Engineering Professionalism

- Engineering Professionalism
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Texas Engineering Practices Act (TEPA)

- Hanna Mine #1 Collapse
- School Explosion
- Odorants added to natural gas to detect leaks
- Only licensed individuals may engage in the practice of engineering
- TEPA
  - Exemptions
    - "a person who does not offer to the public to perform engineering services"
    - "a person who is an employee or subordinate of an engineer...if the person's practice does not include responsible charge of design or supervision"
    - engineering work $<$ \$8000 or non-engineering work $<$ \$20000
    - road maintenance
    - equipment installation/maintenance
  - Licensing
    1. Graduation from:
       1. an engineering curriculum approved by the board
       2. an engineering curriculum from recognized institution (not approved)
    2. Passing of examination requirements prescribed by the board
    3. Engaged in the practice of engineering for:
       1. 4 years if graduation from approved curriculum
       2. 8 years if graduation from non-approved curriculum
  - TEPA Ethical Canons
    1. Protection of the public
    2. Competency
    3. Confidentiality
    4. Responsibility to Profession
       - Professionalism
       - Quality of work (meets requirements)
    5. Proper Scope (work done only in proper jurisdiction)
    6. NSPE, and other professional societies

The Industry Exemption

- Essentially: those doing work for a private company under a licensed individual do not need to themselves be licensed.
- "What happens inside the chain link fence does not threaten society"
- Only 30% of engineers are licensed

NSPE Ethical Canons

1. Hold paramount the *safety, health, and welfare* of the public
2. Perform services only in their area of *competence*
3. Issue public statements only in an *objective and truthful* manner
4. Act for each employer or client as *faithful agents or trustees*
5. Avoid deceptive acts
6. Conduct themselves *honorably, responsibly, ethically*, and lawfully so as to enhance the *honor, reputation, and usefulness of the profession*

Case Study: New London School Explosion

- March 18, 1937
- Gas explosion ignited underneath school
- 298 teachers and students killed
- Nearby hospital opened a day early to treat victims
- School was built under non-qualified engineers
- Motivation for odorants to be added to natural gas

Case Study: Macondo/Deepwater Horizon

- April 20, 2010
- Escaping hydrocarbons caused uncontrollable fire
- Collapse of Deepwater horizon
  - Pipe rupture
  - 5M barrels of crude discharged into the Gulf of Mexico
  - Domes/funnels to divert oil for collection failed
  - Top-kill attempt to block with mud fails
  - July 15 oil finally stopped
- Death of 11 workers
- Economy favored over safety by unlicensed individuals
- Licensed engineers now required to approve safety measures

Professionalism Questions

- Which state was the first to pass a law to regulate the practice of engineering?
  - Wyoming (1907)
- A person is allowed to practice engineering in Texas without a license from the State if…

  - He or she does not offer to perform engineering services for the public
- Which of the following projects are exempt from the requirement to be sealed by a licensed engineer?
  - A public project consting less than $8000 involving electrical or mechanical engineering, or a public project that does not cost more than $20000.
- The National Society for Professional Engineers (NSPE) does not conduct reviews of actual cases in order to determine whether certain behavior is consistent with their Code of Ethics.
  - False
- The Texas Engineering Practices Act (TEPA) defines the practice of engineering as…
  - The performance of a work… that requires engineering knowledge, training…
- An unlicensed engineer who works for a licensed engineer can perform which of the following tasks under the supervision of that licensed engineer?
  - Design of engineered products or projects
- In regard to an engineer's responsibility to protect the public welfar, which of the following statements are accurate?
  - The NSPE code of ethics is perhaps more emphatic than the TBPE rules in describing this responsibility as "paramount"
- Often lawyers work on a "contingency basis", whereby they only receive a fee from their client for their services whent he services result in a financial award to their client. In regard to this type of practice in engineering, which of the following is true?
  - ???
- The purpose behind the NSPE defining an engineer's responsibility to the profession is probably…
  - None of the above
- Which of the following is an example of conflict of interest according to the definition in the TBPE rules?
  - When an engineer accepts an assignment in which the decision he or she will make for the client may be impacted by his or her financial interests.
- Which of the following are among the TEPA rules on professional conduct and ethics?
  - A, B, and C
- The rules outlined in the TEPA should be considered:
  - A law binding on all engineers licensed by TBPE
- What prompted the Texas state legislature to pass the Texas Engineering Practices Act?
  - An explosion at a school that was caused by a gas leak killing nearly 300
- Which of the following were among the reactions to the Macondo blowout and resulting oil spill?
  - Two new federal regulations were immediately adopted requiring

licensed engineers to approve certain aspects of the drilling and completion processes and to certify the blowout preventer.

- After the Macondo blowout, subsequent investigations revealed that only one or two critical engineering decisions were made that tended to favor economy rather than safety.
  - false
- The TEPA, in a section commonly referred to as the "industry exemption", allows employees of a private company to do certain work without a license if…
  - The work can include tasks considered to be the practice of engineering so long as engineering services are not offered to the public.