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Risk statistics on energy

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The risks of potential accidents at nuclear power plants are compared to the risks of other energy forms by a new OECD report for policymakers considering nuclear energy.

The OECD's analysis, *Comparing Nuclear Accident Risks with Those from Other Energy Sources*, is meant to help policymakers understand how accident risks are managed at nuclear plants and illustrate that with a comparison of risks from other energy sources. The intergovernmental body presented data compiled by the Paul Scherrer Institute on every accident causing five or more prompt deaths in the energy industry between 1969 and 2000.

In that time period there were 1870 such severe accidents around the world resulting in 81,258 deaths. The only severe accident at a nuclear power plant - Chernobyl - killed 31 plant and emergency workers.

The figures show a marked difference in safety levels between the countries of the OECD (Organization for Economic Co-operation and Development) and less developed areas. Only 390 severe accidents took place in the OECD, with 8934 of the total fatalities, and there has never been a severe accident at a nuclear power plant in the OECD.

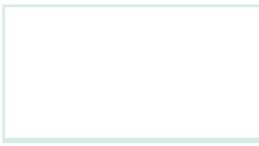
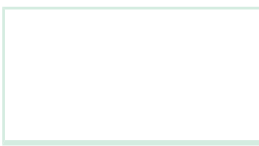
Considering the long-lasting health concerns in areas affected by Chernobyl, the OECD quoted a range of 9000-33,000 eventual deaths from effects of Chernobyl over the next 70 years. These figures come from reports by the European Commission, World Health Organisation, International Atomic Energy Agency as well as Russian authorities, and they depend on the land area considered and how the effects of low radiation dose are understood.

The report heavily qualifies these figures by pointing out that they are based on the contentious "linear dose response relationship with no threshold" (LNT) hypothesis, and that if the same logic is applied to the background radiation normally experienced by all of us, those figures would be insignificant. "For the 70 years over which the above fatality figures were calculated for the accident, the collective dose from natural background would be 910,000,000 person-Sieverts (assuming a constant population), some 1500 times larger, therefore theoretically causing 1500 times as many fatalities (some 50 million) due to exposure to natural background radiation. However there is no way to definitely confirm these figures for Chernobyl, since death rates from all cancers are very much higher."

The report also says that "extrapolating these (Chernobyl) nuclear risks to current OECD countries is not appropriate because OECD plants use other, safer technologies that are operated under a stricter regime than was in force in Ukraine at the time of the Chernobyl accident."

With nuclear accidents so rare, the most powerful way to compare their safety is using a technique called probabilistic safety analysis. Applied to the Muhleberg nuclear power plant

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in Switzerland, this shows a one in one million-year probability of an accident serious enough to cause 2000 latent fatalities. Overall, the likelihood of an accident and radiological release at a new nuclear plant is 1600 times lower than it was when the first reactors were built.

"It is notable," continued the report, "that the estimated latent death rate for the Chernobyl accident are of the same size as the prompt deaths resulting from the largest non-OECD hydro dam failure." This refers to the Banqiao/Simantan failure in China in 1975 that claimed 30,000 lives.

Latent deaths from accidents in non-nuclear energy sources were not included, although premature deaths caused by particulates from fossil fuel generation are thought to be around 288,000 per year worldwide, based on data from the OECD's *Environmental Outlook*. "Overall, accident-related deaths from energy use are much smaller than those that result from the health effects of fossil fuel emissions, but they attract much more media and public attention."

*Researched and written
by World Nuclear News*

Summary of severe accidents that occurred in fossil, hydro and nuclear energy chains in the period 1969-2000

Energy chain	OECD			Non-OECD		
	Accidents	Fatalities	Fatalities/ GWeY	Accidents	Fatalities	Fa
Coal	75	2259	0.157	1,044	18,017	
Coal (China 1994-1999)				819	11,334	
Coal (without China)				102	4831	(
Oil	165	3713	0.132	232	16,505	
Natural Gas	90	1043	0.085	45	1000	
LPG	59	1905	1.957	46	2016	1
Hydro	1	14	0.003	10	29,924	1
Nuclear	0	0	-	1	31*	
Total	390	8934		1480	72,324	

* These are immediate fatalities only
 GWeY: Gigawatt-year of electric power
 Source: Data provided to the OECD Nuclear Energy Agency by the Paul Scherr Institute