Editor's Note: The United Nations Conference on Disarmament (CD) in Geneva is now considering a convention to prohibit the production of fissile material for weapons. Such a convention would allow states which already have stocks of unsafeguarded fissile material to maintain them outside of safeguards, but it would allow future production of fissile material only if the material is safeguarded. The target states for the convention are the five declared nuclear weapon states and three de facto nuclear weapon states—India, Pakistan and Israel.

The monitoring of sites where permitted nuclear weapon-related activities and prohibited material-production activities are collocated poses the most difficult verification problem for a cutoff. The table below presents a summary of the activities at the principal collocated sites. The table was prepared by Oleg Bukharin of the Center for Energy and Environmental Studies at Princeton University, and Frans Berkhout of the Science Policy Research Unit at the University of Sussex. An article by these two authors and Harold Feiveson and Marvin Miller on the fissile cutoff appears in the Fall 1994 issue of International Security.

Weapons-Material Production and Select Civil Facilities in Target Countries.

Site	Facility	Status	Defense Activities at the Site
	RUSSIA		
1. Ural Electrochemistry Plant (Verkh-Neyvinsk)	• CEP[a]	• OP	• HEU processing • stockpile maintenance • components storage
2. Siberian Chemical Combine (Tomsk-7)	• 5 reactors • reprocessing plant • CEP	• 2OP/3S • OP • OP	• HEU/Pu processing • stockpile maintenance • components manufacture • components storage
3. Mayak (Chelyabinsk-65)	• 5 reactors • RT-1 reprocessing plant	• S • OP	• tritium production • fabrication of tritium weapons components • weapons components storage • naval fuel cycle
4. Mining and Chemical Combine (Krasnoyarsk-26)	• 3 reactors • reprocessing plant	• 1OP/2S • OP	
5. Electrochemistry Combine (Krasnoyarsk-45)	• CEP	• OP	
6. Electrolizing Chemical Combine (Angarsk)	• CEP	• OP	

a. All four uranium enrichment sites in Russia may have shut-down gaseous diffusion plants. Also, gaseous diffusion facilities are used to purify uranium feed and for other auxiliary missions.

UNITED STATES			
1. Savannah River Site[a]	• 5 reactors • reprocessing plants (F and H reprocessing areas)	• S • OP	• purification of tritium • production of tritium components for weapons • plutonium processing
2. Idaho National Engineering Lab[b]	• chemical processing plant (reprocessing)	• S	• R&D on naval reactor technologies
3. Oak Ridge Reservation[c]	• K-25 GDP • Y-12 Calutron Facility (non-uranium isotopes) • Centrifuge Plant Demonstration Facility	• S • OP/S[d] • S	• HEU processing • production of weapons components and sub-assemblies (on standby) • stockpile maintenance • weapons components storage • lithium production (on standby)
4. Hanford Reservation	• 9 reactors • 5 separation facilities (reprocessing)	• S • S	
5. Paducah	• GDP	• OP	
6. Portsmouth	• GDP • gas centrifuge enrichment plant	• OP[e] • S	

a. T. Cochran, W. Arkin, R.S. Norris "U.S. Nuclear Warhead Facility Profiles," *Nuclear Weapons Databook*, V.III, p. 92.
b. Ibid., p. 32.
c. Ibid., pp. 65–74.
d. In 1944, the Y-12 Calutron facility consisted of 8 buildings at present, only one building houses operating and standby calutrons.
e. The HEU cascade has been shutdown and placed on standby since 1993.

FRANCE			
1. Marcoule	• 5 reactors[a] • UP1 reprocessing plant	• 2OP/3S • OP[b]	• tritium extraction plant • plutonium processing
2. La Hague[c]	• UP2 reprocessing plant • UP3 reprocessing plant	• OP • OP	• plutonium processing
3. Pierrelatte	• GDP	• OP[d]	• HEU processing[e]
4. Tricastin	• Georges Besse GDP	• OP	

a. In addition to 5 reactors at Marcoule, plutonium was produced by reactors at Cinon (3), St.Laurent-des-Eaux (2), Bugey (1), and Phénix 1. All of them, with the exception of Celestin 1 and 2 and Phénix 1, are shutdown or on standby.
b. The plant is to cease reprocessing activities after 1997. *Nuclear Fuel*, April 25, 1994.
c. Both UP2 and UP3 are partially under IAEA safeguards.
d. Originally, there were 4 gaseous diffusion plants enriching uranum to different levels of enrichment. The first two plants have been shutdown. The rest will be closed some time after 1995 (*Nuclear Fue*l, 25 April 1994.)
e. The HEU metal for the French Defense Department is prepared by Recycle and Production Unit (URE) of Pierrelatte complex. S. Bouchardy and J. Pauty "Recycling of Reprocessed Uranium from Research Reactors."

ISRAEL			
1. Dimona	• reactor • reprocessing plant	• OP • OP	• weapons research, production and maintenance

CHINA [a]			
1. Jiuquan Complex	• reactor • reprocessing facility	• OP(?) • OP(?)	• PU/HEU processing • manufacturing of weapon components • warhead assembly
2. Guangyuan Complex (third line facility, duplicating the Jiuquan Complex)	• reactor • reprocessing facility	• OP(?) • OP(?)	• PU/HEU processing • manufacturing of weapon components • warhead assembly
3. Lanzhou	• GDP	• OP	
4. Heping	• GDP	• OP	

a. See R.S. Norris, A. Burrows, R. Fieldhouse “British, French, and Chinese Nuclear Weapons," *Nuclear Weapons Databook, Vol. V*, (CITY: Westview Press, 1994), pp. 338–341.

PAKISTAN			
1. Kahuta	• isotope separation facility	• OP?	• HEU metallurgy

UNITED KINGDOM			
1. Sellafield	• 6 reactors • B204 reprocessing plant • B205 reprocessing plant • THORP reprocessing plant	• 2S / 4OP • S • OP • OP[a]	• Pu purification[b] • plutonium processing[c]
2. Capenhurst	• GDP • CEP	• OP • OP	• HEU processing
3. Chapelcross	• 4 reactors	• OP	• tritium extraction plant
4. Dounreay	• reprocessing plant	• OP	• naval reactor R&D

a. The plant is partially under IAEA safeguards.
b. Britain has constructed a new plutonium purification facility at AWE Aldermaston (the A90 complex). The facility, however, has never been brought into operation. Ibid p. 72.
c. WgPu is recovered at building B209 and processed to ingot-like "billets." After that, it is sent to AWE Aldermaston for machining into weapons components. Ibid p. 78.

INDIA			
1. Bhabha Atomic Research Center (Tarapur, Bombay)	• Cirus and Dhruva reactors • Trombay reprocessing plant • enrichment facility • PREFRE reprocessing plant	• OP • OP • OP • OP	• weapons research, production and maintenance
2. Indira Gandi Center for Atomic Research (Kalpakkam, Madras)	• reprocessing plant (2 phases)	• OP[a]	
3. Rare Materials Plant (Mysore)	• centrifuge enrichment facility		

a. The plant might be ready for precommissioning trials in 1994, *NuclearFuel*, 9 May 1994.

Table notes:

CEP = centrifuge enrichment plant
GDP = gaseous diffusion plant
OP = operating facilities
S = shut-down or standby facilities