



The French Did Something Right?

The Story of French Nuclear Reprocessing

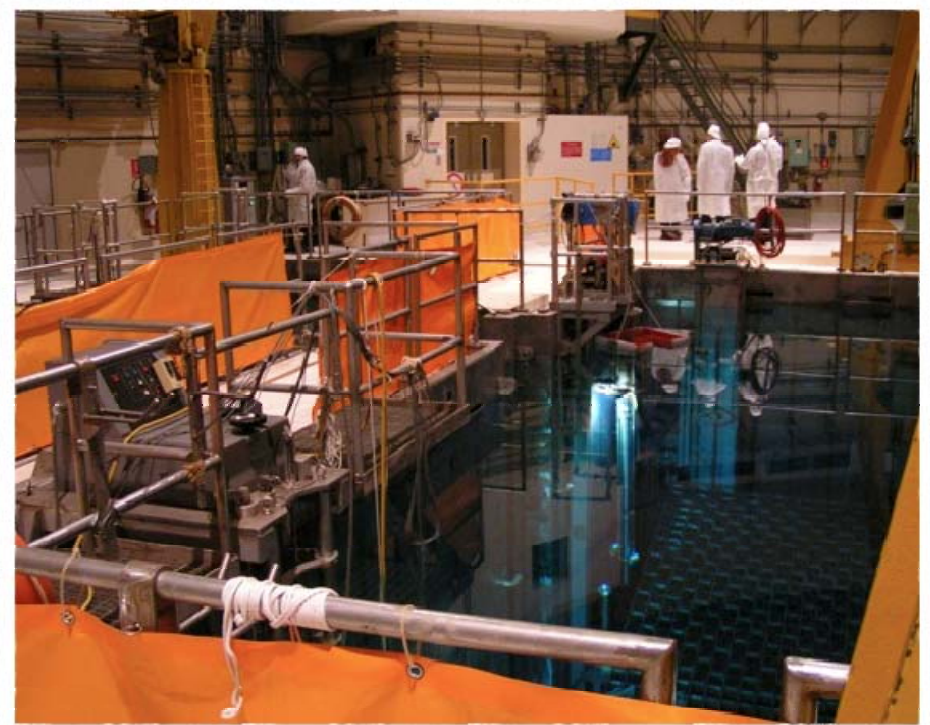
Nuclear Basics

- * Nuclear Reactors use the thermal energy released by nuclear fission to make steam to spin a turbine.
- * To do this the reactor uses bundles of rods of enriched uranium pellets submerged in water where their proximity to other bundles causes a slightly supercritical fusion reaction.
- * To keep it only “slightly supercritical” neutron absorbing control rods are raised/lowered between the bundles



Fuel ReProcessing Basics

- * Reprocessing can recycle 95% of uranium and plutonium in spent nuclear fuel rods. This 95% is largely recycled from the longer term radioactive substances leaving shorter half life substances.
- * This however requires “breeder reactors” which are unavailable to civilians due to their ability to create weapons grade plutonium.
- * France, UK, Russia, Japan and India all



How the US Does it

- * We don't.
- * Carter was a hippy and banned it.
- * Plan started in 2006 for international reprocessing that couldn't make weapons grade plutonium through use of fast breeders.
- * Obama canceled that plan...
- * So no recycling only storage in US.



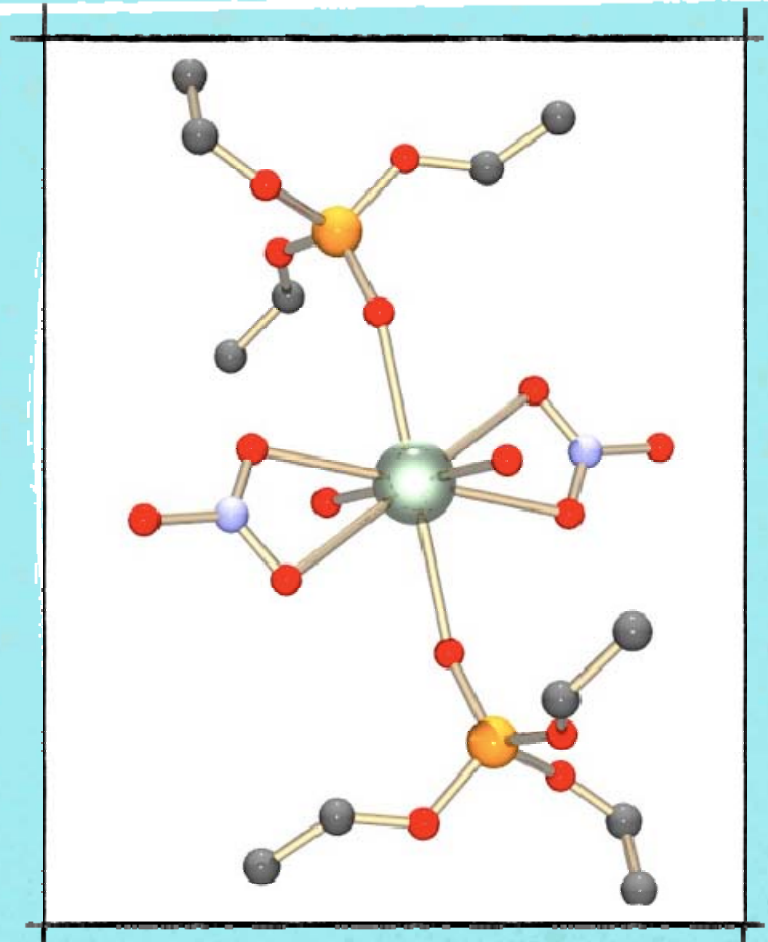
The French Way

- * Centered at La Hague site on Northern French coast.
- * Has a capacity of 1700 tons and processes fuel from France, Japan, Germany, Belgium, Switzerland, Italy, and the Netherlands.
- * Uses the PUREX method.



PUREX

- * Stands for Plutonium Uranium Extraction
- * Can produce weapons grade plutonium from the spent fuel if done incorrectly due to the use of a breeder reactor.
- * This necessitates careful monitoring of chemicals used in the process.
- * This chemical formula means something or perhaps its



GeoPolitical Realities Behind La Hague

- * La Hague started life as a weapons grade plutonium plant for military to fuel French ambitions to be independent of NATO.
- * France's relation with oil exporting countries had been damaged with French Algerian War and the Suez invasion.
- * This lead to France being lumped into embargoed nations during 1973 oil crisis and France decided to derive the majority of its power from nuclear



Benefits over US

- * A 90% reduction in volume of waste.
- * Leftover waste has shorter half life.
- * Diplomatic Leverage over countries they take waste from.
- * Greater Independence from oil
- * Some of the cleanest air in Europe
- * Able to export power for profit.



Weaknesses

- * Attracts hippies...dirty ones.
- * Their drum circles cause an imbalance in the force
- * The area around La Hague has an elevated radiation level of 20 microsieverts per year which is the same as taking a flight once a year.
- * Between \$30 to \$700 dollars per kg more expensive depending on study



Recommendations

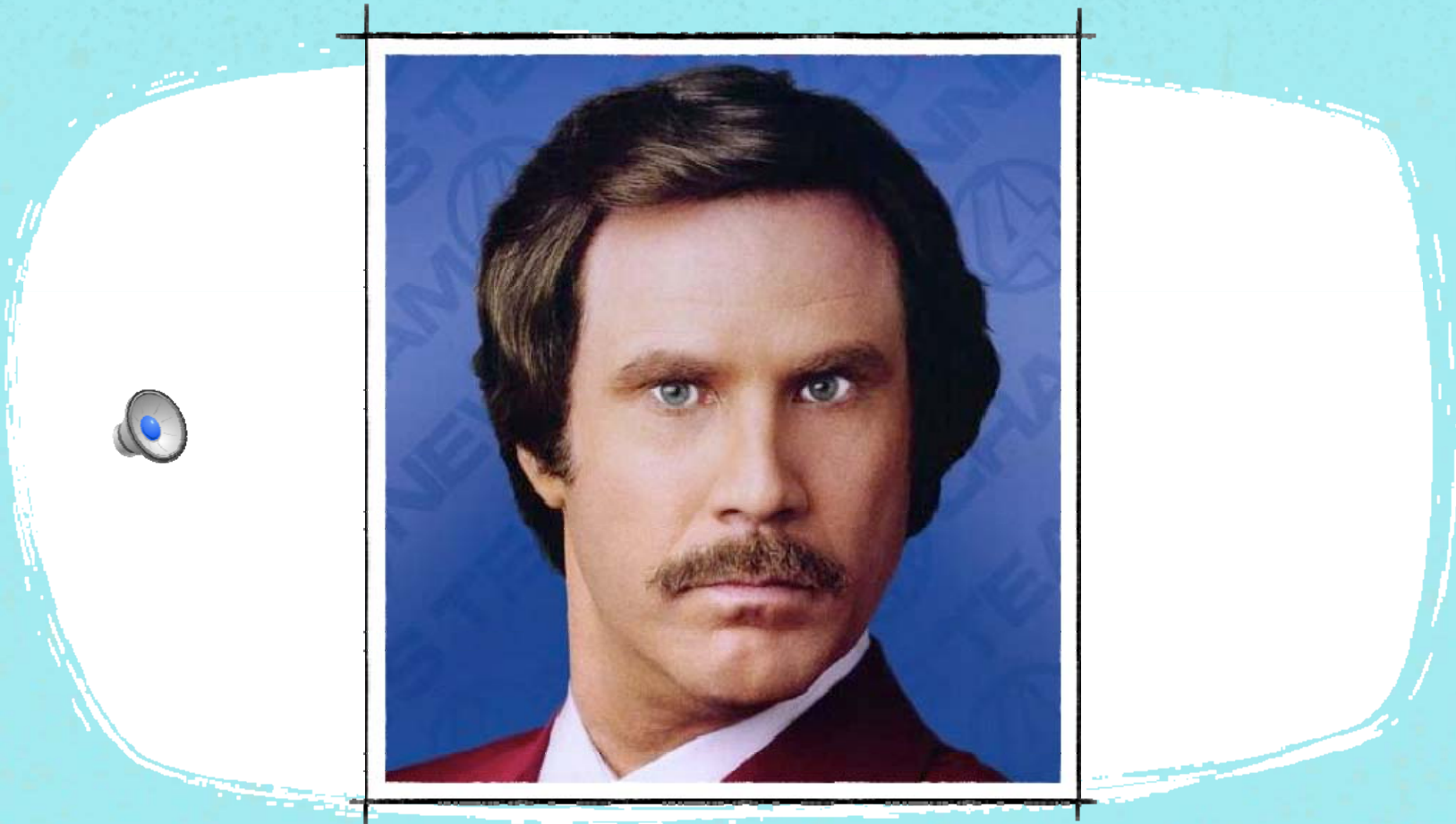
- * The International Reprocessing plan needs to be restarted, under the auspices of NAFTA to keep admin and transportation costs down.
- * Another benefit would be in the cross promotion of a unified North American electrical grid.
- * Reprocessing is still too dangerous of a technology to let fully into the civil market place and it would be best if the facility was government run



Summary

- * Nuclear Reprocessing present far more benefits than detriments given the current ability to prevent the manufacture of weapons grade plutonium.
- * Works best in an international framework so that costs are shared and multiple nations can bear brunt of hippy backlash.





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