

# ETHICS

Responsibilities at Work Places

# Introduction

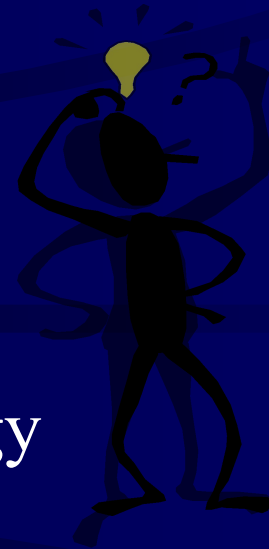
- Ethics

- rules and ideas for human behavior. They tell us what we ought to do.

## Engineering Ethics

the systematic study of the rules and ideals of the engineering profession.

# Why important?



- Growing dependency on technology and science.
- Disastrous Consequences
- Public trust and expectation
- Closely related to public and environment.

# Code of Ethics (IEEE)

We, the members of IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

# Code of Ethics (IEEE)

1. to accept responsibility in making engineering decisions consistent with the safety, health and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;

# Code of Ethics (IEEE)

4. to reject bribery in all its forms;
5. to improve the understanding of technology, its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitation;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;

# Code of Ethics (IEEE)

8. To treat fairly all persons regardless of such factors as race, religion, gender, disability, age or national origin;
9. To avoid injuring others, their property, reputation, or employment by false or malicious action;
10. To assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

# Possible sources of conflict

- Personal integrity vs. corporate loyalty
  - business interests such as cost.
- Career
- Deadline
- Insufficient knowledge



# Reality...

- You will face ethical conflicts when you go out there.
- Your decisions is final and irreversible.
- Your action WILL have impact on our society.
- Unfortunately, solutions to ethical conflicts are not simple.

# Fundamental Question???

- “Can we do it?”

“SHOULD WE DO IT?”

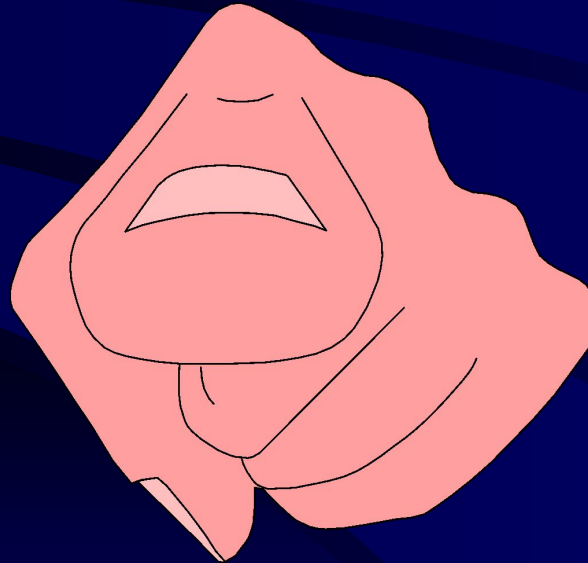


# REMEMBER!!!

- You are professional.
- You are a member of a profession that has many worthy accomplishments.
- You and your profession can do much to help to improve the quality of life

# REMEMBER!!!

- YOU ARE RESPONSIBLE --- DON'T FAIL



# ENGINEERING ETHICS - WORKPLACE EXPERIENCE



# CODE OF ETHICS (IEEE)

1. Accept responsibility in making engineering decisions consistent with the safety, health, and welfare of the public, and disclose promptly factors that might endanger the public or the environment.

# ASSOCIATION OF COMPUTER MACHINERY CODE OF CONDUCT

1.2 Avoid harm to others.

2.1 Strive to achieve the highest quality, effectiveness, and dignity in both the process and products of professional work.

2.3 Know and respect existing laws pertaining to professional work.

2.5 Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks.

# When faced with a problem, how do you:

- learn the details about the problem?
- get ideas for possible useful solutions?
- determine the positive and negative impacts of a given solution?
- minimize the possibility of “harm”?



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**Answer: COMMUNICATE**

Who to talk to:

- Those who will be creating the product
- Those who will be using the product

What to find out:

- What is necessary and what is not?
- What are the concerns of the users?
- What is the easiest way to create the product?

# REVIEW YOUR WORK

- Is your design safe?
- Can it be implemented easily?
- Does it fix the problem?
- Is it cost effective?



# FINISH THE JOB: DOCUMENT YOUR WORK

- Reviews
- Update All Materials
- Date Everything



# Code of Ethics

- Hold Paramount the health and welfare of the public
- Perform services only in areas of their competence
- Issue public statements only in an objective and truthful manner
- Act for each employer or client as a faithful agent or trustees
- Avoid deceptive acts
- Conduct themselves honorably, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession

# Current Issues

- Y2K Bug





- Have Software Engineers Been Deceptive About How Their Product Will Deal With Y2K?
- Have Software Engineers Held The Public Safety, Health, and Welfare Paramount?



# Deceptive Acts

- In 1996 Microsoft Released a statement claiming Windows 95 and NT were totally Y2K compliant
- Shortly afterwards a hackers group named “cult of the dead cow” published several Y2K bugs in the Windows Operating System, and Produced a product which exploited many security errors in windows NT
- If the engineer did not make the press release is he still practicing poor ethics?

# YES!

- According to NSPE:
  - Engineers shall not allow their associates to misrepresent their qualifications, or the qualifications of prior assignments or projects.
  - The Software Engineers at Microsoft knew full well that the product was not Y2K ready and were already working on patches to repair any errors
  - Engineers should also hold the public safety paramount!
  - By allowing windows NT to be sold as Y2K ready the engineers allowed many networks around the world to be built on that assumption hence putting at risk these networks (The US Military uses Windows NT for some of its defense functions)

# Replacing Americas Infrastructure

- Replacement of infrastructure
  - As America ages a good deal of infrastructure will have to be replaced, everything from canals, to railroads, to stairs.

# Examples



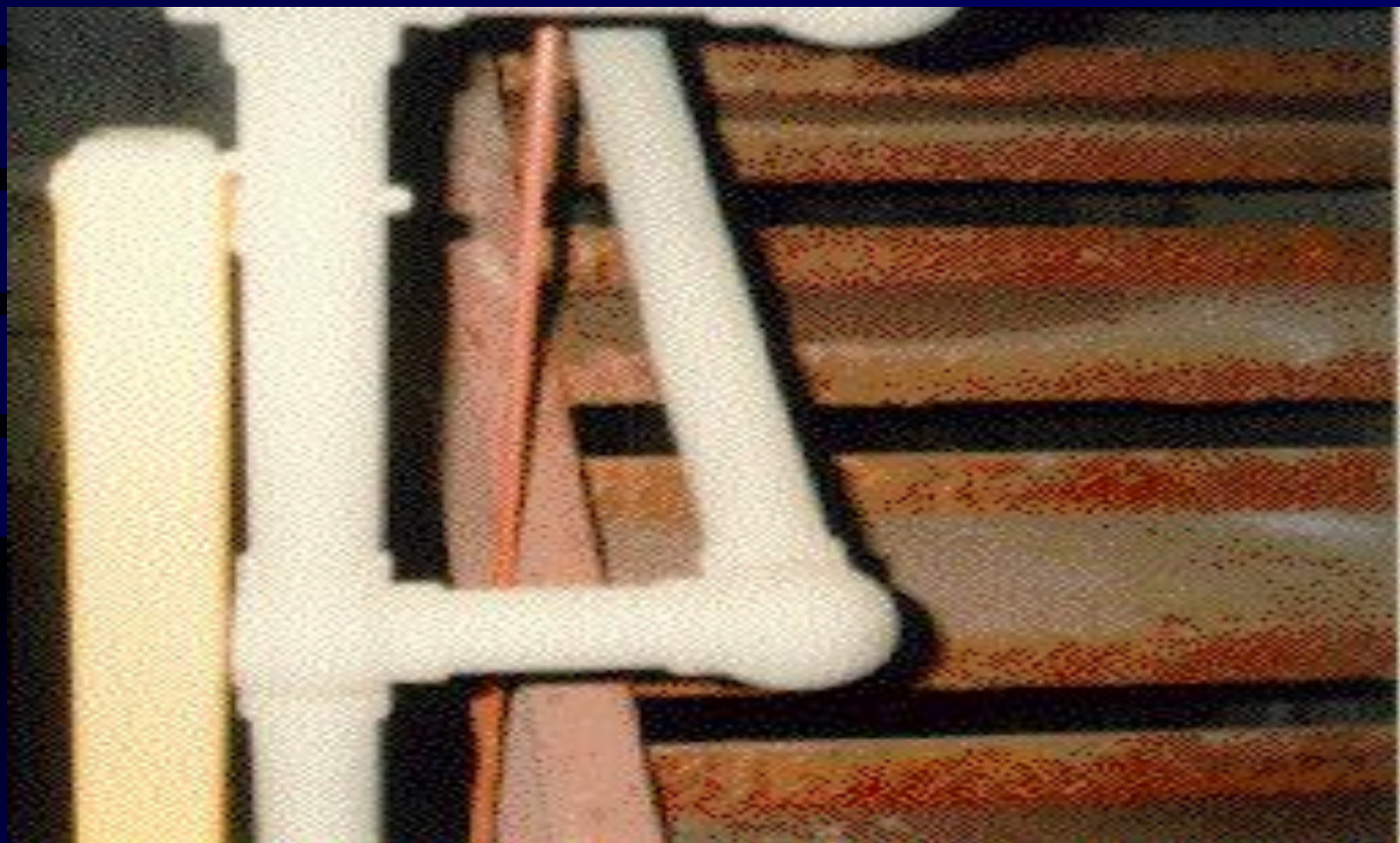
# Mount Morris Dam

- Completed in 1952 it was until recently the largest gravity dam east of the Mississippi river at over seven hundred feet tall
- Located along The Genesee river it is considered to be one of the corps most successful civil works projects in the second half of this century, saving more than its construction cost within its first ten years in service

# Stair Replacement

- After 40 Years exposed to constant dampness, and sulfur fumes the original steel stairs had eroded to a point where they were no-longer safe. The USACE solution was to replace them with fiberglass stairs.
- What should have been a one year seventy thousand dollar job has turned into a three year ninety thousand dollar job which is not yet complete.





# Reasons

- Poor ethics as described by NSPE on the part of the contractor.



# Health and Safety

- Hold paramount the safety, health, and welfare of the public
  - Work was suspended because the crew did not follow USACE safety regulation specified in the contract

# Avoid Deceptive Acts

- While Working on the last few sets of stringers the workers discovered that the fabricator sent out stringers of incorrect length due to a poor measurement by the contractor.
  - When the was discovered the contractors on site engineer ordered the crew to perform an on site splice of the stringers, and not to inform the corps on site construction representative (me) of the splice.

- The workers complied and proceeded to install the newly spliced stringers then fixing the stairs to them.
- This was of course discovered and had to be removed (a process which takes twice as long as installing).

# Who Was Hurt?

- Contractor

- None of the cost for lost time will be repaid by the Federal Government, and it is unlikely that this company will receive another government contract for some time

- Government

- After 3 years the stairs are still not useable on the north side of the dam

- Tax Payer (Customer)

- During this construction the normal tours of the dam have been suspended, and the contract has run overbudget

# The Importance of As-Builds

- When the dam was finished a long spiral stair case was built which led from inside the dam up through the gorge face to a head house above, the purpose was to allow both people and utility lines to run between the dam control center and the dam workshop located at the top of the gorge.

- The project called for a long vertical retaining wall from the head house back a few hundred feet away from the dam. According to all of the blueprints the USACE had there was a clear shot with no obstructions. However about ten feet down we discovered that the utility lines in the as builds were incorrect and the current retaining wall would leave several lines exposed

- Among these lines were two 2.2 Kilovolt power lines a fiber optic cable and phone lines which led to monitoring stations along the genesee.
- Because of the 2.2KV lines work had to stop until a new set of prints could be drawn up, costing one month and four hundred thousand dollars in the end.

# Health And Safety

- By not making sure that his as builds were correct and misplacing two 2.2KV lines the engineer who was in charge of this construction (1970's) put in danger construction workers nearly thirty years later!



# Who Was Hurt

- Government: four hundred thousand dollars had to be added to the contract and 60 days to make no mention of man hours by corps employees trying to come up with an alternate plan for the retaining wall
- Contractor: Through no fault of his own the contractor was cost valuable time he could have spent bidding other jobs

# The Moral Of MMD

- You can only make sure you handle yourself in an ethical manner. You can not control those who are working with you or worked before you were born, but you better be ready to fix the problems caused by their ethics.

Remember . . .



**Can choose to be ethical!**