

## Interpretation of Ethical Issues on the Engineering Field

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### Introduction

The Engineering Field is constantly changing based on the needs, wants, and concerns of society. The most forceful impacts to the engineering world are those made by government controlled regulations. Such regulations and guidelines are generally passed for the “Wellbeing of society”. While this reasoning may be considered viable, have these regulations strengthened or weakened the advancement of the societies that they are designed to protect? Constant regulations passed by federal agencies--such as the *Atomic Energy Act of 1946*--restrict and aim developments in technology for societal or environmental “Wellbeing”, while the regulations involving the development and production of new technology can be--generally--beneficial, they can also be harmful to the advancement of the human species.

### Regulations on Energy

Arguably, the most regulated area of any operation is the field of Nuclear Energy. This is for good reason, certain radioactive substances can cause an area to become uninhabitable for anywhere from two to two-hundred years, cause cancer, and be used in creating weapons of mass destruction. While these regulations are in general “positive” certain restrictions, like the numerous Atomic Energy Acts--notably the *Atomic Energy Act of 1954*--have resulted in stunted research on the use of radioactive materials, most notably: thorium. Thorium is currently a topic of debate in the physics world, as some experts believe thorium reactors to produce less nuclear waste than the current uranium reactors, however others believe it to be nothing more than a matter of preference.

Simply having different points of view from experts in the nuclear field does not give valid reasoning for claiming that the restriction of thorium had a negative effect on society. What does give reason for such claims is the bill S.3060, proposed to congress in 2009. The *Thorium Energy Security Act of 2010* was a bill proposed to congress to amend the *Atomic Energy Act of 1954* to provide for thorium fuel cycle nuclear power generation. The bill died in senate, however thorium may be reconsidered for research funding in the near future. If future thorium research leads to scientific breakthroughs that lead to innovation, that very innovation would be delayed at least sixty years because of the regulations and restrictions set due to social and ethical issues in the 1950's and 60's.

### Environmental Issues

It is common knowledge that automotive manufacturers are subject to strict regulations involving the vehicles they manufacture. Most car commercials mention standards, news reports are commonly reporting on manufacturers that failed to meet standards or cheating on tests to

meet standards--a recent instance being Volkswagen's scandal with their diesel emission "defeat device"(Hotten 2015).

These Emission standards are set by the Environmental Protection Agency(E.P.A.) for the purpose of decreasing human impact on the atmosphere and environment. People have been campaigning and protesting for decreasing humanity's "carbon footprint" for several decades. Still today, environmental health remains a constant social issue.

These restrictions are for commercially manufactured vehicles, not experimental or proof-of-concept vehicles. While this means that commercial manufacturers, and the engineers developing new technology for them, can develop new technology without concern for meeting standards, it also means that any innovations that were not designed to meet standards would need to be redesigned to be produced. These rules make it practically inefficient to design a product for performance, and redesign it for a completely different purpose.

The key to understanding the effect that this has on the automotive industry lies in the formal design process. One of the first steps in the design process is identifying constraints. Constraints such as regulations on emissions. For purposes involving efficiency and practicality, engineers are being pushed to create a design that is efficient, and improving the design to be more powerful. This process is essentially backwards from what automobile design was prior to emission standards.

#### Patent Laws

While patents seem to be one of the foundations of the innovation system of today's society, some may argue that patents can stunt the growth of technology. Patents are filed for the purpose of protecting newly developed technology, by keeping the rights to that technology--as well as any products that feature that technology--within the legal ownership of those that file for them. Keeping the rights of developments in the hands of the hands of the developers seems to be very appropriate, after-all the entire purpose of developing new technology is to acquire wealth from the use of that development.

While patent laws seem to be a perfectly beneficial movement, the faults of a system in which someone can own an idea include the hindered improvement of the idea. The critical reason the patent system is in place is because it provides engineers and companies incentive to develop new technologies and ideas. If an individual or multiple individuals can own an idea and profit from that idea, the profits from producing and licensing provides the incentive to create new products. Without a system of ownership, motivation to innovate and invent would be almost diminished. If someone would invent a new product, someone else will improve upon that idea, or offer it at a lower price, and potentially overwhelm the inventor's business.

The issues involving the engineering field generally include something that is harming something else. The environment, social beliefs, public wellbeing, all examples of things that can change the ways that engineers are regulated and pledged to operate. In today's society the improvement of human technology is not considered to be in the public's best interest. With the

common belief that technological advancement is not more important than economic wealth, engineers are held-back by the laws restricting the products able to be produced.

### Argument

Laws and social premises that are smothering the engineering field are based on economic ethics. Economic ethics are closely held to the belief that the economic well being of those that are responsible for wealth should benefit more than those that are not responsible for the wealth. These laws and social premises also include beliefs that the public should be protected from what science does not yet understand, like certain types of nuclear power that have not been studied yet. The final purpose of the restrictions and social expectations of engineers is to protect the environment, which is seemingly appropriate, however, the environmental concerns constantly cause issued with the design and development of new technology that holds back industry.

### Conclusion

While there are certain exceptions already in place that allow engineers to develop new technologies, the limitations of what can be produced has a large impact on the availability of development. The laws regarding production of goods should be much more lax, and society should decide whether or not the company producing those goods is acting within moral and ethical boundaries, by either purchasing goods from that business, or not doing so. The United State's economy was originally designed for the consumer to decide what businesses should be successful, and that is the way that the engineering field should be handled today: society will decide if the engineer or company was ethical in the development of a product, and conduct business accordingly. The purpose of such a system would mean that the advancement of technology would be steered by the society that it is benefiting, rather than being held back by the restrictions protecting that society.

## Works Cited

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