

Nuclear Weapons

NOTE: This is a OOC guideline on different types of basic nuclear weapons and how they work. Hypothetically these would make excellent alternatives to races with a much lower tech level than that required of other advanced weaponry such as anti-matter. This was originally written by myself with [Freespacers](#) in mind, so certain parts of the article may make reference to them specifically. Keep in mind this is a guideline, and not an actual list of products. Specific yield calculations will still need to be made if these are to be utilized in specific weapons or products.

Neutron Weapons

Neutron flux is deadly in a manner similar to gamma radiation. However, neutrons do not lose energy when they ionize atoms; they are chargeless, thus can pass through most sorts of electromagnetic fields (energy shielding) and armor materials with relative ease. The only exception would be exceptionally thick and atomically heavy materials, like starship hulls, or those insanely advanced spacetime-bending forcefields that the SAoY uses. Most forms of personal or vehicle armor would be vulnerable...I'm not sure about Yamataium or Zesuaium, because there is no information on how they work or what they're made of. Given that they both seem to defy the laws of physics, naturally generate intense plotshields, and that Zesuaium is immune to basically everything else in all existence that isn't Aether...I conclude it's unlikely.

Uses

- **Electronics Disruption:** Neutron flux can damage electrical components not unlike EMP weapons but are much harder to shield against.
- **Anti-Personnel:** Any personnel caught in the maximum effective range of a neutron weapon will be immediately and permanently incapacitated by delirium, disorientation, hemorrhaging, and coma. This effect will often last until a total nervous system collapse within hours of exposure. ST backups may be activated in such an event, but the the body's cells will be too corrupt to record a backup post-exposure. The only survivors of such a blast will be those species with advanced DNA repair abilities (e.g., Nekovalkyrja, Freespacers), or those that are brought to a medical facility with similar capabilities with a matter of minutes. Even then recovery will take days or weeks, assuming the patient was lucky enough to only be caught near the edge of the blast.
- **Wigner Effect:** Intense levels of neutron bombardment will cause atomic displacement; making materials to swell, embrittle, and creep. These defects may cause an exponential loss of integrity and reduce material strength by over 90%, usually in the case of armors that rely on complex molecular structures or almost any material that uses high precision (nanoscale or smaller) engineering. However, steel and other relatively simple materials have such a high resistance that the damage caused by neutron bombardment is negligible.

Multistaged Thermonuclear Weapons

Nuclear weapons commonly lose huge portions of their potential energy when the core begins to fission/fusion, because the heat expansion caused from the nuclear reaction prevents the core from

staying densely packed for length of time needed for all the fuel to react. Staged thermonuclear weapons use explosive force from smaller nuclear bombs to crush the core to such a density that it fuses much better and has exponentially greater energy efficiency. Cost and size also increases exponentially as well, usually limiting their effective size to that of their delivery system. In theory there is no limit on how many stages you can add, though each additional stage will grow increasingly expensive and inefficient.

Uses I'm not sure about the specific numbers, but I imagine that nuclear weapons could be pushed far beyond the DR 5 rating they have now. Large cannons or cruise missiles could probably hit DR 6~7 or so, while rocket vehicles or ICBM-sized missiles could easily hit moon splitting sizes (DR 8~9).

Salted Nuclear Weapons

These are designed with fallout in mind – in most nuclear scenarios, the majority of the casualties die from residual radiation rather than the fire and heat itself. The radioactive decay of Cobalt-60, for example, is short enough to produce intense levels of radiation, but long enough to render an area uninhabitable for at least five years.

Uses An area denial weapon, specifically with the Freespacers in mind. Since they have one of the highest radioactive environment viabilities of all the sentient races in SARP, a potential military application would be attempting to clear a safe zone for planetary landing craft by flushing out ambushers and defenders. Coincidentally Freespacers use very little in high-energy equipment other than nuclear reactors, so a high radiation background could help hide reactor signatures and therefore any sort of war machines from scanners. Finally, a third effect of this would be a sort of pseudo-terraforming, temporarily making the area of a planet habitable by seeding the environment with fallout and eliminating hostile microbes.

Baby Nukes

Also known as miniaturized nuclear ordnance

Tactical nuclear weapons have been tested as early as the 1950s, so it's a perfectly plausible concept. Artillery, shoulder-mounted SAMs, and backpack-sized devices were created during the Cold War, along with other small munitions like mines and charges.

Of course, there's the critical issue of balance; putting too much power in one person's hands. But I imagine that between the advanced building materials of most SARP cities and the existence of nodal/PANTHEON scanners at most major urban centers and important buildings, nuclear terrorism won't be a major issue. If one has tech advanced enough to fool scanning equipment like that, there are likely more stealthy or more powerful alternatives to nuclear weapons at said person's disposal (like anti-matter).

Also, nuclear weapons need to be relatively fresh and well-kept to operate properly, which requires either a newly built weapon or the laboratories to properly maintenance such a device. Even then, radioactive

materials continue to decay, so I imagine a nuke would expire relatively quickly in comparison to other devices. This would, hopefully, greatly restrict the availability of nuclear weapons. In addition is the earlier mentioned problem of radioactive signatures, which I imagine scanners would spot more easily than alternative weapon systems.

Uses Vehicle reactors, demolitions charges, land/space mines, artillery rounds, rocket artillery, lower-caliber starship rounds, portable rocket launchers, portable recoilless rifles, and so on.

NOTE: Yes, tactical nuclear weapons are indeed plausible, despite popular belief. For example, a 20kt bomb makes a roughly 0.2km (0.12 mile) fireball. During the Cold War, handheld launchers were built capable of nuclear explosions as small as 0.01kt when set dialed to the smallest yield setting. Most later nuclear weapons have a similar ability to quickly modify their yield by injecting a dampener gas into the core.

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