
Chapter 6

Honesty, Integrity, and Reliability

Case

John is a co-op student who has a summer job with Oil Exploration, Inc., a company that does exploratory contract work for large oil firms. The company drills, tests, and writes advisory reports to clients based on the test results. John is placed in charge of a field team who test-drill at various sites specified by the customer. John has the responsibility of transforming rough field data into succinct reports for the customer. Paul, an old high school friend of John's, is the foreperson of John's team.

Case (cont.)

While reviewing the field data for the last drilling report, John notices that a crucial step was omitted, one that would be impossible to correct without returning to the site as repeating the entire test at great expense to the company. The omitted step involved the foreperson's adding a test chemical to the lubricant for the drill. The test is important because it provides the data for deciding whether the site is worth developing for natural gas protection. Unfortunately, Paul forgot to add the test chemical at the last drill site.

Case (cont.)

John knows that Paul is likely to lose his job if his mistake comes to light. Paul cannot afford to lose his job at a time when the oil business is slow and his wife is expecting baby. John learns from past company data files that the chemical additive indicates the presence of natural gas in approximately 1 percent of the tests.

Should John withhold the information that the test for natural gas was not performed from his superiors? Should the information be withheld from the customer?

Telling the truth is emphasized in all moral codes, literary and philosophical works throughout the history

- No surprise that engineering codes contain many references to honesty.
 - *NCEES* (The National Council of Examiners for Engineering and Surveying) *Model Rules of Professional Conduct*
 - “objective and truthful in professional reports, testimony, etc.
 - *IEEE Code of Ethics* Canon 3 and Canon 7.
 - “to be honest and realistic in stating claims on available data”
 - “to seek, accept, and offer honest criticism of technical work”
 - *ASME Code of Ethics* Fund. Princ.II and Fund. Can.7.
 - “being honest and impartial”
 - “issue public statements in objective and truthful manner”

NSPE Code of Ethics on Honesty

- ❑ “to participate in none but honest enterprise”
- ❑ “require honesty, impartiality, fairness, and equity”

- ❑ *Fundamental Canon 3 (I.3):*
 - avoid deceptive acts in solicitation of professional employment
- ❑ *Rules of Practice, Item II.1.d.*
 - “Engineers shall not permit the use of their name or firm name nor associate in business ventures with any person or firm which they have reason to believe is engaging in fraudulent or dishonest business or professional practices.”
- ❑ Relevant Items in *Rules of Practice II.2.a,b,c, II.3.a,b,c.*

(other important aspects of professional judgement and communication)

References to Conflicts of Interest

- *IEEE 2nd Canon 2:*
 - avoid conflicts of interest, can distort professional judgment.

- *ASCE (American Society of Civil Engineers) Canon 3:*
 - Not to issue statements on engineering matters which are inspired or paid by interested parties, unless they indicate on whose behalf the statements are made.

- *ASCE Canon 4*
 - forbids engineers using “confidential information coming to them in the course of their assignments as a means of making personal profit if such action is adverse to the interests of their clients, employers or the public”

In this Chapter we will concentrate on issues of responsibility concerning possible harm and benefits to society

- Ways of Misusing the Truth
- Why is Dishonesty Wrong?
- Honesty on Campus
- Integrity in Engineering Research and Testing
- Integrity in the Use of Intellectual Property
- Integrity and Client-Professional Confidentiality
- Integrity and Expert Testimony
- Integrity and Failure to Inform the Public
- Conflicts of Interest

Ways of Misusing the Truth

Engineers can misuse the truth by

- (i) failing to communicate truth (1-5),
- (ii) communicating truth when they shouldn't (6),
- (iii) allowing their judgment with regard to truth to be corrupted (7).

1. Lying

- ❑ Intentionally or knowingly convey false or misleading information.

- (i) A lie involves something false or misleading,

- (ii) ordinarily stated in words,

- (iii) the intention is to deceive.

2. Deliberate Deception

- ❑ Leading persons to false conclusions without necessarily telling lies.

3. Withholding Information

- ❑ Concealing facts intentionally for personal or other reasons.

Ways of Misusing the Truth

4. Failing to Adequately Promote the Dissemination of Information
 - ❑ Not properly informing the public, superiors, colleagues, etc. about the facts or the reality (such as possible harms or dangers).

 5. Failure to Seek Out the Truth
 - ❑ For example, irresponsible use of inconclusive data without conducting further tests or collecting sufficient amount of information.

 6. Revealing Confidential or Proprietary Information
 - ❑ Disclosing confidential information without consent.
 - ❑ Violation of proprietary information.

 7. Allowing One's Judgment to be Corrupted
 - ❑ Decisions influenced by conflicts of interest, personal gains, egoism, etc.
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Why is Dishonesty Wrong?

- Total honesty in social life equivalent to brutal frankness.
 - Total honesty in professional life leaves no way to exercise confidentiality and protect proprietary information.
 - However apart from reasonable exceptions dishonesty and misuse of truth are wrong and unacceptable.
 - From the *Respect for Persons* perspective dishonesty violates the moral agency of individuals by causing them to make (or influenced by) decisions without informed consent.
 - From the *Utilitarian* perspective dishonesty can undermine the mutual trust among the scientific community hence informed decision making, thus impeding the development of technology.
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Honesty on Campus

- Three senior year students came up with an intelligent gauge which continuously measures petrol consumption (before the use of Information Technology in automobiles). But to prove the workability of the gauge they needed a flow meter to measure the oil input to the engine.
- Their supervisor impressed by the design ordered the purchase of a flow-meter and encouraged the students to draft an article.
- Soon the professor received an acceptance letter of the submitted article (co-authored by himself) from the editor of the journal. But:
 - The students did not ask permission from the professor to use his name.
 - The flow-meter hadn't arrived yet, so the paper was not ready for submission.
- The students in their excitement without telling their professor had finished the article in absence of the flow-meter. They had to invent some simulated data to be used as their test results and submitted their findings (as if complete) as a paper to a journal editor.

Honesty on Campus (continued)

- They were sure that the results they would obtain after the arrival of the flow-meter would match with their simulated data so they didn't see anything wrong in submitting their paper to the editor.
- After the flow-meter arrived it turned out that the simulated output did not actually match with what they obtained from the flow-meter.

Results?

The students;

- ❑ Incorrectly assumed the flow,
- ❑ Made false assumptions about the response of the professor to their actions,
- ❑ The paper was withdrawn from the journal, and they sent an apology letter to the journal,
- ❑ Copies of the letter were placed in their files,
- ❑ Received “F” in the senior design (graduation project)
- ❑ Graduation delayed 6 months.

Integrity in Engineering Research and Testing

- Varieties of dishonesty in Science and Engineering
 - Trimming: smoothing of irregularities of data to make it look like accurate and precise.
 - Cooking: retaining only those results which fit into the theory.
 - Forging: inventing some or all research data which are reported without properly carrying out experimentation.
 - Plagiarism: using intellectual property of others without proper permission or credit.
 - Multiple authorship of a research article can become a controversial issue. Examples of improper co-authoring include:
 - Sometimes names are included as co-authors who actually deserve acknowledgement.
 - Senior professors with minimal contribution can be listed as co-authors.
 - Other cases in which almost no contribution of the co-author exists.

Integrity in the Use of Intellectual Property

- Intellectual Property is the outcome of Mental Labor. Intellectual Property can be protected by:
 - Trade secrets.
 - Patents.
 - Trademarks.
 - Copyrights.
- Line drawing approach can be very helpful to resolve whether an act constitutes breach of Intellectual Property rights or not.

Integrity in the Use of Intellectual Property

(cont.)

- Trade secrets
 - Formulas, patterns, devices or compiled information used in business to gain advantage over the competitors. Trade secrets aren't in the public domain because trade secrets aren't protected by patents.

- Patents
 - Documents issued by the government to allow the owner of the patent to exclude others making use of that information for 20 years of time. Secrecy not necessary!
 - To obtain a patent, the invention must be new, useful and non-obvious.

Integrity in the Use of Intellectual Property (cont.)

■ Trademarks

- Words, phrases, designs, sounds, symbols associated with goods or services.

■ Copyrights

- Rights to creative products such as books, pictures, graphics, sculpture, music, movies, computer programs.
- The owner retains the copyright for 50 years after his/her death. Copyrights protect the ownership of the ideas, but not the ideas themselves. These ideas can be referred with proper citation or used with permission from the owner.

Sample Cases on Integrity in the Use of Intellectual Property

- Case 1: Bill (Eng. Manager) has developed innovative production techniques at Roadrubber. He receives a senior management position by a competing company Slippery Tire. Bill had signed an agreement with Roadrubber not to use any of the ideas he developed or learned there for a duration of two years after he quits Roadrubber. After a few months of his employment at Slippery he is asked to reveal some of the secret processes used by Roadrubber.
- This is an attempt to steal information from a rival company. There are reasons to suspect that Bill was offered this job for the sole purpose of getting hold of the production secrets of Roadrubber. This is a clear violation of NSPE ‘Professional Obligations’ III.1.d: “Engineers shall not attempt to attract an engineer from another employer by false or misleading pretenses.”
- Not all cases are as clear as the one above.

Sample Cases on Integrity in the Use of Intellectual Property (cont.)

- Case 2: Betty (an engineer) has developed some useful production at Roadrubber. She moves to a non-competing company Rubberboat. Betty comes up with a new process at Rubberboat but she realizes that this new process is based on her earlier work at Roadrubber. The processes are quite different and two companies do not manufacture similar products.
- NSPE ‘Rules of Practice’ II.1.c: “Engineers shall not reveal facts, data or information obtained in a professional capacity w/o the prior consent of the client or employer except as authorized or required by law or this Code.” Similar statements by item III.4 of NSPE and item I.1.d of NCEES Model Rules of Professional Conduct.
- Based on NSPE or NCEES Betty should tell the management at Rubberboat to enter into licensing negotiations with Roadrubber.
- Some cases can be even less clear: (1) Betty’s ideas were of no use to Roadrubber, (2) she didn’t even mention her findings to anyone at Roadrubber, (3) she didn’t use the facilities of Roadrubber, (4) Betty developed the ideas during the week-ends at home.

Resolving Cases on Integrity in the Use of Intellectual Property by Line-Drawing

- Case 1: Tom designs automobile brakes at Ford and he learns a lot about heat transfer and materials. Later, Tom moves to GM where he applies his knowledge of heat transfer and materials to design engines. Is Tom stealing Ford's intellectual property?

Feature	Positive	Test Case	Neg.
Generic Info.	Yes	X-----	No
Differ. Applic.	Yes	----X-----	No
Info protected as Trade Secret	No	X-----	Yes

- This is generic (no brand) scientific knowledge, hence not the property of Ford. Furthermore application area is different.

Resolving Cases on Integrity in the Use of Intellectual Property by Line-Drawing

- Case 2: Tom designs automobile brakes at Ford and he learns a lot about heat transfer and materials. Later, Tom moves to GM where he applies his knowledge of heat transfer and materials to design automobile brakes. Is Tom stealing Ford's intellectual property?

Feature	Positive	Test Case	Neg.
Generic Info.	Yes	X-----	No
Differ. Applic.	Yes	-----X	No
Info protected as Trade Secret	No	X-----	Yes

- This is generic scientific knowledge, hence not the property of Ford (although application area is same).

Resolving Cases on Integrity in the Use of Intellectual Property by Line-Drawing

- Case 3: Tom designs automobile brakes at Ford. While working for Ford Tom helps develop a brake lining which lasts twice as long as conventional brake linings. Ford decides to keep the formula for this brake lining as a trade secret. Later, Tom moves to GM where he tells them the formula for new brake lining. Is Tom stealing Ford's intellectual property?

Feature	Positive	Test Case	Neg.
Generic Info.	Yes	-----X	No
Differ. Applic.	Yes	-----X	No
Info protected as Trade Secret	No	-----X	Yes

- This is a clear violation of the intellectual property rights of Ford.

Integrity and Client-Professional Confidentiality

- Some engineers practice their own business and they have obligations towards their clients.
- Confidentiality covers both sensitive information given by the client and information gained by the professional in work paid for by the client.
- An engineer can abuse client-professional confidentiality as:
 - ❑ Breaking confidentiality when it is not warranted.
 - ❑ Refusing to break confidentiality despite higher obligation to public or other people.

Integrity and Client-Professional Confidentiality (cont.)

- Example 1: An engineer inspects a residence of a homeowner who is willing to sell. He finds out that the house is in need of some repair-work. He sends a copy of his report to the real estate firm.
- NSPE code II.1.c: “Engineers shall not reveal facts, data or information obtained in a professional capacity w/o the prior consent of the client or employer except as authorized or required by law or this Code.”
- Example 2: An engineer inspects an apartment whose owner is willing to sell. He finds out that the apartment is in need of evacuation because it poses threat to the safety of its inhabitants.
- Competing obligations towards the client and the public. Obligation to public surpasses the moral obligation to client.

Integrity and Expert Testimony

- Engineers are sometimes hired as expert witness in cases where competent technical knowledge is required.

- The Expert should follow certain rules to avoid problems such as withholding information during cross-examination.
 - Not to take a case if there is shortage of time for thorough analysis.
 - Not to take a case unless he/she can finish with clear conscience.
 - To consult extensively with a lawyer while getting prepared for his/her testimony during cross examination.
 - To maintain an objective and unbiased demeanor on the witness stand.
 - To be open to new information, even during the course of trial.

Integrity and Failure to Inform the Public

- Professional irresponsibility can be described as failure to inform those whose decisions are impaired by the absence of the information.
- From the standpoint of Respect for Persons engineers should ensure that technical information is available to those who need it, especially when disasters can be avoided.
 - Convair's design of cargo hatch door for DC-10 planes.
 - Petrol tank of Ford Pinto.

Conflicts of Interest

- What is a Conflict of Interest?

- Conflict of interest exists when an engineer is subject to influences, loyalties, temptations, or other interests that tend to make the professional's judgment less likely to benefit the customer or client than the customer or client expects.

- NSPE Code of Ethics III.5:
 - Engineers shall not be influenced in their professional duties by conflicting interests.
 - (a) Engineers shall not accept financial or other considerations, including free engineering designs, from material or equipment suppliers for specifying their product.

Conflicts of Interest (cont.)

(b) Engineers shall not accept commissions or allowances, directly or indirectly, from contractors or other parties dealing with clients or employers for the Engineer in connection with work for which the Engineer is responsible.

- Conflict of Interest can be:
 - Actual
 - Potential
 - Apparent

- Actual C-o-I can corrupt professional judgment. Potential C-o-I may corrupt professional judgment in future, if not at present. Apparent C-o-I decrease the confidence of the audience even if professional judgment is not actually corrupted.

Conflicts of Interest and Accepting Gifts: Resolving Cases by Line-Drawing

- Case 1: ValCo valves are superior to traditional ones. After a large number of orders from ValCo, Jim (Valco salesman and former classmate of Tom) visits Tom and gives him a pen worth of \$5. Should Tom accept the pen?

Feature	Positive	Test Case	Neg.
Gift Timing	After	X-----	Befo.
Prod. Quality	High	X-----	Low
Gift Cost	Low	X-----	High
Gift giver is a friend	No	-----X	Yes

Conflicts of Interest and Accepting Gifts: Resolving Cases by Line-Drawing

- Case 5: ValCo valves are superior to traditional ones. Before Tom decides to purchase a large number of valves from ValCo, Jim (Valco salesman and former classmate of Tom) visits Tom and offers to sponsor him for membership in an exclusive country club. Should Tom accept the offer?

Feature	Positive	Test Case	Neg.
Gift Timing	After	-----X	Befo.
Prod. Quality	High	X-----	Low
Gift Cost	Low	-----X-----	High
Gift giver is a friend	No	-----X	Yes

Conflicts of Interest and Accepting Gifts: Resolving Cases by Line-Drawing

- Case 7: ValCo valves are inferior to traditional ones. Before Tom decides to purchase a large number of valves from ValCo, Jim (Valco salesman and former classmate of Tom) visits Tom and offers to sponsor him for an all-expenses-paid trip to Bahamas. Should Tom accept the offer?

Feature	Positive	Test Case	Neg.
Gift Timing	After	-----X	Befo.
Prod. Quality	High	-----X	Low
Gift Cost	Low	-----X-----	High
Gift giver is a friend	No	-----X	Yes