

## Why a Nuclear Powerplant CAN NOT Explode like a Nuclear Bomb

Bombs are completely different from reactors. There is nothing similar about them except that they both need fissile materials. But they need DIFFERENT fissile materials and they use them very differently.

A nuclear bomb "compresses" pure or nearly pure fissile material into a small space. There is no other material in the volume containing the nuclear explosive. The fissile material is either the uranium isotope 235 or plutonium. If it is uranium, it is at least 90% uranium 235 and 10% or less uranium 238. There is no isotope separation problem if the fissile material is plutonium. These fissile materials are metals and very difficult to compress. Because they are difficult to compress, a high explosive [high speed explosive] is required to compress them. Pieces of the fissile material have to slam into each other hard for the nuclear reactions to take place.

A nuclear reactor, such as the ones used for power generation, does not have any pure fissile material. The fuel may be 2% uranium 235 mixed with uranium 238. A mixture of 2% uranium 235 mixed with uranium 238 cannot be made to explode no matter how hard you try. A small amount of plutonium mixed in with the uranium can not change this. Reactor fuel still cannot be made to explode like a nuclear bomb no matter how hard you try. There has never been a nuclear explosion in a reactor and there never will be. [Uranium and plutonium are flammable, but a fire isn't an explosion.] The fuel is further diluted by being divided and sealed into many small steel capsules. The fuel is further diluted by the need for coolant to flow around the capsules and through the core so that heat can be transported to a place where heat energy can be converted to electrical energy. A reactor does not contain any high speed [or any other speed] chemical explosive as a bomb must have. A reactor does not have any explosive materials at all.

As is obvious from the above descriptions, there is no possible way that a reactor could ever explode like a nuclear bomb. Reactors and bombs are very different. Reactors and bombs are really not even related to each other. Recommendation: Nuclear power is the safest kind and it just got safer. Convert all coal-fired power plants to nuclear ASAP. See the December 2005 issue of Scientific American article on a new type of nuclear reactor that consumes the nuclear "waste" as fuel.