What you *ARE NOT* supposed to know:

1. **It doesn't take an accident** for a nuclear power plant to release radioactivity into our air, water and soil. All it takes is the plant's everyday ***routine operation***, and federal regulations permit these radioactive releases.

2. Radioactivity is measured in "curies." A large medical center, with as many as 1000 laboratories in which radioactive materials are used, may have a combined inventory of only about ***two*** curies. In contrast, an average operating nuclear power reactor will have approximately 16 ***billion*** curies in its reactor core. This is the equivalent long-lived radioactivity of at least 1,000 Hiroshima bombs.

3. A reactor's fuel rods, pipes, tanks and valves can leak. ***Mechanical failure and human error*** can also cause leaks. As a nuclear plant ages, so does its equipment – and leaks generally increase.

4. Some contaminated water is intentionally removed from the reactor vessel to reduce the amount of the radioactive and corrosive chemicals that damage valves and pipes. This water is filtered and then either recycled back into the cooling system or released into the environment.

5. A typical 1000-megawatt pressurized-water reactor (with a cooling tower) takes in 20,000 gallons of river, lake or ocean water per minute for cooling, circulates it through a 50-mile maze of pipes, returns 5,000 gallons per minute to the same body of water, and releases the remainder to the atmosphere as vapor. A similar reactor without a cooling tower can take in as much as one-half million gallons per minute. ***The discharge water is contaminated with radioactive elements in amounts that are not precisely tracked, but are potentially biologically damaging.***

6. Some radioactive fission gases, stripped from the reactor cooling water, are retained in decay tanks for days before being released into the atmosphere through filtered ***rooftop vents***. Some gases leak into the power plant buildings' interiors and are released during periodic "purges" or "ventings." These airborne gases contaminate not only the air, but also fall out upon soil and water.

7. Radioactive releases from a nuclear power reactor's **routine** operation often are ***not fully detected or reported.*** Accidental releases may not be completely verified or documented.

8. Accurate, economically-feasible filtering and monitoring technologies ***do not exist*** for some of the major reactor by-products, such as radioactive hydrogen (tritium) and noble gases, such as krypton and xenon. Some liquids and gases are retained temporarily in tanks so that the shorter-lived radioactive materials can break down before the batch is released to the environment.

9. Government regulations allow radioactive water containing "permissible" levels of contamination to be released to the environment. **Permissible does not mean safe.** Detectors at reactors are set to allow contaminated water to be released, ***unfiltered***, if below the "permissible" legal levels.

10. The Nuclear Regulatory Commission relies upon self-reporting and computer modeling from reactor operators to track radioactive releases and their projected dispersion. A significant portion of the environmental monitoring data is extrapolated ***– it's virtual, not real.***

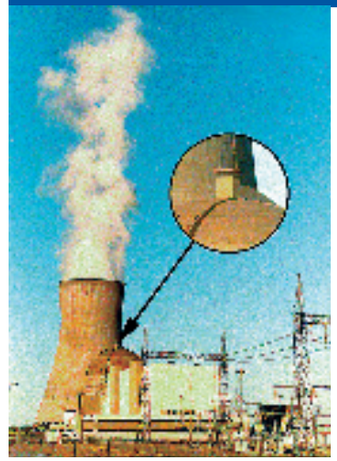
11. Accurate accounting of all radioactive wastes released to the air, water and soil from the ***entire reactor fuel production system*** is simply not available. The system includes uranium mines and mills, chemical conversion, enrichment and fuel fabrication plants, nuclear power reactors, and radioactive waste storage pools, casks, and trenches.

12. Increasing economic pressures to reduce costs, due to the deregulation of the electric power industry, could further reduce the already unreliable monitoring and reporting of radioactive releases. Deferred maintenance can increase the radioactivity released – and the risks.

13. Many of the reactor's radioactive by-products continue giving off radioactive particles and rays for enormously long periods – described in terms of "half-lives." A radioactive material gives off hazardous radiation for **at least ten half-lives**. One of the radioactive isotopes of iodine (iodine-129) has a ***half-life of 16 million years***; technetium-99 = 211,000 years; and plutonium-239 = 24,000 years. Xenon-135, a noble gas, decays into cesium-135, an isotope with a 2.3-million-year half-life.

14. ***Any exposure to radiation increases the risk*** of damage to tissues, cells, DNA and other pivotal-molecules, potentially causing programmed cell death (apoptosis), genetic mutations, cancers, leukemias, birth defects, and reproductive, immune, cardiovascular and endocrine system disorders.

Nuclear Plant Releases to Air, Water and Soil



Reactor Building **vent** at a typical 1000-megawatt pressurized-water reactor.

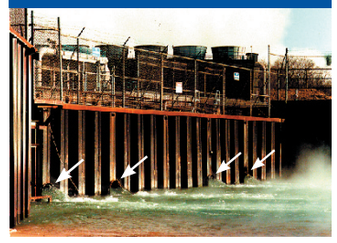
Radioactive gaseous and liquid releases to air, water and soil from nuclear power plants include:

planned releases from the reactor's routine operation

and

unplanned releases from leaks and accidents.

It does not take an accident . . .



Water discharge area at a nuclear power plant on Lake Michigan. Note the flow from four big ejection outlets.

Routine Radioactive Releases from Nuclear Power Plants in the United States

WHAT ARE THE DANGERS?

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1. **Arkansas One 1 & 2 (AR)**
   Dardanelle Reservoir, Arkansas River
2. **Beaver Valley 1 & 2 (PA)**
   Ohio River
3. **Braidwood 1 & 2 (IL)**
   Braidwood Lake, Kankakee River
4. **Browns Ferry 1, 2 & 3 (AL)**
   Tennessee River
5. **Brunswick 1 & 2 (NC)**
   Cape Fear River, Atlantic Ocean
6. **Byron 1 & 2 (IL)**
   Rock River
7. **Callaway (MO)**
   Missouri River
8. **Calvert Cliffs 1 & 2 (MD)**
   Chesapeake Bay
9. **Catawba 1 & 2 (SC)**
   Lake Wylie, Catawba River
10. **Clinton (IL)**
    Clinton Lake, Salt Creek
11. **Columbia (WA)**
    Columbia River
12. **Comanche Peak 1 & 2 (TX)**
    Squaw Creek Reservoir, Brazos River
13. **Donald C. Cook 1 & 2 (MI)**
    Lake Michigan
14. **Cooper (NE)**
    Missouri River
15. **Crystal River 3 (FL)**
    Gulf of Mexico
16. **Davis-Besse (OH)**
    Lake Erie
17. **Diablo Canyon 1 & 2 (CA)**
    Pacific Ocean
18. **Dresden 2 & 3 (IL)**
    Kankakee River
19. **Duane Arnold (IA)**
    Cedar River
20. **Joseph M. Farley 1 & 2 (AL)**
    Chatahoochee River
21. **Fermi 2 (MI)**
    Lake Erie
22. **James A. Fitzpatrick (NY)**
    Lake Ontario
23. **Fort Calhoun (NE)**
    Missouri River
24. **R. E. Ginna (NY)**
    Lake Ontario
25. **Grand Gulf (MS)**
    Mississippi River
26. **Edwin I. Hatch 1 & 2 (GA)**
    Altamaha River
27. **Hope Creek (NJ)**
    Delaware River
28. **Indian Point 2 & 3 (NY)**
    Hudson River
29. **Kewaunee (WI)**
    Lake Michigan
30. **LaSalle 1 & 2 (IL)**
    LaSalle Lake, Illinois River
31. **Limerick 1 & 2 (PA)**
    Schuylkill River
32. **McGuire 1 & 2 (NC)**
    Lake Norman, Catawba River
33. **Millstone 2 & 3 (CT)**
    Niantic Bay of Long Island Sound
34. **Monticello (MN)**
    Mississippi River
35. **Nine Mile Point (NY) 1 & 2**
    Lake Ontario
36. **North Anna 1 & 2 (VA)**
    Lake Anna, North Anna River
37. **Oconee 1, 2 & 3 (SC)**
    Lake Keowee, Savannah River
38. **Oyster Creek (NJ)**
    Barnegat Bay of Atlantic Ocean
39. **Palisades (MI)**
    Lake Michigan
40. **Palo Verde 1, 2 & 3 (AZ)**
    Intake from groundwater and Phoenix City sewage treatment plants (35 miles away); waste water is evaporated, with saturated sludges shipped to a radioactive waste dump.
41. **Peach Bottom 2 & 3 (PA)**
    Conowingo Pond, Susquehanna River
42. **Perry (OH)**
    Lake Erie
43. **Pilgrim (MA)**
    Cape Cod Bay of Atlantic Ocean
44. **Point Beach 1 & 2 (WI)**
    Lake Michigan
45. **Prairie Island 1 & 2 (MN)**
    Mississippi River
46. **Quad Cities 1 & 2 (IL)**
    Mississippi River
47. **River Bend (LA)**
    Mississippi River
48. **H. B. Robinson 2 (SC)**
    Lake Robinson, Black Creek
49. **Saint Lucie 1 & 2 (FL)**
    Atlantic Ocean
50. **Salem 1 & 2 (NJ)**
    Delaware River
51. **San Onofre 2 & 3 (CA)**
    Pacific Ocean
52. **Seabrook (NH)**
    Atlantic Ocean
53. **Sequoyah 1 & 2 (TN)**
    Chickamauga Lake, Tennessee River
54. **Shearon Harris (NC)**
    Harris Lake, Buckhorn Creek, Cape Fear River
55. **South Texas Project 1 & 2 (TX)**
    Colorado River, Gulf of Mexico
56. **V. C. Summer (SC)**
    Monticello Reservoir, Broad River
57. **Surry 1 & 2 (VA)**
    James River
58. **Susquehanna 1 & 2 (PA)**
    Susquehanna River
59. **Three Mile Island (PA)**
    Susquehanna River
60. **Turkey Point 3 & 4 (FL)**
    Biscayne Bay of Atlantic Ocean
61. **Vermont Yankee (VT)**
    Connecticut River
62. **Vogtle 1 & 2 (GA)**
    Savannah River
63. **Waterford 3 (LA)**
    Mississippi River
64. **Watts Bar (TN)**
    Watts Bar Lake,Tennessee River
65. **Wolf Creek (KS)**
    Coffey County Lake, Neosho River

TOTAL OPERATING REACTORS: 104