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Space-to-Earth Weapon Deployment (Continued)

device in a satellite is therefore a legitimate option, technically speaking. Similarly, a nuclear explosion following re-entry of a satellite is an effective weapon of mass destruction. Its tactical or strategic value might be questioned when it is compared to, for example, a submarine launched missile with a nuclear warhead, if for no other reason than that while in orbit, its capability to re-enter at the appropriate place on earth is dictated by its orbital characteristics. Delays of 12 hrs or more to achieve the right sub-orbit location might be a necessary, but an unacceptable, restriction. Nevertheless, a re-entry nuclear device is an option.

A chemical/biological weapon for use against earth targets must re-enter and be placed at a specific location before it is activated. Successful deployment of such a weapon could cause havoc in a heavily populated area. As for the re-entry nuclear device, operational questions arise because of restricted useable time windows and the alternative of a submarine launched missile. But the option does exist.

Beam weapons attacking earth targets from space are a very future oriented concept. First of all, to be effective, the target or some key component of it must be small in size, comparing perhaps to a satellite. Second, most earth targets can be hardened against a beam attack, so the effectiveness of the weapon comes into doubt. In the light of these two difficulties, the range of acceptable earth targets may be so small in numbers that the spacebased beam weapon is suboptimal when compared to other options. A final problem with a beam weapon is the effect that the earth's atmosphere and magnetic field have on it, from the point of view of absorption and beam bending.

Without benefit of sophisticated (and classified) operational research analysis, a simple ordering in likelihood from most probable to least probable is as follows:

- (a) A high altitude nuclear detonation from space creating an EMP
- (b) A de-orbited chemical/biological area weapon