

Site (Data) : RWF Ekores

Stock of waste as at December 2007

Country: BELARUS

Reporting Year: 2007

Site Name: RWF Ekores

Full Name: Special enterprise for radioactive waste storage/disposal under auspice of Unitary enterprise for waste management "Ekores"

Inventory Reporting Date: December 2007 Waste Matrix Used: IAEA Def.

Comment **# 147: What is "RWF Ekores" ?**

RWF Ekores (radioactive waste facility Ekores) is a special enterprise for management of radioactive waste. This is a typical RADON-type facility, constructed in accordance with the standard project TP-416-9-1 "Disposal radioactive waste enterprise" developed by Moscow Project Institute (GSPI) for Radon-type facilities of the former USSR in 1970. The site comprised laundry, garage for transport vehicles and 2 below surface, reinforced concrete vaults for solid radioactive waste, all of them being put in operation in 1977.

There are 2 concrete lined trenches containing so called "historic" radioactive waste in the territory of the site. They were filled with solid waste between 1964 and 1977.

The "Ekores" radioactive waste facility is situated about 10 km from the center of city of Minsk, a few hundred meters from the location of the former Nuclear Research Reactor and Scientific Center «Sosny». It is the only facility in the country that has been intended for storage/disposal of radioactive waste from small users.

Currently this site is under reconstruction. The reconstruction project is directed at improving physical protection and setting advanced technologies for new coming wastes and spent sources. It also makes provisions that the wastes currently disposed in the vaults and trenches should be retrieved, sorted and treated in the same way as new coming wastes.

Comment **# 150: Historic Ekores Disposal Facility**

The historic Ekores waste disposal facility was originally commissioned in 1964 and comprised 2 concrete lined trenches, up to 4 meters deep. A variety of solid radioactive waste (including sealed sources containing short-lived and long-lived radionuclides) was placed in these trenches. The solid waste was not segregated in the different waste types or conditioned. The trenches were filled with waste between 1964 and 1977. In 1977 the trenches were closed. Concrete slabs were placed on top of the trenches and these were covered by a layer of bitumen and by a mounded layer of soil. Today the mounds over the trenches can be seen with local vegetation growing on them. At the current rate the total activity of the waste disposed of in the trenches amounts to 17,6 TBq

Comment **# 151: Ekores storage and disposal facilities**

Second generation waste storage/disposal facilities (repositories) were put into operation in 1977. This comprised 2 below surface, reinforced concrete vaults. Each vault was covered by a lightly constructed building to provide environmental protection and acceptable working conditions to operate the facility throughout the year. Each vault has a storage capacity of 830 m³ and is divided into 8 cells. In addition, at one end of each vault there are a pair of so-called «wells» for spent sourcedisposal.

Each of the cells is covered by six concrete slabs. To load waste into a cell, one of the slabs is lifted by overhead crane, the waste is tipped into the cell and the concrete slab is replaced. According to the design the total activity of wastes to be disposed of in the vault is 7,4 TBq/a, with a specific activity of 3,7 MBq/kg.

The waste is collected from the waste producer by "Ekores" staff. It is not conditioned or volume reduced prior to emplacement in the repository. When a storage cell is considered to be full, free space at the top of the cell is filled with sand and a concrete grout.

One of the repositories (Repository # 1) is full to capacity. The total activity of disposed wastes is 252,8 TBq. The concrete slabs over the storage cells have been covered with a layer of asphalt, thus preventing further access to the cells.

It should be noted that in 1989, irradiated fuel from the nearby research reactor was placed in one of the cells in this repository. This comprises around 2kg of ²³⁵U in 10 purpose-built stainless steel containers.

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Comment # 152: Ekores SRS Facilities

SRS Inventory

Storage and disposal of spent sealed radioactive sources at the Ekores Waste Disposal Facility

All spent SRS which had entered entered the facility until 1977 were buried in the concrete trenches (Kanyon 1, Kanyon 2,). After 1977 there existed two options for spent SRS disposal. Those in protective containers with upper wall unloading were disposed of in the vaults for low and intermediate level waste (Rep 1 and Rep 2) together with their biological shielding. SRS from containers with bottom unloading were disposed of in the bore-hole repositories: Well 1, Well 2, Well 3, Well 4.

By the mid of 90s Kanyon 1, Kanyon 2, and Rep 1 had been closed. Spent SRS disposed of in these repositories are declared today as disposed (not retrievable) radioactive waste. Within Waste data Component of the NEWMDB, the inventory of these SRSs is included into the inventory of LILW in disposal facilities at the Ekores site.

SRS in Rep 2 should be regarded as spent SRS (waste) being in storage in the facilities intended for storage of both SRS and LILW. The structure of the Framework Section of the NEWMDB does not permit to report such kind "mixed" storage. So to settle the issue we need to define an additional dedicated SRS facility "Rep 2SS" at the Ekores site, which is in reality the same facility Rep 2, used for storage of all kinds of wastes.

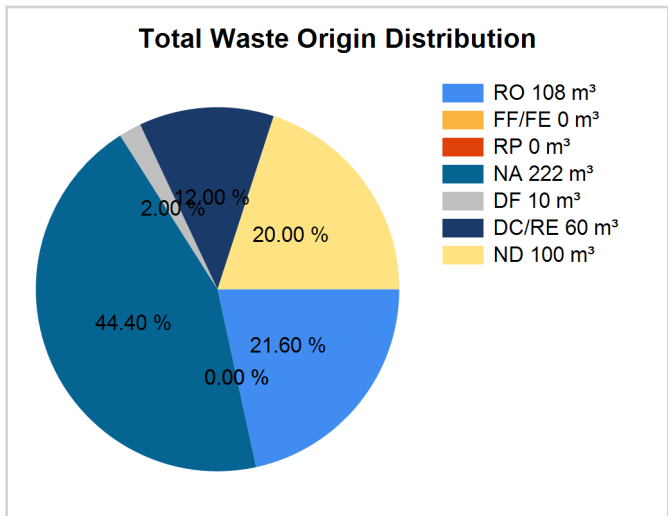
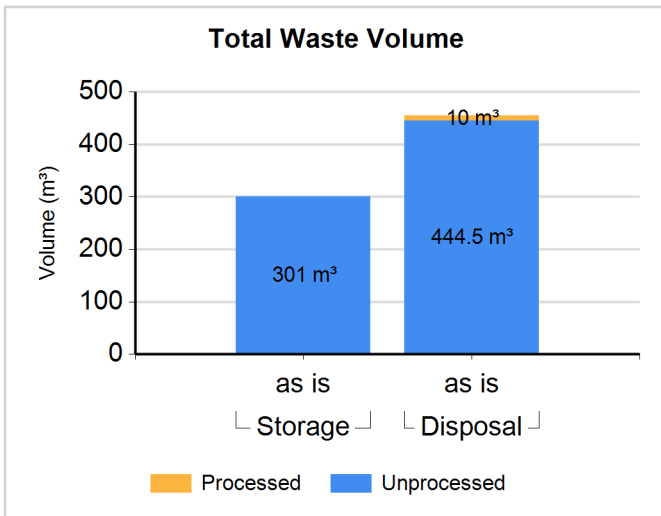
It should be emphasised that SRS inventory reported to the Waste Data Component of the NEWMDB shows not all but only the most important SRS being under storage and disposal at the Ekores site.

Comment # 283: Waste inventory at the RWF "Ekores"

Due to the fact that at the Ekores site waste inventory information is available only in "kg", not in m3, the input screens for inventories of the waste in the Ekores facilities show weight, not volumes (1 m3 = 1 tonne)

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined



Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

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Waste Class: LILW-SL

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m ³)	Volume "as dispo" (m ³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
LILW-SL	Storage	N	N	270.000	270.000	8.00	0.00	0.00	22.00	10.00	60.00	0.00
LILW-SL	Disposal	N	N	403.000	403.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Waste Class: LILW-LL

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m ³)	Volume "as dispo" (m ³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
LILW-LL	Storage	N	N	31.000	31.000	0.00	0.00	0.00	100.00	0.00	0.00	0.00
LILW-LL	Disposal	N	N	41.500	41.500	0.00	0.00	0.00	100.00	0.00	0.00	0.00

Waste Class: HLW

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m ³)	Volume "as dispo" (m ³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
HLW	Disposal	Y	N	10.000	10.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Spent Sources <=30 years in Storage

Nuclide	Number of Sources/Total Activity of Sources (GBq)			c	o	n	c	a	t	Total Activity for all Groups (GBq)	Decay Date
	Group I less than or equal 4GBq	Group II more than 4GBq but less than or equal 4E+4GBq	Group III more than 4E+4GBq								
	num/activity	num/activity	num/activity								
Cd-109	1			N	Y	N				2.200E-004	1989.01
	2.200E-004										
Ce-139	1			N	Y	N				1.000E-004	1989.01
	1.000E-004										
Ce-144	13			N	Y	N				2.600E+001	1989.01
	2.600E+001										
Co-57	3			N	Y	N				2.500E-004	1989.01
	2.500E-004										
Co-60	31	165		N	Y	N				2.101E+003	1989.01
	9.300E-001	2.100E+003									
Co-60	17			N	Y	N				6.000E-004	1989.01
	6.000E-004										
Co-60	39			N	Y	N				7.800E-001	1989.01
	7.800E-001										

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Cs-137	34	11		N	Y	N	7.800E+002	1989.01
	7.100E-003	7.800E+002						
Cs-137	48	5		N	Y	N	6.778E+001	1989.01
	7.800E-001	6.700E+001						
Cs-137	22	51		N	Y	N	3.100E+003	1989.01
	4.200E-002	3.100E+003						
Hg-203	1			N	Y	N	3.000E-004	1989.01
	3.000E-004							
Ir-192		41		N	Y	N	1.000E+005	1989.01
		1.000E+005						
Ir-192		103		N	Y	N	2.400E+005	1989.01
		2.400E+005						
Kr-85	2	1		N	Y	N	3.737E+001	1989.01
	3.700E-001	3.700E+001						
Mn-54	1			N	Y	N	8.400E-005	1989.01
	8.400E-005							
Mn-54	1			N	Y	N	1.000E-004	1989.01
	1.000E-004							
Na-22	1			N	Y	N	1.200E-004	1989.01
	1.200E-004							
Se-75		6		N	Y	N	2.200E+004	1989.01
		2.200E+004						
Se-75		13		N	Y	N	5.400E+004	1989.01
		5.400E+004						
Sn-113	1			N	Y	N	9.600E-005	1989.01
	9.600E-005							
Sr-90	290			N	Y	N	3.400E+000	1989.01
	3.400E+000							
Sr-90	169			N	Y	N	3.200E+000	1989.01
	3.200E+000							

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Sr-90	927			N	Y	N	4.300E+000	1989.01
	4.300E+000							
Th-228	1			N	Y	N	2.800E-005	1989.01
	2.800E-005							
Tl-204	2			N	Y	N	1.200E-005	1989.01
	1.200E-005							
Y-88	2			N	Y	N	1.400E-004	1989.01
	1.400E-004							
Zn-65	1			N	Y	N	9.900E-005	1989.01
	9.900E-005							

Spent Sources <=30 years in Disposition

Nuclide	Number of Sources/Total Activity of Sources (GBq)			c o n d	u n c o n d	c a t	Total Activity for all Groups (GBq)	Decay Date
	Group I less than or equal 4GBq	Group II more than 4GBq but less than or equal 4E+4GBq	Group III more than 4E+4GBq					
	num/activity	num/activity	num/activity					
Ce-139	2			N	Y	N	5.400E-005	1989.01
	5.400E-005							
Co-60	12			N	Y	N	5.600E+000	1989.01
	5.600E+000							
Co-60			3	N	Y	N	2.000E+005	1989.01
			2.000E+005					
Co-60	127	1841		Y	N	N	1.302E+005	1980.01
	2.300E+002	1.300E+005						
Co-60	432	821	9	Y	N	N	4.000E+006	1990.01
	4.100E+002	2.300E+006	1.700E+006					
Co-60	39	66	5	Y	N	N	1.890E+006	2000.01
	1.100E+001	9.500E+005	9.400E+005					
Co-60	5			N	Y	N	8.200E-003	1989.01
	8.200E-003							

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Cs-137	185	508		Y	N	N	2.003E+005	1980.01
	2.700E+002	2.000E+005						
Cs-137	229	559	5	Y	N	N	7.901E+005	1990.01
	1.300E+002	3.100E+005	4.800E+005					
Cs-137	1	136		N	Y	N	9.102E+003	1989.01
	1.900E+000	9.100E+003						
Cs-137	25	101		Y	N	N	6.707E+003	1990.12
	7.100E+000	6.700E+003						
Cs-137	19	53		Y	N	N	1.101E+004	1991.12
	5.700E+000	1.100E+004						
Cs-137	123	2		Y	N	N	3.002E+003	1992.12
	1.900E+000	3.000E+003						
Cs-137	14			Y	N	N	1.100E+001	1993.12
	1.100E+001							
Cs-137	3	1		Y	N	N	1.900E+002	1994.12
	3.700E-002	1.900E+002						
Cs-137	1	1		Y	N	N	2.600E+002	1995.12
	4.000E-004	2.600E+002						
Cs-137	10	4		Y	N	N	4.001E+002	1996.12
	1.200E-001	4.000E+002						
Cs-137	3	1		Y	N	N	9.470E+000	1997.12
	9.700E-001	8.500E+000						
Cs-137	2			Y	N	N	5.900E-003	1998.12
	5.900E-003							
Cs-137	12	27		Y	N	N	1.903E+004	1999.12
	2.700E+001	1.900E+004						
Cs-137	2			Y	N	N	2.400E-001	2000.12
	2.400E-001							
Cs-137	21	256		N	Y	N	4.100E+006	1989.01
	7.000E-001	4.100E+006						

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Cs-137	22	163		N	Y	N	5.845E+003	1989.01
	4.500E+001	5.800E+003						
Eu-152	3			N	Y	N	3.000E-005	1989.01
	3.000E-005							
Fe-55	1			N	Y	N	2.400E-005	1989.01
	2.400E-005							
H-3	12	3		N	Y	N	1.100E+002	1989.01
	4.100E-002	1.100E+002						
H-3		142		N	Y	N	5.700E+003	1989.01
		5.700E+003						
H-3	1	12		N	Y	N	8.900E+002	1989.01
	3.700E-003	8.900E+002						
Ir-192	471	3198		Y	N	N	5.901E+004	2003.01
	5.900E+000	5.900E+004						
Na-22	3			N	Y	N	8.600E-005	1989.01
	8.600E-005							
Ru-97	5			N	Y	N	2.100E-001	1989.01
	2.100E-001							
Se-75	13	76		Y	N	N	8.838E+003	1980.01
	3.800E+001	8.800E+003						
Se-75	6	63		Y	N	N	2.102E+004	1990.01
	2.000E+001	2.100E+004						
Se-75	15	9		Y	N	N	7.413E+003	2000.01
	1.300E+001	7.400E+003						
Sr-90	3915	120		Y	N	N	3.700E+003	1990.01
	1.800E+003	1.900E+003						
Sr-90	1119	138		Y	N	N	2.072E+003	2000.01
	7.200E+001	2.000E+003						
Sr-90	135			N	Y	N	3.200E+001	1989.01
	3.200E+001							

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Sr-90	95			N	Y	N	7.700E+001	1989.01
	7.700E+001							
Sr-90	20			N	Y	N	7.500E+000	1989.01
	7.500E+000							
Y-88	1			N	Y	N	2.600E-005	1989.01
	2.600E-005							
Y-90	2290			Y	N	N	5.300E+002	
	5.300E+002							

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Spent Sources > 30 years in Storage

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	Group I less than or equal 2 GBq	Group II more than 2GBq					
	num/activity	num/activity					
Am-241	1245		N	Y	N	6.900E-002	1989.01
	6.900E-002						
Am-241	1183		N	Y	N	4.400E-002	1989.01
	4.400E-002						
C-14	6		N	Y	N	1.300E-004	1989.01
	1.300E-004						
Ni-63	4		N	Y	N	4.800E+000	1989.01
	4.800E+000						
Ni-63	5		N	Y	N	6.100E+000	1989.01
	6.100E+000						
Ni-63	6		N	Y	N	5.500E+000	1989.01
	5.500E+000						
Pu-239		2	N	Y	N	7.200E+002	1989.01
		7.200E+002					
Pu-239	8317		N	Y	N	2.500E+001	1989.01
	2.500E+001						
Pu-239	7		N	Y	N	8.400E+000	1989.01
	8.400E+000						
Pu-239	3417		N	Y	N	4.400E+001	1989.01
	4.400E+001						
Pu-239	6787		N	Y	N	1.400E+001	1989.01
	1.400E+001						
Ra-226		1	N	Y	N	2.600E+000	1989.01
		2.600E+000					

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	Group I less than or equal 2 GBq	Group II more than 2GBq					
	num/activity	num/activity					
Am-241	274	25	N	Y	N	2.975E+002	2004.12
	7.500E+000	2.900E+002					
Am-241		14	N	Y	N	3.000E+001	1989.01
		3.000E+001					
Am-241	10		N	Y	N	3.900E-003	1989.01
	3.900E-003						
Ni-63	14	1	N	Y	Y	4.740E+001	1989.12
	6.400E+000	4.100E+001					
Ni-63	4		N	Y	Y	3.100E+000	1990.12
	3.100E+000						
Ni-63	11		N	Y	Y	1.300E+001	1991.12
	1.300E+001						
Ni-63	1		N	Y	Y	1.200E+000	1992.12
	1.200E+000						
Ni-63	1		N	Y	Y	1.200E+000	1994.12
	1.200E+000						
Ni-63	1		N	Y	Y	3.000E-001	1995.12
	3.000E-001						
Ni-63	1		N	Y	Y	1.200E+000	1998.12
	1.200E+000						
Pu-239	719		N	Y	N	5.100E+001	1989.12
	5.100E+001						
Pu-239	54838		N	Y	Y	6.700E+002	2003.12
	6.700E+002						
Pu-239		5	N	Y	N	3.800E+002	1989.01
		3.800E+002					

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Pu-239	2		N	Y	N	5.800E-001	1989.01
	5.800E-001						
Ra-226	541683		N	Y	N	3.300E+001	1989.01
	3.300E+001						
Ra-226	419	5	N	Y	Y	3.620E+001	
	1.200E+000	3.500E+001					