




**International Workshop on Sustainable
Management of Disused Sealed Radioactive
Sources, 11 to 15 October 2010
ITN, Lisbon Portugal**

**Experience of the Republic of Tajikistan in
implementing the Code of Conduct**

**NUCLEAR AND RADIATION SAFETY AGENCY
(STATE REGULATORY AUTHORITY)
REPUBLIC OF TAJIKISTAN**

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- ✓ **The infrastructure for regulatory control.**
 - ✓ **The facilities and services available to the persons authorized to manage radioactive sources**
 - ✓ **Training of staff in the regulatory body, law enforcement agencies and emergency service organizations .**
 - ✓ **Experience in establishing a national register of radioactive sources**
 - ✓ **National strategies for gaining or regaining control over orphan sources, including arrangements for reporting loss of control and to encourage awareness of, and monitoring to detect, orphan sources**
 - ✓ **Approaches to managing sources at the end of their life cycles**
 - ✓ **Experience with arrangements for implementing the import and export provisions of the Code and the Guidance on the Import and Export of Radioactive Sources.**
 - ✓ **Conclusions**



Таджикистан



R U S S I A

UKRAINE

KAZAKHSTAN

GEORGIA

ARMENIA

AZERBAIJAN

TURKEY

TURKMENISTAN

UZBEKISTAN

KYRGYZSTAN

TAJIKISTAN

CHINA

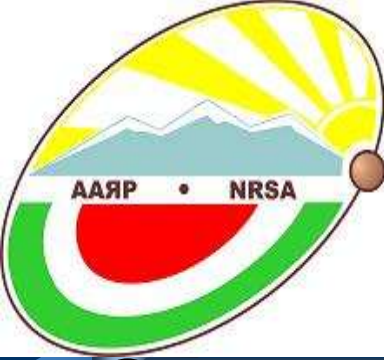
IRAQ

IRAN

AFGHANISTAN

PAKISTAN

Scale 1:19,000,000



TAJIKISTAN



Young independent state (1991), socio-economic conditions affected by civil war (1992-1997), rich and bright history and culture, developing political system.

Mountainous environment 93% mountain, only 7% arable land, world's third water resources per head and 50% glaciers of CA. Population is close to 7 million.

Cotton is the most important crop, fragile economy/ unstable growth, need for roads, future export of hydro electricity to bring revenue (3 stations under completion).

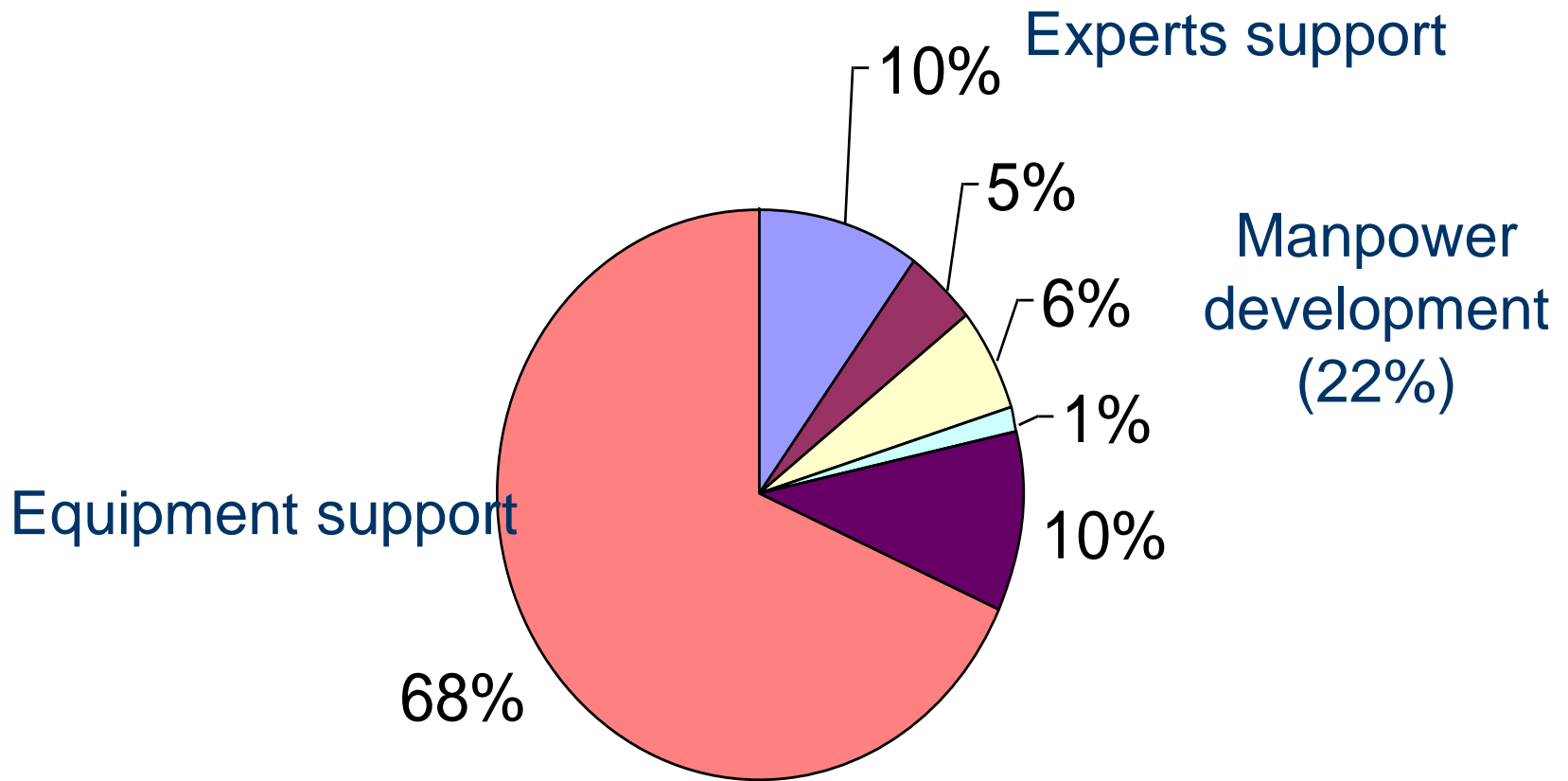
INTERNATIONAL COOPERATION

The NRSA is closely cooperates with several international organizations such as:

- ✓ International Atomic Energy Agency (IAEA)
- ✓ International Scientific and Technology Center (ISTC)
- ✓ Sandia National Laboratories (SNL)
- ✓ Argonne national laboratory
- ✓ Center on investigation the issues of non-proliferation, Monterey institute (USA)
- ✓ Nuclear Regulatory Commission (NRC)
- ✓ Russian Academy of Sciences;
- ✓ Nuclear Society of Russia
- ✓ And with regulatory authorities of IAEA member States

TECHNICAL COOPERATION WITH IAEA

Support to Tajikistan from Sep 2001-present





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1. Infrastructure for Regulatory Control

In accordance with Law on Radiation Protection (article 6) - Nuclear and Radiation safety Agency of the Academy of Science of the Republic of Tajikistan, as assigned as authorized executive state regulatory authority for ensuring radiation safety and as a body to implement a unified State policy, co-ordinate the work of other authorized bodies, and:



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- ✓ Determine types of activity with regard to the handling of ionizing radiation sources subject to licensing;
- ✓ License types of activity involving the use of radioactive substances;
- ✓ Establish standards and regulations relating to radiation safety, physical protection, emergency planning, and accounting and control of nuclear material and ionizing radiation sources
- ✓ Supervise compliance with radiation safety standards and regulations an Licensing conditions;



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Since the last reporting on the Code of Conduct meeting, the following legislative documents were elaborated:

- ✓ The law on radioactive wastes management
- ✓ Rules on radioactive wastes management
- ✓ The order of state account for and control of radioactive sources and radioactive wastes
- ✓ Requirements in regard to scrap metal organizations
- ✓ Requirements on carrying out the Quality Control in medical X-ray diagnostics
- ✓ Rules on safe transportation of radioactive materials
- ✓ Regulation on physical protection of nuclear and radioactive sources.



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Besides above mentioned, the amendments and additions were prepared to:

- ✓ The law on Radiation Safety
- ✓ The law on Licensing specification of separate kinds of activities
- ✓ Regulation on specification of separate kinds of activities

Some of above mentioned documents are already functional and some in the process of agreement with other relevant ministries and authorities.

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DEPARTMENT

ACADEMIC
SECRETARY

PERSONNEL
DEPARTMENT

SCIENTIFIC AND RESEARCH
DEPARTMENT

DEPUTY-DIRECTOR
(LOGISTICS)

DEPUTY-DIRECTOR

BRANCHES:
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SOUTH
EAST

DEPARTMENT
OF MATERIAL AND
TECHNICAL SUPPORT

DEPARTMENT OF
TECHNICAL SERVICES

INDIVIDUAL
DOSIMETRY

OCCUPATIONAL
EXPOSURE DATABASE

DOSIMETRY AND
QUALITY CONTROL

CALIBRATION,
SPECTROMETRY,
MONITORING AND ETC

LICENSE AND
INSPECTION
DEPARTMENT

DATABASE OF NUCLEAR
MATERIALS AND
RADIOACTIVE SOURCES

DEPARTMENT OF
INFORMATION AND
INTERNATIONAL RELATIONS

NATIONAL INIS CENTER
AND
LIBRARY



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2. The facilities and services available to the persons authorized to manage radioactive sources.

Due to unavailability of any appropriate and accredited technical services in the country a department of technical services was established under NRSA which provides the following services:

- TLD Dosimetry
- Dosimetry and quality control
- Calibration
- Spectrometry (alpha, beta and gamma)



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Department of Technical Services was established under NRSA once the laboratory was constructed.































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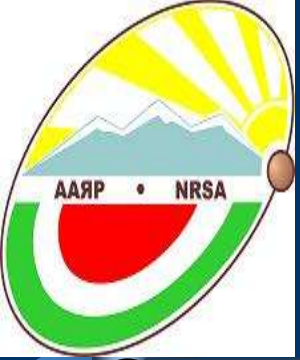
The calibration service of that department was implemented through the IAEA project TAD/6/004 “Establishment Radiation Protection Calibration Service in Tajikistan” during 2007-2008 cycle.





HOPEWELL DESIGNS, INC.





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3. Training of staff in the regulatory body, law enforcement agencies and emergency service organizations.

Due to unavailability of training centres in Tajikistan on radiation safety and security a national project TAD/6/004 “Establishing a National Educational and Training Centre on Radiation Protection” was submitted to the IAEA and currently is underway.

The purpose of that project is: To establish a National Educational and Training Centre on Radiation Protection for the development of sufficient human resources to strengthen the radiation safety and radiation protection infrastructure in Tajikistan.



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4. Experience in establishing a national register of radioactive sources.

A joint project between NRSA and USA Nuclear Regulatory Commission was completed on inventory and establishing a radioactive source database.

The objective of that project was to make an inventory of all available ionizing radiation sources (sealed, unsealed, generators and associated equipment) and input them to the database. Under that project the inventory of all sources in whole regions of Tajikistan were completed.



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All the collected data of sources were inputted to the source database. This database is called RASOD. The uniqueness of RASOD is the program automatically determine the current activity and categorization of the source (categorization is made in accordance with IAEA-Safety Guide-No RS-G-1.9, – Recommended categories for sources used in common practices). RASOD is an information system which allows inputting, store and processing the data of ionizing radiation sources. RASOD is worked out for regulatory authorities on issues of nuclear and radiation safety.

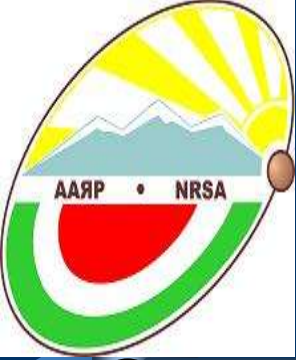


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RASOD 1.3.1 version which is introduced in NRSA AS RT has the following functions:

- ∞ **Input, delete and editing of information regarding sources of ionizing radiation**
- ∞ **Input, delete and editing of information regarding enterprises, organization and institutions which are using sources of ionizing radiation.**
- ∞ **Input and editing of additional information, which is contained in additional tables.**
- ∞ **Formation of requests and production of reports.**
- ∞ **Administration**



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The items of information system are:

- ∞ **Sealed sources (S)**
- ∞ **Unsealed sources (U)**
- ∞ **Generators of ionizing radiation (G)**
- ∞ **Facilities, containing sources (sources which are located inside the facilities) (A)**

RASOD was created taking into account the structure of RAIS database (IAEA). It gives maximum opportunity to easily exchange the information between RAIS and RASOD



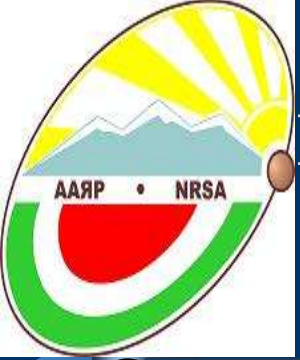
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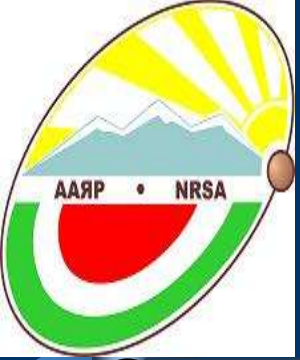
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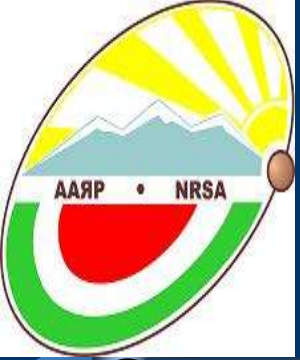
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TOTAL NUMBER OF RADIATION SOURCES (RS) IN TAJIKISTAN (AS OF 15.05.2010)

	West Including Dushanbe	North	East	South	Total
Sealed	405	8	-	194	607
Unsealed	35	-	-	-	35
Generators	321	253	31	210	828 (Maximum 150 not operational) =678
Total RS	761	261	31	400	1466-150= 1316
Associated equipment	15	95	-	-	110
Waste Storage Facility	1 facility	-	-	-	5165

SEALED RADIOACTIVE SOURCES BY CATEGORY (Faizabad is not included)

Category	West including Dushanbe	North	East	South	Total
1	5	2	-	-	7
2	53	2	-	-	55
3	24	27	-	-	51
4	154	79	-	131	364
5	157	421	-	48	626
Not identified	12	-	-	15	27
Total	405	531	-	194	1130



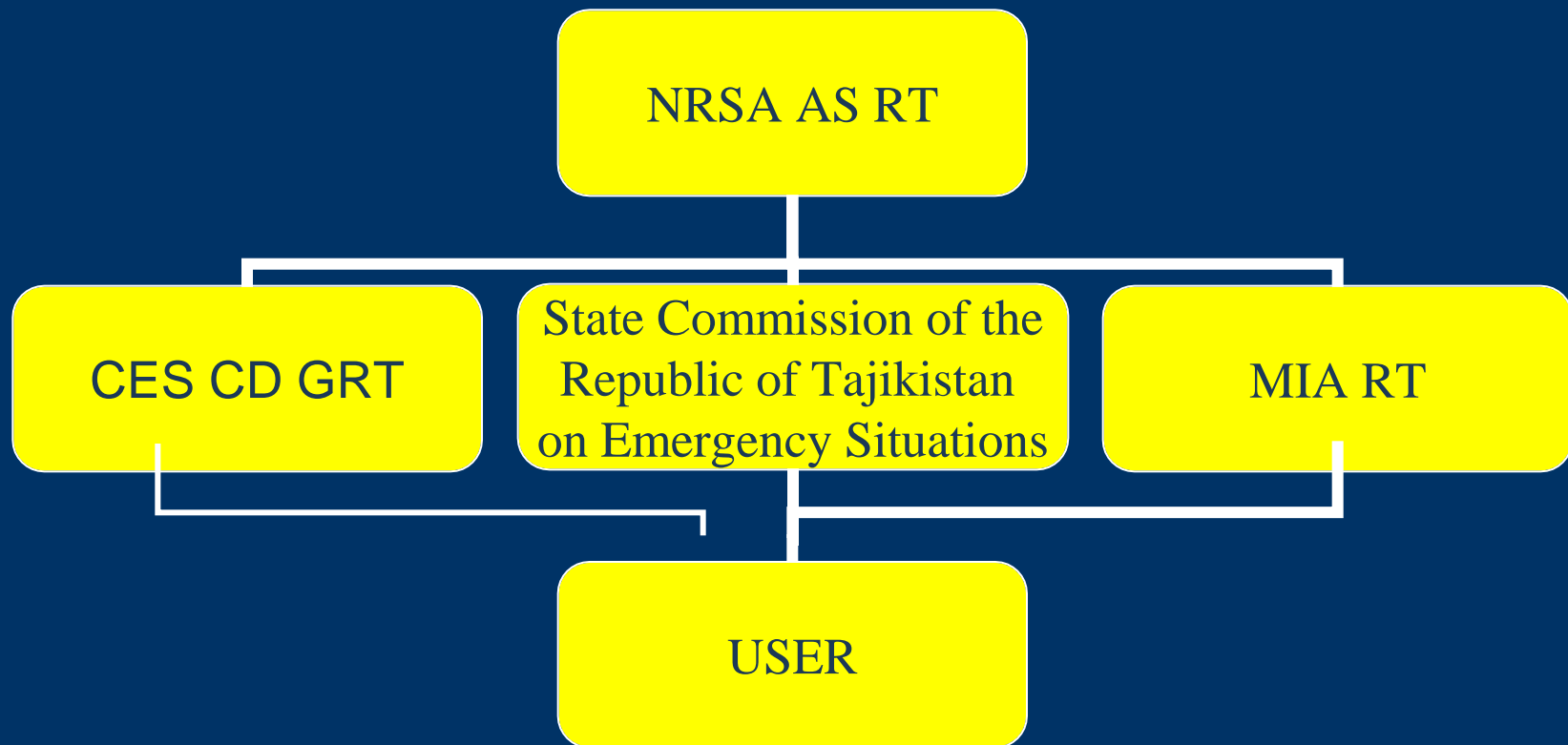
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5. National strategies for gaining or regaining control over orphan sources, including arrangements for reporting loss of control and to encourage awareness of, and monitoring to detect, orphan sources

Identifying, Notifying and Activating

Established system in Tajikistan to promptly initiate an offsite response in the event of an emergency:



Establishing Emergency Management and Operations

USER: -undertake actions in accordance with accident clean-up plans and protection , Information in accordance with warning scheme

CES CD GRT:- Search , localization and identification, participation in clean-up consequences of emergency situation.

MIA RT: - Blocking the area and carrying out investigation

NRSA AS RT: -dosimetric control, verification of found Radiation Ionizing Sources and Owner identification and taking decision

State Commission of the Republic of Tajikistan on emergency

situations: Coordination of actions on emergency situation

liquidation with involving CES CD GRT , NRSA AS RT, RSES and military of Civil Defense

RWDS:- Disposal of Radioactive Sources



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Starting 2005 there is a joint project of NRSA and USA DoE.

For successful implementation of this project several sets of equipments were delivered to the country on behalf of the Global Search and Secure Program.

Training on performing site searches utilizing the delivered equipment and technique was performed in the orphan source training in 2005 and 2009. The specialists of NRSA, Committee of Emergency Situations and Civil Defence, Ministry of Interior and State Committee of National Security and other organizations were trained by Sandia National Laboratory specialists in 2005 and 2009.

РАДИОАКТИВНОСТЬ

Период полураспада - время, за которое количество радиоактивных ядер уменьшается вдвое



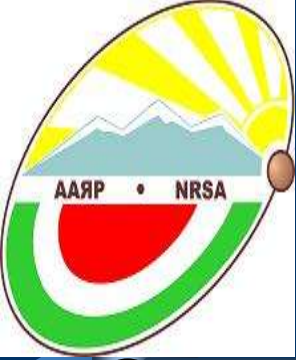
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Аналогия: время, за которое в коробке останется половина конфет ($1/2 = 1$ ч)







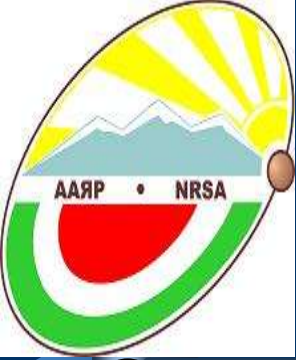


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Also under this project the NRSA's inspectors together with representatives of Committee of Emergency Situations and Civil Defence, Ministry of Interior and State Committee of National Security carried out searches in the North of Tajikistan. More than 500 hundred "orphan" or sources doesn't meet the requirements of radiation safety were found in different storages which were bankrupted or not operational.

The management of new enterprises which changed the line of their business even didn't know that those sources are exists in their storages



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By the financial support of IAEA, technical assistance of “IZOTOP” experts as well as NRSA inspectors transportation of those sources were arranged to the Republican waste disposal site in order to prevent unauthorized access or damage to, and loss, theft or unauthorized transfer of, radioactive sources, so as to reduce the likelihood of accidental harmful exposure to such sources or the malicious use of such sources to cause harm, to individuals, society or the environment.



S-0082

S-0071

S-0048

S-0046

S-0004

S-0011

S-0007

S-0001

S-0002

S-0003

S-0005

S-0006

S-0008

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S-0010

S-0012













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Currently the team carries out searches in the south and east. They are searching previous soviet military bases. After the collapse of Soviet Union a lot of orphan sources are remained in the territory of their location.

This project helps a lot to regulatory authority to regain control over orphan sources.



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6. Approaches to managing sources at the end of their life cycles

National policy and strategy in the field of radioactive waste management.

Ensuring the security of radioactive and nuclear materials in all stages of their life cycle is obligatory for users.

Ensuring the security of radioactive and nuclear materials foresees the single planning system and realization of technical and organizational complex of measures directed to:

- Prevention of unauthorized access to the territory of radioactive and nuclear material location as well as their theft and damage
- Regaining Control, recovery and return of lost or theft radioactive and nuclear materials.



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There is no any company in Tajikistan on re-processing of wastes. That's why after exploitation all of them are disposed in the Republican Waste Disposal Site

Republican Waste Disposal Site (RWDS)

RWDS is located in the territory of Faizabad district not far from Dushanbe city (45km). This site started to operate in 1962. The construction of second part of the site was started in 1979 and started to operate in 1986. The RWDS is under the central administrative board of Dushanbe city accomplishment. (HUKUMAT)

GENERAL VIEW



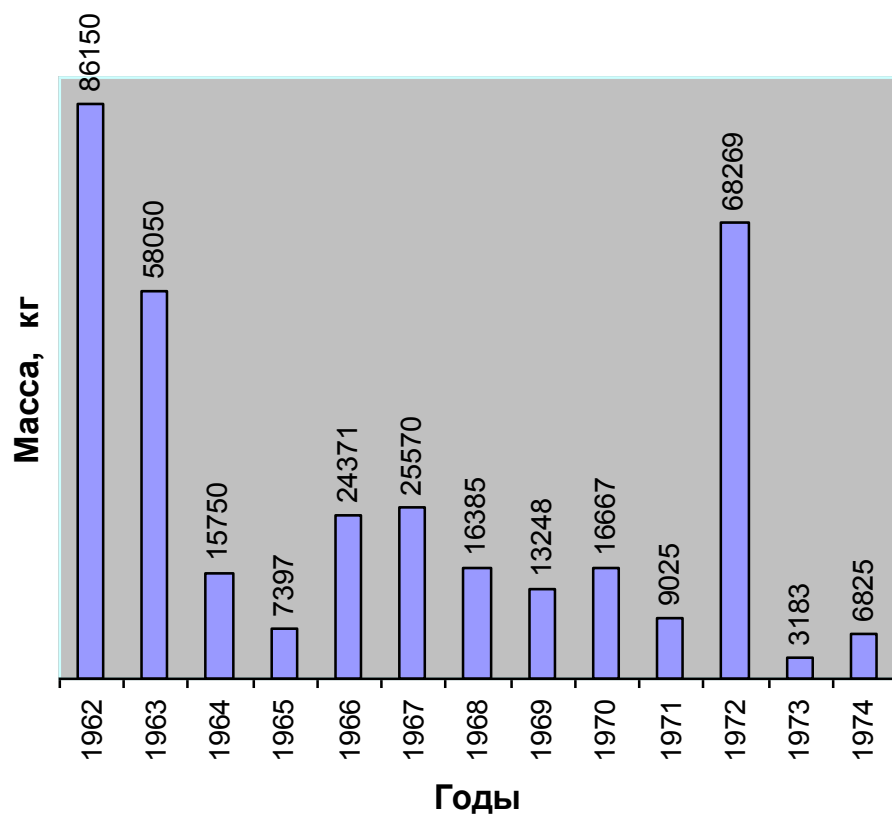


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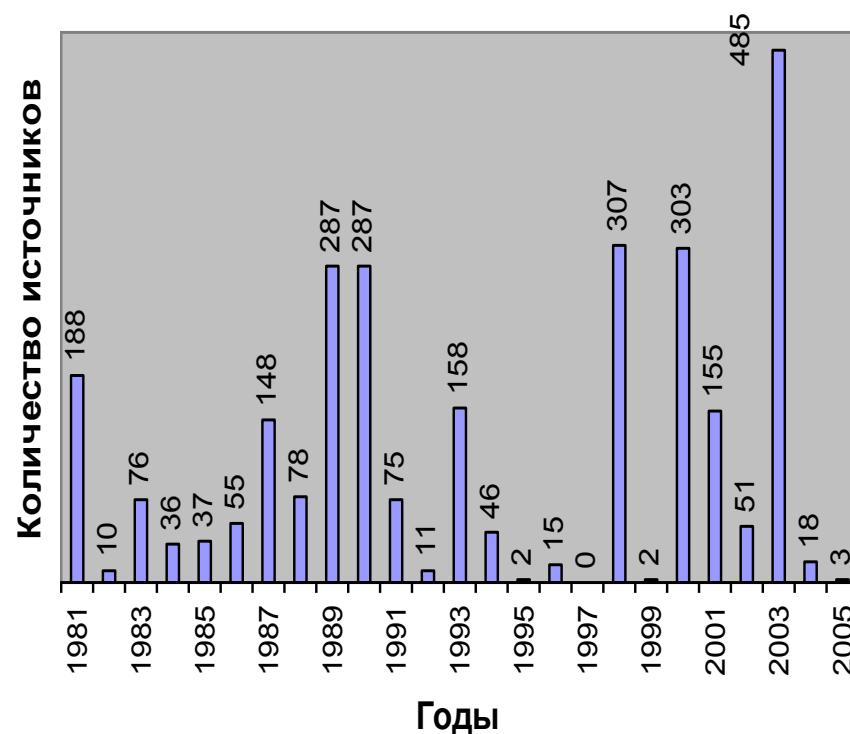


THE NUMBER OF RECEIVED RADIOACTIVE SOURCES BY RWDS

Количество принятых источников



Количество принятых источников





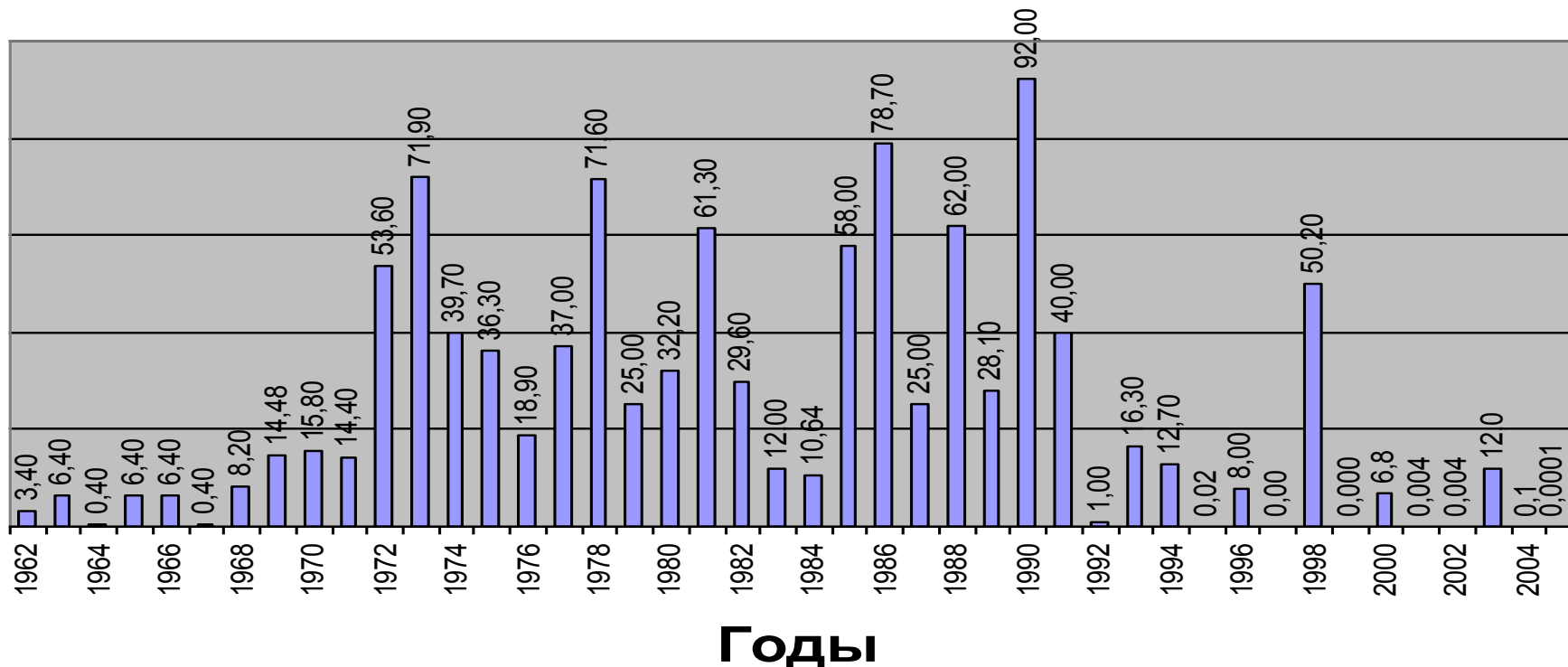
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THE ACTIVITY OF RECEIVED RADIOACTIVE SOURCES BY RWDS

Количество принятых источников

АКТИВНОСТЬ, КЮРИ





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The Problems of Republican Waste Disposal Site are:

1. To prepare storage of open type: (first disposals from 1962 to 1990):

a) to concrete cargo hatch;

б) to carry out earth filling up to 1 meter height with the area 18x18m;

в) to make an awning under arised hill against precipitation and fall out (for 50 years);

2. To carry out reprocessing of radioactive liquid

120 m³

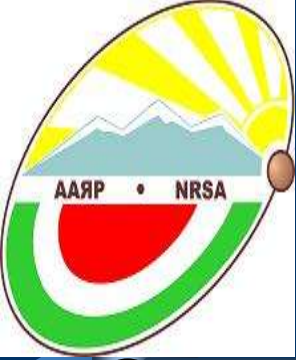
3. To construct monolithic barrier around controlled area ~ 900 n/m and to establish secured alarm system (surveillance over site from control panel), infra-red emission.



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4. To solve the issue of disposal or separate storage of high radioactive radioisotope generators “RTG’s” – 3 pieces and in transport container 1 piece which is in emergency condition (packed into concrete).
5. To solve a problem of permanent energy and water supply.
6. To change existing radio-dosimeter units of 1972-1987 to the new and modern one.
7. To solve the issue of creating the own laboratory of RWDS for investigation of water, soil, and plants.



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Through bilateral projects between
NRSA and USA DoE, UK
GOVERNMENT AND IAEA the
following upgrades were performed:

RECONSTRUCTION OF BUILDING №20 WITH THE PURPOSE OF PHYSICAL PROTECTION UPGRADE



RECONSTRUCTION OF BUILDING №20 WITH THE PURPOSE OF PHYSICAL PROTECTION UPGRADE



ORGANIZED MILITARY SECURITY IN RWDS



LABORATORY



CAPACITY FOR SOLID WASTES



ALARM AND VIDEO-CAMERA



ANTENNA FOR TRANSMISSION OF INFORMATION TO DUSHANBE AND FAIZABAD POLICE



INFORMATION RECEPTION IN NRSA AND FAIZABAD POLICE



The construction of new building



FUTURE STORAGE.





CCP





Already constructed CCP





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7. Experience with arrangement for implementing the import and export provisions of the Code and the Guidance on the Import and Export of Radioactive Sources.

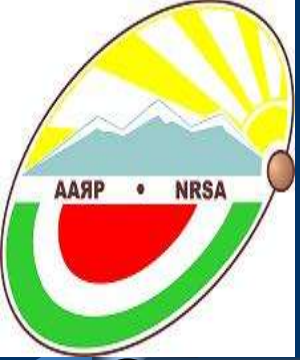
In comparison with previous report currently the licensing, inspection and enforcement measures are fully operational. The basic infrastructure was established and currently is upgrading. Several legislative documents are in the process of elaboration and approval.



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Arrangements for implementing the import and export provisions of the Code and the Guidance on the Import and Export of Radioactive Sources are introducing step by step. The Republic of Tajikistan has already make a political commitment to the Code and the Supplementary Guidance on the Import and Export. The contact point is designated . Necessary amendments are made in the Law on Radiation Protection in order to be compatible with international standards. Working out of necessary documentation still in process. Radiation portals started to be installed. One is already installed in the border with Afghanistan and others are in process. Attempts to sale radioactive sources were arrested by representatives of State Committee of National security (Beryllium sources of fast neutrons and Cs-137 sources).



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CONCLUSIONS

Tajikistan fulfils the almost all the requirements of the Code of Conduct and its Supplementary Guidance on the Import and Export but a lot of work are still under the development.

The basic one is installation of detection portals in the border with neighboring countries in order to prevent the illicit trafficking cases



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ACKNOWLEDGEMENT

The NRSA would like to express the greatest gratitude to

- ✓ IAEA
- ✓ USA Department of Energy
- ✓ USA NRC
- ✓ USA Embassy in Tajikistan
- ✓ Government of UK
- ✓ Norwegian Radiation Protection Authority
- ✓ Radiation Protection Centre of Lithuania

for their assistance in fulfilling the requirements of Code of Conduct by Tajikistan



THANK YOU FOR YOUR ATTENTION

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