

Engineers & Society

CHAPTER 3 (Part 2)

PROFESSIONAL CODES OF ETHICS

by

Ir. Dr. Muhamad Zahim Sujod

Faculty of Electrical & Electronics Engineering

zahim@ump.edu.my

Contents

- * Case studies

Case Study 1

- * Engineer A is employed by a company which works on defence projects.
- * His assigned duties relate to the work of subcontractors, including review of the adequacy and acceptability of the plans for material provided by subcontractors.
- * He found problems with certain subcontractor submissions, and proposed that one of them be redesigned because it represents excessive cost and time delays.

Case Study 1 (cont.)

- * After continued disagreement between Engineer A and management, management placed a critical memorandum in his personnel file, and placed him on three months' probation, with the further notation that if his job performance did not improve, he would be terminated.
- * Does Engineer A have an ethical obligation, or an ethical right, to continue his efforts to secure change in the policy of his employer under these circumstances, or to report his concerns to proper authority?

source: <http://www.onlineethics.org/cases/nspe/>

Case Study 1 - discussions

- * “Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.”
- * Unjustified expenditure of public funds
- * The whistle blower may well have to pay the price of loss of employment. From past experiences, even if they have ultimately prevailed on legal or political grounds, the experience is not one to be undertaken lightly.

Case Study 1 - conclusion*

- * Engineer A **does not have an ethical obligation** to continue his effort to secure a change in the policy of his employer under these circumstances, or to report his concerns to proper authority, but **has an ethical right** to do so as a matter of personal conscience.

Case Studies: Public Safety and Public Welfare

(source: <http://www.onlineethics.org/cases/nspe/>)

Case Study #1

- * Code Enforcement
- * Ahmad is director of a building department in a big city. Because of budget concerns, the city has been unable to hire a sufficient number of qualified individuals to perform building inspections. This makes it difficult for the inspectors to do a good and thorough job. At the same time, a new and tougher building code was adopted by the city. While this code promotes greater public safety than the last one, it also contributes to the difficulty inspectors have doing a good and thorough job.

Case Study #1

- * Ahmad sets up an appointment with the chairman of the city council to discuss his concerns. The chairman agrees to hire additional code officials for the building department on the condition that Ahmad agrees to permit certain specified buildings under construction to be inspected under the older, less rigid enforcement requirements.
- * Should Ahmad agree to the chairman's proposal? Why?
- * What are the references to your opinion?
- * What should Ada's next step be?
- * -adapted from NSPE Cases No. 98-5

Case Study #2

- * Software Design Testing
- * Software Engineer Ganesan is hired by a software company and involved in the design of specialized software in connection with the operations of facilities that impact public health and safety, such as those that control air and water quality. Testing the software system is part of the design process. Ganesan conducts extensive testing and finds that the software is safe to use under existing standards. But Ganesan is aware that new draft standards are about to be released by a standard setting organization-- standards that the newly designed software may not meet.

Case Study #2

- * Ganesan could suggest that the software company and its client perform more tests on the software to see if it meets these new safety standards. Such tests would determine whether the company should move forward with the use of the software. But the client is eager to move forward and the company is eager to satisfy its client and protect its finances and existing jobs. Doing the tests would be extremely costly and delay the project at least six months. This would put the company at a competitive disadvantage and cost the company a lot of money-- putting the goals of protecting its finances, existing jobs, and pleasing the client in jeopardy.

Case Study #2

- * Testing would also result in a significant rise in the state public service commission utility rates during the six months the new testing would delay the project. But at the same time, the management of the software company wants to be sure that the software is safe to use.
- * The company requests Ganesan recommendation concerning the need for additional software testing. What should Ganesan recommend?
- * -adapted from NSPE Cases No. 96-4

Case Study #3

- * Knowledge of Damaging Information
- * The State Pollution Control Authority advises the Bright Corporation that it has 60 days to apply for a permit to discharge manufacturing wastes into a body of water.
- * In order to convince the Authority that it will meet the environmental standards, the Bright Corporation employs Lee, an engineer, to perform consulting engineering services and submit a detailed report. After completing the studies, Lee concludes that the discharge from the plant will violate environmental standards and that the corrective action will be very costly to Bright.

Case Study #3

- * Lee verbally notifies the company, which terminates its contract with Lee with full payment for the services performed. It instructs Lee not to render a written report to the corporation.
- * A short time later, Lee learns that the Authority has called a public hearing, where the Bright Corporation will present data to support its claim that the present plant discharge meets minimum standards.
- * What, if anything, should Lee do now? Is Lee obliged to report the violation of environmental standards to the Authority? Does Lee have any residual obligation to the Bright Corporation that would stand in the way of doing so?
- * --adapted from NSPE Case No. 76-4

source: <http://www.onlineethics.org/cases/nspe/>

Case Studies: Conflict of Interest

(adapted from <http://www.onlineethics.org/cases/nspe/>)

Case Study #1

- * Lisa is an engineer who is competent to prepare specifications for a water expansion system. Lisa is also the CEO of a company that manufactures and sells water expansion systems. Firm Y asks Lisa to prepare specifications for a water expansion system.
- * How should Lisa respond to this request? Should she agree to propose the specifications?

Case Study #1

- * If so, should Lisa tell Firm Y about her other professional job? What, if any, information should she give Firm Y?
- * Lisa decides to prepare the specifications after informing Firm Y that she does, in fact, hold a high position in a water expansion company. As part of her report, she provided the firm with four other manufacturers that prepare water expansion systems for bidding purposes, and she did not include her company as one of the four specified manufacturers.

Case Study #1

- * Now Firm Y now wants to meet with Lisa. They ask her for a bid from her company for the water expansion system.
- * Should Lisa comply with their request? Why or why not? How should she respond?
- * -adapted from NSPE Cases No. 98-11

Case Study #2

- * Engineering Student Serving As Consultant to University
- * Jan, a professional engineer on unpaid leave from Punto Consultants, is a part-time graduate student at a small private university and is enrolled in a research class for credit taught by Dimanro, a mechanical-engineering professor at the University. Part of the research being performed by Jan involves the use of an innovative geothermal technology.

Case Study #2

- * The University is in the process of enlarging its facilities, and Dimanro, a member of the University's building committee, has responsibility for developing a request for proposal (RFP) in order to solicit interested engineering firms. Dimanro plans to incorporate an application of the geothermal technology into the RFP. Dimanro asks Jan to serve as a paid consultant to the University's building committee in developing the RFP and reviewing proposals. Punto Consultants will not be submitting a proposal and is not hesitant to having Jan work on the RFP and proposal reviews. Jan agrees to serve as a paid consultant.

Case Study #2

- * Is it a conflict of interest for Jan to be enrolled in a class for credit at the University and at the same time serve as a consultant to the University? If so, is disclosure sufficient to meet Jan's obligations? Is it ethical for Jan to participate in the preparation of the RFP? Is it ethical for Jan to review the proposals?
- * -adapted from NSPE Board of Ethical Review Case No. 91-5

Case Study #3

- * Binary Service to Same Client
- * You and Smith are engineers who own a consulting engineering firm. You and Smith also own Electricity Services, Inc., a separate corporation. Electricity Services has a management arrangement with a rural district. Under this arrangement, Electricity Services provides several services on a regular basis, including meter reading, billing, recommendations for repair and maintenance. Every so often, Electricity Services provides recommendations for additions and improvements to the water system. The board of directors of the water district meets regularly and receives the reports and recommendations of Electricity Services.

Case Study #3

- * The contract between Electricity Services and the rural district is about to be renegotiated. Smith suggests that the new terms of this contract include a stipulation that when the board approves recommendations of Electricity Services, it awards the engineering assignments for the required professional services to your consulting firm.
- * How should you respond to this suggestion?
- * -adapted from NSPE Case No. 78-3

Case Studies: Engineering Ethics

(source: <http://www.onlineethics.org/cases/nspe/>)

Case Study #1

- * Comments by One Engineer Concerning Another
- * Engineer Alice practices in Ohio but requires the services of a structural engineer licensed in New York. Alice contacts the secretary of the New York Society of Professional Engineers to ask for a recommendation. The secretary looks at the list of member engineers and suggests Anna. Largely on the basis of this suggestion, Alice hires Anna.

Case Study #1

- * Alice is not satisfied with Anna's services. Among other things, she believes Anna does not communicate well.
- * How should Alice handle the situation?
- * Should Alice contact the secretary to inform him that he did not give a good recommendation?
- * Should Alice contact the secretary without first saying something to Anna?

Case Study #1

- * Suppose that Alice does contact the secretary without first saying something to Anna.
- * What, if anything, should the secretary do?
- * -adapted from NSPE Cases No. 96-10

Case Study #2

- * Refusing to Sign/Seal Construction Documents
- * Engineer Sarina left firm A, at which she was an employee, to work for a competitor, firm B. A project on which she was in charge while at firm A was virtually completed before she left, but she did not sign or seal the construction documents before leaving. Tan, a principle in the first firm, requests Sarina to sign and seal the drawing.

Case Study #2

- * Can Sarina refuse to sign or seal the construction documents?
- * Can Sarina ask firm A to pay her for signing the documents?
- * What are Sarina's obligations with respect to the work she left behind?
- * -adapted from NSPE Cases No. 96-3

Case Study #3

- * Signing Off on Drawings
- * Putnam is an engineer employed by a computer manufacturer. He is responsible for the design of some computer equipment and signs off on the drawings. Although his design has been properly prepared, the manufacturing process is faulty, drives up cost, and suffers a mechanical breakdown. The manufacturing division suggests modifications to bring down costs, but Putnam analyzes the recommendations and finds that they would reduce the reliability of the product that would likely cost the company more through warranty claims.

Case Study #3


- * Putnam's supervisor asks him to sign off on the changes anyway. Although there is nothing to suggest that there is a safety problem, Putnam raises reliability concerns to his supervisor.
- * What are Putnam's professional responsibilities in this case? What are the supervisor's responsibilities? What should Putnam do?
- * -adapted from NSPE Cases No. 88-5

Case Studies: Research Ethics

(source: <http://www.onlineethics.org/cases/nspe/>)

Case Study #1

- * Joint Authorship of a Paper
- * Jan and Keith, both engineers, are faculty members at a major university. Both are seeking tenure from the university, and as part of the requirement, they are required to publish original articles in scholarly and technical journals.
- * As a graduate student, Jan developed a paper that he had never published, but now feels would be an excellent topic to publish in a journal. Jan discusses this idea with Keith, and they agree to work together on revising the paper.

- 
- * Jan does most of the work of revising the paper to bring it up to date. Keith's contributions are minimal, but Jan agrees to include Keith's name as co-author, so as to enhance Keith's chances of obtaining tenure. The article is accepted and later published in a scientific journal.

- * Is it ethically acceptable for Jan go back to his graduate work for an article to publish?
- * Should Jan's thesis supervisor be credited in some way, and if so, how?
- * Should Jan acknowledge the source of the funding for his thesis research in the paper?
- * Is it responsible for Jan to ask Keith to help revise the article?
- * How much could (or should) Jan and Keith have agreed upon at the start of their collaboration?
- * Was it either unethical or unwise for Jan to include Keith's name as co-author?
- * --adapted from NSPE Case No. 85-1

Case Study #2

- * Improper Credit Given for Research Data
- * Ramos is the head of a chemical company. As a part of a research and development effort, Ramos offers to provide funding to the chemical department of a major university for removing poisonous heavy metals (chromium, copper, lead, nickel, zinc) from waste streams. In return, the university agrees to give Ramos's company the exclusive rights to any technology developed in the field of water treatment or waste stream management. As a compensation, the university will also receive a royalty from the company from the profits derived from the use of the technology.

Case Study #2

- * At the university, a group of professors, led by Polinski, decide to form a company to exploit the technology obtained except for water treatment and water waste management.
- * Meanwhile, at the same time the university is conducting research in this, Ramos's company is conducting its own parallel research. Both teams obtain data and performance figures, and Ramos's company freely shares its results with those in Polinski's company.

Case Study #2

- * Later, Deponiadis, a professor of civil engineering at the university, wants to conduct research and publish a paper relating to sewage treatment technology. He contacts the professors in the chemistry department, who furnish him with data from their tests, as well as with data from Ramos's company. Deponiadis is totally unaware that the results come from two parties.

Case Study #2

- * Deponiadis is successful in his research, and his article is published in a major journal. The data obtained by Ramos's company is displayed prominently in the paper, and makes up a major portion of the article. The paper credits the members of the chemistry department, but nowhere mentions the contributions of Ramos's company, even though their funds supported both projects. Deponiadis later learns that Ramos's company was the major contributor to the data in his paper.

Case Study #2

- * Is it plagiarism for Deponiadis to publish the data without publishing the full sources? Is it Deponiadis's obligation to give full credit to Ramos's company? Should Ramos take any action after discovering the article? Is so, what kind? What additional information would help you analyze the situation further?
- * --adapted from NSPE Case 92-7



Editor: Ir. Dr. Muhamad Zahim Bin Sujod

Authors: Ir. Dr. Muhamad Zahim Bin Sujod
Prof. Dr. Mahamod Bin Ismail (UKM)