



Nuclear Power: Safety

There are already more than 8 000 reactor-years of accumulated operational experience worldwide, equivalent to an average of 20 years of operation for each nuclear power unit. Building on this large experience base, today's reactors incorporate improved safety measures and are designed to rule out an environmental release in the case of a severe accident. Designers believe the newest plants would suffer no more than one severe core damage accident in 100,000 reactor-years of operation and this without a subsequent environmental release. [1]

1. If risk assessments considered only short term severe accident fatalities (Table 2), the reported data would indicate that hydroelectric and gas fuel cycles have led to the largest single event fatality numbers. [1]

Short Term Fatalities (1970 - 1992)

	Fatalities			Average fatalities per GW(e).yr
	Number of Events	Fatalities per event	Total fatalities	
Coal	133	5-434	6 418	0.32
Oil	295	5-500	10 273	0.36
Natural gas	88	5-425	1 200	0.09
Liquid propane gas	77	5-100	2 292	3.10
Hydro	13	10-2500	4 015	0.80
Nuclear	1	31	31	0.01

2. More than 20,000 containers of spent fuel and high-level waste have been shipped safely over a total distance exceeding 30 million kilometres. During the transport of these and other radioactive substances - whether for research, medicine or nuclear -

there had never been a harmful radioactive release. [2]

3. The radiation produced within the core of nuclear reactors is similar to natural radiation but more intense. At nuclear power plants, protective shielding isolates this radiation, allowing millions of people to live safely nearby. Typically, the radiation people receive comes 90% from nature and 10% from medical exposures. Radiation exposure from nuclear power is negligible. [2]
4. The analyses used a fully-fuelled Boeing 767-400 of over 200 tonnes as the basis, at 560 km/h - the maximum speed for precision flying near the ground. The wingspan is greater than the diameter of reactor containment buildings and the 4.3 tonne engines are 15 metres apart. Hence analyses focused on single engine direct impact on the centreline - since this would be the most penetrating missile - and on the impact of the entire aircraft if the fuselage hit the centreline (in which case the engines would ricochet off the sides). In each case no part of the aircraft or its fuel would penetrate the containment. Other studies have confirmed these findings. [2]
5. Penetrating (even relatively weak) reinforced concrete requires multiple hits by high speed artillery shells or specially-designed "bunker busting" ordnance - both of which are well beyond what terrorists are likely to deploy. [2]

[1] <http://www.iaea.org/Publications/Booklets/Development/devseven.html>

[2] <http://www.world-nuclear.org/why/nucsafety.html>