

## **Public Health and Safety – Development of Computer Code**

Case No. 15-4

### **Facts:**

Engineer A, a licensed professional engineer with expertise in computer programming and computer coding, is employed by Company X, which manufactures air pollution monitoring equipment for power generation companies. Engineer A is asked to design, program, and develop code for a new type of equipment the company is planning to develop. The computer code Engineer A develops performs well during testing but causes the company's equipment to reduce its pollution monitoring capacity during peak periods of energy consumption, which decreases the amount of actual pollution reported to the power generating companies—data that is then routinely reported to state and federal officials. Company X officials advise Engineer A that this reduced capacity feature will extend the life of the equipment and provide better value to power generation companies who will purchase it.

### **Question:**

Would it be ethical for Engineer A to design, program, and develop code for a new type of equipment the company is planning to develop for power generation companies with a feature that reduces the amount of actual pollution reported to the power generation companies—data that is routinely reported to state and federal officials?

### **NSPE Code of Ethics References:**

- Section I.1. – *Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the public.*
- Section I.5. – *Engineers, in the fulfillment of their professional duties, shall avoid deceptive acts.*
- Section II.1. – *Engineers shall hold paramount the safety, health, and welfare of the public.*
- Section II.1.b. – *Engineers shall approve only those engineering documents that are in conformity with applicable standards.*
- Section II.4. – *Engineers shall act for each employer or client as faithful agents or trustees.*
- Section III.2.b – *Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.*
- Section III.8.a. – *Engineers shall conform with state registration laws in the practice of engineering.*

**BER Case Reference: 89-7****Discussion:**

Obligations within the NSPE Code of Ethics often conflict. As the NSPE Board of Ethical Review has noted on numerous occasions, individuals should read the Code in its entirety and understand that no provision should be read in a vacuum. Instead, the Code should be read as an organic whole with certain provisions having greater priority and each provision depending upon the others.

Among the more common conflicts in the NSPE Code of Ethics is the conflict between the obligation to the employer/client and the obligation to protect the public health, safety, and welfare.

The NSPE Board of Ethical Review has considered several cases over the years that attempt to balance the obligation to the public and the obligation to the client. A good example is BER Case No. 89-7, in which Engineer A was retained to investigate the structural integrity of a 60-year-old occupied apartment building, which his client was planning to sell. Under the terms of the agreement with the client, the structural report written by Engineer A was to remain confidential. In addition, the client made it clear to Engineer A that the building was being sold “as is” and he was not planning to take any remedial action to repair or renovate any system within the building prior to its sale. Engineer A performed several structural tests on the building and determined that it was structurally sound. However, while Engineer A provided services, the client confided him that the building contained deficiencies in the electrical and mechanical systems, which violated applicable codes and standards. While Engineer A was not an electrical nor mechanical engineer, he did realize those deficiencies could cause injury to the occupants of the building and so informed the client. In his report, Engineer A made a brief mention of his conversation with the client concerning the deficiencies. However, in view of the terms of the agreement, Engineer A did not report the safety violations to any third party.

In determining that it was unethical for Engineer A not to report the safety violations to the appropriate public authorities, the Board of Ethical Review first noted that the facts presented raised a conflict between two basic ethical obligations of an engineer: (1) the obligation of the engineer to be faithful to the client and not to disclose confidential information concerning the business affairs of a client without that client's consent, and (2) the obligation of the engineer to hold paramount the public health and safety. In its review, the Board noted that NSPE Code of Ethics Section III.4 can be clearly understood to mean that an engineer has an ethical obligation not to disclose confidential information concerning the business affairs of any present client without the consent of that client. That provision makes no specific exception to the language. For example, the drafters of the NSPE Code could have provided exceptional circumstances in which such confidential information could be disclosed by the engineer; however, no such provisions have been included. After noting the significance of NSPE Code Section III.4, the Board stated:

“We believe under the facts, NSPE Code Section II.1.c should be read in conjunction with NSPE Code Section II.1.a. The latter section refers to the primary obligation of the engineer to protect the safety, health, property, and welfare of the public. The obligation of the engineer to refrain from revealing confidential information, data, and facts concerning the business affairs of the client without consent of the client is a significant ethical obligation. We further believe that matters of public health and safety must take precedence. The NSPE Code is clear on this point. NSPE Code Section I.1 employs the word ‘paramount’ to describe the obligation of the engineer with respect to the public health and safety.”

Much of the same reasoning applies in the present case. Although it does not involve an obligation of confidentiality as was the case in BER Case 89-7, this case does involve a clear conflict between the obligation of the engineer to the public health and safety and the obligation to be a faithful agent and trustee to an employer or client.

Balancing the ethical considerations, it is the Board’s view that Engineer A’s proposed coding would be inconsistent with his obligation to the public health and safety. The Board further notes that such coding would also run a risk that Engineer A, Company X, and its power generation clients could find themselves in violation of state and federal pollution control laws and regulations. While the power generation clients may see some benefit in an equipment feature that will extend the life of the equipment and provide better value to them and other power generating companies that will purchase the equipment, the effect on accurate pollution monitoring is clear and unmistakable and wholly inconsistent with a reading of the NSPE Code of Ethics.

**Conclusion:**

It would not be ethical for Engineer A to design, program, and develop code for a new type of equipment the company is planning to develop for power generation companies with a feature that reduces the amount of actual pollution reported to the power generation companies—data that is routinely reported to state and federal officials. Engineer A has an ethical obligation to offer to the client that he attempt to develop a new code that does not have this reporting deficiency. If Company X chooses to use the original code without reporting the deficiency to state and federal officials, then Engineer A has the ethical obligation to report that deficiency.

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*Each opinion is intended as guidance to individual practicing engineers, students, and the public. In regard to the question of application of the NSPE Code to engineering organizations (e.g., corporations, partnerships, sole proprietorships, government agencies, and university engineering departments), the specific business form or type should not negate nor detract from the conformance of individuals to the NSPE Code. The Code deals with professional services, which must be performed by real persons. Real persons in turn establish and implement policies within business structures.*

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