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Reprocessing:
Environmental, Economic, and Security Risks

Over time, the fuel used to operate nuclear reactors becomes so radioactive that it can no longer efficiently maintain the nuclear chain reaction. The irradiated fuel is then said to be "spent" and withdrawn from the reactor. The very worst step to take next is to "reprocess" the spent fuel. Reprocessing spent nuclear fuel harms the environment, deepens the nuclear waste problem, squanders taxpayer dollars, and encourages nuclear bomb-making.

During reprocessing, intensely radioactive spent fuel is dissolved in acid so targeted ingredients can be precipitated out. One of the ingredients, plutonium, can be used to make new reactor fuel – or nuclear bombs. Since separated plutonium encourages nuclear weapons proliferation, President Ford halted the export of reprocessing technologies. President Carter outlawed U.S. commercial reprocessing in 1976. Even though the domestic ban has since been lifted, reprocessing is so expensive that the U.S. nuclear power industry has shown no interest in its resumption.

Reprocessing Increases Nuclear Contamination

Reprocessing produces very dangerous waste. The liquid acid used to dissolve the irradiated fuel is intensely radioactive, toxic, thermally hot, and difficult to contain. The tanks used to store this liquid high-level waste must be cooled or the waste will explode. In 1957, one such tank exploded in Russia, contaminating 6,000 square miles. Liquid high-level waste from Cold War reprocessing presents the greatest contamination threat and cleanup challenge in the U.S. nuclear weapons complex, and it has already damaged crucial water resources at the three sites where it occurred – Hanford, Washington; Savannah River, South Carolina; and the Idaho National Laboratory.

In Idaho, 16 billion gallons of liquid hazardous and radioactive waste were routinely injected into the Snake River Aquifer, which is the sole source of drinking water for 300,000 people across the southern part of the state. Waste was also allowed to percolate down to the aquifer from unlined ponds. Most important, million of gallons of the most intensely radioactive waste ended up in tanks buried above the aquifer. Though the tanks themselves did not leak, the pipes and valves around them did. The facility to dry the last 900,000 gallons of liquid waste cost nearly half a billion dollars to construct and will begin operating at the end of 2011. Partial cleanup of the soil and water already contaminated will cost another $475 million.

Reprocessing Wastes Billions of Dollars

In 1996 the National Academy of Sciences estimated that reprocessing the current U.S. spent fuel inventory could easily add $100 billion to our nuclear tab. Approximately $100 billion more will be needed to bring some level of cleanup to the four former reprocessing sites in the U.S. These are all costs the taxpayer – not the nuclear power industry – would bear.

Reprocessing Does Not Solve the Nuclear Waste Problem

A geologic repository is still necessary even if spent fuel is reprocessed, and its cost must still be factored in. Though some proponents try to paint reprocessing as a "recycling" solution to nuclear waste, reprocessing spent fuel does not conserve resources or reduce waste. In fact, if spent fuel is reprocessed once, as it is in France, it does not appreciably reduce the space needed in a deep geologic repository while producing other radioactive wastes that remain hazardous for thousands of years. No matter what, some nuclear waste will need to be isolated from the human biosphere forever.

Reprocessing Encourages Nuclear Bomb-making

Reprocessing proponents claim it is a way to control nuclear materials proliferation, but the opposite is true. Irradiated fuel that has not been reprocessed is "self protecting" because the fuel is heavy, bulky, and intensely radioactive. But separated plutonium is a concentrated powder, and only 20 pounds are required to make a bomb. Loss or theft of this dangerous material is hard to guard against in the complex plutonium separation factories where it is very difficult to track plutonium through each step of the process. The current worldwide inventory of separated, weapons-usable civilian plutonium stands at 250 tons – enough to make approximately 30,000 nuclear bombs.

Current Situation

The draft report from the Blue Ribbon Commission on America's Nuclear Future supports consolidating storage of spent nuclear fuel at one or more federal sites, but it acknowledges the public's concern that "interim" storage facilities could become *de facto* permanent storage. Even the possibility of reprocessing will always lead to the consolidation of its feed stock – intensely radioactive spent fuel. But the BRC's draft report also states that "no currently available or reasonably foreseeable reactor and fuel cycle technology developments—including advances in reprocess and recycle technologies—have the potential to fundamentally alter the waste management challenge this nation confronts over at least the next several decades, if not longer."