

Fukushima

For many years after the earthquake and tsunami, if you worked at Fukushima, at the beginning of your shift they put you in your protective suit. Two pairs of socks, boots, full body suit, full helmet with respirator, and three pairs of gloves. You get a new suit after lunch, and they're not reusable. If everything goes as planned, in 40 years when they finally get it shut down, they would have to dispose of around twenty million contaminated protective suits if everything goes better than expected and forty million if it doesn't. The actual number will be much less as they design robots to do a lot of the work. They're going to need the robots, because it's getting progressively harder to find qualified workers as they dose out on radiation exposure and need to be replaced. They've already built a large incinerator plant for the disposal of protective suits.

So far, very little has been cleaned up, and it's likely that much of it never will be. All that's been done so far is to haul the solid waste out of town and store it in plastic bags and barrels, and store the contaminated water in hastily constructed tank farms that stretch to the horizon. Dispersing the radioactive water into the ocean will be the eventual safest solution. The ice wall will need to remain in operation into the distant future. The immediate "cleanup" costs are easily upwards of half a trillion dollars, and the costs of disruption to the community is around another half trillion. Total tangible economic impact of the disaster at Fukushima is already upwards of \$10,000 per capita in Japan. No one knows what the eventual costs will be. There are still several potential disasters looming at Fukushima, some of which are far more serious than the initial event to date. Since Fukushima only supplied about 1/2% of Japan's total electricity generation, cost per consumer so far is already around \$1,500,000.

Studying state of the art technology for the disposal of obsolete and derelict nuclear power plants; unless we spend a lot of time and money, it seems likely that a high percentage of them will end up spilling their guts one way or another. You can learn all the basic plans for their cleanup just by watching a cat take a crap. Some of them will need to keep pumping water on their fuel rods just about forever; a totally unrealistic fantasy. All of them rely on the grid with diesel backup to avoid catastrophe, both of which are vulnerable to a variety of disasters. We don't need to hear any more bullshit about how contemporary nuclear energy is cheap, safe, and clean.

Vitrification and deep burial are safe waste disposal, but it's a bit expensive and it's potentially wasteful, as new technology is about ready to mitigate some of the problems with spent fuel rods and provide us with clean energy for a few generations as we learn to get another round of energy from spent fuel rods. They still contain a lot of usable energy.

Building any more primary nuclear power plants can be extremely reckless. Only the best of plans for the next generation of nuclear power seem safe and affordable. It's not about abandoning nuclear energy. We need it. It's about learning from our mistakes and proceeding with caution.