Russia's Facilities Using Highly-Enriched Uranium

Last update: October 2012

#	Title	Type	Location	Fuel	Enr. %	Status
1	AKSAMIT/RP-50	CA	Kurchatov, Moscow			
2	Argus	Solution	Kurchatov, Moscow	Tank UO2SO4+ H20	90	Feasibility study completed 2012
3	Astra	CA	Kurchatov, Moscow	Spheres Pebble Bed Graphite	21	Facility has limited use; conversion unlikely
4	BARS-1	Pulsed	TsFTI, Sergiyev Posad			
5	BARS-4	Pulsed	NIIP, Lytkarino			
6	BARS-5	Pulsed	VNIITF, Snezhinsk			
7	BARS-6	Pulsed; W	IPPE, Obninsk			
8	BFS-1	CA; fast	IPPE, Obninsk	Also Pu	90, 36	Cannot be converted to LEU
9	BFS-2	CA; fast	IPPE, Obninsk	Also Pu	90, 36	Cannot be converted to LEU
10	BIGR	Pulsed; W	VNIIEF, Sarov			
11	BIR-2M	Pulsed; W	VNIIEF, Sarov			
12	BN-600	Breeder	Beloyarsk NPP, Zarechnyi			
13	BOR-60	SS; fast	RIAR, Dimitrovgrad	Also UO2-PuO2	90	Fast reactor cannot be converted to LEU; to be replaced in 2019 with MBIR
14	BR-1	Pulsed; W	VNIIEF, Sarov			
15	Delta	CA	Kurchatov, Moscow			

LEGEND: **CA**-Critical Assembly **HEU**-Highly-Enriched Uranium **LP**-Low Powered **Pu**-Plutonium
SS-Steady State **SubCA**-Subcritical Assembly **W**-Weapons-use

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#	Title	Type	Location	Fuel	Enr. %	Status
16	Emphir-2M /EFIR-2M	CA	Kurchatov, Moscow			
17	FBR-L	Pulsed; W	VNIITF, Snezhinsk			
18	FKBN-2	CA	VNIITF, Snezhinsk			
19	FM MIR M-1 (CA MIR M1)	CA	RIAR, Dimitrovgrad	Tubular UO2 in Al	90	
20	FM PIK	CA	IPPN, Gatchina	UO2 in copper-beryllium matrix	90	Requires new high-density fuel for conversion
21	FM SM3 (CA SM)	CA	RIAR, Dimitrovgrad	UO2 in copper-beryllium matrix	90	Requires new high-density fuel for conversion
22	FRBN-2M	CA	VNIIEF, Sarov			
23	FS-1M	CA	IPPE, Obninsk			
24	FS-2	CA	NIKIET, Moscow			
25	Gamma	SS; LP	Kurchatov, Moscow	Tubular UO2 in Al	36	
26	GIR 2	Pulsed; W	VNIIEF, Sarov			
27	Hydra/Gidra	Pulsed; solution	Kurchatov, Moscow	Tank UO2SO4+ H20	90	Feasibility study to be initiated 2012
28	IBR-2M	Pulsed	JINR, Dubna	PuO2		
29	Igrik	Pulsed; W	VNIITF, Snezhinsk			
30	IR-8	SS	Kurchatov, Moscow	Tubular UO2 in Al	90	Feasibility study completed 2012
31	Iren	Other	JINR, Dubna			

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32	IRT-2500	SS	MEPhi, Moscow	Tubular UO2 in Al	90	Feasibility study completed 2012
33	IRT-T	SS	TPU, Tomsk	Tubular UO2 in Al	90	Feasibility study completed 2012
34	IRV-M2	SS	SRIA, Lytkarino	Tubular UO2 in Al	90	
35	Iskra	CA	Kurchatov, Moscow			
36	IVV-2M	SS	INM, Zarechnyi	Tubular UO2 in Al	90	
37	KV-1	Naval	NITI, Sosnovyi Bor			
38	KV-2	Naval	NITI, Sosnovyi Bor			
39	Kvant	CA	Kurchatov, Moscow			
40	LF-2 Lyudmila	Isotope	NPO Mayak, Ozersk			
41	MAKET (R&L)	CA	ITEF, Moscow			
42	MIR-M1	SS	RIAR, Dimitrovgrad	Tubular UO2 in Al	90	
43	Nartsiss-M2	CA		Kurchatov, Moscow		
44	OKUYAN	CA	IPPE, Obninsk			
45	OR (OP)	SS; LP	Kurchatov, Moscow	C-36 Pin UAl Alloy in Al	36	Feasibility study completed 2012
46	Priz	Pulsed; W	TsFTI, Sergiyev Posad			
47	RBT-10/2	SS	RIAR, Dimitrovgrad	UO2 in copper-beryllium matrix	90	Requires new high-density fuel for conversion
48	RBT-6	SS	RIAR, Dimitrovgrad	UO2 in copper-beryllium matrix	90	Requires new high-density fuel for conversion

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#	Title	Type	Location	Fuel	Enr.%	Status
49	Ruslan	Isotope	NPO Mayak, Ozersk			
50	SF-1	CA	Kurchatov, Moscow			
51	SF-7	CA	Kurchatov, Moscow			
52	SM-3	SS	RIAR, Dimitrovgrad	UO2 in copper-beryllium matrix	90	Requires new high-density fuel for conversion
53	SO-2M SubCA	CA	VNIIKhT, Moscow			
54	ST-1125	CA	OKBM, Nizhniy Novgorod			
55	ST-659	CA	OKBM, Nizhniy Novgorod			
56	STEND-4	CA	MSZ, Elektrostal			
57	STEND-5	CA	MSZ, Elektrostal			
58	UKS-1M	CA	IPPE, Obninsk			
59	VIR-2M	Pulsed; W	VNIIEF, Sarov			
60	VVR-M	SS	IPPN, Gatchina	Tubular UO2 in Al	90	
61	VVR-T	SS	NIFKhI, Obninsk	Tubular UO2 in Al	36	
62	Yaguar	Pulsed; W	VNIITF, Snezhinsk			
(+1)	Elyang	CA	ITEF, Moscow			Under construction
(+2)	MBIR	Breeder	RIAR, Dimitrovgrad	Also UO2-PuO2		Under construction
(+3)	PIK	SS	IPPN, Gatchina	UO2 in copper-beryllium matrix	90	Under construction; requires new high-density fuel for conversion
-1	27/VM	Other	IPPE, Obninsk			Shut down

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-2	27/VT	Other	IPPE, Obninsk			Shut down
-3	AST-1	SS	RIAR, Dimitrovgrad			Shut down
-4	BARS-2	Pulsed	NIIP, Lytkarino			Shut down
-5	BARS-3M	Pulsed	NIIP, Lytkarino			Shut down
-6	BR-1	Breeder	IPPE, Obninsk	Also used Pu		Shut down 2008
-7	BR-10	SS	IPPE, Obninsk			Shut down
-8	BR-K1	Pulsed; W	VNIIEF, Sarov			Shut down
-9	FS-4	CA	NIKIET, Moscow			Shut down 2010
-10	FS-5	CA	NIKIET, Moscow			Shut down 2010
-11	IIN-3M	Solution	NIIP, Lytkarino			Shut down
-12	KOBR	Other	IPPE, Obninsk			Shut down
-13	Mayak	CA	Kurchatov, Moscow			Shut down before 2000
-14	MR	SS	Kurchatov, Moscow			Shut down
-15	RBT-10/1	SS	RIAR, Dimitrovgrad			Shut down
-16	RF-GS	Other	IPPE, Obninsk			Shut down
-17	RFT	Other	RIAR, Dimitrovgrad			Shut down
-18	SF-3	CA	Kurchatov, Moscow			Shut down 1993
-19	SF-5	CA	Kurchatov, Moscow			Shut down 1993
-20	SGO	Other	IPPE, Obninsk			Shut down

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-21	ST-1120	CA	OKBM, Nizhniy Novgorod			Shut down
-22	ST-659L	CA	OKBM, Nizhniy Novgorod			Shut down
-23	STEND-2	CA	MSZ, Elektrostal			Shut down
-24	Strela	CA; space	IPPE, Obninsk			Shut down 2009
-25	T-2	Other	IPPE, Obninsk			Shut down
-26	TIBR-1M	Pulsed	NIIP, Lytkarino			Shut down
-27	TVR	SS	ITEF, Moscow			Shut down
-28	VVR-2	SS	Kurchatov, Moscow			Shut down

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Sources:

[1] Styrkaar Hustveit and Ole Reistad, "From HEU Minimization to HEU Elimination: the case of research and test reactors" paper presented at the 34th International Meeting on Reduced Enrichment for Research and Test Reactors, 14-17 October 2012, Warsaw, Poland;

[2] "Facilities: Research and Isotope Production Reactors," IPFM website, www.fissilematerials.org, accessed 23 October 2012;

[3] J.E. Matos, "Technical Challenges for Conversion of Civilian Research Reactors in Russia," presentation for the NAS-RAS Research Reactor Committee Briefing, 29 November 2010.

[4] Igor Tretiyakov, "Status of Research Reactors in Russia and Prospects for their Development," presentation at the 2nd International Symposium on Nuclear Energy (ISNE-09).

[5] List of facilities shut down is from CNS correspondence with Pavel Povdig and Alan Kuperman, 24 October 2012.

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[6] Also see Pavel Podvig, Consolidating Fissile Materials in Russia's Nuclear Complex, *IPFM Report*, May 2009, pp. 33-34; Pavel Podvig, Susan S. Voss, “Use of highly-enriched uranium in Russian reactors”, Proceedings of the 50th Annual Meeting of the Institute for Nuclear Material Management, July 12-16, 2009.