



THE BODY OF ETHICS

BY RYAN BURGE

*How sound judgment and creative techniques
can help ensure safety and quality*

the body of ethics

YOU WAKE UP ONE MORNING, SIT DOWN TO A BIG bowl of Cheerios, strap on your steel-toe boots and head out the door. It's the same routine. You've been through it hundreds, perhaps even thousands, of times. Even on the shop floor. You slip on your gloves, check the performance figures (i.e., the normal takt time data and same stale control charts) hanging on the big whiteboard above the water fountain, and you head to your station. As you're walking over, your supervisor (Jim) calls out, "I need you to run the mill this morning. We're short-handed — the IE department has cut us to the bone. Mark called in sick and Aaron's on vacation. You're the only one who has had any exposure."

"But, I'm not certified to be on that machine," you question.

"You've had some training on it right?"

"A little, but nothing real formal."

"Eh, you'll be all right. You're going to be the only one at that station, so let me know if you need anything," replies Jim.

Thinking little of it, you shrug, sigh a short, "all right, whatever," and go on.

But things get a little busy. The next department is screaming for more product and you're doing the absolute best you can — as fast as you can. Heck, you're doing a two-person job and moving as quickly as you can to squeeze out a little more productivity to appease the red-faced manager at the other end of the plant. Oops, you accidentally drop a tool into the mill, and without hesitation you reach in to grab it.

What's the moral of the story? Is it similar to that of Aesop's fable about the tortoise and the hare: "Slow and steady wins the race"? Or perhaps another rendition of "better to be safe than sorry?" The second seems to resonate a little more, however, one must ask who's at fault. The blame easily could go in the direction of the manager as he told you what to do; however, it also could go in the direction of the worker as he did not alert anyone else to the inappropriate assignment.

But what about the IE department? Before the accident (potentially fatal), IEs were looking for ways to slash costs. Jim mentioned it himself. By cutting a job, demand grew and easily outweighed your competency level with the machine. To make it worse, the only qualified worker not on vacation at the beach called in sick — one of only two to have any formal training. So what do you think? Whose fault was it?

Sadly, the story — although short and seemingly fictitious — is based on an actual event at a manufacturing plant in the Midwest recently. The young man — in this case *you* — actually lost an arm. You can always skim through magazines and quality-related journal articles and read about new charting or statistical methods for solving some challenging problems, but safety (and therefore ethics) seems to be relatively ignored —

in publications, in IE training and academic curricula, and in our daily thoughts and considerations as we make decisions. In many cases, improvement "experts" enhanced short-term bottom lines and dramatically cut operational costs but at the expense of worker safety and morale. Regardless of who you may believe was at fault, it is time to reinvigorate two of the most basic, yet absolutely critical, elements of true industrial engineering — ethics and safety.

Ethics — it does a body good

So it's a slogan for milk. Regardless, ethics does your body (i.e., your internal person — otherwise known as your morals) and others' good. But what exactly is ethics? The *Merriam-Webster Dictionary* states that it is "the discipline dealing with what is good and bad and with moral duty and obligation." Facing great criticism for failures associated with corrupt chief executives and the financial debacle, Harvard Business School students and faculty launched an initiative to expose future leaders to a more ethical practice of business and accountability. They call it the M.B.A. oath. Following the 100th anniversary of the Harvard Business School two-year M.B.A. program and the devastating financial meltdown, two Harvard scholars and business experts decided it was time to inject ethics back into the mix. Joining a team of passionate M.B.A. students willing to contribute, Max Anderson and Peter Escher developed an oath intended to amplify ethical decision making among business school graduates. This was intended also to set an example for other career paths as well. Both lawyers and doctors are required to abide by some form of oath. What about engineers? In many ways, industrial engineers can impact the well-being of customers, patients and workers more so than lawyers and even doctors.

There is no common oath to help ensure ethical practice — just an "understood" expectation that engineers should make ethical decisions. Of course, there is a very short (the shortest) section on the Fundamentals of Engineering (FE) and Professional Engineering (PE) exams for engineering ethics. If these exams — often not even taken by IE graduates — are some of the only materials that require a basic knowledge of ethics, then there are some deficiencies. There remains a looming question: What can be done? Many believe that ethics is a matter of personal and professional growth and is not taught — that humans are inclined to make such unethical decisions at some point. Babur M. Pulat, engineering research associate at the University of Oklahoma and director of OU's collaborative Center for Engineering Logistics and Distribution, thinks that while people will be inclined to make poor decisions at the expense of safety and quality, the idea of ethics "must be

instilled in young minds.” Today, this university and others are integrating more ethics-based training in their curricula to promote ethical decision making at any level of a person’s career.

Ethics is simply the foundation for solid decision making, and it is up to you to ensure sound judgment. Everything else is intertwined, somewhat like a quilt. For example, having spent many years in industry as both an engineer and manager, Pulat outlined what he calls “The Five Simultaneous Equations.” These five equations (Figure 1), or functions of various criteria, are critical to success as an industrial engineer: safety, quality, production, customer and financial health.

The key to these equations is the fact that they are *simultaneous*. Addressing only one, or even one at a time, can lead to undesirable consequences. For example, looking only to financial health certainly has its problems. We already mentioned the financial disaster, and there are plenty of other examples where financials as the driver for improvement can lead to poor performance, perhaps even legal prosecution. It is consistently considering these five, ethically charged equations that will help you make more informed, sound decisions whether you’re the one running the machine, the one instructing someone to run it or the IE looking to improve the process.

ALL THINGS BEING EQUAL



Rooted in ethical decision making

Figure 1. Addressing the five simultaneous equations of engineering researcher Babur M. Pulat is critical to ethical decision making for industrial engineers.

Safety is always first

As we have seen, safety is not exactly the first step, but a simultaneous step following the decision to be ethical. You cannot couple cost-cutting strategies with poor ethics and expect workers to be safe or even expect that the organization will be shielded from the law. And, in most cases — as pointed out by Pulat — the “cut corners are quality and safety.” It is easy to reduce the quality of products or services, dramatically reduce staffing where it should not be, cut training and safety programs, and walk away seeing dramatic cost savings, at least for a short while. Sure, it’s easy, but it all happens at the expense of some other simultaneous equation. Given that we are more focused on safety here, let us take a look at another example.

In a short article by Helen Pieron of *Occupational Health and Safety* magazine, she discusses a small, family-run construction company’s lack of evidence “that any of the employees or owners had enough training to be a competent person for the scaffolding that was erected” at a work site. When questioned by auditors of the Occupational Safety and Health Administration (OSHA), no one could provide an adequate response, and the company was fined approximately half of the total cost of the project — a relatively small amount, but nonetheless the company lost money. Analyzing the situation further, the author felt that the company was relatively “lucky.” She wrote that “the incident caused managers to realize where their safety deficiencies lay before an accident occurred.” This obviously was not the same result in the manufacturing example opening this article.

As industrial engineers, we are improvement experts; we are tasked and obligated to enhance the value of products, services, processes, systems and conditions. We’ve seen a couple of examples of poor decision making, and the burden easily can be placed on the shoulders of an industrial engineer. Therefore, a few strategies to combating inefficiencies in a more intelligent, ethical manner are needed.

This is risky business (no, not the 1983 teen comedy)

Improving a process often can be risky business, as can making a decision that could alter a process and result in safety hazards. So you may be asking, “Can these types of things happen even though I make ethical decisions?” Unfortunately, yes — it is called uncertainty. But there are ways to help ensure that one or more of the simultaneous equations defined by Pulat are not ignored or end up in a lesser state as a result of uncertainty.

In an industrial engineering curriculum, we are taught various methods to plan for, deal with and reduce the effects

SAFETY, NUCLEAR STYLE

To know how damaging a catastrophic accident can be to a business, look no further than BP's oil leak in the Gulf of Mexico.

The British-based company has been pilloried by the press, pundits, comics and the president of the United States. The Deepwater Horizon oil leak killed 11 people, unleashed tens of millions of gallons of crude and will cost BP PLC tens of billions of dollars, if not more.

According to *The Wall Street Journal*, the deepwater drilling industry could take a page from nuclear and space regulators and estimate the probability of unlikely disasters. NASA has used probability risk assessment, or PRA, since the 1980s, while nuclear power companies have used the tool since a decade earlier.

PRA examines the possibility of failure among many machines and people, setting a ceiling on allowable risk. Part of the PRA calculates how much damage such a rare disaster would cause. Companies can use PRA to identify and repair trouble spots before disaster strikes.

A NASA spokesman told the newspaper the tool has helped the space agency examine its high-risk areas. According to the Nuclear Regulatory Commission, the agency's goal is to limit the chance of a plant releasing radioactivity to below one-in-a-million.

BP PLC didn't analyze its drilling in this way before the Deepwater Horizon drill exploded, a spokesman said.

of the uncertain. These methods, ranging from risk management to stochastic modeling/simulation, help us make more informed decisions without knowingly compromising the safety of workers or the quality of products and services. Without "rehashing" these techniques in detail, let us take a look at a few useful means for reducing uncertainty and ensuring our decisions are both ethical and safe. You will notice that one of these methods has been modified. Although they are useful in their original state, solving problems, especially those that have not happened in the past, requires a little more creativity.

One of the more critical means for identifying problems is root cause analysis (RCA), a method predicated on the idea that by identifying and eliminating the root cause of a problem, rather than the symptoms, that the problem will disappear. However, many engineers and managers view this method as useful if it is being used to eliminate an immediate problem with obvious symptoms. Although this method often helps to improve both quality and safety for targeted symptoms, it does little to address uncertainty with potential decisions and alternatives.

So we turn it on its head. Rather than asking, "Here are the symptoms, now what is the root cause of the problem?" we say, "Here is the problem (a scenario — a young man getting hurt from reaching into a mill). Now, is it possible that this could happen, and what could we do to prevent it?" First, it starts with ethics, as we already have discussed. Then, we play devil's advocate. We do not simply accept that our day-to-day routines, standard operating procedures and methods are guaranteed safe and efficient. We challenge them. We model problems in a predictive manner, working to identify potential fallacies in our systems, processes and programs. Unfortunately, some managers and engineers only make decisions based on historical trends and immediate changes in productivity and safety. Although this limited method is useful in solving some problems, reactive methods only lend themselves to a certain degree of critical thinking and problem solving. They fail to get past the immediate problem or similar problems and do little to aid improvements that are unseen (i.e., uncertainty).

The predictive method presented sounds relatively difficult, and in some cases it is. However, without effort, hazardous events as those mentioned earlier are likely to happen. It is just a matter of time. Therefore, the challenge to you is not to analyze problems based on the typical RCA or reactive methods, but try new things, challenge what you feel are adequate standards and quality methods, and predict and solve problems before they occur. Just because something bad has yet to happen does not mean that it will not.



It's more than a game

Have you ever played the game of Risk? It was released by Parker Brothers in 1957 and remains a popular board game today. The intent is for each player to use strategy to eliminate other players that stand in their way of conquering the world. The problem is that there is a tremendous amount of uncertainty. First, you are dealing with a roll of the dice. Second, in most cases, you have no idea what the other players plan to do.

So let's play this out. The game is your company. You are an improvement expert. The other players are problems. You are analyzing problems, guessing on what may fix such problems (i.e., a roll of the dice) and hoping for a significant return on your investment. Even though you think you have become quite the expert in tackling various issues, the problems keep coming up. Some are small, some large, but all are causing a stir and resulting in higher operational costs. So what do you do? Predictive analysis and decision making are methods discussed earlier, but what about managing the game or otherwise managing risk. Sure, it's a common thread, but do you really manage risk appropriately?

The International Organization for Standardization (often referred to as ISO) offers guidelines for properly implementing risk management. Fusing a few of these guidelines with other methods for success, the list below offers some advice for when you return to the game tomorrow morning:

- **Create value and become integral.** Do more than just create a list of potential risks, post them on a board and ignore them. Create value by making ethical decisions, become an integral part of the organizational processes and continuously refer back to the ethically charged simultaneous equations to ensure you are on track for success.
- **Be part of decision making.** Do not just accept things because it is the norm. Challenge the status quo, but also

be prepared to make informed suggestions and ethical decisions for improvement. There is more to improving quality and ensuring safety than skimming your quality and engineering textbooks. Try new things and continuously search for ways to make things better, even if you have to turn old methods upside down.

- **Explicitly address uncertainty.** Do everything you can to stop disasters before they happen. If stochastic modeling is your cup of tea, drink it. If you prefer the predictive RCA-type approach discussed earlier, by all means, use it. Take control, identify risks and mitigate them.

Be safe, not sorry

To reiterate a phrase used earlier in the manufacturing example and commonly spoken by parents, friends and co-workers, "it's better to be safe than sorry." Although the story at the beginning was a bit depressing, this is a call to all engineers, managers and front-line workers to make ethical decisions while considering the impact of such decisions. For some, it may be just a few minutes or hours thinking about a problem or a process. For others, it may require the use of the methods above or others. But it always should require an ethical approach to decision making that has been dipped in the various simultaneous equations, thus ensuring that risks have been mitigated, quality amplified and safety guaranteed. ~

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