

ETHICS IN ENGINEERING → VERY REAL, POORLY UNDERSTOOD PROBLEMS

ETHICS IS USUALLY BASED ON HEURISTICS

- ↳ 1) DO NOT GUARENTEE A SOLUTION
- 2) MAY CONTRADICT OTHER HEURISTICS
- 3) MAY REDUCE TIME TO SOLVE A PROBLEM
- 4) DEPENDS ON IMMEDIATE CONTEXT RATHER THAN ABSOLUTE STANDARD

WHEN DO YOU USE ETHICS?

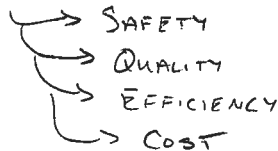
- DEVELOP ^{SELF} PRODUCTS
- DESIGN PROCESSES
- COMMUNICATE
- INTERACT W/ CLIENTS
- REPRESENT FIRM TO GOVT OR PUBLIC

MOST ANYTIME YOU DO MOST ANYTHING!

ex SOLUTIONS & ~~Q~~ FOR A PROBLEM

- 1) EASY, LESS ^{ACCURATE} ~~PRECISE~~, SAVES TIME, MONEY
- 2) RIGOROUS, MORE ACCURATE, COSTS MORE

How DO YOU DECIDE?
ACCURACY CRITICAL?



USE YOUR OWN MORAL STANDARDS, BUT

- KEEP IN MIND:
- 1) LEGAL REQUIREMENTS
 - 2) PROFESSIONAL CODE OF ETHICS
 - 3) PERSONAL CODE OF ETHICS

EARLY CHILDHOOD FAMILY EXPERIENCES
RELIGION
CONSCIENCE

BE TRUE TO YOUR MORAL VALUES AS YOU WORK THROUGH ETHICAL PROBLEMS

CAMPAIN

MORAL AUTONOMY

EVERYONE IS DIFFERENT → ENGINEERING IS ETHICS DOES NOT UNIFORMITY OF DECISIONS, BUT THE AUTONOMY TO MAKE THE RIGHT DECISION

CONSISTENT WITH

- YOUR MORAL PRINCIPLES
- ENGINEERING CODES OF CONDUCT; ETHICS
- OBLIGATIONS

- MAKE SURE ANY DECISION YOU MAKE IS ONE YOU CAN LIVE WITH

- YOUR DECISIONS MAY NOT BE ACCEPTABLE TO OTHERS { BOSS, FAMILY, LAW

HOW TO REDUCE ETHICAL STRESS IN REAL SITUATIONS → PRACTICE REHEARSE DO EXAMPLES LIKE HW

Example 20.1

The Falsified Data [2, Reprinted by special permission from *Chemical Engineering*, May 5, 1980 and September 22, 1980, Copyright © 1980 by McGraw-Hill, Inc., New York, NY 10020]

Jay's boss is an acknowledged expert in the field of catalysis. Jay is the leader of a group that has been charged with developing a new catalyst system, and the search has narrowed to two possibilities, Catalyst A and Catalyst B.

The boss is certain that the best choice is A, but directs that tests be run on both, "just for the record." Owing to inexperienced help, the tests take longer than expected, and the results show that B is the preferred material. The engineers question the validity of the tests, but, because of the project's timetable, there is no time to repeat the series. So the boss directs Jay to work the math backwards and come up with phony data to substantiate the choice of Catalyst A, a choice that all the engineers in the group, including Jay, fully agree with. Jay writes the report. WHAT SHOULD JAY DO?

STRESS ?

WHAT

DEFINE: WHAT IS THE REAL PROBLEM ?

EXPLORE: WHAT ALTERNATIVES COULD THERE BE ?

- REQUEST MORE TIME TO RERUN
- ALERT USERS THAT THE DATA MAY BE FLAWED
- WORK W/ TECHNICIAN TO DETERMINE ERRORS IF ANY

LOOK BACK: WHAT KEY CHARACTERISTICS COULD BE DEVELOPED FROM THIS SCENARIO

- INEXPERIENCED PEOPLE (TECH) MAY BE RIGHT
- TALK CAREFULLY W/ PEOPLE BEFORE ASSUMING FACTS ABOUT ACTIONS
- DECISIONS BASED ON FALSE ASSUMPTIONS/DATA
- BE HONEST

MOBILE TRUTH

- ITS NATURAL TO ASSUME GROUPS YOU BELONG TO ARE RIGHT ; OTHER GROUPS ARE WRONG



GIVES RISE TO LOYALTY, ^{GROUP?} FAMILY, PRIDE

THE STRENGTH OF COLLECTIVE ACTION DEPENDS ON THIS NATURAL RESPONSE

BUT IN ENGINEERING ETHICS THIS MIGHT NOT BE GOOD

ex/ ~~THE~~ AICHE VS MECHANICAL ENG IN VOLLEYBALL

REF MAKES A TOUGH CALL

- YOU ARE ^{MUCH MORE} LIKELY TO ~~AGREE~~ BELIEVE THE CALL IS RIGHT IF THE CALL FAVORS YOUR TEAM

- CONVERSE IS TRUE -> YOU ARE MUCH MORE LIKELY TO BELIEVE THE CALL IS WRONG IF IT FAVORS THE OTHER TEAM

- NOT UNETHICAL, BUT ITS A TENDENCY THATS ^EIMPORTANT TO RECOGNIZE.

WHY?

WHEN YOU GO TO WORK -> DEVELOP BONDS
LOYALTY TO COMPANY
MAY CLOUD JUDGEMENT

EX/20.3

- WHEN YOUR AFFINITY TO A GROUP CLOUDS YOUR ETHICAL DECISION MAKING, YOU ARE AFFLICTED BY MOBILE TRUTH

LEARN TO RECOGNIZE IT AND FILTER IT OUT OF YOUR ETHICAL DECISION MAKING.

How?

- ASK YOURSELF IF YOUR DECISION WOULD BE DIFFERENT IF YOU WORKED FOR ANOTHER PART OF THE COMPANY, OR ANOTHER COMPANY
- IMAGINE YOU ^{YOUR FAMILY} ~~YOURSELF~~ LIVE JUST OUTSIDE THE PLANT FENCE
- IMAGINE YOU WORK FOR EPA OR OSHA
- HOW WOULD SOMEONE OUTSIDE THE COMPANY VIEW ^{ADMINISTRATION} THE DECISION?
- ASK SOMEONES OPINION. EXPLAIN THE SITUATION, SUGGESTING THE FACTS PERTAIN TO A DIFFERENT ORGANIZATION -> MAKE A BETTER DECISION

IN GENERAL, TOUGH ETHICAL CHOICES ARE EASIER IF THEY ONLY AFFECT YOU

SOME CHOICES MAY AFFECT YOUR FAMILY

- LOSE YOUR JOB
- LOSE YOUR FRIENDS
- SOCIAL OUTCAST
- WANT TO MOVE
- ~~LOSE~~ STRESS YOUR FAMILY

TALK W/ FAMILY
WHAT EFFECTS?

EX / 20.4

DUTIES & OBLIGATIONS

LOOK

- WHEN YOU ACCEPT A POSITION → ACCEPTING THE RESPONSIBILITY THAT GOES WITH IT

- ASSIGNMENTS, PROBLEM SOLVING, SAFETY

WHEN MAKING ETHICAL DECISIONS

- REMIND YOURSELF OF RELEVANT DUTIES & OBLIGATIONS
- IF DUTIES & OBLIGATIONS CONFLICT → RANK YOUR RESPONSIBILITIES

POTENTIAL

DISCUSS SOLUTIONS WITH THOSE THAT ARE AFFECTED.

EX / 20.4 A

WHISTLE BLOWING → UNETHICAL SITUATION → WHAT ACTION SHOULD YOU TAKE.

#2 AICHE CODE → FORMALLY ADVISE EMPLOYERS OR CLIENTS OF PRESENT OR FUTURE HEALTH RISKS

#3 AICHE CODE → OFFER OBJECTIVE CRITICISM TO OTHERS

#4 " " → PRESENT INFO IN OBJECTIVE & TRUTHFUL MANNER

SO YOU TELL YOUR BOSS → NOTHING HAPPENS → NOW WHAT?

~~YES~~ - GO OVER BOSS' HEAD?
GO TO NEWS PAPERS?

OBLIGATED BY 2-4, BUT OFTEN RESULTS IN SEVERE PERSONAL & PROFESSIONAL PROBLEMS

SOME LAWS PROTECT WHISTLE BLOWERS
SOME STATES, EMPLOYERS CAN FIRE FOR ANY REASON

CAMPAD