

## Assignment 7: Ethics (Volland Chapter 8)

The NSPE Code of Ethics (<https://www.nspe.org/resources/ethics/code-ethics>) was used as an outside resource in question 1.

1. Identify the specific section(s) of the NSPE Code of Ethics that relate to the following actions and summarize the main gist of the code in less than 4 sentences each.
  - a. Whistle-blowing when confronted by unethical behavior within your firm: NSPE II.1.a. This section clearly states that if any unsafe behavior (“circumstances that endanger life or property”) are observed, then the proper authority should be notified. This holds priority over any of the other codes.
  - b. Disclosing a potential conflict of interest: NSPE II.4. This section states that engineers should truthfully disclose any potential conflicts of interest. This includes not deciding in both corporate and public sector decisions, not receiving compensation from multiple parties, and not accepting government contracts, as these can all cause disloyalties from the main employer (i.e., a conflict of interest.)
  - c. Accepting a gift from a client or contractor: NSPE II.3.c., II.4.b., II.5.b. Section II.3.c. states that all interested parties (including those that paid for the communication) must be acknowledged in any official statement. Section II.4.b. states that engineers should only be paid by one party unless earlier agreed upon. Section II.5.b. states that engineers should not receive give or receive any contributions that could be seen as causing impartiality. Together, these statements mean that engineers should be virtuous, not accepting gifts or payments from outside parties that may make them impartial, and to acknowledge all contributing parties.
  - d. Preparing a misleading proposal: NSPE II.3.a., III.3.a. The example given by the text is of Ford engineers manipulating a test to get better results. This is the equivalent of lying to the public: if important information is missing or downright incorrect (as was the case of the Ford engineers), clients may cause harm to themselves by taking faulty information to be true.
  - e. Failing to reveal a potential hazard in a design: NSPE II.1.a. Volland states that “One may fail to protect the safety, health, welfare, and property of the public by *not notifying employers or clients of such dangers* (II.1.a)” (Volland 281). Accidents related to known dangers, such as the bad integrity of the O-rings on the Challenger or the health risk of asbestos, may have been easily avoided if all parties involved are aware of these dangers. Hiding information about potential dangers to increase profit or because it is assumed the dangers are obvious are not acceptable; it is the duty of an engineer to make sure the dangers are known to others.
  - f. Working on a project for which you are not qualified by education or experience: NSPE II.2.a. A lack of expertise in a field may cause injury to the engineer, who may not know how to properly operate equipment or know proper safety techniques. It may also cause injury or dissatisfaction to the client, if the quality of the product is that of a product created by a qualified engineer.

- g. Approving a report of work that was not directly supervised by you or your direct control: NSPE II.3.b.
  - h. Criticizing another engineer's work: NSPE III.6, III.7. Section III.6 states that engineers should not try to gain employment by unfair methods such as unfairly criticizing other engineers' work. Section III.7 states that engineers should not attempt to malign other engineers without justification being sent to authorities.
2. Compare and contrast the Ford motor company case involving engine emission tests with the BART case (Case history 8.4). In what ways are these two cases similar? In what ways do they differ?

These two cases are very different because one involves unethical engineers that hid their behavior from the company, and the other involves an unethical company that hid their behavior from the public; the major similarity is that they both involved some sort of serious unethical behavior that resulted in lawsuits against the company. There were also whistleblowers in both cases.

In the Ford motor company case, employees fudged data by tuning the engine during a test. In doing so, they intentionally lied to the public about the performance of their engine. The whistleblower was a different engineer who found the results to be wrong. Luckily, when he told the president of the company, his feedback was immediately acknowledged and changes were put into place. This prevented further complications with the wrong data.

On the other hand, in the BART case, the whistleblowers had the opposite luck. The company executives fired them for insubordination. However, by disregarding the potential safety issues, the company faced much worse problems than the Ford company (which had quickly responded to the whistleblower's feedback), as they had several train accidents because of these problems.

3. Review the Citicorp Center crisis in Section 8.1 (also known as "The Fifty-Nine Story Crisis). Briefly discuss the massive structural oversight, the process that led to the building's eventual structural integrity, identify the ethical and personal dilemmas involved and how these were handled by structural engineer LeMessurier.

The engineering oversight in the design of the Citicorp Center was due to its interesting design (which was due to the building constraints of having a church underneath) and changes in the original design in order to reduce costs (by making faulty assumptions). The building was built on high stilts with four main columns. Steel braces used in the columns were originally designed to be welded together: however, the engineers building the beams for the columns believed that they were building beams for diagonal trusses, which in turn caused them to use fewer bolts than necessary (the original design involved welding the beams together, but this was more expensive). The weakness caused by the insufficient bolts meant that high-wind storms (a "sixteen-year storm") could topple the building.

The beginning of the stabilization was when LeMessurier thought about the design of the building and recalculated some of the forces on the building when

wind hit the building. He then realized that there were not enough bolts to resist the much-increased tension in the bolts. Then, LeMessurier quickly contacted Citicorp and told them of the problem, and steel plates were welded onto the building to reinforce the bolts.

The ethical and personal dilemma is that LeMessurier has a moral obligation to make the building safe but also a reputation to uphold. Luckily, because LeMessurier realized the great danger of his building quickly and performed calculations to determine the necessary fixes, a disaster was avoided. He risked his career to acknowledge the faults in his design and fix them— in the end, this actually benefited his reputation.

4. Review the case entitled Titanium Oxide – Keep it a Secret! Do you agree with the court’s decision to issue an injunction against the engineer? Explain your reasoning and other counterarguments that might be made by the court?

Similar to the other case, in which an injunction was filed against Donald Wohlgemuth to prohibit him from releasing trade secrets, the engineer is not allowed to work on titanium oxide projects for fear of disclosing Du Pont’s trade secrets. This is most likely reasonable: the likely motive of the engineer is higher pay or some other benefit; if this is the sole reason, however, this breaks the NSPE II.4 codes. A selfish reason such as higher personal benefits should not be the reason to leak trade secrets to another company.

That being said, if there was a greater motive, such as unethical behavior or poor worker treatment at Du Pont, then the engineer should be able to argue this position in court and be allowed to work at another company. If this is the case, then his motive to change companies is not an unloyal move because the employer was unfair. This is less likely, however, because he responded to a job advertisement looking for his particular job expertise.