Ethics in Engineering Practice: Rethinking the Why and How

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Why do we care about ethics?

- Society?
- Personal?
- Professional?
- Cultural?
Introduction

- Where does ethics come up in engineering practice?
- Examples
Where does ethics come up in engineering practice?

Examples

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Introduction

- Recent Changes to ASCE Code of Ethics (2020)
- Organization of ethical duties into a hierarchy of five "stakeholders"
  - ASCE Code of Ethics 2020
- Let’s look at the intent of the reorganization
Introduction

- ASCE Code of Ethics 2020
  - 1a takes precedence over all other responsibilities

- 1a. First and foremost, protect the health, safety, and welfare of the public
Introduction

- ASCE Code of Ethics 2020
- In the case of a conflict between ethical responsibilities, the five stakeholders are listed in the order of priority
  - Society
  - Natural and Built Environment
  - Profession
  - Clients and Employers
  - Peers

Where does self enter in?

Broader impacts and perspectives
Introduction

- PE violations & penalties
  - Transparency
  - Consistency

- Examples
  - https://pels.texas.gov/disciplinary.htm
Introduction

- PE Trainings in MN
  - Relationships in Business
  - Business and Management focus

Focus?

Bulk purchases at a discount of program titles below are available. Learn more.

Contact Engineering Alliance Minnesota with questions.

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Ethics instruction training/seminars:
  - I attend more than are required
  - I attend when required
  - I avoid unless absolutely necessary
  - This is my first one
Ethics discussions:
- Are enjoyable
- Are somewhat interesting
- I don’t care one way or the other
- Are not very worthwhile
- Should be avoided whenever possible
Introduction

- Purpose of this presentation
- Reflection on current practice and future work
  - What could be improved in your practice?
  - What works well and can be built on?
The Problem with Ethics

- How do we typically discuss ethics?
  - Rules
  - Case studies
  - Legal documents

- What is the purpose of this approach?
  - Minimum standards and penalties

- Are ethics just a guardrail on public safety?
The Problem with Ethics

- Case study examples

- Discuss 2 Cases from ASCE Ethics Pages
  - Clarification of provision
  - Catastrophic lapse

- What is the ethical dilemma?
- Are these dependent on the ASCE Code of Ethics to resolve?

https://www.nspe.org/resources/ethics/ethics-resources/board-ethical-review-cases
The Problem with Ethics

- OSHA: Trench Safety Measures:
  - Trenches 5 feet (1.5 meters) deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required. Trenches 20 feet (6.1 meters) deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b) and (c)
Case Study 1

- An engineer visiting a construction site observes an unshored trench which could cause serious harm to construction workers if it collapsed.
- The engineer’s contract expressly disclaims responsibility for construction means or job site safety.
- The engineer takes no action to address the issue or give warning.

*Courtesy of Tara Hoke*
Trenching Case Study

The Decision was:

- Ethical
- Somewhat ethical
- Somewhat unethical
- Unethical
Case Study 1

- Were the intermediate options possible?
- Can we have “somewhat” ethical responses?
ASCE I Society a.

Ia. First and foremost, protect the health, safety, and welfare of the public

ASCE I Society i.

Ii. Report misconduct to the appropriate authorities where necessary to protect the health, safety, and welfare of the public.

ASCE V Peers c

Vc. Foster health and safety in the workplace
Trenching Case Study - Retake

The Decision was:
- Ethical
- Somewhat ethical
- Somewhat unethical
- Unethical
The Problem with Ethics

- Trenching Case Study

- How does context and self enter in?
  - History on site
  - History within company
  - Training/mentoring
  - Relationships
  - Mood
Case Study 2

- Space Shuttle O-Ring
  - Brief Overview
  - Specific Engineer decision
  - Ethical dilemma?

By Kennedy Space Center -
https://www.flickr.com/photos/nasa2explore/10697912315/in/album-72157630719371642
Space Shuttle O-Ring Case Study

The Manager Decision was:

- Ethical
- Somewhat ethical
- Somewhat unethical
- Unethical
Space Shuttle O-Ring Case Study

The Engineer Decision was:
- Ethical
- Somewhat ethical
- Somewhat unethical
- Unethical
Case Study 2

- Space Shuttle O-Ring issue

  - 2nd Look at Culture of decision making in company
  
  - Does known outcome influence our perspective?

By Kennedy Space Center -
https://www.flickr.com/photos/nasa2explore/10697912315/in/album-72157630719371642
The Problem with Ethics

- Ethical Dilemma “a situation in which a difficult choice has to be made between two courses of action, either of which entails transgressing a moral principle.” Online Dictionary
The Problem with Ethics

- Case study examples
- Were these ethical dilemmas?
  - Are “equally undesirable” outcomes apparent?
  - Can a true dilemma be defined as “right” versus “wrong” decision?
The Problem with Ethics

- ASCE IV Clients and Employers f.
  - IVf. Perform services only in areas of their competence

- How is “competence” defined?
  - Prior to taking on work
  - After completion of work
  - Performance over years
The Problem with Ethics

- Can ethical perspectives change?
  - Speed limit example
    - Legality versus ethics
    - Influence of experiences
    - Rationalizations
  - If a light turns red on a deserted road…
  - Parallels to design decisions
Ebbinghaus Illusion, also known as Titchener circles
(Photo: Phrood~commonswiki assumed (based on copyright claims). [Public domain], via Wikimedia Commons)
https://mymodernmet.com/optical-illusions-explained/2/
Ebbinghaus Illusion, also known as Titchener circles
(Photo: Phrood~commonswiki assumed (based on copyright claims). [Public domain], via Wikimedia Commons)
https://mymodernmet.com/optical-illusions-explained/2/
"Ethical fading occurs when the ethical aspects of a decision disappear from view. This happens when people focus heavily on some other aspect of a decision, such as profitability or winning."

[ethicsunwrapped.utexas.edu/glossary/ethical-fading]
Decision Making Process

- Ethical dilemma decision you have made
  - What was the process?
My ethical decision process
- Was reflexive (immediate without thinking)
- Was rational (thought out process)
- Was a combination of these
My ethical decision process
  - Was immediate
  - Took a few minutes
  - Took a few hours
  - Took a day or longer
Ethical dilemma decision you have made

- What was the process?
  - Reflexive
  - Rational
  - Combination

- How certain was your choice?
- Have you second guessed your choice?
- How did you rationalize your choice?
Decision Making Process

- Reactionary/reflexive
- Cognitive/rational
- Combination

- How do these relate to case studies presented earlier?
Decision Making Process

- Can decisions be “undone”?
- Reflexive behavior can be modified through rational reflection
- Practicing “what-ifs” can prepare you for upcoming decisions
Questions and Discussion
BREAK: 15 Minutes
Review

- Important to our profession
- Talking about ethics
- Hierarchy of five “stakeholders”
- Everyday versus catastrophic scenarios
- Ethical perspectives can change
- Process of making decisions
  - reflexive versus rational
Questions and Discussion
Ethical perspectives

- P.E. on letterhead
- P.E. stamp
- Safety equipment on site
Ethical perspectives

- Continuum of ethical choices
- Continuum of ethical perspectives
- Is situational context relevant?
- Are there “degrees” of ethics?
**Ethical perspectives**

- Microethics – related to self interest
- Mesoethics – related to community interest
- Macroethics – related to societal interest

“Often the processes of microethical judgments are intuitive and may even go unrecognised at the time. It is the accumulation of infinitesimal microethical moments that composes the large-scale ethical landscapes in which we live.”  
Wikipedia
Ethical perspectives

- Imagination theory
- Definition
- Applications

- Can you put yourself in the decision process being discussed or only think about it abstractly?
- Are you having a cognitive discussion or feeling the reflexive aspect of the decision?
Example Scenario 1: You have inspection responsibilities on a project. A concrete batch is delivered to the site. The 9 in slump is out of spec for the project (4-6 in). Some water was added to the truck, but was not recorded. The sample was taken from the middle of the load, so much of the concrete has already been placed. The driver and contractor say that the next trucks will be corrected, and that this is typical and the rest of this concrete should be placed rather than rejecting the truck or removing any concrete.
I should
  - Accept the truck
  - Reject the truck
  - I need more information
Ethical perspectives

- How does the experience and mentoring of the person in the scenario influence the ethical dilemma?
- Is the best ethical decision independent of the information available to the person at the time?
  - Intern
  - Entry Level Engineer
  - Senior Engineer
Experiences of individuals limit the situations that they can imagine themselves in. This can limit their readiness to resolve ethical dilemmas.

- **Intern**
- **Entry Level Engineer**
- **Senior Engineer**
Ethical perspectives

- Perceptions of ethical behavior based on experiences.
  - Intern
  - Entry Level Engineer
  - Senior Engineer
Is a decision ethical if it is the best decision for information at the time?

Experience:
Can trend towards ethical OR unethical!
It is easier to “resolve” ethical dilemmas you are not invested in. Practicing incremental imagination exercises can expose the true dilemma in a scenario.

- Intern
- Entry Level Engineer
- Senior Engineer
Example Scenario 2:
You are designing an office building according to LRFD design. This is a design-build project, so steel has been ordered based on your partially completed design. As you complete your design you realize that typical floor girders are consistently 6% overstressed ($\phi M_n = M_u / 1.06$). Any changes at this stage will delay the project significantly.
I should
- Accept the members as is
- Redesign the members and submit a change order
- I need more information
Ethical perspectives

- How does the experience and mentoring of the person in the scenario influence their ethical dilemma?
- Is the best ethical decision independent of the information available to the person at the time?
  - Intern
  - Entry Level Engineer
  - Senior Engineer
Discussions among different perspectives can improve ethical decisions.

- Intern
- Entry Level Engineer
- Senior Engineer
Mentoring that understands perspectives and includes incremental imagination exercises can be effective.

- Intern
- Entry Level Engineer
- Senior Engineer
Ethical perspectives

- Mentoring
  - Intern versus supervisor perspectives
  - Remote workspace
Discussion Questions

- What ethical lapses do you see in the profession?
- What ethical lapses do you see in your practice?
- Look for how these overlap – we often see ethical issues outside of our practice or control.
Ethical Perspectives

- Assessing workplace culture
  - “Aw, c’mon – can’t you take a joke?”
  - “Look out, the boss is here!”
- Systematic versus isolated incidences
- How are incidences addressed?
Checker Shadow Illusion
(Photo: Edward H. Adelson [Copyrighted free use], via Wikimedia Commons)
https://mymodernmet.com/optical-illusions-explained/2/
Checker Shadow Illusion
(Photo: Edward H. Adelson [Copyrighted free use], via Wikimedia Commons)
https://mymodernmet.com/optical-illusions-explained/2/
Ethical perspectives

- Doing the right thing when no one is looking
- Assume someone is always watching
- Assume things can be brought up in arbitration
  - Email
  - Missing calculations
Ethical Perspectives

- Ethical dilemma or difficult ethical decision you have made

- Provide a reasonable argument for:
  - A client or other engineer would feel you made the wrong decision
  - Someone would want to sue you for damages
Ethical Perspectives

- You are required to attend a town hall meeting to discuss your project and answer questions.
The main purpose of the meeting is to:

- Present the design to the community
- Explain design decisions to the community
- Hear community concerns about the project
- Obtain information that can guide design decisions
- Get publicity for the project
- Fulfill project requirements
The audience at this meeting generally

- Has a good grasp on the technical aspects of the project
- Does not understand the engineering constraints
- Is in between these two options
The audience at this meeting generally

- Is supportive of new projects
- Is resistant to change and new projects
- Is in between these two options
SURVEY 8-d

- The audience at this meeting generally
  - Has relevant feedback to aid the project
  - Does not have relevant feedback
  - Is in between these two options
ASCE Code of Ethics 2020

In the case of a conflict between ethical responsibilities, the five stakeholders are listed in the order of priority:

- Society
- Natural and Built Environment
- Profession
- Clients and Employers
- Peers

Where does self enter in?

Broader impacts and perspectives
Conclusions

Ethical decisions are influenced by:
- Personal experiences and practices
- Company culture
- Ethical fading
- Perspectives included

How can these be addressed?
Conclusions

- What are typical signs of problems?
- How can intervention redefine the discussion?

- Active bystander
- Whistleblower
- “Not my problem”
Conclusions

- It is up to individuals to assess and change company, project, and general culture
- Be aware of ethical issues, on the lookout for ethical fading, and an active participant
- Communication and discussion is critical to finding optimal solutions and correcting course
Conclusions

- Understand your decision process
- Include diverse perspectives
- Make informed decisions
- Maintain a high level of ethical standards
- Mentor those around you
Conclusions

- Ethics are messy
- Being ethical is a mindset
- Being ethical takes practice

Image from: https://pcvsec.weebly.com/
Topics from Comments
Conclusions

- Questions and Discussion

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