



## WHAT'S SO AND WHAT'S NOT On Radiation & Nuclear Power

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**Myth:** *Man created radiation. It's unnatural, little-understood, an unprecedented threat to the earth.*

**Facts:** Radiation has been with us since the dawn of time. Life evolved in a sea of radiation. Our soil, our water and our bodies are naturally radioactive. Radioactive processes light the sun and the stars, keep the earth's core molten and our environment livably warm. Radiation is better understood than most environmental challenges. Tests show it is probably essential to life.

**Myth:** *We're fouling our nest and degrading the gene pool by continually adding to the earth's radioactivity.*

**Facts:** Fission changes long-lived uranium into shorter-lived fission products, ultimately **decreasing** earth's radioactivity. All the radioactivity we produce is less than the natural decay that continually decreases earth's total radioactivity each year.

**Myth:** *The quantity of nuclear waste is so great! What can we do with it?*

**Facts:** Nuclear plants produce less than a millionth of the volume of waste from an equivalent coal-fired plant, so it can be put into sealed drums and controlled, rather than dumped into the environment. The 50,000 tons of radwaste destined for Yucca Mtn was produced by all 103 U.S. nuclear plants over the past 40 years. This is less than **2 pounds per person served** for the whole 40 years. This is small compared to wastes produced by most other industries, or even our homes. The waste volumes associated with construction and operation of solar, wind, and other renewables are larger, on a per-kilowatt-hour basis, than nuclear wastes.

**Myth:** *Radwaste stays toxic for thousands of years. Humanity has never faced such a long-term hazard.*

**Facts:** Radioactive wastes continually **decrease** in toxicity, whereas other toxic wastes like mercury, lead, arsenic, selenium, cadmium, chromium, etc. retain full toxicity forever. After 500 years, you could eat a pound of it. We bury it 2000 feet underground. The top 2000 feet of U.S. soil contain millions of times more lethal doses of natural poisons than all the nuclear power waste together. We make **10,000 times more lethal doses of chlorine each year**, and put it in our drinking water to kill germs.

**Myth:** *Shipping these "Mobile Chernobyls" (**spent fuel casks**) past schools and homes is a terrible risk.*

**Facts:** These casks pose no significant risk. They are nearly indestructible, being tested by collision, explosives and fire. They contain no liquids and can't "go critical" like a reactor. In tests, armor-piercing missiles blew a hole in one side, but the small amount of radioactivity released was not harmful.

**Myth:** *Nuclear power is an especially unforgiving technology. A momentary slipup, and it's catastrophe.*

**Facts:** Just the opposite. **Nuclear plants are uniquely robust.** They can resist earthquakes, hurricanes, power loss, sabotage and operator errors. Even if the core were to melt, even with containment breached, analyses and tests show that few, if any, persons would be seriously injured or killed. Hundreds of nuclear plants worldwide, operating for decades, have confirmed this.

**Myth:** *But Chernobyl killed thousands of people and disabled millions.*

**Facts:** Not true. Thirty workers and firefighters at the plant were killed. But a 16-year investigation by the UN and WHO concluded that there were no public radiation deaths or injuries. No significant increase in any illness resulted except for 2000 cases of childhood thyroid cancer, a highly treatable disease from which there have been few if any deaths. But **fear of radiation** led to unnecessary evacuation of large population groups, causing unemployment, depression, alcoholism and suicides. In the year after the accident, there were 100,000 additional abortions downwind of the accident, presumably in unwarranted fear of bearing a "nuclear mutant." Deformed "Chernobyl victims" used to raise money for relief were later found to be a scam—unrelated to the accident. Some were from far away, others were deformed before the accident.

**See:** <http://cnts.wpi.edu/RSH/docs/HANDOUTS/> **Myth Vs Fact**

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**Independent Individuals Knowledgeable in Radiation Science and Public Policy**

**Committed to Change Radiation Science Policy in the Public Interest**

## Point paper on nuclear “problems:”

Many people hold **contradictory beliefs** about nuclear energy. For example:

1. The UK applies a **carbon tax** to fossil fuels, to encourage power sources that do not generate global warming gases. When asked if this tax would be applied to nuclear plants that generate no such gases, the Energy Minister replied, “Of course! Otherwise nuclear would have an unfair advantage over coal.”
2. Many patients at the Taipei Municipal Hospital are given a diagnostic “**radioactive cocktail**,” assured that it will not hurt them. After some hours, some of the cocktail is excreted in the urine, which is collected in a tank to allow the 8-hour half-life to decay before disposal. On Jan 14, 2003, some of this urine was spilled, creating a “radioactive contamination emergency.” The treatment center and the intensive care unit were shut down and sealed off, the press reported the “public health scare,” and a formal incident investigation was performed. Note that this radioactivity was deemed not harmful when all of it, fresh, was inside a person’s body, but was a full-blown public health emergency when a small portion of it, decayed for many hours, was spilled.
3. The European Community has been struggling with the fact that many substances are naturally radioactive, some in excess of regulations for nuclear facilities. Current regulations address this by requiring that materials released from nuclear facilities be less than 1% as radioactive as materials with “**natural**” **radioactivity**, even when the radioactivity is from the same radioisotopes.
4. Soil over most of the earth contains uranium, some in quite high amounts. Careful studies show that this has not harmed the health of inhabitants. When this uranium is processed for use for in nuclear power, most of the radioactivity, is removed, leaving “**depleted uranium**.” This depleted uranium is thereafter falsely characterized as a special health hazard.
5. In many diverse cultures world-wide, **natural radon spas** have been used for centuries to treat a variety of illnesses. Patients are often sent there by physicians, with the treatment paid for by the national health insurance. The evidence for benefit is impressive. Yet, while spas boast of their high radon, elsewhere “radon police” warn people that radon in their homes, although much lower than at the spas, is a health hazard.
6. Nuclear power plants are forced to go to great extremes to reduce any potential environmental **pollution** to far below natural levels. Yet when it is suggested that coal miners should stop pushing the tops of mountains into pristine streams, it is objected that this would make coal plants uneconomical.
7. Europeans are particularly concerned about the **safety of their food**. Luxembourg prohibits the import of any irradiated food and inspects it at the borders. But the only sure test that food has not been irradiated is the presence of pathogens, So they test to sure there are pathogens.
8. An intensive program during the 1970s and 80s, in which the federal government participated, measured the **release of radioactivity** from molten reactor fuel and monitored its dispersion in the air. It was found that nearly all the radioactivity stayed bound in the fuel, or dissolved in the water, or plated out on adjacent structure. Very little escaped into the air, and that which did not remain long in respirable form. This confirmed results of the Three Mile Island and Chernobyl accidents, where few if any fatalities occurred among the public. Yet government-sponsored “studies” are repeatedly released, claiming tens of thousands of deaths would result from such accidents, even hundreds of miles away.
9. The only way one can “predict” large numbers of deaths from a nuclear accident is to **multiply the expected trivial individual radiation doses by very large populations** assumed to be exposed. This practice has been called scientifically indefensible, even by the organizations who recommend it as a “prudent course.” Yet emergency plans are all based on such “predictions.”
10. “**ALARA**,” the practice of requiring that cumulative radiation dose be kept As Low As Reasonably Achievable, restrains workers from performing needed inspections (e.g. for leakage and corrosion) and preventive maintenance in radiation zones, **decreasing** assurance of **plant safety** in the name of “prudence.”