

Memo to: Participants in October 21 MPN Meeting, Washington, D.C.
From: Christopher Paine, NRDC
Subject: Future DOE Requirements for Nuclear Weapons Materials
Date: October 6, 1991

George Perkovich of the Alton Jones Foundation suggested that I send around a summary of our most recent estimate of likely trends in the nuclear stockpile and nuclear materials requirements. As you can see from the attached tables, the combined impact of START and the recently announced U.S. unilateral tactical reductions will reduce the active nuclear weapons stockpile from about 18,500 warheads today to 12,500 warheads next year to 10,500 warheads around the year 2000. Further reductions of tactical nuclear bombs and DeMIRVing of strategic missile forces could further reduce the stockpile to 3000 weapons, the low end of the stockpile sizes said to be under review in the PEIS.

The impact on tritium requirements is shown in the attached tables, which assume no current production and continuing commercial sales of tritium at an average of 150 grams per year. For example, maintaining a START I compatible stockpile of 6000 missile warheads, 3000 strategic bombs, and 1500 tactical bombs, plus a two year tritium reserve, would require restart of an SRS Reactor in 1998, or about the year 2000 without the reserve.

A nuclear arsenal of 4500 warheads (or less) would not require a tritium producer to be on line until the year 2010, at the earliest. Reductions to 1000 warheads would delay new production until around the year 2025, at which point the small quantities needed could be produced by a modest-sized linear accelerator at Los Alamos National Laboratory or some other site. Under any deep reductions scenario, the Savannah River site would no longer be needed, as both plutonium processing and tritium requirements could be met by lab scale facilities, such as a linear accelerator or TA-55, the modern plutonium processing facility at Los Alamos.

With respect to both highly-enriched uranium (HEU) and weapon-grade plutonium, there will be abundant supplies available from retired weapons. So much so, in fact, that the Portsmouth Enrichment Plant, which supplies highly-enriched uranium to the Navy for reactor fuel, can be shut down. The Navy's needs can be met for many years using the HEU from retired weapons. In the interim, the Navy should convert to the use of commercially available low-enriched fuel.

In the current environment, there can be no reasonable justification for restarting the Rocky Flats plant in order to produce the W-88 Trident II warhead. The Navy is already purchasing adapter kits which will allow use of 1536 soon to be retired W-76 Trident I warheads on the Trident II missile.

In fact, with a stockpile of 1000 warheads and a 25 year stockpile life for the average weapon, the annual remanufacture requirement would be 40 weapons per year. Such a level of production could be supported by a single site, such as Los Alamos Laboratory, with commercial subcontractors providing the non-nuclear components. All other DOE complex facilities could be closed.

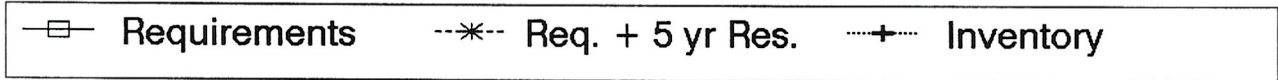
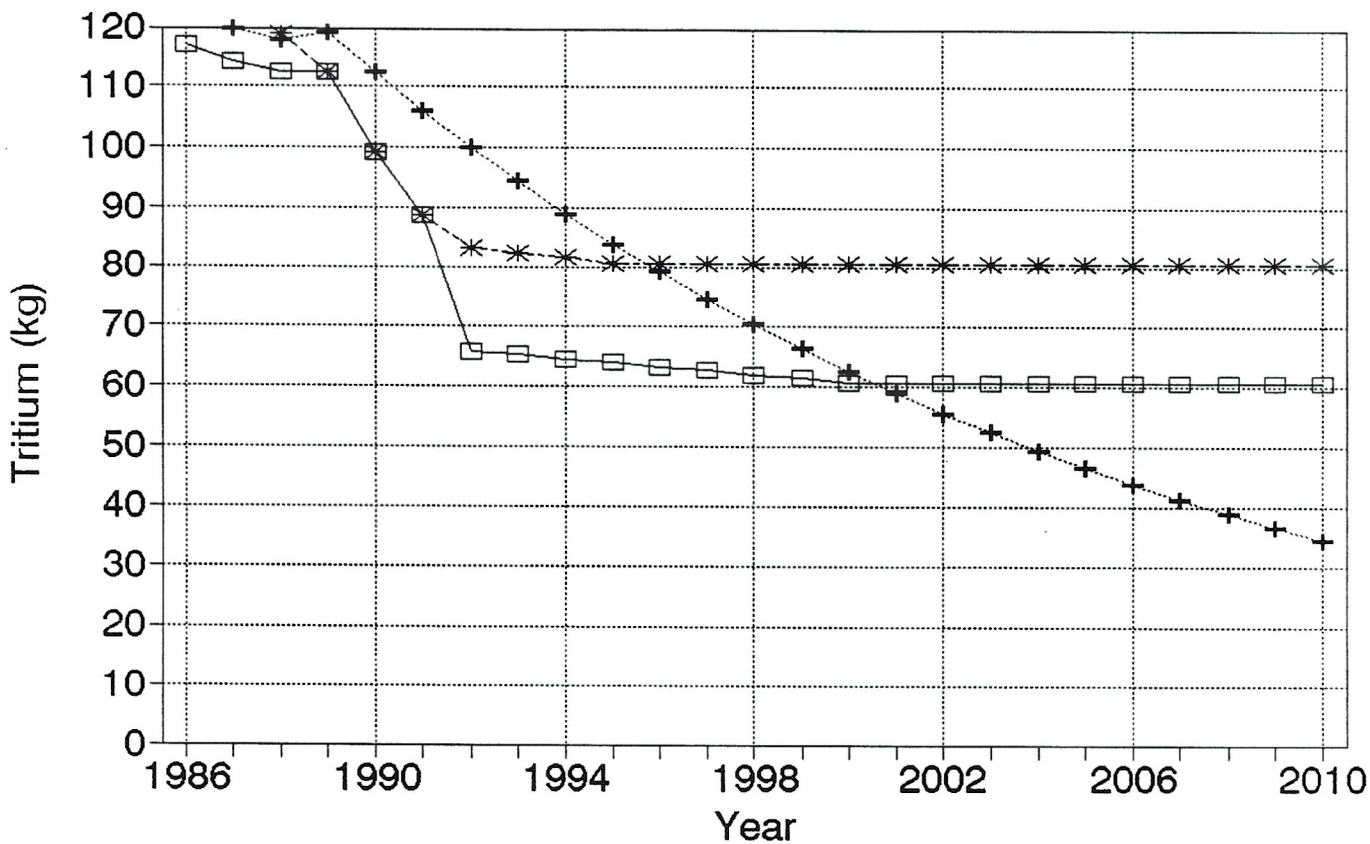
TABLE NOTES

1. This represents the low end (15% of current size) of the Department of Energy's announced range of sizes for the future stockpile that will be considered in the Programmatic Environmental Impact Statement on the Modernization of the Nuclear Weapons Complex.
2. In his press conference of September 27, 1991 Defense Secretary Cheney stated, "approximately 50 percent of those [naval weapons] that are being brought home will, in fact, ultimately be destroyed. These are older systems [i.e the B57] that we believe can safely be eliminated."
3. Between FY1992 and FY1999, twelve older 16-tube submarines "backfitted" with the Trident I missile will be retired, leaving eight 24-tube Trident submarines in the Pacific fleet equipped with the Trident I missile: $8 \text{ subs} \times 24 \text{ tubes} \times 8 \text{ warheads} = 1536$ plus spares = 1700
4. On ten 24-tube subs based at Kings Bay, GA.; assumes downloading from eight to six warheads per missile plus spares.

Estimated Impact of Bush and START Reductions on Nuclear Weapons Stockpile

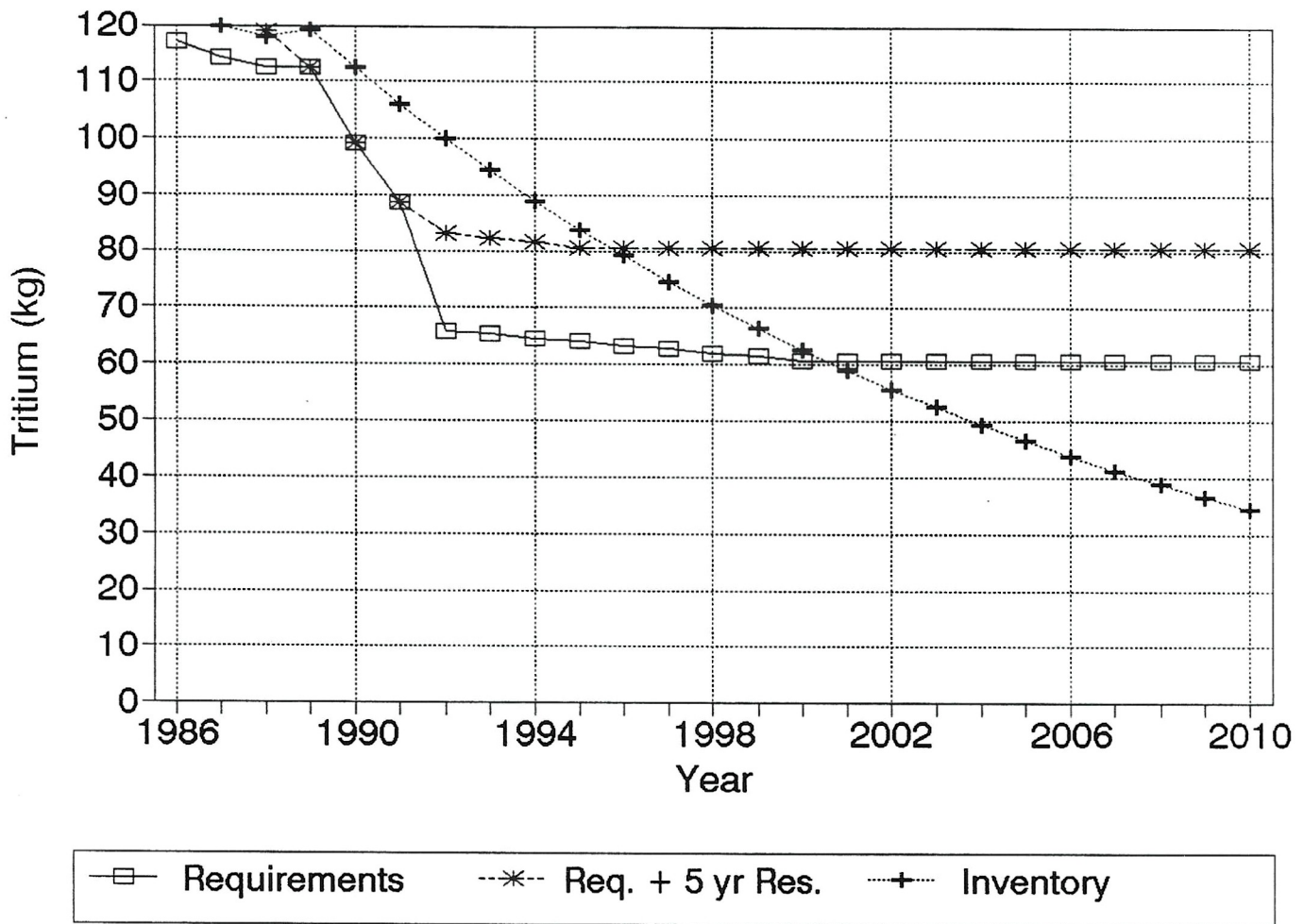
Weapon	<u>Year-end/</u>	<u>FY1991</u>	<u>FY1992(Bush)</u>	<u>FY2000(START)</u>	<u>Low-End PEIS ¹</u>
B28 Strategic Bomb		100	0	0	0
W33 Artillery Projectile (8-in)		700	0	0	0
W48 Artillery Projectile		900	0	0	0
B53 Strategic Bomb (9MT)		50	[off alert] 50	0	0
W56 Minuteman II		475	[elimination accelerated]	0	0
B57 ASW depth/shore strike weapon		1550	[stored pending elimination] ²	0	0
B61 Bomb (Strategic)		900	900	900	150
B61 bomb (Tactical)		1925	1925	1925	150
W62 Minuteman III		610	610	[SICBM] 250	0
W68 Poseidon		1000	0	0	0
W69 SRAM A (off alert in FY 91)		1110	1110	0	0
W70 Lance {700 overseas/200 in U.S.}		900	0	0	0
W76 Trident I (Pacific Fleet, Bangor, WA)		3200	3200	1700 ³	800
W78 Minuteman III		950	950	700	0
W79 AFAP (8-in)		550	0	0	0
W80-0 SLCM		350	[withdrawn from ships]	350	0
W80-1 ALCM/ACM		1950	1950	1700	500
B83 strategic bomb		650	650	650	200
W84 GLCM (Inactive reserve)		(400)	0	0	0
W87 MX		550	550	550	[W87/SICBM] 200
W88/[W76] Trident II (Atlantic Fleet, Kings Bay)		400	400	1600 ⁴	1000
<hr/>					
[in development]					
W61 Earth Penetrator		0	0	150	0
W89 SRAM II (est. 1400 planned)		0	[missile cancelled 9/27/91]	0	0
W91 SRAM-T (est. 500 planned)		0	[missile and warhead cancelled]	0	0
Totals		18320	12645	10475	3000

Tritium Requirements and Inventory (No Production after 1988)

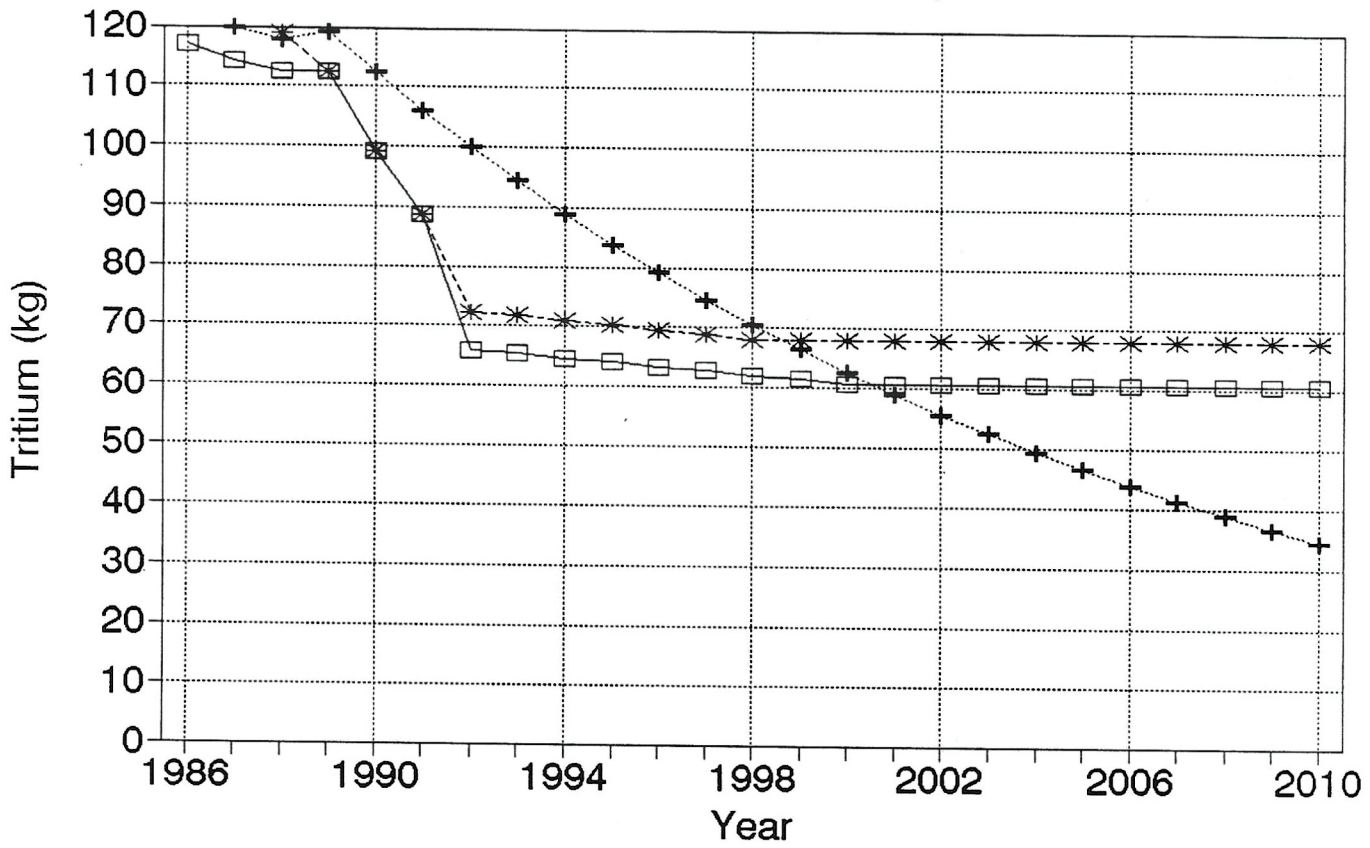


Begin CY	Warheads	T Req WH+PL (kg)	Req + 2 y Res.	Req + 5 y Res.	T Inv. (kg)	T Inv. Decay (kg)	T Prod. (kg)	T Sales (kg)	Net T Inv. Chang	T/WH (g)
1986	24,000	117.0	125.8	133.1	123.8	-6.80	3.01	-0.18	-3.98	4.87
1987	23,400	114.2	125.8	125.8	119.8	-6.59	4.73	-0.18	-2.03	4.88
1988	23,000	112.3	118.8	118.8	117.8	-6.47	8.04	-0.25	1.32	4.88
1989	23,000	112.3	112.3	112.3	119.1	-6.55	0.00	-0.18	-6.73	4.88
1990	20,950	99.2	99.2	99.2	112.4	-6.18	0.00	-0.18	-6.36	4.74
1991	18,900	88.7	88.7	88.7	106.0	-5.83	0.00	-0.12	-5.95	4.69
1992	13,305	66.0	72.4	83.2	100.1	-5.50	0.00	-0.15	-5.65	4.96
1993	12,964	65.3	71.7	82.4	94.4	-5.19	0.00	-0.15	-5.34	5.04
1994	12,623	64.7	71.0	81.5	89.1	-4.90	0.00	-0.15	-5.05	5.12
1995	12,281	64.0	70.3	80.7	84.0	-4.62	0.00	-0.15	-4.77	5.21
1996	11,940	63.4	69.5	76.2	79.3	-4.36	0.00	-0.15	-4.51	5.31
1997	11,599	62.7	68.8	72.1	74.7	-4.11	0.00	-0.15	-4.26	5.41
1998	11,258	62.1	68.1	68.1	70.5	-3.87	0.00	-0.15	-4.02	5.52
1999	10,916	61.5	64.3	64.3	66.5	-3.65	0.00	-0.15	-3.80	5.63
2000	10,575	60.8	60.8	60.8	62.7	-3.44	0.00	-0.15	-3.59	5.75
2001	9,575	55.8	55.8	55.8	59.1	-3.25	0.00	-0.15	-3.40	5.83
2002	8,575	50.8	50.8	50.8	55.7	-3.06	0.00	-0.15	-3.21	5.93
2003	7,575	45.8	45.8	45.8	52.5	-2.88	0.00	-0.15	-3.03	6.05
2004	6,575	40.8	40.8	40.8	49.4	-2.72	0.00	-0.15	-2.87	6.21
2005	5,575	35.8	35.8	35.8	46.6	-2.56	0.00	-0.15	-2.71	6.43
2006	4,575	30.8	30.8	30.8	43.8	-2.41	0.00	-0.15	-2.56	6.74
2007	3,575	25.9	25.9	25.9	41.3	-2.27	0.00	-0.15	-2.42	7.23
2008	2,575	20.9	20.9	20.9	38.9	-2.14	0.00	-0.15	-2.29	8.10
2009	1,575	15.9	15.9	17.2	36.6	-2.01	0.00	-0.15	-2.16	10.07
2010	1,000	13.0	14.5	17.2	34.4	-1.89	0.00	-0.15	-2.04	12.99

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Requirements
 * Req. + 2 yr Res.
 + Inventory

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2007	10,575	60.8	68.1	80.7	41.3	-2.27	0.00	-0.15	-2.42	5.75
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2009	10,575	60.8	68.1	80.7	36.6	-2.01	0.00	-0.15	-2.16	5.75
2010	10,575	60.8	68.1	80.7	34.4	-1.89	0.00	-0.15	-2.04	5.75