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Readability and Comprehensibility as NEPA Minimums

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Participants in Shipley NEPA workshops often ask what the target readability for an Environmental Impact Statement or Environmental Assessment should be. They usually want a simple answer like, "Write for a 10th grade reader." Readability is, however, a much more complex issue, as I explain below.

Questions about readability reflect the mandate from Section 1502.8 of the Council on Environmental Quality Regulations: EISs "shall be written in plain language . . . so that decisionmakers and the public can readily understand them."

Plain language is not, however, a simple concept to define or to practice. Most of us can easily decide if a sample of writing is clear or unclear. A less easy task, however, is to translate unclear text into clear text. Moreover, 100 percent clarity is even harder. Text that is 100 percent clear should be so clear that an average reader cannot miss its message.

(For information about the plain language initiative and its application to governmental documents, see www.plainlanguage.gov. As this web site illustrates, texts using plain language reflect a number of criteria. These range from a clear, usable document design to the careful profiling of readers performing actions—thus active instead of passive sentence structures. Notice that the plain language criteria avoid focusing on a calculated grade level. Such calculations, from early readability formulas, usually reflect only average sentence length and average syllables per word in a passage. These two variables are good initial indicators of readability. But well written and readable documents usually draw on a number of other writing standards.)

Many court decisions from the early 1970's focused on the confusing and muddled thinking recorded in early EISs. These decisions became the basis for Section 1502.8 in the CEQ Regulations as published in 1978. Both judges and the framers of the CEQ Regulations understood that if information from an agency was unclear, then agency decision making would also be unclear, even flawed.

This CEQ mandate for clear writing reflects a major NEPA requirement: full and honest disclosure of potential impacts to all affected and interested parties. Full and honest disclosure of impacts is impossible if the writing that summarizes relevant information is so unclear that readers miss key points. Even worse, decisionmakers will be making decisions based on flawed or contradictory information.

Legal concerns about readability overlap with concerns in the plain language initiative. This overlap is why the listed recommendations below for NEPA documents are consistent with similar listed recommendations from experts in plain language.

Legal concerns about readability are as current today as they were in the 1970's. An August 22, 2006 District Court decision in the Northern District of California (California v. U.S. Forest Service No. C 05-00898 CRB) addressed the readability of Forest Service NEPA documents. The judge's decision in this case mentioned missing information, inconsistent information, and information difficult to assess because key points were spread among several linked documents.

According to the judge, the problem was one of "incomprehensibility." The judge's decision also referenced prior cases, including several from the Ninth Circuit, where problems of "readability" and "understandability" were the crux of legal decisions.

Clarity of information surely summarizes the preceding terms. This is why Shipley Group NEPA workshops have increasingly focused on the need for 100 percent clarity in NEPA documents. This focus on clarity is consistent with the government's plain language initiative. It is also consistent with current research in ways to improve technical and business writing.

The following list of six recommendations summarize the Shipley approach to making NEPA documents 100 percent clear. These recommendations are the basis for Shipley printed workshop materials, and they form the basis for Shipley work as consultants on writing and editing projects.

Recommendations for Making Documents 100 Percent Clear

1. Survey/list potential readers.

2. Design the document to be 100 percent clear to projected readers.

3. Set readability and content goals for different sections of an EIS or EA.

4. Check the usability/readability of your design (before writing text).

5. Write text and graphics, keeping sentences short and using only essential technical terms.

6. Test draft text and graphics for usability/readability.

1. Survey/list potential readers.

Surveys of potential readers are essential, but rarely done carefully. Most technical writers in the 1970's and 1980's traditionally talked about potential readers, but this talk rarely ended with a complete list of diverse readers and their projected needs/wants related to the document at hand.

I have to admit that as a technical writer and editor in those years, I had never done a formal audience analysis until one morning at the Allegheny National Forest. My consulting assignment was to help the Forest Service writers with the Allegheny Forest Plan and EIS.

On my first morning in the Allegheny office, John Butt (their Forest Supervisor) opened the discussion by asking the Forest Service team to list all potential readers of the Forest Plan and EIS. After filling a whiteboard with listed readers, John asked us to identify which sections of the Forest Plan/EIS each reader would be most interested it. His assumption was that readers would likely read only selected sections. I had always argued that readers would approach complex documents in this fashion, but I had never done such a disciplined analysis of just which sections each reader would likely be interested in. (John, now retired from the Forest Service, does take on occasional consulting assignments, including a few from the Shipley Group.)

The list of potential readers for the Allegheny Forest Plan/EIS was valuable for two reasons. First, it assisted the Forest Service with its overall scoping effort. After all, scoping, as defined in Section 1501.7of the CEQ Regulations, implies that agencies should already have at hand a list of all interested parties. Second, this formal list of potential readers guided Allegheny writers to tailor their different sections of text to the expectations of actual readers.

The technical writing principle illustrated here is that a complex document has different writing styles/approaches and different readability levels in different sections.
I always suggest, for example, that CEQ's required summary for an EIS be written and edited for a lay audience. Many readers get no further than the summary, so it should clearly present all essential information. Similarly, I suggest that backup resource reports (either in an appendix or in agency files) are correctly more technical and complex (thus be less understandable to lay readers). This doesn't mean that reports are unclear or inconsistent, but merely that they present technical information that many readers may find difficult to follow.

So as my first recommendation suggests, survey carefully all potential readers. What information do they need or want? How can each section and subsection properly address these readers' needs and wants? A simple way to do this would be to prepare a list of readers (as in the preceding Allegheny example). Then add columns to this list, with separate columns for each chapter or even subsection of an EIS/EA. Which chapters or sections would readers be most likely to read? What resource details, for example, would be most convincing and credible?

2. Design the document to be 100 percent clear to projected readers.

I urge NEPA teams and even individual writers to take time to design a document by physically laying out its chapters and sections. Such design decisions should precede the writing of text or work on graphics. Notice that one of the first plain language recommendations (as listed in the plain language web site) is to choose an effective design for a document to be written.

A valuable technique for designing documents is a mockup (also called a storyboard or prototype). A mockup is similar to a detailed outline, but it is a spatial product instead of being a mere list of topics, as in an outline. A working mockup of a summary for an EIS would include the following:

- Actual blank pages (or screens) for the targeted number of pages (or screens)—perhaps 30 sheets for a projected EIS summary.
- Potential headings and subheadings, with a numbering system for the headings (for cross references and for easy navigation through the summary). Headings suggest needed content, and the page/screen sequence should allow writers to estimate the amount of detail/information necessary for the summary.
- Quick notes or reminders of content for writers to provide on a given page or section. Whenever possible, such notes should link to other pages or key graphics. Writers should begin to think about their writing as contributing to the overall message within the summary.
- All projected graphics (maps, planning charts, summary matrices, etc.). Position these exactly as they would appear in the final summary. Don't worry about filling them in with data; that will come later. The assigned spaces for graphics become placeholders to be filled in later.

The goal of the mockup is to have a "working" version of the document in place before writers begin to generate text. The team of writers should be able to review the mockup page by page (or screen by screen) as they check its logic and its appropriateness for readers. This is when writers should be assigned to work on sections or graphics. They should be asking these questions: What would readers most want to know? How will readers use and access specific pieces of information? How does this graphic or this data link to other discussion points in the document?

Shipley training materials and Shipley workshops routinely introduce mockups as a powerful planning tool. Many workshop participants have never had any first-hand experience with mockups. So using mockups is a culture change for many organizations.

I recommend introducing mockups gradually to NEPA teams who have not created mockups before. After all, mockups ask writers to plan a document carefully before writing a lot of text. This process reverses how many of us learned to write documents. Remind NEPA contributors, however, that mockups are especially valuable when documents need to be team written (as in a NEPA context) and need to be highly consistent and effective (again, as in a NEPA context).

3. Set readability goals for different sections of an EIS or EA

Writers (contributors to the final EIS/EA) should discuss and set readability goals for each major section or subsection they will be contributing to the EIS/EA and to supporting documents.

Such goals are not grade levels or other simplistic numerical ratings. Instead, encourage writers to vary their writing to fit their profile of potential readers. A resource specialist should vary his or her writing level depending on the type of information to be provided in a chapter or section. Content for a broad range of potential readers should be accessible to lay readers, not technical specialists. Technical terms and complex information should be appropriately summarized from a layperson's point of view. More technical content would appeal to a smaller, more technical audience. Both types of writing would, however, need to be as close to 100 percent clear as possible.

Consider, for example, the resource information a single resource specialist might contribute to an EIS/EA:

1. Existing resource conditions (Chapter 3)
2. Direct, indirect, and cumulative impacts on resource (Chapter 4)
3. Summary of impacts for the comparative summary of impacts (Chapter 2)
4. Resource profile for the preview of major issues of relevance to the project (Chapter 1)
5. Resource-specific mitigations for inclusion in one or more of the action alternatives (Chapter 2)
6. Technical appendix discussing field data and the relevant resource literature (An appendix or, optionally, inclusion in the analysis file).
7. Key text for the Summary (required for an EIS but optional for an EA). This text would supplement or explain the summary information in the Chapter 2 impact summary, which usually appears in a matrix.
8. Resource-specific responses to scoping information, from either other agencies or the public.
9. Glossary definitions for terms and concepts essential for understanding data about this single resource.

Review the preceding list. Which of these would need to be the most readable (or user friendly)? Probably the key text for the Summary (listed item 7) and the summary impact information for Chapter 2 (listed item 3).

Which of the preceding listed sections would be the most technical (and least user friendly)? Probably the backup appendix report (listed item 6). This is not to argue that a resource appendix is poorly written and unreadable. Its content should link to and be 100 percent consistent with resource information throughout the EIS or EA. The point, however, is that some of the technical information in an appendix might be complex enough that a lay reader would be unlikely to spend much time reading it.

But notice that key conclusions in the technical resource appendix should be 100 percent consistent with information elsewhere in the EIS or EA. Copying and pasting such key conclusions is perhaps the best tool for guaranteeing consistency. This is where exact repetition is a legal virtue precisely because it does help ensure 100 percent clarity throughout the entire legal record.

Readability, as just discussed, is not a simple grade level target—for instance, writing at the 10^{th} grade level. Such a grade level usually reflects only surface features in the language. Highly readable text has an effective design, has content-rich headings, and uses only essential technical concepts. Recommendations below list these and other features of text that is readable and clear to potential readers.

4. Check the usability/readability of your design (before writing text).

Review and assess your mockup (assuming you have done one!). NEPA contributors should allow for a brief meeting to review what is expected from them as they write up their assigned information.

Such a review might occur as team members turn pages in the mockup and ask the following questions:

- Will the design help readers navigate through the document?
- Are key points clearly linked at the heading level? What kinds and how many cross references should appear in the final text.
- What are the potential resource indicators (projected measures for estimating the context and intensity of impacts)?
- Where in the mockup would exact repetition of key information be desirable? How can writers plan for such repetition?
- How integrated are potential graphics into the overall content of the text?

This review of the mockup, as just described, is an informal check of a document's usability/readability. Recommendation 6 below discusses several more formal usability tests. These more formal tests are more appropriate when much of the text is written, even if the text is still a rough working draft.

5. Write text and graphics, keeping sentences short and using only essential technical terms.

Resist the temptation to write text before you have a sense of a document's overall purpose and of the text or content actually needed. I find that many professional adults begin writing difficult text before they have conceptually framed what it is they need to accomplish with the text.

This approach to writing reverses the model most of us learned to use during our schooling. Often teachers told us, and even today, tell students to brainstorm text so that they are able to get some words and phrases down on paper. Next, teachers encourage students to review their brainstorming, adding information as necessary and rearranging ideas if necessary. The content evolves and changes during its writing. Such an approach to writing is fine for inexperienced writers and for documents that do not have well-defined legal requirements. Novels or poetry come to mind. It is also fine for writers who have the time to revise and condense rambling brainstorming notes!

NEPA documents properly demand an approach that differs from the traditional school process. NEPA writers start with many givens—from the required CEQ chapters to specific sorts of resource information. With this many givens, writers should be writing text to fit the overall document, not to discover new and wondrous implications from their brainstorming notes. Brainstorming, if it occurs, would be most helpful during the development of the mockup (recommendation 2 above).

As NEPA writers begin to write the required text and to complete projected graphics, they should follow these seven principles of document clarity:

1. Follow the headings and subheadings, as set in the design of the overall document (see the mockup, as discussed in recommendation 2).

2. Preview content so that readers always can predict what comes next in a section or even on a single page.

3. Move key information up and left in sections, subsections, paragraphs, and even sentences.

4. Keep paragraphs short and replace long paragraphs, as appropriate, with graphics or displayed lists.

5. Keep sentences short—with an average length under 20 words; a 15-word average is even better.

6. Repeat key words or concepts in successive sentences so that the content has a logical, convincing thread for readers to follow.

7. Choose simple, conversational language and avoid, whenever possible, complex terms, acronyms, and technical abbreviations.

The preceding seven principles are the basis for the Shipley Group workshops on effective writing for NEPA specialists. My reason for mentioning them here is to suggest that writers need to write with these principles in mind so that their initial rough draft text is as close to clear and readable writing as possible. Some editing and revision of the draft text will always be necessary, but a writer's initial draft should be also close to the final version as possible.

Notice that these seven principles go far beyond the traditional topics usually covered by readability formulas. The traditional readability formula calculated a readability index using average sentence length and average syllables per word (in a sample of sufficient length). Such calculations are implied in principles 5 and 7, but notice that the other principles are also very important in contributing to the overall readability of a document. This is why I earlier chose not to express readability goals solely in terms of a projected grade level.

Use the preceding seven principles both to generate text and then to evaluate text for its overall clarity. These seven principles can be and often are the basis for the readability or usability of a document.

6. Check draft text and graphics for usability/readability.

Quality documents always merit internal review (often called some sort of editing). I am choosing to call this review step for documents a usability test. This terminology includes the notion of someone actually using the information in a document.

So a usability test begins with a writer's decision about what a reader should do with the information from the document (or, optionally, what the reader should know or should feel about content in a document). The to-do goal is the important one.

In some documents a reader's role clearly includes the completion of an action. For example, a reader of assembly instructions for a child's bike can test the instructions while assembling the bike. If the instructions are so unclear that the assembly is difficult, then the text fails the usability test. More likely, they are moderately usable, but may be unclear at times as to what part attaches to another part or when bracket Q should be attached to support bar R. Such usability lapses are easy to identify when a physical task is the usability test.

What would be usability tests for sections of an EIS or EA?

Perhaps the simplest one would be to ask readers of a Chapter 4 section (the impacts chapter) to identify the direct and indirect impacts of Alternative A on a single resource, perhaps water quality. If one or more readers cannot find a sentence clearly stating the impacts of Alternative on water quality, the usability of the water quality section is flawed. Or, if three or four readers (perhaps other team members) cannot agree as to what the water quality impacts of Alternative A are, the section is similarly flawed.

So usability tests are simply an alternate way of talking about how successful readers will be in understanding a chapter to section of an EIS or EA.

Sadly, many NEPA teams provide for only limited reviews of key chapters or sections. Often, I hear from team leaders that they didn't have time for structured reviews by other writers or by externally chosen readers. Documents that do have such reviews are always in danger of being incomprehensible to lay readers or, even worse, of failing to include key facts that readers (such as a judge) need to know if the EIS or EA is to be a legally credible document.

A quality EIS or EA always requires time for carefully structured reviews of all sections, ranging from the four major chapters of an EIS or EA to the background memo on a key resource question. All parts of the written record must be credible legal products or the whole NEPA process may be compromised.

A Challenge

Pick a recent EIS or EA, either your own document or one created by colleagues. Pick a key section from Chapter 4 (the NEPA impacts chapter). Ask three or four colleagues to read the section and to tell you what the impact conclusion is in the selected pages. If your colleagues fail to find a clear conclusion or if they differ in their responses, that section of the EIS or EA is obviously not clear.

This very simple usability test will provide you with valuable feedback on the legal credibility of the chosen EIS or EA. As appropriate, repeat the test with each resource discussion in Chapter 4. Also, ask readers to check their identified impacts against the summary of impacts in Chapter 2 (assuming the EA/EIS provided this recommended summary).

The following question is the best readability test, but notice that it would surely need to be based on tests such as those suggested in the preceding paragraphs. **Would a judge view your EIS/EA as a legally compliant NEPA document?** (The good news is that most EISs or EAs never have to survive legal challenge in the Federal courts.)