

# Professional Ethics in Engineering

## Case Studies Involving Professional Ethical Issues (4 hours)

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## 6.1 Copyrights and Patent Protection

6.1.1 A fresh water resources engineering graduate (Engineer A) is approached by a Department of Groundwater (DoG ) senior engineer. The DoG engineer asks Engineer A to conduct a district-wide study of groundwater-surface water inter-link in Palpa, and provides a sample of a report to be produced. Engineer A finds that the sample report is based on a superficial study, with all the data taken from USA, and requests money to visit Palpa and collect field data. The DoG engineer refuses, saying that they got the project from low bid, asks Engineer A to prepare the report based on assumed data and assures that Engineer A will not face problem since the contract to conduct the study was obtained by a consulting firm registered in DoG engineer's spouse's name, the DoG engineer himself is responsible to check the report quality, and Engineer A's name will not be in the report.

- List all the options for Engineer A.
- Separate the options into moral, ethical, and legal categories.
- Analyze each option based on ethics and risk to Engineer A.



### 6.1.1 List of options for Engineer A.

- Follow the suggestions of the DoG engineer (use data from textbooks to prepare report)
- Visit the site at Engineer A's own expense, and prepare good report based on field data.
- Collect and study previous reports of the same area which provides related data and prepare report based on secondary information.
- Refuse to be involved in the work and return the sample report to DoG Engineer.
- Accept the assignment, secretly record further conversations with the DoG engineer and report the case to CIAA, with proof.
- Publish an article in newspaper/magazine about the case, with the name of the DoG engineer.



## 6.1.2 Breach of intellectual property rights & copyrights

- [Weak IPR laws bane for foreign investment](#); Published: March 14, 2017; by **PUSHPA RAJ ACHARYA**
- *Owing to trademark dispute with a local firm, Kansai Paint mulling over pulling out from Nepal*
- At a time when the government has been harping on foreign investment in a bid to advance Nepali economy, one of the reputed foreign joint ventures is mulling over retracting its investment from Nepal as a consequence of intellectual property rights (IPR) dispute with a local firm.
- A Japanese foreign investment in Nepal, Kansai Paint, which entered Nepal in 2012 in joint venture with Nepal's Shalimar Paints, has failed to obtain trademark from the Department of Industry (DoI). This is because capitalising on the weak intellectual property rights (IPR) laws in the country, a local investor had registered a firm under the name 'Kansai Nerolac Paint Nepal Pvt Ltd' at the Office of Company Registrar and had applied for trademark before the foreign joint venture.
- The local firm — Kansai Nerolac Paint Nepal Pvt Ltd, which is run by Goyal Group — is in no way related to the Kansai Paint.
- Since Nepal is a member of World Intellectual Property Organisation (WIPO), it is a pity that the country was unable to identify even a globally reputed brand like Kansai. The country may lose foreign investment worth Rs 350 million of the Kansai Paint, which entered the country through its Indian subsidiary Kansai Nerolac Paints India, as the DoI has scrapped the application of the foreign joint venture to obtain trademark of its own name.
- As per Pradip Koirala, director general of DoI, the authorised agency under the Ministry of Industry to enforce Patent, Design and Trademark Act, the department had scrapped the application of the foreign venture as per the provision of law that provides favourable treatment on 'first come, first served' basis. He, however, admitted that the laws need to be amended to lure foreign investment citing foreign firms are sensitive in regard to intellectual property rights.
- The globally renowned Kansai Paint had purchased 68 per cent stake of Nepal's Shalimar Paints through its Indian subsidiary Kansai Nerolac Paints India and registered a company Kansai Paints Nepal Pvt Ltd. However, the foreign joint venture had faced a court case from the local company — Kansai Nerolac Paints Nepal Pvt Ltd. The Supreme Court, some four months back, had issued a verdict in favour of the local firm citing that it had registered the company prior to the foreign joint venture.
- The local firm, which is producing paints under the brand of Nerolac and Kansai, again filed a case at the DoI and the DoI also scrapped the application of foreign joint venture and refused to issue the trademark it had sought. The foreign joint venture also faced unfavourable decision from the Patan High Court, where it had filed a case seeking protection of its trademark. As per the court's decision, the company has to change the name of its product because the local firm has already captured the brand of reputed Kansai Nerolac Paint in the Nepali market.
- Due to all these reasons, the foreign investors are now thinking about exiting from Nepal, according to sources. Nepali partners of the foreign joint venture have also backed this claim. "Kansai Paint, which came to Nepal through its Indian subsidiary after signing of bilateral investment promotion and protection agreement (BIPPA) with India during the premiership of former prime minister Baburam Bhattarai, has been left red-faced in Nepal," said Ashok Vaidya, who is a Nepali partner of the foreign joint venture.
- Kansai Paint, originally from Japan, has set up factories in 25 countries and is selling its product under its own name. Due to the country's weak IPR laws, this case will establish a false precedence among potential foreign investors in Nepal, according to Vaidya. "The country will not only lose foreign investment, there are chances it will also lose its reputation across the globe if the foreign investors withdraw investment from Nepal."
- The foreign joint venture Kansai has been providing direct employment to 100 individuals and contributing revenue worth Rs 500 million to the government every year. Kailash Chandra Goyal, who has been operating the local firm under the name of 'Kansai Nerolac Paint Nepal Pvt Ltd' and producing paints under the brand name of Nerolac and Kansai refused to comment on the matter.

# 6.2 Personal Data Privacy

- The US government asked the details of phone calls and emails of a seven persons it suspects as anti-nationals from a Europe based communication company, with a branch in the USA. The company refused, citing its policy of protecting personal privacy provision of its client, and requests to provide legal documents from US court for it to submit the data. The US government informed that the suspects are planning to conduct a major crime and needs the information immediately. However, the company was adamant, also cited European and US laws prohibiting disclosure of personal data without a court subpoena. A major criminal incident occurred two weeks later and one person died; the US government arrested several persons including all the seven whose communication details it sought; and accused the communication company of collusion in the crime. The court found only one of the seven persons guilty of the crime.
- A) Was it right for the US government to demand the personal data of all the persons it suspects of plotting a crime, without submitting subpoena?
- B) Was it right for the company to refuse to cooperate with the demands of a legitimate government?
- C) Do you agree that the company assisted the criminals by not providing the personal data to the US government?
- D) Should the company assume responsibility for the crime?
- E) Since one of the seven suspects was found to be involved in the crime, do you consider the demand of the US government to provide personal data of all the seven suspects justified?
- F) Do you consider the European and US laws prohibiting disclosure of private data to a legitimate government without a court subpoena needs to be amended?
- G) Do you consider the company liable for the breach of the right to life of the person who died in the incident?



## 6.3 Industrialization and Environmental protection

The Environment Protection Act compliance monitoring team is about to visit a major electronics industry, which was accused of dumping its lead based hazardous materials in a dug well which contaminated the groundwater and posed health hazard to the local residents. The manager of the industry asked the MIS officer to change the data in its system to show that it is complying with all the existing laws of hazardous waste dump. The MIS officer refused, saying that the data is available in many locations within the system, someone else may have downloaded the data which may eventually get in the hands of the monitoring team, and that it is unethical to change the data. When the MIS officer was asked again to do the same act, he demanded the order in written form. The manager informed that the potential penalty of the breach of the law can severely damage the industry's financial condition and its image, and industry may be bankrupt. He promised that if the changes are made in the database and they are successful in averting penalty, the industry will install water treatment plant, provide the clean water to the local residents, and also install proper hazardous waste management system thereafter; this will be in the benefit of the industry, the local residents, and the industry's employees.

- A) Do you consider the demand of the manager moral and ethical?
- B) Was it OK for the MIS Officer to ask for the written order?
- C) Since changing the data seems to benefit of all the parties, should the MIS Officer comply to the demand?
- D) If the MIS Officer did not comply, and the industry went bankrupt, what is the degree of responsibility of the MIS Officer for the joblessness of the employees?
- E) If you are the MIS Officer, what would you do in this condition, and why?



## 6.4 Risk/Benefit considerations in public transportation

- **USA:** In 2014, 32,675 people were killed in 29,989 crashes, an average of 96 per day. The number of deaths, and deaths relative to the total population, has declined over the last two decades. From 1979 to 2005, the number of deaths per year decreased 14.97% while the number of deaths *per capita* decreased by 35.46%. The 32,479 traffic fatalities in 2011 were the lowest in 62 years (1949).
- **Nepal:** According to Nepal Police records, 1,356 people died in road accidents in the fiscal 2008-09, 1,734 in 2009-10, 1,689 in 2010-11, 1,837 in 2011-12, 1,816 in 2012-13, 1,786 in 2013-14 and 2004 in 2014-15. At least 1,305 road fatalities were reported in the first 10 months of the current fiscal. On an average, 1,800 persons die in road accidents in Nepal every year. Police say road accidents are on the rise due to increased vehicular traffic. A fairly large number of accidents go unreported, because the parties involved settle the matter themselves. (August 4, 2017, THT)

Based on the information given above answer the questions.

- A) What is the trend of fatal road accidents in Nepal versus USA?
- B) Considering that the population of the USA is 330 Million, and vehicle ownership is 1 vehicle per 1.3 person, compare the numbers given above in terms of fatalities per million population and fatalities per number of vehicles; the total number of vehicles registered in Nepal, including motorbikes, is about 2 million.
- C) As an electronics engineer, what role can you play in reducing risk of fatal road accidents in Nepal?



## 6.4 Risk/Benefit considerations in public transportation

- **The Public Transportation Entrepreneur Association (PTEA)** demanded 15% rate hike in bus fare when the diesel price went up by 10%. PTEA claimed that the risk and benefit associated with operation of public buses is linked with diesel price; as fuel price rise risk increase (higher investment for lower return) and benefit decrease (lower seat occupancy). So to compensate for rise in risk and drop in benefit, the bus fare needs to be raised by higher percentage.
- **The Government of Nepal (GoN)** did not agree with the PTEA logic. GoN said that the bus fare is based on fuel, vehicle maintenance, tyre wear and tear, lubricants and oils, driver and helper's wages, bank loan, and profit on investment. Since the price of only one of the parameters has increased, it is unfair and unethical to increase bus fare by more than 2%.
- GoN refused the PTEA demand saying that the diesel price is not linearly related with diesel price. The PTEA threatened to call a strike if their demands are unmet within 48 hours. Eventually a technical committee was formed to settle the dispute, and appointed you as the decision maker. Prepare your report which addresses all the issues raised by PTEA and GoN, electronic monitoring of seat occupancy, and a design to automatically revise bus fare in similar situations in the future so that the risk and benefit in operation of public transport is transparent.





# 6.5 Engineers and the military

- The Nepalese Army (NA) has already established a medical college and planning to run an engineering college. The NA is engaged in disaster Risk Management and construction of fast track highway and also planning to invest in hydropower sector in Nepal.
- (a) if you are an engineer working for the NA, what suggestion would you give to the decision makers for further expansion of the NA in other sectors where engineering services are needed?
- (b) if you are an engineer working in a private sector in hydropower development and/or highway sector, what is your suggestion/opinion on the gradual expansion of the NA in the sectors traditionally handled by the private sector engineering firms?



## 6.6 Science and technology for medicine

- An insurance company asked for the medical records of one of its clients, claiming that the patient has unreported a pre-existing condition, and hence ineligible for reimbursement of expenses. The hospital administrator asked you, the IT Officer, to provide the records. You asked the part-time doctor who checked the patient; the doctor refused to allow you to submit the report, citing patient confidentiality provision. The administrator then asked you to make a copy of the report and submit to him or reveal him the password of the hospital MIS system. The administrator also threatens to take disciplinary action against you if you did not act accordingly.
- A) What are your options in this situation? Which options are ethical and which ones are unethical?
- B) Is there any way to fulfil the administrator's demand without compromising patient confidentiality?
- C) As a professional engineer, what should you do in this situation?



## 6.6 Science and technology for medicine

- Many governments have banned stem cell research or erected obstructions in SC research.

*Stem cell research thus raised difficult questions:*

*Does life begin at fertilization, in the womb, or at birth?*

*Is a human embryo equivalent to a human child?*

*Does a human embryo have any rights?*

*Might the destruction of a single embryo be justified if it provides a cure for a countless number of patients?*

*Since embryonic stem (ES) cells can grow indefinitely in a dish and can, in theory, still grow into a human being, is the embryo really destroyed?      <http://learn.genetics.utah.edu/content/stemcells/scissues/>*

- What are the roles of an electronics engineer in addressing these questions?



## 6.7 Engineers in international development

### MSc Engineering for International Development



The MSc Engineering for International Development aims to expose engineers and built environment students and professionals to the challenges and complexities of working in a global context, and equip them with necessary skills and knowledge to place these in the frameworks and paradigms in which they might work. This programme will focus on the provision of sustainable and resilient infrastructure in low-middle income countries.

Engineers without Border

Policy Intervention

Sustainable, balanced, justified development

Site specific research for reliable design: bio-physical aspects

Access to the fruit the development: affordability

Energy – Water – Food Nexus

Culture and Disaster Sensitive Development

Conflict free development: local livelihood, benefit sharing



## 6.7 Engineers in international development

- You are assigned to design an integrated circuit / hydropower dam for a project in a country which is considered hostile to your country.
- A) Should you accept the assignment and do your best professional work for the project?
- B) Should you accept the assignment and secretly and deliberately introduce bug in the program, or introduce weak section so that the project will eventually fail and result in a disaster?



## 6.8 Arbitration

- The project you are involved in from the contractor's side is in dispute with the consultant and client. The client refused payment even after completion of work citing 30-days delay in work completion. The delay was due to initial 5-day strike by the contractor's workers, immediately followed by a 6-day national strike by a political party. The contractor claimed that it could have completed the work if there was no national strike, which resulted in the workers returning home and also resulted in unavailability of construction materials in time, and hence not responsible for the delay; the client cited workers' strike as the main cause of delay.
- Which method of dispute resolution would you prefer – arbitration or litigation?
- Prepare your logic for full payment claim.



*Seyane*

10. This MoU shall be binding, final and executable on both Parties and supersede any earlier subcontract agreement on the subject.
11. Any of the terms of this MOU may be waived in writing by the party which is entitled to the benefit thereof; provided, however, that the failure of a party to exercise any right given it hereunder, or to insist on strict compliance with all the terms herein, shall not constitute a waiver of any term, condition, or right under this agreement, unless and until that party shall have confirmed any such action or inaction to be a waiver in writing.
12. This MoU contains the entire understanding between the parties hereto relating to the subject matter hereof, and shall supersede all prior negotiations, representations, agreements and understandings, whether oral or written, between these parties with respect to the subject matter herein, and neither party shall be liable or bound to the other in any manner by any warranties or representations (whether oral, implied or otherwise) not set forth herein.

This MOU is signed in two copies, one for each Party and is binding on the Parties.

On behalf of Employer



Witness

*[Handwritten signature]*

*[Handwritten signature]*



On behalf of Sub Contractor

*Seyane*  
Shri Ram Neupane

Witness

*[Handwritten signature]*  
Phanindra Raj Pandey

*[Handwritten signature]*

## Arbitration Committee formed in Melamchi Dispute: CMC vs. Megatech

मेलम्ची आयोजनाको मूल ठेकेदार र सहायक ठेकेदारबीच भुक्तानी बिबादलाई सल्टाउन पक्षहरूको अनुरोधमा खानेपानी मन्त्रालयका सहसचिव अनिलभद्र खनालको संयोजकत्वमा मूल ठेकेदार र सहायक ठेकेदारहरूका तर्फबाट १/१ जना प्रतिनिधि रहने गरी ३ सदस्यीय मध्यस्थकर्ता समिति गठनगर्ने आपसी सहमति भए बमोजिम हिजो एक समिति गठन गरिएको छ । यो कमिटीले पक्षहरूबीच आपसी सहमतिका आधारमा भुक्तानी बिबाद सल्टाउने सिफारिस गर्ने र सोही बमोजिम समस्या यथाशिघ्र समाधान हुने अपेक्षा सबै सरोकारवालाको रहेको छ ।

Facebook Post of Mr. Bhim Upadhyay,  
Secretary, Ministry of Water Supply and  
Sanitation, August 11, 2017

# Some basic guidelines in analyzing case studies

- Read the question carefully, paying attention to adjectives.
- Analyze the case from ethical, moral, social, legal and professional angles, and assign role/responsibilities of each party involved in the case.
- Base your analysis, wherever appropriate, on professional code of conduct of NEC, NEA, FCAN, SCAEF, IEEE, CAN, or any other professional organization. Specifically mention code, if you can.
- Many cases involve conflict of interest (COI); if the case you are dealing with is related to COI, specifically mention it.
- If specific laws are applicable, perform legal analysis and mention the law, and specific sections/clause(s).
- Make your recommendations impartially, thinking of you as an impartial judge, considering existing social, technical, legal and professional codal provisions.



**Sample Case studies (i):** A client came to a designer and asked to design a multistoried building. The soil type of the proposed site was found not suitable for that type of structure. The designer hesitated to design the building. The client said that he actually was not going to build that structure. He wanted to collect money from outside sources showing that designed as a proposal for his venture and wanted to utilize that money in other business. Explain the roles of the client and the designer in the perspective of professional ethics.

Your answer should address the following issues.

**Role of Client and Designer (a)** Is the intention of the client legal? **(b)** Is the intention of the client moral? **(c)** Is the intention of the client ethical?

Morally, ethically, and legally, what should the designer do after knowing the real intention of the client?

Should the client be penalized for telling the “real intention” to the designer?

Should the designer refuse to design? If yes, why? If no, why?

Should the designer refuse to design and just keep quiet?

Should the designer just submit a design and keep quiet because what the client does with the design is none of the designer’s business?

Should the designer design with piles (or other suitable foundation design) to make the structure suitable for the type of soil?

Since the client is not going to build the structure anyway which does not increase hazard from the building to anyone, what is wrong in just providing a design, as a hypothetical case?

Should the designer refuse to design and inform the government officials about the client’s intention?

Should the designer refuse to design and inform the media, or write an article in the newspaper, about the intention of the client?

As long as the design is structurally sound, is the designer responsible (morally, ethically, legally) for what the client does with the design?

**Sample Case studies (ii)** A recently built simply supported RCC roof slab of a single storied poultry farm in Chitwan, collapsed and killed all the chickens in the farm. The farm owner blamed the labor contractor for the defective work. The contractor denied and accused the client for providing low quality and inadequate amount of steel bars for the roof slab. The farm owner then asked for compensation from the steel bar supplier (for inferior quality bars) and the consultant (for improper supervision during construction). The bar supplier defended herself by saying that the farm owner bought the cheapest bar from her which has no guarantee. The consultant reported that the cause of the roof collapse is the use of very dirty water in mixing the concrete, which was provided by the farm owner and used by the contractor despite objections from the consultant's site supervisor.

Analyze the situation carefully and decide which party (client, contractor, and consultant) is more responsible or less responsible for the roof collapse. Explain your decision with reference to the Code of Conduct of NEC and FCAN.

Things to notice before assigning degree of responsibility:

**Client:** (a) Did only labor contract with the contractor, supplied materials on her own, (b) Supplied low quality steel bars (thinks all steel bars are same), (c) Supplied inadequate quantity of steel bars (shows no faith in design details), (d) Supplied dirty water for concrete mixing, despite objections from consultant (thinks water quality unrelated to concrete quality)

**Contractor:** (a) Worked with low quality steel bars, knowingly. Thought that contractor is not responsible for material quality since it is only labor contract. (b) Tied inadequate numbers of steel bars (increased steel bar spacing), knowingly. Thought that contractor is not responsible for material quantity since it is only labor contract. (c) Used very dirty water to mix concrete, knowingly, despite objections from consultant.

**Consultant:** (a) Did not or could not stop client from supplying low quality steel bars, (b) Did not stop contractor from tying inadequate number of steel bars, (c) Did not or could not stop client and contractor from use of very dirty water to mix concrete, (d) Reported the problems only after roof collapse and client's compensation claim

