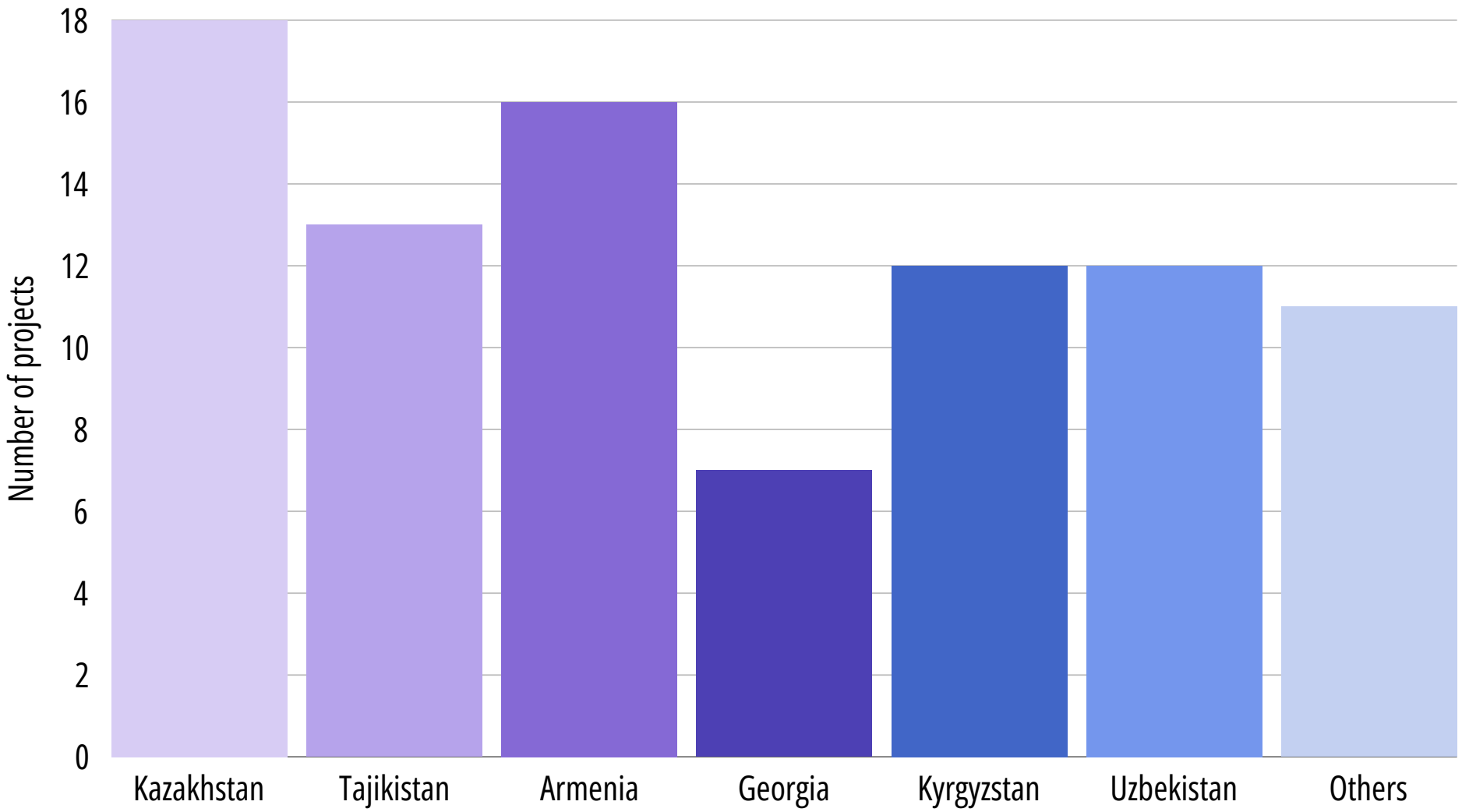
$11 MILLION PROJECT INVESTMENTS

Including newly launched, ongoing, and completed efforts -highlighting efficient and meaningful resource deployment.

AREAS OF INTEREST

- **CBRN Risk Mitigation** - biosafety, biosecurity, nuclear non-proliferation and related fields.
- **Energy Technologies** - renewable energy & energy efficiency, nuclear technology applications, materials, SMR (Advanced Modular Reactors), etc.
- **Export control on dual-use materials and technologies**
- **Hazard Mitigation Planning and Monitoring** – Earth observation and space applications, civil protection and critical infrastructure
- **Emerging technologies**
- **Public health** – capacity building in handling infectious diseases, emergency preparedness and related fields.
- **Environmental and Water Resources**

TOTAL PROJECTS PER COUNTRY



ISTC'S 30TH ANNIVERSARY: SCIENCE FOR A SAFER WORLD

On June 6, 2024, the International Science and Technology Center (ISTC) celebrated its 30th anniversary with a full-day event under the theme "Science for a Safer World." Hosted at the Wyndham Garden Hotel in Astana, Kazakhstan, the event brought together high-level officials, diplomats, and scientists from 25 countries to reflect on the Center's significant contributions and to decide on its future direction.

Opening the ceremony, the Chair of the ISTC Governing Board, Dr. Ronald F. Lehman, and the former ISTC Executive Director David Cleave delivered heartfelt messages of gratitude, recognizing the commitment of member states, scientific partners, and global stakeholders. Notable attendees included Sayasat Nurbek, Minister of Science and Higher Education of the Republic of Kazakhstan, and FUKAZAWA Yoichi, Parliamentary Vice-Minister for Foreign Affairs of Japan, alongside other government ministers, international organization representatives, and ambassadors, reflecting ISTC's broad international reach.

The day's program featured engaging discussions on ISTC's origins, evolution, and future impact. Speakers underscored ISTC's success in fostering scientific engagement to prevent the proliferation of weapons of mass destruction.

30 YEAR HISTORY

OVER **100** COUNTRIES

MORE THAN **80,000** EXPERTS

MORE THAN **4,500** SCIENTIFIC PROJECTS VALUED AT MORE THAN **$1.6 BILLION**

OVER **800** RESEARCH INSTITUTES

ISTC'S 30TH ANNIVERSARY: SCIENCE FOR A SAFER WORLD

As part of the strategic vision for the future, the event highlighted the launch of ISTC's seven-year Strategic Roadmap (2024-2030), aimed at expanding the Center's focus areas and inviting new countries to participate in collaborative S&T efforts.

The anniversary concluded with a formal reception and a site visit by ISTC Governing Board members for the opening of the Kazakh Toxicology Information Center - symbolizing the Center's continued commitment to regional and global health security.

The 30th anniversary was more than a celebration of the past - it was a reaffirmation of ISTC's mission: to create peaceful, impactful multilateral science and technology collaborations that make the world safer, more secure, and sustainable.

CAPACITY BUILDING

ISTC supported participation of four talented researchers from Georgia and Kazakhstan at World Smart Energy Week 2024 from November 17 through 24 in Osaka, Japan. Professor Paata Kervalishvili and Associate Professor Tamar Berberashvili from Georgia Technical University and Kazakhstani researchers Gulnara Akanova and Akmaral Ismailova of Al-Farabi Kazakh National University. The focus of their visit was presenting innovative advancements in solar energy technology.

World Smart Energy Week 2024 provided an opportunity to generate significant interest among experts and industry leaders in a silicon graphene nanosystem as it relates to enhancing solar energy conversion efficiency. And, while in Osaka, Professors Kervalishvili and Berberashvili moved forward with preparing a joint ISTC research project, with Ms. Akanova and Ms. Ismailova dedicated to developing laser plasma and tools for preparing rare earth materials-based nanosystems for different applications.

The financial support is provided by the Government of Japan and administered by the International Science and Technology Center.

“Strengthening Biorisk Management in Kazakhstan, Kyrgyzstan, and Tajikistan” workshop was organized on August 12-14 in Kazakhstan by the Health Security Partners (HSP) in collaboration and support of the International Science and Technology Centre (ISTC). The workshop was led by subject matter expert, Dr. Maria Espona. Presentations on supplemental topics were provided by experts Firuza Nasyrova, Tatyana Volkova, Farida Tishkova, Elmira Akmatova, Daniil Shauer, Gulmira Kalmambetova, Tamara Tazhibayeva, Svetlana Firsova, and Anna Vilkova. The event was attended by thirty-three academic, laboratory, medical, research, and IT experts from Kazakhstan, Kyrgyzstan, and Tajikistan. Participants identified gaps and challenges in biorisk management.

In the aftermath of the session, attendees had the chance to submit challenge grant applications. The recipients of the scholarships received assistance in putting biorisk management concepts into practice and refining them at their respective organisations. The goal of this workshop was to close gaps in biorisk management through encouraging regional learning and experience exchange.

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TARGETED INITIATIVE - CBRN EXPORT CONTROL ON DUAL-USE MATERIALS AND INTANGIBLE TECHNOLOGIES IN CENTRAL ASIA

OBJECTIVE:

This Targeted Initiative (TI) strengthens and enhances protection and security measures of national CBRN Infrastructure facilities. The main aim is to ensure minimization of any CBRN hazards which can induce health consequences, human and economic losses and/or violation of physical protection.

KEY FACTS:

- **Funding Party:** FPI, European Union
- **Countries Involved:** Armenia, Kazakhstan, Kyrgyzstan, Tajikistan
- **Duration:** September 2017 – September 2025
- **Budget:** €7,500,000.00

KEY ACHIEVEMENTS:

The project showed considerable success in fostering sustainable practices and legal frameworks within partner nations. The TI successfully developed academic ecosystems, including university-level courses and PhD grants, addressing the long-term need for education in CBRN export control. Universities in Kazakhstan, Kyrgyzstan, Tajikistan, and Armenia integrated tailored curricula, developed syllabi, and produced educational materials. A regional research network was created, and several training and awareness-raising events were held.

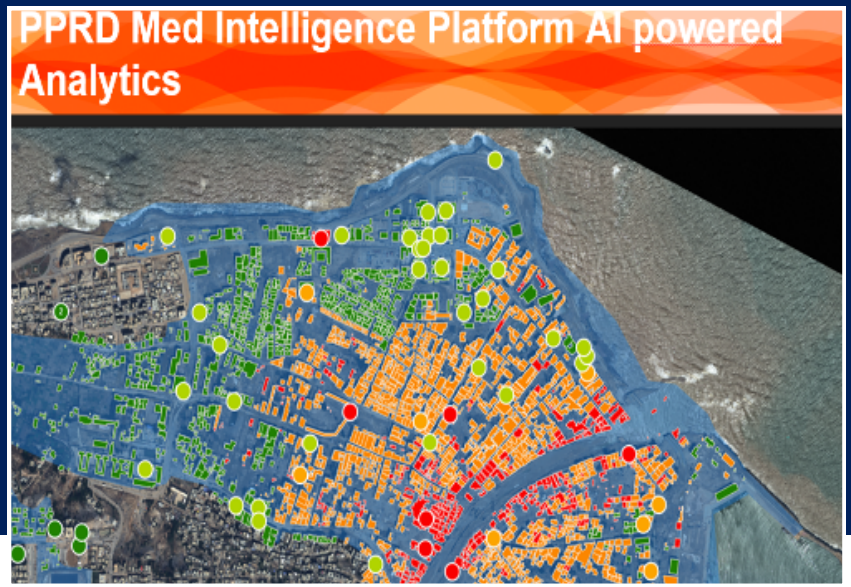
Additionally, specific tools such as a web repository, mobile apps, and handbooks helped localize knowledge and extend access to vital export control information. TI's outreach extended to the private sector, where significant steps were taken to raise awareness among industries handling dual-use goods and technologies. It facilitated the development of Internal Compliance Programmes (ICPs), industry specific handbooks, and multilingual tools for commodity identification. These resources supported businesses in navigating export control systems and reinforced compliance culture. During 2024 most of the TI's activities were wound down and completed.

NEW TOOLS FOR FIRST RESPONDERS: HOW TO BETTER PREPARE FOR CLIMATE-DRIVEN DISASTERS

OBJECTIVES:

The project aims to strengthen disaster risk reduction and emergency preparedness in the Maghreb and Middle East regions.
It focuses on using satellite data and AI-driven tools, to improve early warning systems and support first responders in mitigating the impacts of climate-driven disasters like floods, dam collapses, and cascading effects triggering Industrial risks (ChemRad).

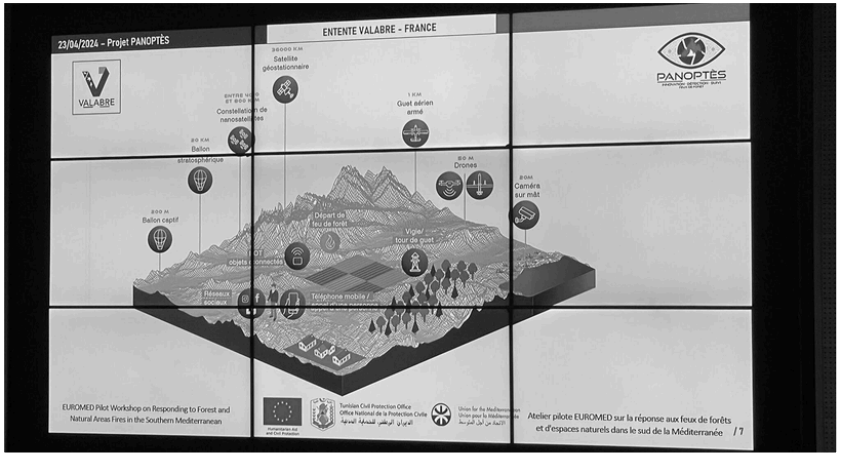
Website: https://www.pprdmed.eu/



KEY ACHIEVEMENTS:

At the core of the activities is the new SAVE (Space Analytics for Visual Environment) decision support tool, which employs AI-driven algorithms to monitor, analyze, model, and visualize data regarding the extent of floods and their impacts on critical infrastructure such as dams, power grids, healthcare facilities, industrial sites, and road networks. It enhances preparedness for contingency planning and response coordination, strengthens risk assessment capabilities, and consolidates regional cross-border cooperation (Tunisia-Algeria and Israel-Palestine-Jordan).

SAVE supports and works in synergy with national instruments for crisis management that comply with specific national legal and regulatory frameworks.



KEY FACTS:

- **Countries Involved:** Mauritania, Morocco, Algeria, Tunisia, Libya, Egypt, Jordan, Palestine, Israel, Lebanon
- **Key Partners:** European Space Agency (ESA), University of Twente, Deltares, Geospatial Insight (GSI), Starion, Regional Space agencies, Hydrometeorological Services.
- **Funding Party:** ECHO (Directorate-General for European Civil Protection and Humanitarian Aid Operations). OGR
- **Project Timeline:** January 11, 2023 – January 11, 2026
- **Total Budget:** €3,000,000

EXPECTED RESULTS:

- Enhanced Disaster Preparedness
- Developed flood scenarios including possible impact on population density, transportation, health, and energy infrastructure.
- Operational Pilots conducted in each of the participating countries, focused on dam stability, industrial risks, critical infrastructures.
- Knowledge Transfer enhances operational decision-making and contingency planning through space data, integrating scientific knowledge into daily operations across ten countries.
- Liaised with national agencies to better coordination of disaster risk management
- Demonstrated transregional cooperation in Maghreb/Middle East

In anticipation of the 2024 summer fire season, this 1st EUROMED pilot workshop, co-organized by the Tunisian National Civil Protection Office, DG ECHO, and the Union for the Mediterranean, initiate discussions on possible cross-border, sub-regional, and regional response measures to combat forest and natural area fires.

STRENGTHENING SEISMIC INFRASTRUCTURE AND RESEARCH

ISTC supports seismic initiatives focused on earthquake monitoring, scientific data preservation, and regional cooperation in disaster risk reduction. These projects strengthen seismic infrastructure, support digital transformation of legacy data, and foster knowledge exchange across Central Asia, the Caucasus, and beyond.

(1) SEISMIC NETWORK EXPANSION IN CAUCASUS AND CENTRAL ASIA (SNECCA)

The SNECCA Project (Seismic Network Expansion in Caucasus and Central Asia) is a regional initiative aimed at improving seismic hazard monitoring across six countries —Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, and Tajikistan. With ISTC and STCU coordination and U.S. technical support, the project strengthens earthquake response and risk reduction through advanced seismic infrastructure and data-sharing.

OBJECTIVES:

- Expand national seismic networks with modern seismic stations.
- Improve the quality and real-time availability of seismic data.
- Strengthen national data centers with new servers and software.
- Foster regional cooperation and open data exchange.
- Enable accurate seismic hazard assessments for disaster prevention.

KEY FACTS

- **Participating Countries:** Azerbaijan, Armenia, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan
- **Funding Party:** US Department of Energy, National Nuclear Security Administration
- **Collaborator:** Lawrence Livermore National Laboratory, IRIS PASSCAL Instrument Center
- **Project Timeline:** September 2019 - January 2026
- **Total Budget:** $3,100,325

KEY ACHIEVEMENTS:

1. 88 new seismic stations installed across 6 countries:

- Azerbaijan – 22 stations, including 12 for mud volcano monitoring.
- Armenia – 10 stations, improving coverage around Yerevan
- Georgia – 14 new stations added to the national network.
- Kazakhstan – 12 new sites across key seismic zones.
- Kyrgyzstan – 14 stations, with a focus on strong motion monitoring
- Tajikistan – 12 stations, including 4 in the capital Dushanbe.

2. National seismic data centers were upgraded with modern servers and SeisComp3 software for real-time monitoring and analysis.

- Improved accuracy of earthquake detection and location.
- Enabled cross-border seismic data sharing and improved regional coordination.
- Strengthened scientific capacity through regional training.

(2) DIGITIZATION OF HISTORICAL NUCLEAR EXPLOSION SEISMOGRAMS

Objective:
To convert old analog recordings of nuclear test waveforms into digital format. Archives are used from the Institute of Seismology of the Kyrgyz Republic (ISKR) and the National Center for Seismological observations and Research of the Ministry for Emergency Situations of the Republic of Kazakhstan (NCSOR MES RK).
For future research, it is important to preserve the integrity of the data set and convert waveforms to digital signals that are usable for modern digital analysis techniques.

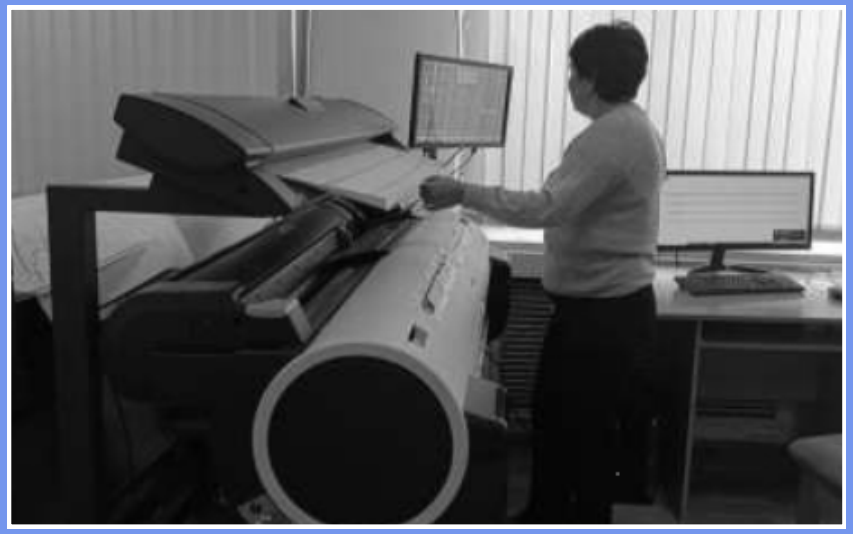
KEY FACTS

- **Participating Countries:** Kazakhstan and Kyrgyzstan
- **Funding Party:** Michigan State University
- **Project Timeline:** September 2024 - December 2025 (to be extended)
- **Total Budget:** $399,408.00

(3) SEISMIC EQUIPMENT FOR IRAQ

Objective: Enhance Iraq's seismic monitoring capacity and data reliability by supplying high-precision seismic instruments and connectivity infrastructure.

Work with historical archive



Scanning seismograms on a Canon ImagePROGRAF iPF 770 scanner

DEVELOPING THERMOELECTRIC MATERIALS FOR CONVERTING WASTE HEAT INTO ELECTRICITY

PROJECT TITLE:

Enhancing the thermoelectric conversion performance of cobalt-based oxide materials through doping and microstructure modulation

PROJECT TIMELINE:

Oct 01, 2022 – March 31, 2025

OBJECTIVES:

With the increasing demand for energy consumption, approximately 70% of the world's energy is wasted as heat, causing the negative environmental impacts. To address this, there is a focus on developing alternative eco-friendly energy conversion technologies. One promising approach is to convert waste heat into electricity using the thermoelectric phenomenon known as the Seebeck effect. The development of efficient thermoelectric materials is expected to provide a breakthrough in the widespread application of thermoelectric generators for electricity generation from waste heat. The main objective of the project is to enhance the heat-to-electricity conversion efficiency of thermoelectric cobaltite materials by incorporating appropriate dopants into these materials.

KEY ACHIEVEMENTS:

- Established the first thermoelectric cobaltites laboratory in Georgia and the Caucasus region.
- Improved thermoelectric efficiency of cobaltite materials through doping and microstructure modulation.
- Strengthened international collaboration between Georgian Technical University and Japan's Nagaoka University of Technology, with the possibility of future cooperation in the development of laboratory models of thermoelectric generators using optimized materials.

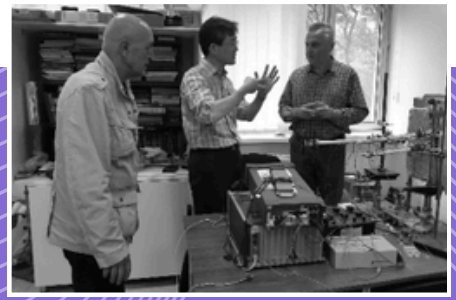
KEY FACTS:

- **Countries Involved:** Georgia, Armenia
- **Key Partners:** Georgian Technical University, The Institute for Physical Research of National Academy of Sciences of Armenia, Nagaoka University of Technology (Japan), Institute of Technical Physics and Materials Science (Hungary)
- **Funding Party:** Japan
- **Total Budget:** $199,910
- **Key Focus Areas:** Thermoelectric materials, Green technology

DEVELOPING THERMOELECTRIC MATERIALS FOR CONVERTING WASTE HEAT INTO ELECTRICITY

RESULTS:

- This project was the first attempt to enhance the efficiency of Co-based oxide thermoelectrics via doping of (Ca,Bi)3Co4O9, Bi2Sr2Co1.8Oy, and Bi2Ca2Co1.7Oy materials with bismuth borate: BiBO3 and cobalt borate-Co3(BO3)2. These dopants have been selected for the first time by the research team.
- By Georgian team performed:
  - Synthesis by the solid-state and sol-gel methods of (Ca,Bi)3Co4O9, Bi2Sr2Co1.8Oy, and Bi2Ca2Co1.7Oy materials doped with BiBO3 and Co3(BO3)2;
  - Measurements of temperature dependences of Seebeck coefficient, resistivity and thermal conductivity and evaluation of thermoelectric conversion efficiency of prepared materials;
  - Nanostructuring (high-energy ball-milling treatment in a planetary micro mill) of selected best compositions and measurements of their thermoelectric properties.
- By Armenian team performed:
  - X-ray diffraction (XRD) analysis of prepared materials;
  - Analysis of the microstructure, phase, and elemental compositions of the samples by scanning electron microscope (SEM) coupled with Energy Dispersive X-ray (SEM/EDX) microanalysis system.
- Collaboration with Prof. Masatoshi Takeda from Nagaoka University of Technology, Japan resulted in five joint presentations at international conferences and 3 peer-reviewed publications, including Journal of the Ceramic Society of Japan, Journal of Fluid Flow, Heat and Mass Transfer (JFFHMT), and Journal of Physics Communications.




DEVELOPING NOVEL ANTIVIRAL AND ANTIBACTERIAL COMPOUNDS TO COMBAT DRUG-RESISTANT VIRUSES

PROJECT TITLE:

Target-directed synthesis and screening of antiviral (anti-SARS-CoV) and antibacterial compounds based on non-proteinogenic amino acids, peptides and polymers

PROJECT TIMELINE:

April 01, 2022 - March 31, 2025

OBJECTIVE:

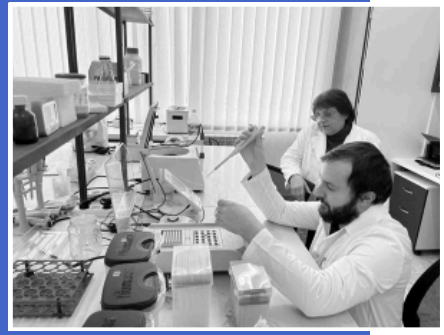
Infectious diseases, especially viral infections, are a major global health concern. Drug-resistant pathogens often reduce the effectiveness of current treatments. The COVID-19 pandemic highlighted the critical need for new therapeutic approaches, such as targeting unexplored enzyme pathways with novel compounds. The main objective of the project is to create new types of biological active compounds that can fight harmful viruses, such as the coronavirus, and bacteria that are resistant to antibiotics.

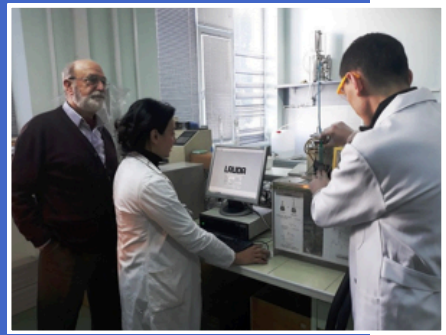
KEY ACHIEVEMENTS:

- Drug discovery potential: Promising compounds were identified through docking studies for their interactions with critical receptors such as TMPRSS2, 3CLpro, and EGFR kinase. These compounds could be used as antiviral and antibacterial drugs.
- Contributions to antibiotic resistance: By studying antibiotic resistance genes in P. aeruginosa, the research team identified new antibacterial compounds that are effective against resistant strains.
- Development of new materials: The research team developed novel polymers based on non-protein amino acids, opening new possibilities in materials science, leading to advancements in drug delivery systems and biomedical applications.
- This project has identified potential antibacterial candidates, which is important due to the rise of multidrug-resistant (MDR) bacterial strains. Finding new treatments for infections resistant to current antibiotics is crucial in addressing the public health threat.

KEY FACTS:

- **Countries Involved:** Armenia, Georgia
- **Key Partners:** Yerevan State University (YSU), Scientific and Production Center "Armbiotechnology" NAS RA, Agricultural University of Georgia
- **Funding Party:** Japan
- **Total Budget:** $494,000
- **Key Focus Areas:** Antiviral research, Antibacterial research, Materials science applications





RESULTS:

- Synthesis of Non-Proteinogenic Amino Acids and Catalysts: Over 45 unnatural amino acids were synthesized, including 18 N-protected derivatives. Over 20 compounds were developed and evaluated as asymmetric catalysts, achieving high stereoselectivity and chemical diversity.
- Peptide Synthesis: Peptides incorporating non-canonical amino acids were prepared, including 22 dipeptides, 4 tripeptides, and 1 tetrapeptide.
- Biochemical and Microbiological Research: Docking of 120 compounds was performed against clostridial collagenase (2YS0), TMPRSS2 (7MEQ), and SARS-CoV-2 3CLpro. Approximately 100 compounds were tested against MDR strains (K. pneumoniae, E. coli ESBL, P. aeruginosa, S. aureus, S. maltophilia).
- Contributed to scientific advancement through publications of seven peer-reviewed articles, including four in Q1 journals (e.g., European Polymer Journal, IJMS) and two in Q2 (Molecular Catalysis, Amino Acids).
- The project has established a solid foundation for future research and development, particularly in antimicrobial and enzyme-targeted drug discovery. The findings show great promise for creating new therapeutics to combat bacterial resistance and protease-driven diseases.
- This project is a successful example of international scientific collaboration, involving multidisciplinary teams from various countries. Researchers with expertise in synthetic chemistry, computational modeling, microbiology, and enzymology worked together towards a common goal.

EXPANDING GLOBAL KNOWLEDGE OF TUBERCULOSIS BY CREATING A TB PORTAL IN KAZAKHSTAN AND KYRGYZSTAN

- **Funding Party:** OCICB, USA
  US Department of Health & Human Services / National Institute of Health / National Institute of Allergy and Infectious Diseases / Office of Cyber Infrastructure and Computational Biology (OCICB), Rockville, MD, USA
- **Project Timeline:** KZ TB Portal project timeline: February 2018 - January 2026
  KRTB Portal project timeline: April 2019 - September 2025
- **Total Budget:** $1, 041,191.83

OBJECTIVE:

This project supported the establishment of the Tuberculosis (TB) Portals in Kazakhstan, Kyrgyzstan, Georgia, and Belarus to collect anonymized clinical, imaging, laboratory, and genomic data, focusing primarily on multidrug-resistant (MDR) and extensively drug-resistant (XDR) TB.

KEY ACHIEVEMENTS:

Kazakhstan and Kyrgyzstan have made notable progress in advancing TB research through the TB Portals initiative. Kazakhstan: The TB Portal supports research on drug-resistant TB, aiding in the development of advanced diagnostics and personalized treatments. Kyrgyzstan: Integrated clinical, imaging, lab, and genomic data into a national TB Portal. Submitted 456 DNA samples for sequencing in Germany. Entered data from 201 patients (724 samples) into the portal. Regular quality checks conducted with NIAID involvement. These efforts have strengthened regional research capacity and international collaboration in the fight against TB.

KEY FACTS AND RESULTS:

In 2024, Kazakhstan submitted data from over 550 TB cases, Kyrgyzstan reported 456 cases. The initiative supports global research efforts to prevention of tuberculosis, enhance diagnosis, treatment, and management of TB.

The International TB Portal Program represents a remarkable success story in global health security. Starting from a single site in Belarus in 2004, this initiative has grown into a network spanning 19 countries with 60 active sites. The program now manages over 20,000 TB cases, collecting comprehensive clinical, socioeconomic, laboratory, and genomic data. Its recent HHS Data Excellence Award recognition demonstrates its impact.

EXPANDING GLOBAL KNOWLEDGE OF TUBERCULOSIS BY CREATING A TB PORTAL IN GEORGIA AND BELARUS

- **Funding Party:** OCICB, USA
  US Department of Health & Human Services / National Institute of Health / National Institute of Allergy and Infectious Diseases / Office of Cyber Infrastructure and Computational Biology (OCICB), Rockville, MD, USA
- **Project Timeline:** GE Portal project: January 2015 - December 2025
  BY Portal project: September 2023 - August 2025
- **Total Budget:** $1,437,517.09

OBJECTIVE:

This initiative establishes Tuberculosis (TB) Portals in Kazakhstan, Kyrgyzstan, Georgia, and Belarus to collect anonymized clinical, imaging, laboratory, and genomic data, focusing primarily on multidrug-resistant (MDR) and extensively drug-resistant (XDR) TB.

KEY FACTS AND RESULTS:

In 2024, Georgia reported 817 cases, and Belarus reported 120 cases. There are differences in data collection methods; for instance, Georgia has focused on surgical samples, while Belarus has prioritized severe MDR/XDR-TB and HIV/TB co-infections. This initiative is an open-access data repository with tools for sharing and analyzing TB data, fostering an international network of scientists and clinicians dedicated to advancing TB research and improving global health.

TB Portals was also among the NIH projects recognized by the HHS Data Excellence Award for outstanding contributions to data sharing and innovation.
The TB Portals Program remains a vital resource in the fight against TB, uniting clinicians, scientists, and policymakers to leverage data for impact.
For more information or to collaborate, visit: https://tbportals.niaid.nih.gov

KEY ACHIEVEMENTS:

The TB Portals continue to advance in Georgia and Belarus, creating centralized databases of anonymized patient data to support global tuberculosis research, diagnosis, and treatment, especially for drug-resistant TB.
Georgian experts successfully collaborated to solve an issue with TB patients selecting procedures and entering data into the portal. Georgia's portal supports TB hospitals and labs nationwide and contributes a significant share of data to the global platform.
Belarus is focused on expanding the functionality of its portal by using AI-based image analysis and genetic data to study drug resistance and potential treatments for tuberculosis (TB). Advanced AI techniques for CT and CXR image analysis help detect and quantify features related to lung conditions.

STRENGTHENING CBRN MEDICAL EMERGENCY PREPAREDNESS AND RESPONSE IN SOUTHEAST ASIA

OBJECTIVE:

Incidents involving chemical, biological, radiological or nuclear (CBRN) materials (for example, chemical transport accidents) have the potential to cause large numbers of casualties while also posing an unintended risk to first responders and medical professionals who must offer critical care from the scene of an incident to the hospital while mitigating exposure to and the spread of contamination. Consequently, mobilizing a safe and effective CBRN medical response requires specialized procedures, equipment and training.
Understanding the unique hazards presented by CBRN incidents, and the vital role played by first responders and medical professionals, the project aims to strengthen CBRN medical emergency preparedness and response in Southeast Asia to minimize the health consequences following CBRN incidents.

KEY FACTS:

- **Funding Party:** FPI
- **Countries Involved:** Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam
- **Key Partners:** EU CBRN CoE Initiative
- **Duration:** December 2023 – November 2027
- **Budget:** €3, 500,000.00

KEY ACHIEVEMENTS:

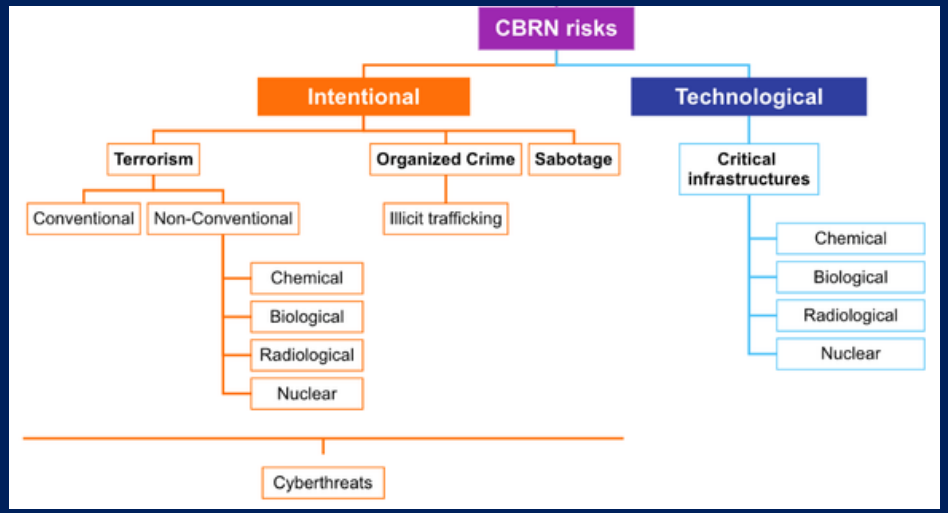
A first regional (kick-off) conference was conducted in Kuala Lumpur, Malaysia, 22-24 October 2024 to raise regional awareness and cooperation among stakeholders about the importance of CBRN medical preparedness, with over 80 experts participating from Partner Countries, EU, Implementation Team and international organisations. The meeting was organized in close cooperation with Malaysia stakeholders, who conducted a table-top exercise and a field demonstration at the Hang Tuah Fire Station.
Additionally, the conference enabled introduction of the project scope and initial conversations with the Partner Countries about their priorities on training efforts to strengthen different aspects of CBRN medical emergency response: a) scene management, b) prehospital medical care, c) hospital medical care, d) emergencies at points of entry.
Furthermore, meetings were held to discuss how to enhance national technical competency to investigate chemical, infectious disease, radiation, nuclear, and environmental event relevant to public health, by bolstering existing regional field epidemiology training programmes (FETPs).
In follow-up, in-country consultation visits are planned for the first part of 2025 to meet national stakeholders and discuss future activities.


Funded by the European Union
Centres of Excellence
STRENGTHENING CBRN MEDICAL EMERGENCY PREPAREDNESS AND RESPONSE IN SOUTHEAST ASIA
P98
EU CBRN COE PROJECT 98
EMED

ENHANCING CBRN CRITICAL INFRASTRUCTURE PROTECTION AND (CYBER) SECURITY IN SOUTH-EAST AND EASTERN EUROPE, CENTRAL ASIA AND MIDDLE EAST REGIONS

OBJECTIVE:

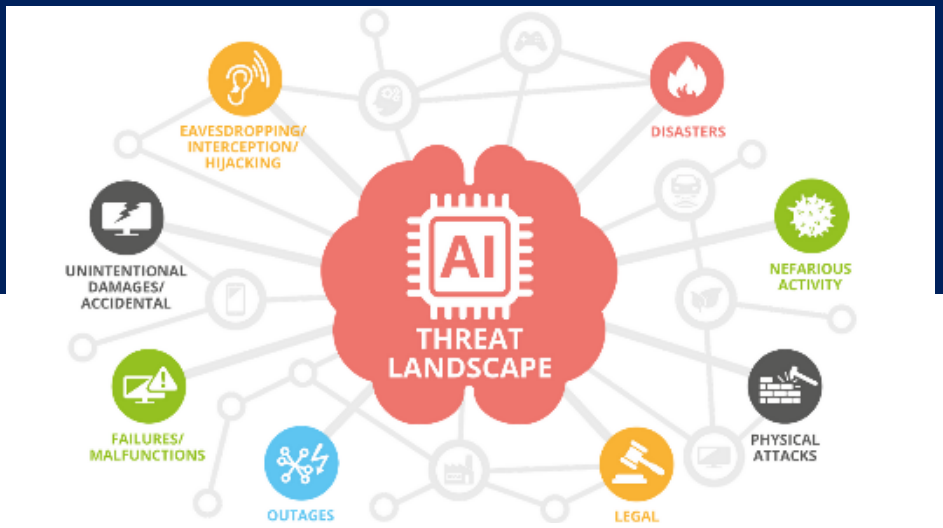
To strengthen and enhance protection and (Cyber)security measures for national CBRN Critical Infrastructure facilities and practices in partner countries, to ensure minimization of consequences of attacks/breaches at such facilities.



KEY ACHIEVEMENTS:

A first inter-regional (kick-off) meeting was conducted in Noordwijk, The Netherlands, 1-3 October 2024, with participation of 60 participants from Partner Countries, EU, Implementation Team and international observers. During the meeting, the scope of the project was introduced, and initial conversations were started with the Partner Countries. In follow-up, in-country consultation visits are planned for the first part of 2025 to meet national stakeholders and further specify each Partner Country's for the protection of their critical CBRN infrastructure.

The Norwegian Directorate For Radiation Protection and Nuclear Safety joined the project in December 2024, providing additional funding for 2 years, with a focus on RN critical infrastructure in Central Asia. Discussions are ongoing with other international stakeholders on providing support to this project.

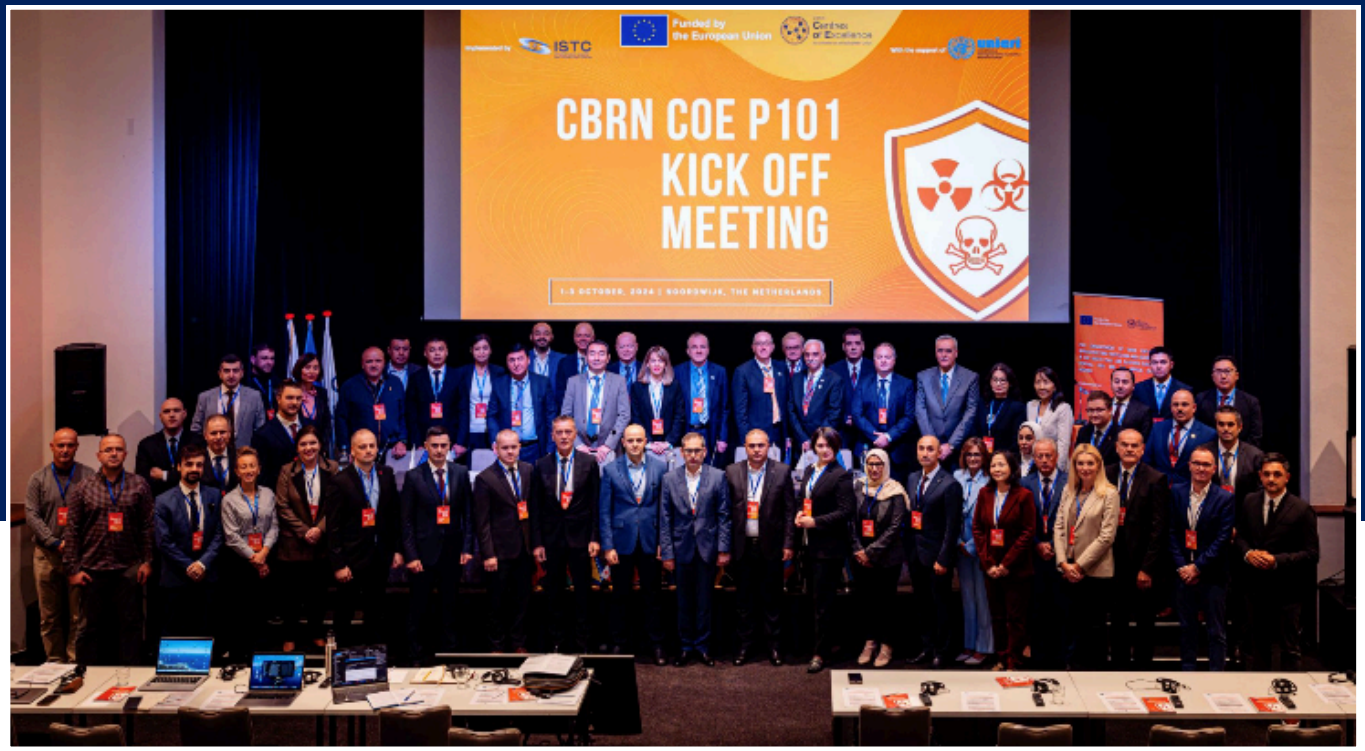


From MITIGATING ARTIFICIAL INTELLIGENCE (AI) RISK: Safety and Security Guidelines for Critical Infrastructure Owners and Operators - U.S. Department of Homeland Security (DHS), April 2024

ENHANCING CBRN CRITICAL INFRASTRUCTURE PROTECTION AND (CYBER) SECURITY IN SOUTH-EAST AND EASTERN EUROPE, CENTRAL ASIA AND MIDDLE EAST REGIONS

KEY FACTS:

- **Partners:**
  - Norwegian Directorate For Radiation Protection and Nuclear Safety (DSA)
  - EU CBRN CoE Initiative,
- **Duration:** September 2023 - June 2028
- **Budget:** €8.5 mil (EU) + €1 mil (DSA)
- **Partner countries:**
  Central Asia: Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Uzbekistan
  South East and Eastern Europe: Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, North Macedonia, Serbia, Ukraine
  Middle East: Iraq, Jordan, Lebanon



EU CBRN CoE P101 – Inter-regional Kick-off meeting, Noordwijk, Netherlands, October 2024

ADVANCING NUCLEAR FORENSICS CAPABILITIES IN CENTRAL ASIA AND CAUCASUS

ISTC, with funding and technical support from the U.S. Department of Energy (DoE), is implementing a multi-country initiative to enhance nuclear forensics (NF) capabilities in Central Asia and Caucasus. The program supports the development of National Nuclear Forensics Libraries (NNFLs), strengthens laboratory infrastructure, facilitates cooperation between organizations, and builds technical expertise to counter illicit trafficking of nuclear and radioactive materials.

OBJECTIVE:

- Develop National Nuclear Forensics Libraries (NNFLs) to help law enforcement agencies to investigate and trace radioactive materials.
- Strengthen laboratories and field response capabilities for the identification of nuclear materials.
- Improve interagency Standard Operating Procedures (SOPs) and response coordination mechanisms for nuclear security events.
- Provide advanced training, exchange visits, and joint exercises for NF experts, law enforcement, and regulators.
- Support scientific collaboration and data-sharing across institutions.

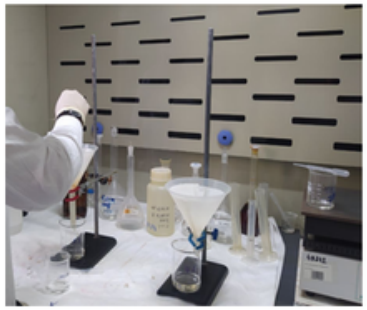
KEY FACTS

- **Participating Countries:** Armenia, Georgia, Kazakhstan, Tajikistan
- **Funding Party:** US Department of Energy, National Nuclear Security Administration, Nuclear Smuggling Detection and Deterrence Program
- **Collaborator:** Lawrence Livermore National Laboratory CA, U.S.
- **Total Budget:** $2,131,687.00

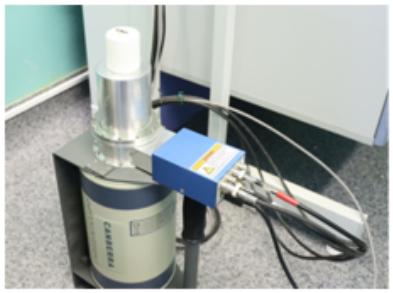
ARMENIA AND GEORGIA

Nuclear and Radiation Safety Center (NRSC), Armenian Nuclear Regulatory Authority (ANRA), Center for Ecological-Noosphere Studies of Armenia, Armenian Nuclear Power Plant, Ministry of Internal Affairs of Georgia

- Standard Operating Procedures (SOPs) were created and tested for both Armenian and Georgian agencies (handling orphan radioactive sources, transport and storage of radioactive materials, steps for lab analysis and emergency response).
- Armenia and Georgia held table-top and field exercises simulating radioactive smuggling and emergency scenarios.
- Joint activities have included training in alpha spectroscopy and gamma spectrometry to help experts accurately identify and trace radioactive materials.
- A concept and technical specifications were developed for Armenia's future National Nuclear Forensics Library.
- A detailed needs assessment was conducted across-border control points and nuclear facilities, identifying gaps in protective equipment, tools, and training.



The process of radiochemical sample preparation



Sample measurement geometry

ADVANCING NUCLEAR FORENSICS CAPABILITIES IN CENTRAL ASIA AND CAUCASUS

KAZAKHSTAN

National Nuclear Center of the Republic of Kazakhstan (NNC RK)

- Developed a prototype of the National Nuclear Forensics Library (NNFL) of Kazakhstan to support the identification and tracking of radioactive materials.
- Strengthened the skills of experts to improve national readiness and response to nuclear and radiological incidents.

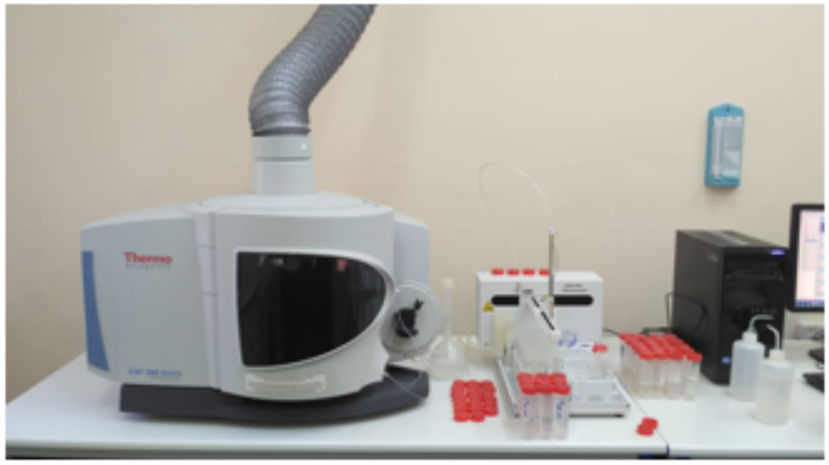
Institute of Nuclear Physics (INP) & Kazatomprom

- Equipped the INP laboratory with advanced tools for nuclear forensics to enhance the accuracy and depth of material analysis.
- Jointly working on staff training and improving testing methods to ensure consistent, high-quality forensic investigations.
- Developing a National Database on Uranium Concentrates to trace the origin of nuclear materials and support law enforcement investigations.

TAJIKISTAN

CBRN Safety and Security Agency, National Academy of Sciences of Tajikistan

- Modernized with advanced IT, audio, and security systems to support secure operations and data sharing in forensic investigations.
- Established a fully equipped nuclear forensics laboratory to analyze seized materials and provide scientific evidence in criminal cases.
- Launched a new regional center in October 2024 to serve as a hub for CBRN research, emergency response, and professional training.
- Supports the training of law enforcement and security officers to enhance national capacity in detecting and responding to CBRN threats.



Determination of macro-elements in a sample using an ICAP 7400 Duo inductively coupled plasma emission spectrometer

Liquid and loose radioactive sample preparation process

LIST OF PROJECTS COMPLETED IN 2024

Project No	Short title	Lead Institute	Funding by	Collaborator Country
# A-2334	Caucasus Transect	Institute of Geological Sciences of the National Academy of Sciences of Armenia	USA	USA
# GE-2606	Development of Sorbents- Carriers, Catalysts and Technology for Utilization of Methane and Carbon Dioxide Greenhouse Gases	Georgian Technical University, Tbilisi, Georgia	Japan	Finland, USA, Japan
# K-2410	The ecology and persistence of Brucella and transmission potential to humans in Kazakhstan	"Research Institute for Biological Safety Problems", Gvardeiski, Kazakhstan	Partner	USA
# KZ-2514	Properties of the irradiated SiC-matrix.	Institute of Nuclear of Physics, Almaty, Kazakhstan	Japan	Japan
#KZ-2539	Building Capacity on Multilateral Verification of Nuclear Disarmament	National Nuclear Center of the Republic of Kazakhstan	Partner	UK
#PR-103	EU CBRN CoE Project 60 - Support to the Center of Excellence of Eastern and Central Africa in Nuclear Security	ISTC	EU, DG DEVCO	Belgium
#PR-112	Water Monitoring System in Central Asia	Middle East Institute for Security (MESIS)	EU, DG DEVCO	Belgium
#PR-138	Strategic Trade Control (STC) Enforcement Seminar, Pretoria	ISTC	USA	South Africa
#PR-154	Visit to Japan of the Award winners of ISTC's 25th Anniversary	ISTC	Japan	Japan

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ISTC has been connecting science to peace since 1992