

You Say Tom-ah-to; I Say Tom-ay-to Cobalt vs Tantalum Bombs Used in Armageddon sgm, 2018/JUL/25

Please skim the article here:

<https://foreignpolicy.com/2015/11/12/putins-doomsday-machine-nuclear-weapon-us-russia/>

At the end of the article, they talk about deterrence. But I think it's the *wrong kind* they suggest. Putin **HAS** cobalt-bombs *ready to deploy*. Let's look at the facts:

Mechanism [edit]

A cobalt bomb could be made by placing a quantity of ordinary cobalt metal (^{59}Co) around a thermonuclear bomb. When the bomb explodes, the neutrons produced by the fusion reaction in the secondary stage of the thermonuclear bomb's explosion would transmute the cobalt to the radioactive cobalt-60 (^{60}Co), which would be vaporized by the explosion. The cobalt would then condense and fall back to Earth with the dust and debris from the explosion, contaminating the ground.

The deposited cobalt-60 would have a half-life of 5.27 years, decaying into ^{60}Ni and emitting two gamma rays with energies of 1.17 and 1.33 MeV, hence the overall nuclear equation of the reaction is:



Nickel-60 is a stable isotope and undergoes no further decays after emitting the gamma rays.

The 5.27 year half life of the ^{60}Co is long enough to allow it to settle out before significant decay has occurred, and to render it impractical to wait in shelters for it to decay, yet short enough that intense radiation is produced.^[10] Many isotopes are more radioactive (gold-198, tantalum-182, zinc-65, sodium-24, and many more), but they would decay faster, possibly allowing some population to survive in shelters.

Tantalum has been examined theoretically as a "salting" material for nuclear weapons (cobalt is the better-known hypothetical salting material). An external shell of ^{181}Ta would be irradiated by the intensive high-energy neutron flux from a hypothetical exploding nuclear weapon. This would transmute the tantalum into the radioactive isotope ^{182}Ta , which has a half-life of 114.4 days and produces gamma rays with approximately 1.12 million electron-volts (MeV) of energy apiece, which would significantly increase the radioactivity of the nuclear fallout from the explosion for several months. Such "salted" weapons have never been built or tested, as far as is publicly known, and certainly never used as weapons.^[25]

Example of radiation levels vs. time [edit]

Assume a cobalt bomb deposits intense fallout causing a dose rate of 10 sieverts (Sv) per hour. At this dose rate, any unsheltered person exposed to the fallout would receive a lethal dose in about 30 minutes (assuming a median lethal dose of 5 Sv). People in well-built shelters would be safe due to radiation shielding.

After one half-life of 5.27 years, only half of the cobalt-60 will have decayed, and the dose rate in the affected area would be 5 Sv/hour. At this dose rate, a person exposed to the radiation would receive a lethal dose in 1 hour.

After 10 half-lives (about 53 years), the dose rate would have decayed to around 10 mSv/hour. At this point, a healthy person could spend 1 to 4 days exposed to the fallout with no immediate effects.

After 20 half-lives (about 105 years), the dose rate would have decayed to around 10 μSv /hour. At this stage, humans could remain unsheltered full-time since their yearly radiation dose would be about 80 mSv. However, this yearly dose rate is on the order of 30 times greater than the peacetime exposure rate of 2.5 mSv/year. As a result, the rate of cancer incidence in the survivor population would likely increase.

After 25 half-lives (about 130 years), the dose rate from cobalt-60 would have decayed to less than 0.4 μSv /hour (natural background radiation) and could be considered negligible.

The half-life of ^{60}Co is over five **YEARS**. This implies we'd have to wait over a **hundred YEARS** to safely use that land again. That's just totally un-humane and irrational. What kind of spiteful jerk even *thinks* about that kind of punishment? I can imagine Putin saying this after deployment: "They won't be able to use that land for a hundred years!" [laughing]. What an absolute **Jerk!**

Since America **loves** to tout our progressiveness, rationality, and humanity, instead of pretending they don't have the cobalt-bombs or won't use them, let's **overtly** deploy tantalum-bombs! The half-life of ^{182}Ta is **one-fifteenth** that of cobalt so we'd only have to wait say **seven years!** :) O.O Wow! That's so cool! :)

God 'bress' America, 'rand' of the free!