

## **Ethics Awareness for the Practicing Safety Professional— What Can we Learn from the Engineering Profession?**

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### **Abstract**

Safety professionals strive to maintain professionalism in all their varied activities. As the profession continues to mature in its acceptance by the public and private sector, competence must be married to ethical conduct. The engineering profession has for decades addressed ethical conduct issues involving their field of practice. Inherent to this history is a profound sense that professional ethics begins as a taught product in the various engineering schools. In preparing individuals for the safety profession, what can the safety profession learn from the engineering profession? The answer lies in accepting a primary tenet – “professionalism requires ethical conduct and ethical conduct requires professionalism”. This is not circular thinking, but a premise for assuring any profession will not bring harm to those it serves.

### The Engineering and Safety Professions – An Early Collaboration and Mutual Reliance

The engineering profession has a long history of existence. Going back in recorded history to the building of the pyramids of ancient Egypt there are ancient manuscripts that detail engineering practices, standards and processes that assured these great monuments would withstand the sands of time while being erected in the deserts adjacent to the Nile greenbelt.

Concurrently, ancient manuscripts also contained writings that would describe what would be called today as an organizational chart. There was a key leader called the Chief Designer who managed the entire project. There were the labor managers who assured manpower was available. There were specialists that assured materials and tools were available. There was the also a critical block on the organizational chart for logistics specialists – to assure everything happened in a sequence that made sense.

The modern safety profession, on the other hand, seems to not be similarly blessed with a long history of providing service to humankind – or does it? Most historical texts reflect that the safety profession really had its recorded birth at the beginning of the twentieth century. This would imply that safety professionals have barely 100 years of recorded professional history as a basis for their heritage. Surprisingly though, those same manuscripts that detailed the engineering activities of the building of the pyramids also revealed something very interesting – those ancient projects actually had our modern equivalent of on-site safety professionals. Equally interesting, there was a close relationship between the engineering personnel and the safety personnel. They were actually “married” as a cohesive unit – each depended on the other to assure a project was completed to the timetable and specifications of the Chief Designer.

Five thousand years ago, ethical conduct was essential to not only the livelihood of Egyptian engineers and safety personnel but their life as well. Less than ethical behavior could lead to faulty building practices that would ultimately cost the treasury of the Pharaoh. His way of handling the issue was to shorten the life expectancies of those who failed. Those who lied, cheated or stole were dealt with severely. Safety professionals and engineers were all in it together to assure ethical standards were upheld – they worked side by side and learned from each other. From the engineering profession the local safety person on the project learned the skills of organization and planning. The safety professionals taught the engineers how to get the most out of labor and do it safely and efficiently. In its purest sense, safety professionals at that time were the equivalent of industrial engineers in today’s world – masters of melding human potential with hardware so as to maximize output with as little wasted energy as possible.

All those millennia ago, those in safety management and engineering practice learned valuable skills and lessons from each other.

As time progressed through the millennia the engineering profession continued to grow and prosper. Along the way, the engineer’s sense of professional conduct and ethical practice evolved. The safety profession has little written history that marks a similar ethical evolution over that same period of time. Surely there is something that the engineers can teach safety professionals about how to instill a personal and professional sense of ethical worth – after all they have had thousands of years of practical experience dealing with the issue.

### Engineers and Ethics

Today, worldwide there is little debate that the practice of engineering is considered a profession in the eyes of society. Credentials are offered for those engineers that demonstrate they understand the basics of applying the physical sciences for the public good – including ethical conduct as it relates to the day-to-day practice.

Centuries ago, engineers prepared for professional practice by way of an apprenticeship. Generations of apprentices were trained by practicing engineers in individual ad hoc development programs or programs developed by guilds. When an apprentice was being “tested” for the right and privilege to fully practice, he would present himself to a commission of practicing engineers who would pass judgment on whether the apprentice was ready to begin a professional practice. According to surviving documents from England in the 1700’s, individual conduct was one of the major areas of personal testing by the reviewing commission. Engineers were held in such high regard and esteem that the public trust was foremost when deciding who would advance from apprenticeship. The public recognized the profession literally policed itself for the good of society.

To some degree, this explains why the political leaders in democratic and parliamentary societies were from the engineering profession. They had already been proven worthy of public trust and therefore they were elected to publicly held offices or appointed to public policy making bodies.

In the United States, the public trust was severely tested during the era referred to as the industrial revolution. Engineers were in higher demand than the traditional apprenticeship programs could produce. Consequently, the engineering profession suffered because the “quality control” of who could render engineering decisions that impacted the public welfare was not well defined. Universities and colleges began trying to fill the gap with the first comprehensive engineering

degree programs. However, the justice system played a bigger role. Professional malpractice acts by engineers generated civil, and in some cases, criminal liability issues. State and local governments began the processes of protecting the public by defining what engineering is and who can practice. This was the advent of the various engineering title and practice acts we have today throughout all fifty states.

While the states have taken jurisdiction on who can professionally practice engineering, it was not until recent years that some states have begun requiring engineers to prove continuing professional competency as a requirement for licensing. Included in many of these jurisdictions are the mandatory requirements to show proof of continuing professional development in the field of ethics.

### The Advent of the National Institute for Engineering Ethics

For several decades the National Society of Professional Engineers (NSPE) promoted ethics with their membership when they founded the National Institute of Engineering Ethics (NIEE). In the mid-1990's, with the full blessings of the NSPE Board, NIEE was incorporated as a separate not-for-profit institute. The American Society of Safety Engineers became a participating society of NIEE and has one Board position in the governance of the organization.

Engineering schools have advanced and updated their curricula to include at least one semester of engineering ethics at the undergraduate level. Engineering colleges throughout the United States and the world receive valuable support from NIEE for information that is useful in ethic curricula at the undergraduate level. Unofficially, NIEE is recognized as a premier authority on the "state of the art" in the field of engineering ethics. Their website at [niee.org](http://niee.org) is packed with information that practicing engineers may access at their discretion, including representative ethics cases and links to other professional ethics resources.

NIEE has made many contributions to further ethics within engineering, but one of the most visible is its recent training video, "Incident at Morales", produced through private funding sources and a grant from the National Science Foundation. This dramatic telling of a practical engineering ethics dilemma faced by a practicing engineer was distributed to over 700 engineering schools in the United States and many universities overseas. A synopsis of the qualities of this ethics video is found later in this paper.

### Ethics in the Safety Profession

Safety professionals have ethical issues very similar to engineers. A viewing of "Incident at Morales" reveals the central focus issue of engineers having to deal with budgetary issues, internal company politics, human dynamic relationships and questions of safety as they relate to a safe engineering design. While specifically designed for engineers, most of the training video has direct applicability to ethics education that is required of safety professionals.

While safety professionals are not licensed by state government agencies in all 50 states, there is nevertheless the professional liability associated with personal professional conduct and ethics. Engineers, within their licenses, are sworn to protect the welfare of the public they serve. Safety professionals affirm statements with similar effect as a matter of earning professional credentials offered by the Board of Certified Safety Professionals and other organizations.

What the safety profession “lacks” is a central clearinghouse of ethics cases, problems and solutions that are the basis of advancing the “state of the art” of applied ethics. In the absence of such a clearinghouse, those in the professional safety practice can learn much from the history of ethics in the engineering profession. The types of ethical issues are very similar in their fundamentals.

*Author’s Note –text from this point in the paper to the conclusion is heavily taken from the NIEE training seminar on professional ethics. Permission was granted from NIEE to paraphrase that information and include in this publication. The author acknowledges the contributions of Dr. Jimmy Smith, Executive Director of NIEE and Patricia Harper, Secretary-Treasurer of NIEE for the content of the NIEE training seminar.*

### The State of the Art for Ethics in Engineering

Ethics begins with personal values. Many of these are developed at an early age and only “fine tuned” as a person gets older.

An interesting quote from Elvis Presley stated, “Values are like fingerprints; nobody’s are the same. But we leave ‘em all over everything we do.” One of the classic engineering societies, the Institute of Electrical and Electronics Engineers (IEEE), issues the following in their Code of Ethics (as approved by the IEEE Board in February, 2006). Their code states that members of IEEE will ... commit ourselves to the highest ethical and professional conduct and agree (in part):

- To accept responsibility in making decisions consistent with the safety, health and welfare of the public
- To avoid real or perceived conflicts of interest
- To be honest and realistic in stating claims based on data
- To reject bribery in all its forms
- To improve the understanding of technology
- To maintain and improve our technical competence
- To seek, accept and offer honest criticism of technical work ... acknowledge and correct errors ... credit properly the contributions of others
- To treat fairly all persons
- To avoid injuring others, their property, reputation, or employment by false or malicious action
- To assist colleagues and co-workers in their professional development

This is an example of a code that promotes ethical actions by establishing expectation and encouraging ethical leadership. Safety professionals could take this code and apply it just as easily to their careers.

Why should ethics be so heavily promoted with a profession? Simply stated, it reinforces the concept of the protection of the health, safety and welfare of the public, increases self respect for the profession and improves the public’s image of the profession.

But even with practical ethics codes, things can still go very wrong. Businesses can fail because of bad ethics – for example Enron and WorldComm. The public loses trust in businesses. More laws are created and the public loses trust in the political processes.

In an article from the New York Times (July 10, 2002 by David Skeel and William Stuntz) the following is quoted:

“How should we respond to the wave of scandals that have hit corporate America? Everyone in Washington seems to agree on the answer: more law ... in particular ... more criminal law.”

“Toughening existing criminal laws and adding new ones might seem the best way to make sure that future Enrons and WorldComms won’t happen ...”

“But it won’t work! ... Criminal laws lead people to focus on ... what is legal ... instead of what is right.”

“Perhaps that’s because we’ve turned what used to be moral questions into legal technicalities. In today’s world, (some) executives are more likely to ask ... what they can get away with legally ... than to worry about what’s fair and honest.”

The education of engineers in ethics boils down to “methods” of education as well as content. One of the more common educational methods includes ethics seminars. The goal of the ethics seminar is to develop moral autonomy – the ability to think critically and independently.

Many times ethical problems encountered in professional practice are complex and sometimes involve conflicting ethical principles. Ethics seminars allow engineers to analyze complex problems and resolve them the most ethical manner. They also sensitize professionals to important ethical issues before they have to confront them and provide tools for decision making.

Another educational process is the discussion of ethical theories – the three primary theories being utilitarianism, duty ethics and virtue ethics. These theories attempt to formulate fundamental principles applicable to professional and personal conduct. Utilitarianism focuses on maximizing the well-being of society as a whole. Duty ethics are those actions that can be written as a list of duties (be honest, be fair, etc.). Finally, virtue ethics is closely tied to personal character (i.e. “Have I acted in a responsible fashion?”).

In solving ethical problems, as a practical matter the good news is that in solving ethical problems, we are not limited to choosing one theory, but may use all of them to assure all perspectives on the issue are covered.

When evaluating ethical actions, a variety of tests can be used. There is the “harm test” – will the benefit of the action outweigh the harm – both in the short term or long term? The “reversibility test” is another – would I think this was a good choice if I traded places? As a third test, the “colleague test” hits close to home – what would my professional colleagues say?

A fourth test is the “legality test” – would my choice violate a law or policy of my employer? Then we have the “publicity test” – how would my choice look on the front page of a newspaper?

The “common practice test”, while humorous on the surface really makes one think – what if everyone behaved this way? The “wise relative test” gets somewhat close to family – what would my wise old aunt or uncle do?

The “smell test” is one we hear a lot about – does this choice smell or feel right?

But the ultimate is the “self-respect” test – how will I feel about myself after making this choice?

### Ethical Leadership

To be a complete leader in any profession, ethics is a vital step in achieving excellence. An ethical leader will create candor in the workplace. There will be an environment where employees feel safe bringing up and resolving ethical issues.

An effective ethical leader fosters an environment of trust among individuals in the workplace. This trust will encourage openness among team members without fear of retribution. It is important that all on the team are treated as being intrinsically valuable and not as a means to an end.

In the engineering profession, ethical leadership is a skill that is developed by the individual. These skill sets include:

- A clear understanding of professional ethics – the current state of the art
- Communication skills – an ability and willingness to communicate ethical issues
- An appreciation for the frequency at which ethical issues occur
- An awareness that guidance on ethical dilemmas is available from a variety of sources
- A comprehension of “knowing what’s right”
- A desire, willingness and courage to “do what’s right”
- The ability to resolve ethical issues by using traditional methods of inquiry, namely:
  - Listing options
  - Testing the options
  - Making a decision
  - Acting

Many times when assigned an engineering project, ethics can and will become an issue where there may be opposing, or competing, viewpoints on how the issue should be managed. If we collectively pull together with a common goal to resolve an issue ethically, it can be the glue that holds a project team together. Without this we have engineers using ethics as a game of competition.

It paints this picture. We can pictorially represent this as a group of engineers, split equally into two competing groups playing a game of tug of war. Each group tugs on its end of the rope as they try to move the center of the rope closer to their “win” line. Add to the picture that they are on a very small island such that as each group, when taking their position, is teetering precariously close to falling off the island into the water. Hungry alligators are ready to devour them should the rope break and both teams fall backward off the island as a result. The rope represents ethics. If the rope breaks, they all lose. The point of the example is, if ethics is the center of competing factions such that there is not a free flow of information and discussion, then the entire process will break down and the whole team and its project could fall apart.

### NIEE’s Video Project – “Incident at Morales”

Safety professionals can gain valuable insight from viewing and discussing the engineering ethics video, “Incident at Morales”. This video is available from NIEE by inquiring at its website, [niee.org](http://niee.org), or borrowing a copy from an engineer, engineering firm or college of engineering who has obtained a copy for internal use. As previously mentioned in this paper, this video is a tool for undergraduates in engineering to view and discuss ethical issues that will prepare them for their careers after graduation. Engineering firms can use this as a continuing education opportunity internally to their firms.

The purposes of the video include:

- Sensitivity – to raise awareness of the ethical aspect of professional work
- Knowledge – to learn about professional standards such as codes of ethics
- Judgment – to development skills in moral reasoning
- Commitment – to strengthen personal dedication to exemplary conduct

NIEE, through this video project, wanted viewers to be able to:

- Identify ethical, technical and economic issues and problems
- Identify affected parties (stakeholders) and their rights and responsibilities
- Identify social and political constraints on possible solutions
- Determine whether additional information is needed to make a good decision
- Suggest alternative course of action for the principal characters
- Imagine possible consequences of those alternative actions
- Evaluate these alternatives according to basic ethical values

The basic ethical concepts that are the focus of the video include:

- Ethical considerations are an integral part of making engineering decisions
- The professional obligations of engineers go beyond fulfilling a contract with a client of customer
- Codes of ethics can provide guidance in the decision-making process
- Ethical obligations do not stop at the US border
- Wherever engineers practice, they should hold paramount the health, safety and welfare of the public
- How an engineer fulfills those obligations may depend on the social and economic context of engineering practice

Stressors that are inserted in the video story than enhance the education value include:

- The importance of trust and candor
- Technical and ethical decisions and how they are developed
- Effective communication
- Personal relationship
- Safety issues
- Budget issues

Considerations that are brought out in dramatic form:

- Moral courage
- Using cheaper products
- International cultural issues
- The difference between margin of error and reasonable care
- Corporate logos and taglines and how they impact judgment
- What would you do if you were in charge?

NIEE provides free supporting materials for “Incident at Morales” at its website, [niee.org](http://niee.org). NIEE produced this video via a combination of private funding and a grant from the National Science Foundation.

## **Conclusion**

The safety profession is young when compared to the maturity of the engineering profession. All conventional wisdom states that safety professionals are held accountable to the same standards of ethical practice as engineers. Therefore, safety professionals should be held to the same standards of continuing professional development in ethical practice. There is no pressing need to reinvent the wheel when determining where resources are available to achieve this. The engineering professional has readily available educational materials that are readily available for the practicing safety professional.