

edmond weiss consulting

115 Cooper Rd., Voorhees, NJ 08043
856-753-3440/edweiss@aol.com/www.edmondweiss.com

An Unreadable EIS is an Environmental Hazard

Edmond H. Weiss, Ph.D.

An Unreadable EIS is an Environmental Hazard

*Edmond H. Weiss, Ph.D.,
Cherry Hill, New Jersey*

Abstract. An Environmental Impact Statement alerts the government and public to the possible hazards of proposed actions. An unreadable EIS is an environmental hazard, potentially as deadly as stack emissions or dioxin in the groundwater.

Many EISs, of course, are written by engineers and researchers, without benefit of professional "wordsmiths." The engineer's notorious aversion to writing (and the unwillingness of most firms to buy writing services) means that EISs are at least as unreadable as most other technical documents prepared by a team of middling writers working to an unforgiving deadline.

But, despite what some consultants may think, the bad writing in an EIS is much more serious than a matter of esthetics; the issue is not "English" or refinements of style. The issue is the quality of the document, its usefulness in support of the goals of environmental legislation, and, by implication, **the quality of the environmental stewardship entrusted to the scientific community.**

PART OF THE PROBLEM OR PART OF THE SOLUTION

An unreadable EIS not only hurts the environmental protection laws and, thus, the environment. It also turns the sincere environmental engineer into a kind of "polluter."

Consider the irony. Environmental engineers, those solitary champions of environmental quality, usually more than ready to do battle with well-financed developers and

well-connected waste handlers, are increasingly perceived as paid apologists for the people whose actions may foul the environment. Why? Because most Environmental Impact Statements are so difficult and unpleasant to read that they make people suspicious. Even someone only moderately skeptical might suspect that readers are **discouraged** from reviewing the report too carefully. And, in a time when bright people worry that environmental laws can be manipulated and undermined by powerful interests, the inaccessible and unreadable EIS has come to be viewed as part of the problem instead of part of the solution.

Some EISs, then, are seen as a deliberate effort to obscure the questions, to inhibit debate and intimidate all the opponents of a proposed project or action.

Of course, this public perception is unfair. Although environmental consultants occasionally err in the favor of the agencies who pay their fees, the typical individual or firm is scrupulously honest in describing and predicting environmental consequences. Whether motivated by the noble ethics of the profession or just by the mundane fear of being discredited in the consulting marketplace, environmental specialists would be the last to defeat the spirit of the environmental protection laws and codes. Quite the contrary. The typical EIS is not obscure by intent. It only **seems** that way—the consequence of certain bad habits of thought and expression.

There are three broad classes of errors that undermine the clarity and credibility of many EISs:

Strategic Errors are mistakes of planning, failure to understand why the EIS is being written and for whom.

Structural Errors are mistakes of organization, failure to arrange the elements in the document in a way that makes them easy to follow, and

Edmond H. Weiss, Ph.D. is an independent consultant, writer, and lecturer, specializing in technical communication. He spends most of his time traveling throughout North America teaching writing seminars for engineers, scientists, and computer professionals. He is the author of *The Writing System for Engineers and Scientists* (Prentice-Hall, 1982), *How To Write a Usable User Manual* (ISI Press, 1985), and *How To Document a System* (Oryx Press, 1990). His base is Cherry Hill, New Jersey.

Requests for reprints may be addressed to Edmond H. Weiss, Ph.D., 1612 Crown Point Lane, Cherry Hill, New Jersey 08003 (609/795-5580).

Tactical Errors are mistakes of editing, failure to test and revise the texts for clarity and readability.

STRATEGIC ERRORS

A strategic error is tantamount to writing the **wrong** document. That is, the engineers and others, for a variety of reasons, produce an EIS that misses the true objective of the project— even while it complies with federal or state "guidelines." Especially when the EIS is composed by several authors working independently, the risk is great that the final product will meet the letter of the law but not the spirit.

More specifically, EISs are often undermined by **naive attitudes**, the most prevalent being that the document is a dispassionate, objective collection of unambiguous, hard facts about environmental effects. Typically, though an EIS vitally affects hundreds or thousands of people—including a few very rich and powerful ones. In a sense, the principal function of the EIS is to provide facts, projections, and analyses that **raise the level of debate among those thousands at interest.**

In countless cases the EIS has affected the commercial interests of developers and contractors, even the political aspirations of local officials whose campaigns include promises of projects with environmental implications. No matter what the guidelines say, and no matter what disclaimers appear in the introduction, the findings in an EIS may potentially help or hurt the progress of some project. At the very least, it can uncover adverse effects that add corrective costs to a proposed action. In extreme cases, it can curtail the plans of the **very agency or firm that paid for the study.**

Moreover, an EIS, like even the best science done in support of public policy and health, contains a substantial number of extrapolations and inferences, many built on simplifying assumptions, debatable theses, and even secondhand data from parties with vested interests. (Given two or three questionable presumptions, environmental assessment becomes only slightly more precise than stock market forecasting.)

In short, an EIS is a work of science, as opposed to an aggregation of hard facts; it is rich with, to use Popper's term, **intelligent conjecture.** Consultants, often under pressure from sponsors to produce unambiguous conclusions, must remember that the quality of their assessments derives from the quality of the underlying **warrants** (Steven Toulmin's term) in their models.

The document should be much more than a compendium of technical details, interesting mainly to readers with the

appropriate technical background. But, without meaning to, most EIS authors aim their writing at the **wrong audience.** They assume not only that the work will be read almost exclusively by environmental engineers and specialists, but also that each specialized component (air, water, archeology, odor. . .) will be read only by persons with that specialty.

Even though many of the readers are such specialists, **the most important readers are not.** Quite the contrary, the main readers of the EIS are in three motivated groups:

A higher jurisdiction of government, responsible for a series of decisions, often including enforcement, frequently under political pressure to approve or disapprove (in the guise of "neutral" review for compliance)

Supporters of the proposed action, hoping that the EIS will not forecast any unavoidable consequences or more attractive alternatives, impatient to have it approved as quickly as possible

Opponents of the action, alert to any instance in which its adverse effects are minimized or in which those of the alternatives are exaggerated, especially skeptical of all assumptions, inferences, and secondhand or imputed data.

By failing to appreciate that the EIS is a work of scientific conjecture, aimed at motivated and even cynical readers, environmental engineers commit the worst strategic error of all, the one that **undermines not only EISs but many other technical documents as well: lack of apparent function or purpose.** (That is, there is a tendency among among intellectual writers— scientists, engineers, scholars—to act as though the purpose of the document was to **write about the subject.** An effective EIS, though, or any effective technical publication, is designed and written to accomplish specific communication objectives in well-defined audiences. Ironically, the more fascinated the author is with the subject, the greater the risk that the document will lack purpose and frustrate its readers.)

An EIS, in addition to presenting its facts and projections, must assure those who deserve to be assured, arouse those whose interests are at risk, satisfy the stewards of environmental laws, and stimulate enlightened discussion among decisionmakers and their constituents.

The assessment of environmental impact is hardly ever simple, objective, or uncontroversial. Rather, it is a problem in scientific advocacy, in which the main issue is whether the investigating team has assembled enough credible evidence and argument to **prove a central thesis.** Either that

The proposed action will have no important adverse effect on the environment, or

The proposed action is better for the environment than "no action," or

The proposed action is clearly better for the environment than the alternatives, or

Although there is an environmentally superior alternative, its greater costs are not justified by its environmental benefits (or are justified). . . .

For an EIS to have an effective thesis (one of those above, or some other more appropriate to the situation), the Project Director must assert responsibility and take intellectual risks. Put simply, he or she must **direct** the project and see that the EIS has a coherent point of view—that each of the five or ten or twenty specialists at work on each of the "parameters" knows the audience and the thesis. Without such direction, the EIS will look like so many of them do: a patchquilt.

STRUCTURAL ERRORS

If form follows function (as some architects are fond of saying), it is not surprising that many EISs are in a form that reflects their lack of thesis and their indifference toward the audience. Generally, they are huge and inaccessible. Like a patchquilt, they are filled with beginnings and endings, choppy, inconsistent, ragtag.

Most EISs appear to be organized in a way that makes them easier to review or "check off" than to study and question. They are arranged so that even a superficial reviewer will quickly see that everything that is supposed to be in the document is there. And if that were the only mission of the EIS, to satisfy some mindless bureaucratic checklist, such an organization would be appropriate. Furthermore, if that were the only function of the EIS, there would be no reason to write this essay!

But that is not the sole mission or function. EISs are important documents meant to be read by interested readers with vital concerns. (Not just compendiums of fact to be appraised with a checklist.) It is shamelessly cynical for environmental consultants to regard the writing and reviewing of the EIS as nothing more than "going through the motions" of environmental assessment, a tiresome administrative hassle, "red tape" en route to getting the project approved.

For many readers, the typical EIS has an **inaccessible organization**. Most readers do not want to study each "environmental parameter" in depth. They do not want to reflect on the history of the planet before they find out

whether the local groundwater is likely to be fouled. Nor do they want to read several hundred pages to learn if there are any unavoidable consequences of the project.

For the sake of most readers, the EIS should be organized to allow direct and immediate comparison of the proposed action with the "no action" alternative, followed by a similar comparison with alternative sites, technologies, and actions. Moreover, the comparisons should address **only what is relevant**. If the effect on a certain parameter is inconsequential, it should be reported briefly and dismissed (even though we paid a hefty fee to the subcontractor specialist). If differences between alternatives are too small to matter, they need not be discussed—unless there is reason to believe that part of the audience is especially interested. Nowadays it is hard to escape the impression that the controversial or "soft" parts of the study are being deliberately camouflaged beneath hundreds of pages of unimportant detail.

In a well-made EIS, the average reader—including the lay reader—should be able to find what he or she wants to know in less than five minutes. One minute, if the findings are unusually straightforward.

An effective EIS should be well-endowed with "search tools": introductions, summaries, overviews, reviews, digests, or abstracts. It is even easy to imagine an EIS that is mainly summaries, with much of the technical detail relegated to attachments and appendixes. In contrast, though, what do we usually see?

The introduction is malnourished; it reads like an afterthought.

The table of contents is incomplete, and the headings (the names of the sections) do not address the questions raised by readers. In effect, one must be an expert to find anything.

There are no chapter introductions or section introductions; no marginal glosses.

There is hardly any typographic emphasis or accent: underscoring, boldfacing, italics, indentation, color, capitalization—none of the simple techniques for making the most pointed and conclusive sentences stand out from the dense background of the page.

(I recently read a 500-page EIS that had not one underscored sentence. When I proposed changes in presentation and typography, I was told directly by the sponsor that he **didn't want the EIS to stimulate any more discussion than necessary!**)

Because of the way they are written, most EISs are clumsy and **disjointed**.

They are obviously the work of many authors, with jarringly different styles of writing. Typically, each author doesn't care much about what the others are up to; the project director spends more time reassuring the sponsor than ensuring that all the authors are working on a coherent document.

Often, the several sections are at radically different levels of detail or difficulty—some containing sophisticated models, others high school primers on the measurement of sound. The worst problem is the disjunction of text and exhibits, the needless separation of text from the charts, tables, photos, and figures. Readers are perpetually told to "see Map X"—which is typically several pages away, or in another volume.

My own research in technical communication has led me to conclude that this simple mechanical problem—the separation of the text from the exhibits needed to make it clear—is the single greatest barrier to the reading of EISs and other technical publications. In a well-designed EIS (Note: EISs must be designed, not just assembled!), nearly every time a reader is told to see a chart or table it will be either on the **same page or a facing page**. The more we ask readers to jump, skip, detour—the more often we ask them to be in two places at once—the greater their suspicion that the writers do not really want the material read.

Of course, most of the people who write the separate parts of an EIS do not even think about so pedestrian a question as the position of the charts and maps. That, after all, is an editor's problem—or, in some places, the typist's problem. Generally, the only writers who care deeply about the physical layout of the document are those who want it to be **easy to read**.

TACTICAL ERRORS

Tactical errors are failures of editing. They include the mechanical mistakes—misspellings, errors of grammar and punctuation—as well as misused words and phrases. More subtle, and more serious, are failures of style: clumsy syntax or awkward, wordy sentences. When most engineers think about "writing," it is these tactical issues that come to mind. And when most engineers disparage their writing, it is actually their editing that is at fault.

Tactical errors add "friction" to communication. Where there should be a simple transfer of facts and ideas from writer to reader, instead there are distractions, irritations, rubs.

There are two broad kinds of tactical errors: obvious violations and subtle mistakes. The obvious ones are less dangerous because they are more likely to be detected and corrected. Misspelling "supersede", using the word criteria as a singular, using "due to" in place of "because of": these are the bugs that should be caught by the writer, or even such "style-checking" software as RightWriter or Grammatik.

The trouble with the subtler mistakes is that they are rarely textbook errors. And, unless there is a real editor or an especially literate PD in the firm, no one is likely to correct them. These are errors of style, like the "smothered verb" ("perform the computation of" versus "compute"; "conduct an inspection of" versus "inspect"). Or the "vitiating predicate" ("The possibility of damage to the crops from the steam exists" versus "The steam might damage the crops").

There are also scores of wordy, windy, wasteful constructions, like "consensus of opinion" or "ten-year period of time" or "visible to the eye." And ostentatious synonyms, like "utilize" for "use" or "facilitate" for "aid." And misused words, like "fortuitous" (which does **not** mean lucky) and "enormity" (which does **not** mean immensity) or "preventative" (which is **not** the same word as preventive) or "remediate" (which is a solecism on the verge of being a barbarism, no matter how many people use it).

Recently I edited an EIS in which I removed the word "situated" more than 100 times. "X is situated in Y" becomes "X is in Y." "Q is situated west of P" becomes "Q is west of P." In the same document I also changed "presently" to "currently" at least fifty times.

Why are there so many young professionals who cannot distinguish "historical" from "historic"? And why is there no basic agreement on whether the word "impact" itself refers to all effects or only to undesirable ones. (Does "no impact" mean no effect, or no harm? If all "impacts" are bad, why do we write "adverse impact"?) Would it improve our EISs if we wrote them without any form of the word "impact"? Answer: Yes

And these are the easy mistakes, the ones even a green editor would correct in a minute. What about the more difficult problems, though? The unbearably long sentences and paragraphs? The lack of links to connect one sentence to the next? The jarring differences in style from section to section? The oppressive lack of variety in sentence patterns? These problems need a better editor, who, in turn, needs the time and authority to correct them.

Most EISs have never been visited by a real editor. Of those I've read, about one in five shows evidence of anything more than rudimentary editing. Partly, this is because most of the smaller consulting firms believe that they cannot

afford an editor, forgetting that their main product is reports, but mainly it is because of deadlines. Almost universally, project directors on environmental assessments regard editing as an incidental frill, a step that can always be sacrificed for the sake of delivering a draft two or three days earlier.

The worship of deadlines is understandable and, in some cases, forgivable. But it is also **wrong**.

If, for the sake of meeting a review deadline, the consultants allow an unreadable draft to be distributed (and most first drafts by engineers are unintelligible to anyone but the author and some friends), then the consultants are morally compromised. If the purpose of the EIS is to support a frank discussion of the consequences of the proposed action, then an unreadable document is an impediment, an environmental hazard.

If some of the aggrieved readers of the EIS suspect deception, and if the inaccessibility of the text contributes to that suspicion, then the consultants are part of the perceived conspiracy.

SOLVING THE PROBLEM

For the three groups of errors there are three paths of attack.

Eliminating **strategic errors** calls for genuine project leadership by a project director with intellectual vigor. The various specialists on the assessment team, including subcontractors, must **not** begin to write "their sections" until their respective findings and conclusions have been discussed and evaluated.

As impractical as it may sound, and as far from standard practice in most firms, the individual contributors should not be turned loose on their writing assignments until they have presented **written summaries of their data and interpretations for discussion by the team as a whole**. Specialists must not be encouraged to formulate their judgments while they are writing their first (and last) drafts. Put bluntly: competent scientists and engineers ought to be able to summarize what they are going to write before they begin; too many of the people who work on EISs, though, cannot tell you what they are going to say until they have said it. More than a few engineers have told me that their writing assignment was little more than "covering enough pages."

Only after the overall sense of the findings has been clarified, only after the conflicts and inconsistencies have been resolved, should the project director permit the separate pieces to be written.

In this context, only what is relevant should be featured prominently in the body of the EIS. Incidental information, tutorials and primers on environmental science, and miscellaneous exhibits should be relegated to appendixes. (Note: I did not say that only what is "favorable" to the thesis should be in the body of the document; I said what is "relevant." Surely, unfavorable data are quite relevant.)

Eliminating **structural errors** calls for more professional document design. The documents should be packaged and summarized in a way that lets most readers find what they need to know at once. Most important, the central questions of any EIS must be answered prominently: Are there unavoidable consequences? Are there alternative sites or technologies with less environmental hazard? Etc.

The most useful way to help readers follow complicated discussions is to unify the text with the associated tables, maps, and charts. For more than thirty years, certain industries have been preparing "modular" publications, in which the entire document is conceived of as a set of two-page spreads, with text and exhibit on facing pages. (Currently, the only efficient way to read an EIS is to have two copies, with one open to the referenced chart or table.)

And finally, the only way to eliminate or control **tactical errors** is with a professional editor. At the very least, such a person is needed to clean up after the parade of technical specialists has marched through. Every EIS, like every final report, needs the attentions of someone who knows how to reduce the burden on the reader, to contain the effort and "overhead" needed to read and use the document.

To do that job, however, takes time. Schedules must allow room for the editor to work. And project directors must be less willing to deliver undercooked drafts to eager sponsors.

Quality Assurance specialists are fond of saying that the bitterness of poor quality lingers long after the sweetness of meeting a deadline. I might add that the bitterness of an unreadable EIS can undermine the intellectual authority of the environmental engineer. And even foul the air.

Books by Edmond H Weiss

These and other works are available at Amazon and other book sources.



The Elements Of International English Style: A Guide To Writing Correspondence, Reports, Technical Documents, And Internet Pages For A Global Audience by Edmond H. Weiss (**Paperback** - Feb 28, 2005)

Buy new: **\$21.95** 21 Used & new from **\$14.27**

★★★★★ (4)

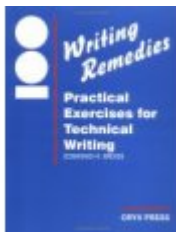


How To Write Usable User Documentation: Second Edition by Edmond H. Weiss (**Paperback** - Jun 26, 1991)

Buy new: ~~\$32.95~~ **\$19.67** 28 Used & new from **\$6.98**

★★★★★ (5)

Books: See all 45 items



100 Writing Remedies: Practical Exercises for Technical Writing by Edmond H. Weiss (**Paperback** - Sep 4, 1990)

Buy new: **\$25.00** 15 Used & new from **\$2.50**