Irreversibility

Plutonium is inherently restless. It cannot be sent to the heavens. Nor do we have the means to lay it to rest on earth. Any degree of finality is hard to come by in handling plutonium in the here and now. As we've seen, irreversibility is less exact than we might desire as a criterion for WGPu disposition, and for discrimination among varying approaches to the work of disposition. Still, let's see what can be done with it as the first of our three domains of conditionality.

Taking irreversibility as a physical process in which WGPu is dispositioned to the spent-fuel standard in reactors, alternative U.S. approaches (1)-(4) are virtually indistinguishable. They all serve to embed what was once WGPu in a nasty matrix akin to that ordinarily produced by light-water reactors. Approach (5), while useful as a first step, does not take us far on the road to spent-fuel disposition. On this reading, irreversibility would seem to be of little or no use in selecting for long-term sustainability.

With an understanding of irreversibility that's political as well as physical, we do gain some leverage in sorting the variants proposed by the United States. Item (5), early commitment to a conversion facility in Russia, acquires special significance in dealing with contravention in the form of hedging.

Nuclear hedging presents a powerful challenge to the irreversibility, and hence the sustainability, of disposition. As currently maintained by the United States, about whose activity more is known, the hedge consists of a reserve of warheads and pits sufficient for the rapid regeneration of a Cold War strategic force posture (Cochran, et al., 2002; Kristensen, 2001). Specifically, if the United States were to reduce to roughly 2500 deployed strategic warheads (the Strategic Offensive Reduction Treaty maximum of 2100 operationally deployed plus about 300 on SSBNs undergoing maintenance and the like at any given moment), it would also maintain an active responsive force of something like 2500 replacement warheads, an inactive reserve of a further 2500, and 5000 replacement pits for the active and inactive reserve combined. A total of up to 12,500 plutonium pits is therefore to be retained by the United States against a future need to reverse course and rebuild strategic offensive forces without delay.

Viewed from Moscow, Washington is seen to maintain the option of breakout from nuclear disarmament. Russia, or so goes the argument in Moscow, has no alternative but to maintain a hedge of its own, albeit one that's less imposing than the American.[4] Whether the Russian Federation is indeed set on maintaining a substantial option for breakout into the indefinite future cannot be said. At a minimum, Moscow will surely need the capacity to react to a Chinese response to a U.S. missile defence programme. In any case, there's no Russian denial of Russian hedging. Russia's reserves of military plutonium could be used to generate a force of 20,000 nuclear weapons (Bunn, 2000, p. 54). Improbable, certainly, but the potentiality is there.

---

[4] Officials say that Russia's economic condition and industrial base make for a less than impressive capacity to go into reverse and rebuild strategic nuclear strength. One put Russia's operationally deployed strategic warheads at 1600 and declining because of a persistent inability to do the servicing required every seven or eight years. Mention is also made of the relative ease with which the United States could reload Trident and the B-1. See also the commentary in Bukharin, 2000.