**10 WAYS TO IMPROVE YOUR TECHNICAL WRITING**

Better technical writing can result in proposals that win contracts, advertisements that sell products, instruction manuals that technicians can follow, and letters, memos, and reports that get your message across to the reader. Here are ten tips on style and word choice that can make writing clear and persuasive:



Know your reader – Are you writing for engineers? managers? technicians? lay people? Make the technical depth of your writing compatible with the background of your reader.

Write in a clear, conversational style--Naturally, a technical paper on sizing pumps shouldn't have the same chatty tone as a personal letter. But most technical professionals lean too much in the other direction, and their sharp thinking is obscured by windy, overly-formal prose.



The key to success in technical writing? Keep it simple. Write to express--not to impress. A relaxed, conversational style can add vigor and clarity to your work.

FORMAL TECHNICAL ST YLE

The data provided by direct examination of samples under the lens of the microscope

are insufficient for the purpose of making a proper identification of the components of the substance.

INFORMAL CONVERSATIONAL STYLE

We can't tell what it is made of by looking at it under the micro- scope.

We have found during conver- sations with customers that even the most experienced of extruder specialists have a tendency to avoid the extru-

sion of silicone profiles or hoses.

Our customers tell us that exper- ienced extruder specialists avoid extruding silicone profiles or hoses.

The corporation terminated

the employment of Mr. Joseph Smith.

Joe was fired.



Be concise--Technical professionals, especially those in industry, are busy people. Make your writing less time - consuming for them to read by telling the whole story in the fewest possible words.

How can you make your writing more concise? One way is to avoid redundancies --a needless form of wordiness in which a modifier repeats an idea already contained within the word being modified. For example, a recent trade ad described a product as a "new innovation." Could there be such a thing as an old innovation? The ad also said the product was "very unique." Unique means "one of a kind," so it is impossible for anything to be very unique.

By now, you probably get the picture. Some other redundancies that have come up in technical literature are listed below, along with the correct way to rewrite them:

REDUNDANCY

advance plan actual experience

two cubic feet in volume

cylindrical in shape uniformly homogeneous

REWRITE AS

plan experience two cubic feet cylindrical homogeneous

Many technical writers are fond of overblown expressions such as "the fact that," "it is well known that," and "it is the purpose of this writer to show that." These take up space but add little to meaning or clarity. The following list

includes some of the wordy phrases that appear frequently in technical literature. The column on the right offers suggested substitute words:

WORDY PHRASE

during the course of in the form of

in many cases

in the event of exhibits the ability to

SUGGESTED SUBSTITUTE

during as often if

can



Be consis tent – “A foolish consistency," wrote Ralph Waldo Emerson, "is the hobgoblin of little minds." This may be so. But, on the other hand, inconsistencies in technical writing will confuse your readers and convince them that your scientific work and reasoning are as sloppy and disorganized as your prose.

Good technical writers strive for consistency in the use of numbers, hyphens, units of measure, punctuation, equations, grammar, symbols, capitalization, technical terms and abbreviations. For example, many writers are inconsistent in the use of hyphens. The rule is: two words that form an adjective are hyphenated. Thus, write: first- order reaction, fluidized-bed combustion, high-sulfur coal, space-time continuum.

The U.S. Government Printing Office Style Manual (1), Strunk and White's "The Elements of Style" (2), and your organization's writ ing manual can guide you in the basics of grammar, punctuation, abbreviation and capitalization.



Use jargon sparingly--Chemical engineering has a special language all its own. Technical terms are a helpful shorthand when you're communicating within the profession, but they may confuse readers who do not have your special background.

Take the word "yield," for example. To a chemical engineer, yield is a measure of how much product a reaction produces. But, to car drivers, yield means slowing down (and stopping, if necessary) at an intersection. Other words that have special meaning to chemical engineers but have a different definition in everyday use include: vacuum, pressure, batch, bypass, recycle, concentration, mole, purge, saturation, catalyst. Use legitimate technical terms when they communicate your ideas precisely, but avoid using jargon just because the words sound impressive. Do not write that material is "gravimetrically conveyed" when it is simply dumped.



Avoid big words--Technical writers sometimes prefer to use big, important-sounding words instead of short, simple words. This is a mistake; fancy language just frustrates the reader. Write in plain, ordinary English and your readers will love you for it.

Here are a few big words that occur frequently in technical literature; the column on the right presents a shorter--and preferable--substitution:

BIG WORD

terminate utilize incombustible substantiate optimum

SUBSTITUTION

end use

fireproof prove best



Prefer the specific to the general--Technical readers are interested in detailed technical information--facts, figures, conclusions, recommendations. Do not be content to say something is good, bad, fast or slow when you can say how good, how bad, how fast or how slow. Be specific whenever possible.

GENERAL

a tall spray dryer plant

unit

unfavorable weather conditions structural degradation

high performance

SPECIFIC

a 40-foot-tall spray dryer oil refinery

evaporator

rain

a leaky roof 95% efficiency



Break the writing up into short sections --Long, unbroken blocks of text are stumbling blocks that intimidate and bore readers. Breaking your writing up into short sections and short paragraphs – as in this article – makes it easier to read.

In the same way, short sentences are easier to grasp than long ones. A good guide for keeping sentence length under control is to write sentences that can be spoken aloud without losing your breath (do not take a deep breath before doing this test).



Use visuals --Drawings, graphs and other visuals can reinforce your text. In fact, pictures often communicate better than words; we remember 10% of what we read, but 30% of what we see. Visuals can make your technical communications more effective. The different types of visuals and what they can show are listed below:

TYPE OF VISUAL

Photograph or illustration Map

Schematic diagram

Graph

THIS SHOWS...

...what something looks like

...how it is put together

...how it works or is organized

...how much there is (quantity); how one thing varies as a function of another

...proportions and percentages

...comparisons between quantities

...a body of related data

...what goes in and what comes out

Pie chart Bar chart Table

Mass and energy balances



Use the active voice – In the active voice, action is expressed directly: "John performed the experiment." In the passive voice, the action is indirect: "The experiment was performed by John."

When possible, use the active voice. Your writing will be more direct and vigorous; your sentences, more concise. As you can see in the samples below, the passive voice seems puny and stiff by comparison:

PASSIVE VOICE

Control of the bearing-oil supply is provided by the shutoff valves.

ACTIVE VOICE

Shutoff valves control the bearing-oil supply.

Leaking of the seals is prevented by the use of O-rings.

O-rings keep the seals from leaking.

Fuel-cost savings were realized through the in- stallation of thermal insulation.

The installation of thermal insulation cut fuel costs.