Light Water Reactors

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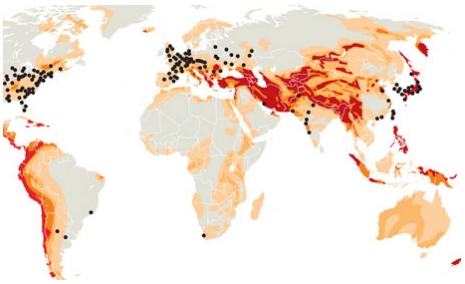
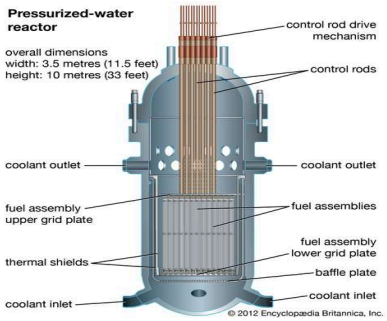
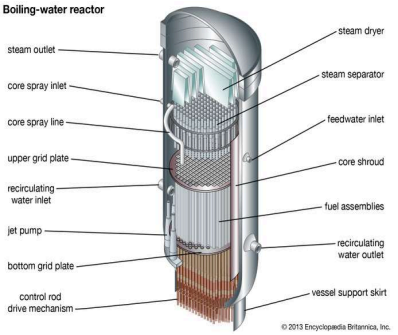
Nuclear energy has been a science closely studied by humans since the discovery of nuclear fission and atomic radiation in 1895. Nuclear energy is the energy released from the splitting and fusing of an atom's nucleus during the processes of fission and fusion that occur within a nuclear reactor. These processes are harnessed and used to generate electricity in nuclear reactors that are located in nuclear power plants all over the globe. Nuclear reactors contain a system of tanks and piping that transport the water and steam used to moderate the environment nuclear fuel rods are stored in. One type of nuclear reactor that can be found at a nuclear plant is a light water reactor.

- A Light Water Reactor (LWR) is a type of nuclear reactor that is used to produce electricity through processes of fission
- Use of nuclear energy in the United States saves Americans an average if $91 billion per year
- LWR uses "ordinary water", or H_2O, to cool and control the reactors unlike Pressurized Heavy Water Reactors that use "heavy water", or D_2O.
- There are two types of Light Water Reactors; Pressurized Water Reactor (PWR) and Boiling Water Reactor (BWR)
- There are 94 active BWRs in 8 countries on the North American, European and Asian continents.
- There are 265 active PWRs in 24 countries on the North American, South American, European, Asian and African continents.
- The PWR operates at high temperatures and pressures to remove heat from the fuel rods that are generating electricity at higher temperatures to create the steam needed in the turbine.
- BWRs use boiling water under controlled pressure levels to create hot vapor used to power the turbine
- BWRs has fewer mechanical parts but has a complex internal system
- More emergency cooling systems are needed in BWR systems
- There is a general interest to increase the use of nuclear power as the demand for cleaner, cheaper and more reliable energy sources increases







Works Cited

Encyclopedia Brittanica , Spinrad, B. I., & Marcum, W. (2019 5). Nuclear reactor - Types of reactors. Retrieved 24, 2020, from https://www.britannica.com/technology/nuclear-reactor/Types-of-reactors#ref45778

Zarubin, B. (2016 7). Introduction To Light Water Reactors. Retrieved 24, 2020, from http://large.stanford.edu/courses/2015/ph241/zarubin1/

United States Nuclear Regulatory Commission . (2019 21). NRC: Glossary -- Light water reactor. Retrieved 24, 2020, from https://www.nrc.gov/reading-rm/basic-ref/glossary/light-water-reactor.html

Rogers, S. (2011, April 11). Nuclear power stations and reactors operational around the world: listed and mapped. Retrieved 24, 2020, from https://www.theguardian.com/news/datablog/2011/mar/18/nuclear-reactors-power-stations-world-list-map#data

HyperPhysics, & Nave , C. (2006 1). Light Water Nuclear Reactors. Retrieved 24, 2020, from http://hyperphysics.phy-astr.gsu.edu/hbase/NucEne/ligwat.html

Mooz, W. E., A Second Cost Analysis of Light Water Reactor Power Plants. Santa Monica, CA: RAND Corporation, 1979, from https://www.rand.org/pubs/reports/R2504.html

Dawson, K. (2017, September 1). A Review of Light Water Reactor Costs and Cost Drivers. Retrieved 24, 2020, from https://www.osti.gov/biblio/1466793-review-light-water-reactor-costs-cost-drivers

NOVA. (2005 1). NOVA | Hitler's Sunken Secret | Dangerous Water | PBS. Retrieved 24, 2020, from https://www.pbs.org/wgbh/nova/hydro/water.html

Atomic Heritage Foundation . (2017 2). Heavy Water Reactors. Retrieved 24, 2020, from https://www.atomicheritage.org/history/heavy-water-reactors