# Obfus-gate: Engineers and Writing

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## Question

Which one of these statements can be attributed to an engineer?

1. I did not have sex with that woman.
2. This study relies heavily on currently available information, including a myriad of existing studies previously completed by the agencies.

Actually, it might be a tossup.

Until recently, it wasn't necessary to ponder the definition of sex or its potential ambiguity—at least not while writing or reading project updates, specifications, or design reports. The second example does seem, however, essentially political—dubious, ambiguous, and perhaps an attempt to misrepresent the truth.

Example 2 raises many questions, too many for the technical profession of engineering. What, for instance, does "heavily" mean? Half? Two thirds? Ninety percent? What comprises "currently available information," and is there some information the writer could have used if it had been available?

The questions continue. "Previously completed" is redundant; but when *were* the studies completed—last year, 10 years ago, 20? Readers usually overlook the superfluous "existing" (how could the information rely on studies that didn't exist?). But what readers can't be sidetracked from asking is how many studies does a "myriad" comprise?

Dictionaries inform us that a myriad is a heck of a lot: a vast, indefinite number. Myriad comes from the Greek *myrios*, for numberless, although one sense of the word is exact: it means precisely 10 thousand. There's also a group of insects categorized as *myriapods*, to which the centipede belongs. Myriad can be used figuratively as well to get a point across: we understand the centipede has a lot of legs but not exactly a hundred. Myriad can be used hyperbolically, too, in an exaggerated sense to dramatize an exhaustive project of seemingly endless tasks—whether constructing a new airport or building a space station to watch the myriad of stars close up.

## Answer

An engineer did write Example 2. The myriad of studies included three reports; the currently available information was a survey based on 30 telephone interviews.

By using this porous language, did the writer really mean to raise so many questions or attempt to misrepresent the effort behind the work? Could this engineer be guilty of Clintonizing, a new and already

overused term for obfuscation, that is, evading the truth by trying to baffle, bamboozle, and confuse?

Whether the writer was intentionally vague or not is irrelevant because the outcome is the same. Rather than bewilder readers, obfuscation, as we will see, makes the writer vulnerable and open to questions about professional competence, legal responsibility, and personal ethics. How this unintentionally happens, however, can be explained by circumstances and misconceptions that confront engineers who must write as part of all the work they do.

## Choosing the right word

Well intentioned people often use words without thinking that someone else could be confused or misconstrue their purpose. Please return this "at your earliest convenience." We're trying to be polite in using this outdated civility, yet readers can interpret it as "take your time, it's not very important," or "get to it when you can." You're sunk if you need it Friday. Another example: "For safety, workers should inspect every six months the utility tunnels that run under a river." However, the standard operating procedure states that the inspections should be done "periodically." So what's a little flooding?

This vague and meaningless language also jeopardizes business relations when it creates the suspicion that you are lying. Is it a smokescreen when someone writes that the installation crew will complete a project "expeditiously," "as soon as possible," "in a timely manner," or "in the near future"? Or is this just a poor use of words? They might sound firm, but they are meaningless and more often construed as a stall tactic. Readers cannot distinguish between the sincere person and the insincere when each uses the same lame words.

## Everyone does it

Most engineer writers do not try to deceive. The urge to embellish is tempting, however. We write to conduct business efficiently—clarifying when, where, and how something works or how to perform work. While we're at it, we would like to sound professional and intelligent—well, like an engineer.

When engineers aren't sure what this kind of writing is supposed to sound or look like, they might look at what's around. Writers can be led astray if they happen to use as models the following examples that are riddled with loopholes and ambiguity. I have underlined potentially troublesome words and comment on their questionable meanings in the italicized statements.

**Construction specifications:**

All hangers shall be provided with suitable approved vertical adjustment devices or features.

> *"Shall be provided" could be ambiguous; but since the specification is directed to the contractor, this is clearly the contractor's responsibility. But what is "suitable" and who approves it—the contractor, manufacturer, an industry association, the writer, the courts?*

When holes are to be cut through existing concrete, the contractor shall, where practicable, use a concrete drill.

*What does "practicable" mean? Who decides where it is practicable? Or will you decide in court? "Existing" is a word sometimes useful in distinguishing between new construction and old; but how would someone go about cutting through concrete that doesn't exist?*

**Request for survey work:**
Because the road project is in such close proximity to the building, it will be necessary to have surveys conducted.

*What's "close proximity"? Why not state how close it is: four feet, 500 yards? Or haven't you measured?*

**Employment directive:**
The contractor is hereby directed to make a concentrated effort to increase minority and female utilization in its construction workforce.

*What does "increase minority and female utilization" mean? Is the writer directing the contractor to hire more women and minorities or make them work overtime? And how many more should be hired? If someone makes "a concentrated effort"—whatever this means—and fails, is everything still OK?*

**Environmental impact statement:**
Deicing salts from the roadway can impact water quality and vegetation.

*What is the possible impact? Does this mean deicing salts from the roadway can pollute the water quality and destroy vegetation?*

**Computer report:**
We will explore the feasibility of incorporating files generated from other applications.

*Who knows what this means?*

These examples—all excerpts from engineers' writing—are not restricted to any job level or industry. They come from across the engineering profession: project managers as well as entry-level staff, chief engineers, principals and partners, government, and private consulting companies. Their cumulative effect creates the impression that this type of writing is what's expected, although none can pass the standards the industry itself has in place for effective writing.

## Engineering writing standards

Some claim that engineers are just not good writers. If anything, engineers would be excellent writers if they were to apply the exacting standards of their profession to their writing—the need to be objective, practical, direct, clear, and logical.

Engineering writing guides, industry directives, and training programs spell out these standards. The *Manual of Practice* published by the Construction Specifications Institute (CSI) offers four *c*'s as guidelines to writing specifications: clear, concise, correct, and complete. Nowhere does it state or hint at extra *c*'s: conniving, confusing, circumlocutory.

The *Department of Defense Standardization Manual* offers similar advice: "The paramount consideration in a specification is its technical essence, and this should be presented on language free of vague and ambiguous terms. Using the simplest words and phrases will best convey the intended meaning." (Military Standard 490)

Engineering companies and government agencies spend thousands of dollars every year in training programs to meet these same goals. In the effective writing seminars I have conducted for engineers, we begin by putting together a checklist of the qualities of writing—the kind of good writing they would like to see in their own and others' work. The groups always come up with a list that includes the CSI's four *c*'s, along with accuracy, preciseness, and sincerity. No one wants to read or write documents that are wordy, vague, indirect, or absurd.

## The emperor's new clothes

Despite universal displeasure, despite engineering guides and training, the profession continues to produce substandard material, although it knows better and can produce better. What could explain this paradox?

In Hans Christian Andersen's *The Emperor's New Clothes*, two swindlers convince a vain emperor to hire them because they weave the finest cloth in the land. The catch is that the clothes are magical, invisible to anyone who is "unfit for his office or unforgivably stupid." When the emperor wants to see how his tailors are progressing with his new clothes, he doesn't go himself; what if he doesn't see anything? So he sends his minister, who sees nothing:

> "Am I stupid?" he thought. "I can't believe it, but if it is so, it is best no one finds out about it. But maybe I am not fit for my office. No, that is worse. I'd better not admit that I can't see what they are weaving."
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> "Tell us what you think of it," demanded one of the swindlers.
>
> "It is beautiful. It is lovely," mumbled the old prime minister adjusting his glasses. "What patterns! What colors! I shall tell the emperor that it pleases me ever so much."

The phenomenon spreads through the town. And so the emperor, his ministers, the leaders of the town, and all the townsfolk—ye olde chief engineers, project managers, entry-level engineers, and technicians—are afraid to speak up, to say what they see or don't see, for fear of being judged as stupid or incompetent for their jobs.

## Intentional gobbledegook

Given peer pressure and occasional lapses, we may sometimes honestly write something we didn't intend. We can be forgiving when this happens, however, but then take steps to avoid it in the future. But what about those times when writers actually try to write gobbledegook as a means to a supposed practical end?

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"No, no, no!" the project manager insists. "We don't have *problems;* we have *issues*." So the junior engineer searches and replaces "issue" for every "problem." Since this is such a secret tactic, only the manager knows, and he's convinced the tactic will really fool everyone.

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Here is a common, perhaps minor, instance of trying to deceive readers. We are sometimes led to believe word choice is strategic—because it emphasizes positives and downplays negatives. But since everyone knows this hoax, the word switch fools no one, especially when the attempt is to conceal information, not to reveal it. This word ploy plays with questionable business ethics, as unpleasant when engineers try it as when politicians do. Besides, it doesn't work. Who reads "issues" and doesn't think "problems"? Who reads "inappropriate relationship" and doesn't think "affair"? Who has heard "I did not have sex with that woman" and knows he did?

## Weasels at work

Perpetuated by politicians, the weighty misconception that vagueness and ambiguity protect writers is hard to dispel. Here's an e-mail request from one engineer to another. He is trying to track down a handout from a college course they took together years ago:

> Do you remember in ... class when [the professor] gave us a list of weasel words and phrases? It was a one- or two-page handout of phrases he uses in reports so that he can never be pinned down on anything. I think it was mostly meant as a joke, but I'm sure it had some truth to it too! I was talking to a lawyer friend of mine last week, and the subject came up. (underlining added)

Thinking that there is some truth in deception reinforces the notion that effective writing is a magic act. With a little hocus-pocus, you can cast a spell of idiocy on your readers so that they will be numb to what you are doing.

The actual truth, though, is that weasel-writing simply does not work. It is costly, legally weak, and jeopardizes good business relations. Vague and ambiguous written instructions are the main cause for worksite disagreements, construction disputes, extra work orders and charges, and expensive and needless lawsuits, whatever side you are on. (See Giunta and Ramirez. "Avoiding Defective Specifications." *Civil Engineering*, 1991; and Jahren and Dammeier. "Investigation into Construction Disputes." *ASCE Journal of Management in Engineering.* January 1990.) When more than one reasonable interpretation can be drawn from a specification or contract's language, the courts will rule against the writer. Reasonable people are not expected to be mind readers.

Obfuscation increases the chance that your reader can escape your supposed magic hold, pinning you down instead. Seymour Traub, a lawyer working in products liability prevention with Blank Rome Comisky & McCauley, LLP, in Allentown PA and a former engineer, teaches liability prevention at Lehigh University. Traub says that "most engineers when they write have difficulty distancing themselves from their work. They have to take the perspective of how a plaintiff's lawyer is going to look at it, as if under a microscope, and with the intent of using ambiguity to their disadvantage in an adversarial setting." Traub frankly states that the lawyer's analysis comes from a perspective of "how can I screw you with that you have written?"

The best way to protect yourself is to write clearly. "It is when you're not clear," Traub explains, "that you become liable. You need to stand behind, not hide behind, your words. And, of course, you should

know what your objective is in the first place. For instance, warnings are not effective unless they are clear and create the desired activity."

Obfuscation is contrary to all the objectives we seek through writing—to conduct business effectively, verify plans, avoid confusion, and clarify responsibility. In writing, words don't dissipate in air as they do when we speak. They land on the page and stay there for everyone to examine—as closely as one might examine design plans.

Effective writing establishes trust. The weasel, therefore, is a curious choice of critter upon which to model one's business conduct and ethics. When you think about it, who would want to be known as a weasel? Weasels prey on vulnerable eggs of birds and reptiles left unprotected. Then they suck the life out them.

## The Challenger explosion

The cause of the space shuttle *Challenger's* explosion in 1986 is well known— faulty O-rings and lapses in management and quality control. (See Richard Feynmann. *What Do You Care What Other People Think?* Bantam Books, 1988) What isn't discussed often is the quality of writing in the recommendation sections of the seals report.

**Here's one of the recommendations:**

The lack of a good secondary seal in the field joint is most critical, and ways to reduce joint rotation should be incorporated as soon as possible to reduce criticality.

*This recommendation is as leaky as the O-rings. It is open to as many questions as the statement about myriad sources that began this article.*

- Does the lack of a good secondary seal mean we don't have a secondary seal or the one we have is faulty? *What's wrong with the seal?*
- What do "critical" and "criticality" mean? *Might the hot gas leak and explode?*
- Why use the passive voice "should be incorporated"? *Who should make these changes to reduce joint rotation? By using the passive, was the writer intentionally or unintentionally vague? Trying not to be nailed down?*
- What does "as soon as possible" mean?

It's easy to see how other engineers or managers reading the recommendation could overlook the findings and their significance, especially if they were reading quickly or were bogged down with this tiresome prose for an entire report. It's tragic to ponder what the outcome might have been had the writer stated the recommendation clearly and directly:

> To eliminate fuel leaks that can cause an explosion, reduce joint rotation. Redesign and replace the faulty secondary seal before the next flight so no one gets killed.

This O-ring example is no worse than the writing we come across every day or those cited in this article. As we have discussed, no one can be sure what the reason is for weak writing. But there are practical, legal, and ethical consequences for obfuscation. Did the writer innocently assume all readers would

know what “criticality” and “as soon as possible” meant? The writer may have thought such terms were clear enough and sounded good. Maybe the engineer was unaccustomed to taking responsibility and hesitant or afraid to point out a problem to management. Or, perhaps the writer dabbled with weasel words so as not to be nailed down in case something went wrong.

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