I pledge my honor I have abided by the Stevens Honor System

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Extreme Outliers and Nuclear Energy's Resulting Tainted Image

The demand for energy to power various components that drive our daily lives is growing everyday. Countries all around the globe have looked to increase their electrical output by building more nuclear power plants in response to this, as nuclear energy provides a large amount of energy without the harmful pollutants that fossil fuel methods are known for. Unfortunately, while nuclear power has yielded almost exclusively positive results, it has become terribly misunderstood by the general public, seeing it as potentially dangerous and claiming it to be an unnecessary risk to even have operating nuclear plants at all. However, with a more in-depth look, the argument favoring an enlarged use of nuclear energy can be easily made that greatly outshines its competition. As of 2017, the world has over 449 nuclear plants in operation since the establishment of EBR-I in 1951. This number does not include ceased or decommissioned facilities that have made their mark over the years as well, including EBR-I which was decommissioned in the year 1964 and replaced with EBR-II. In very rare cases, nuclear power facilities have been responsible for disastrous malfunctions, which have ended up tainting its reputation as a result. There have been only four major nuclear power plant accidents in its 70+ year lifetime, with these events being the Three-Mile Island disaster, SL-1, Fukushima-Daiichi and the most catastrophic, Chernobyl. The 1986 incident at Chernobyl yielded by far the most scepticism around nuclear power plants, but sceptics fail to consider the extraordinary conditions surrounding the accident, and refuse to look at a more modern scenario like Fukushima, whose results were much better than expected, with minimal casualties and radiation leak coming from a modern-day facility in a less than ideal location. The disaster in

Fukushima was caused entirely by natural occurrences, as opposed to human error, a key factor associated with the Chernobyl disaster. In fact, modern nuclear facilities are much safer than their predecessors, with even the oldest nuclear plants also being safer than the rest of the energy industry, being responsible for fewer than seventy fatalities in the same amount of years. This negative view surrounding nuclear plants fails to take into account the heavily increased safety measures that technological advancements and experience has provided. Improvements in nuclear power technology has also enhanced the efficiency of processes like Pressurized Water (PWR) and Boiled Water (BWR) reactors. Every modern nuclear reactor requires enriched Uranium Dioxide as a fuel source to create heat that vaporizes water, producing steam to spin electrical generators. PWRs incorporate water in two separate loops, acting as both the coolant and moderator for its reactions, increasing efficiency and safety as a result. The water passes through the reactor's rods, heating the water up to create the steam, and simultaneously moderating the reaction, since steam would also slow the Uranium Dioxide chain reaction to slow down the entire reactor. BWRs work similarly, with the main difference being that they only use a single loop, which means the water does not moderate the reaction as efficiently, but still enough to maintain safety. Modern nuclear reactors are built to be self-sufficient by producing Plutonium-239 that becomes more fuel, and designed to be self-moderating. As seen from its various properties, the ability of modern-day nuclear reactors to safely generate clean energy as opposed to more conventional fuels shows that nuclear energy deserves much more praise than it currently receives from society, choosing to dwell on outdated events instead.