

LAS 432 Week 8 Course Project Narrative

Slide 2

One ethical theory that I think will help me further develop an analysis of the Gen IV nuclear fission reactor technology is utilitarianism. This is because each consequence of producing and using nuclear power can be divided into two categories. In comparison to other forms of energy, the first would be cleaner energy for the nation, more efficient energy production, limited environmental harm, employment development, and less degradation of the atmosphere. The second is the failure of nuclear reactors, which could result in the dispersion of hazardous materials. The chances of a nuclear reactor failing is very low, and the CO₂ emissions produced by nuclear power generation are minuscule when compared to other energy sources.

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Strengths

A major advantage to the Gen IV reactor technology is that with the same quantity of nuclear fuel, this technique produces one hundred to three hundred times more energy. Plus, a closed nuclear fuel cycle may use existing nuclear waste to continue generating energy, and any nuclear waste that remains will only be radioactive for a few decades rather than millennia. The environmental advantages of nuclear energy extend beyond the low-carbon generation of electricity, having a positive influence on culture and society. For example, nuclear energy may be used to create hydrogen, which can then be used in a variety of applications such as transportation and desalinating water in places where fresh water is scarce.

Weaknesses

Safety concerns following the Fukushima power plant catastrophe feature characteristics of this technology that might impede its success. In addition, particular regulations encouraging the deployment of renewable energy sources, as well as construction cost overruns and delays for new building projects are also factors to consider. Because reactor operators have little expertise with the new design and people make mistakes, safety concerns may be higher at first. This would represent a technological constraint. Additionally, issues of fairness and human health arising from nuclear power generation and waste disposal are particularly pressing concerns for the public.

Opportunities

High-performance computation and enhanced modeling skills are two external variables that might help the technology succeed. These are paving the way for new applications in reactor physics and nuclear engineering.

Threats