## How to Prevent NEPA Documentation Disasters

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NEPA documents can sometimes be disasters despite a NEPA team's best efforts. A documentation disaster usually begins at the earliest stages of document creation. Team members may fail to get clear and consistent task descriptions, so their contributions to an EIS or EA are weak, perhaps irrelevant. Or the entire team conceptually frames key information without getting approval from the decisionmaker. Whatever the actual reason, most document disasters occur when the initial conception for the EIS or EA is flawed, and no one catches the flaws until the EIS or EA is published.

Similar problems can and often do produce software disasters, especially when a team of software developers makes early conceptual mistakes. An article in the June issue of *Scientific American* discusses recent software disasters, especially those that can be traced back to early conceptual flaws. Daniel Jackson, its author, argues that projects can avoid flawed software if analysts conduct early reliability tests of the software design decisions (essentially, the early planning decisions). Such early tests, using sophisticated analysis engines, can discover if the software, when finally written, will be reliable.

Jackson cites several major software disasters to support his plea for early testing. The most well known of these disasters was the baggage handling software at the Denver International Airport (DIA). Defective software initially delayed the opening of the airport for some 16 months. Even then the software did not work as planned. Finally last summer, nearly 11 years after the airport's opening, airport managers "pulled the plug" on the software. Manually handled luggage and human-driven carts returned to DIA. This disaster cost the DIA and United Airlines, its principal tenant, billions.

**Recommendation: NEPA writers can and should avoid documentation disasters by using early reviews (or tests) in preparing an EIS or a complex EA**.

This recommendation parallels Daniel Jackson's recommendation for avoiding software disasters. By analogy, NEPA documents and software documentation share many of the same features. NEPA documents need to work in a legal sense just as a complex software program needs to work when finally installed. Documents work when they deliver the necessary information to users (readers) who need to find and easily retrieve legally relevant information.

**A published NEPA document <u>works</u> if it answers all analysis questions with 100 percent clarity**. Even the most skeptical of readers will not miss major conclusions nor misunderstand the rationale behind them. Such documents will reflect an agency's good faith effort to assess honestly all potential environmental impacts.

Draft NEPA text should require no major revisions if writers are addressing previously identified topics and providing appropriately focused information. All technical details and conclusion should be 100 percent consistent with content elsewhere in the document. A dependable and useful EIS or EA will have no legal glitches. And if any underlying assumptions in an EIS or EA turn out to have been flawed, sound writing strategies should help its writers and editors identify possible flaws well before text for the final document is ready for publication.

Unfortunately, few NEPA documents receive early and timely review. Critical adequacy reviews for most NEPA document often occur only after the document is either finished (and published) or nearly finished. Senior managers or agency legal counsels usually conduct such late-stage reviews, and any flaws they discover require weeks or months of expensive revision work.

NEPA writers and resource specialists often argue that they don't have time for ongoing internal reviews of an evolving EIS or EA. Instead, they are rushing to meet a deadline. No wonder many published EISs or EAs have embarrassing gaps or inconsistencies. (As an example, a recent agency EIS was withdrawn after publication when the agency's regional reviewers decided that the document had severe legal problems. Regional reviewers explained that they had not had time to review the entire internal draft for legal adequacy before it went out to the public.)

I propose the following four steps for NEPA managers and writers to use in preparing an EIS or EA. These steps parallel similar steps that Daniel Jackson recommends for software development. If done early, the following steps should help NEPA writers produce documents that work—that is, documents that deliver the necessary NEPA legal information in initial drafts rather than in late-stage, patched-together revisions.

1. **List (and illustrate) specific document features for each contributor to an EIS or EA.**

2. **Construct a full prototype (model) of the intended document.**

3. **Test the model's usability by reviewing its design links to the document features (from step 1).**

4. **Fix any flaws or legal glitches before the text is final.**

Note that the preceding four steps are not the same as the steps Jackson lists on p. 71 of his *Scientific American* article. His steps and the accompanying analysis program are mathematically rigorous. My steps parallel his but without the same type of rigor. My steps use analogous concepts in order to arrive, hopefully, at a similar result.

The following article discusses each of these four steps and their application to NEPA documents. The article ends with a final suggestion for monitoring and feedback on NEPA documents so that agency teams do not repeat the same mistakes on their next EIS or EA.

1. **List (and illustrate) specific document features for each contributor to an EIS or EA.**

All contributors to an EIS or complex EA should list (or receive a list of) specific document features before any real work goes into resource analysis and into the writing up of an analysis. These features are really quality criteria, against which a reviewer can measure an evolving EIS or EA for adequacy.

Such features (quality criteria) are rarely, in my experience, listed before a NEPA team begins to work. Yes, some agencies provide generic templates for their NEPA practitioners to follow. Others provide a general outline of headings for a typical EIS or EA Such templates or outlines are rarely more than a listing of the four major chapters needed to conform to the Council on Environmental Quality (CEQ) Regulations. Even if second-level chapter subheadings are specified, explicit and useful guidance is missing as to the exact nature of the information needed in each section, subsection, and sub-subsection.

For most NEPA projects, the assumption is that all contributors already know what they should produce. This assumption is usually wrong, as the following examples of document features illustrate.

What sort of detailed document features do I have in mind? Here are four examples:

1. Guidance for Chapter 1(Purpose and Need) should mandate that teams identify and then list in text the major project objectives. These objectives, a logical version of the agency's purpose in proposing an action, should be measurable and should link to agency laws, regulations, or policies. These objectives should be stated as follows:

   To reduce erosion and undesirable compaction on soils in the project area, especially when erosion or compaction is occurring on or near established trails.

(For more details about objectives, see my discussion of the NEPA purpose and need chapter in last month's Shipley Group newsletter. That newsletter also suggests how the required Chapter 1 list of objectives becomes an important topic for linking with later sections of an EIS or EA and even for the rationale for final agency decision.)

2. A BLM office in Nevada generated a 2-page list of criteria for a contractor to use in designing alternatives for a BLM Resource Management Plan. This list explicitly showed the contractor how to arrive at a "range of reasonable alternatives" (the legal requirement).

   I mention this BLM example because it is a rarity, from my experience. Internal teams, for example, rarely start with a framed list of criteria for the development of alternatives. Instead, they begin with some straw alternatives, and massage those in various ad hoc ways until they satisfy the team leader or decision maker.

   From my experience, most agency NEPA coordinators expect a contractor (or an internal team) already to know how best to arrive at a range of reasonable alternatives. Without explicit guidance, however, no contractor or team can come close to what the agency really expects to see in an acceptable list of alternatives. No wonder many NEPA teams are still changing their alternatives even as they are drafting the final EIS or EA.

3. A NEPA team leader and the responsible decision maker agree early that impacts on a certain resource will be important. They further agree that the impacts will be linked to certain measurable indicators. Such early decisions should be given to the resource specialist. These initial decisions then can become quality criteria for the resource specialist to use as work begins on the identification and measurement of impacts.

   In this scenario, the resource specialist would receive a clearly framed list of topics to cover, a projected level of effort (both projected days in the field and pages of analysis information), and instructions as to how to record this information for display in an EIS or EA. (Optionally, the NEPA team leader and each specialist should meet as early as possible to lock down these project expectations. Such a meeting would head off worries about early management decisions limiting the resource specialist's creativity!)

   This detailed level of project management contrasts with the open-ended assignments most resource specialists receive. They are usually assigned to work on impacts from a proposed action (and alternatives). How much work and what the final analysis information will say and what the text will look like are rarely specified at the start of an analysis. And specialists often argue that they don't know such information until they immerse themselves in a particular project. This argument reflects project management by blank check. Contributors to the final EIS or EA receive blank checks as to what to do and what to deliver. No wonder NEPA documents often fail to meet their initial deadlines.

4. A written effects analysis should always include a separate heading for cumulative effects. Text should refer to the identified analysis boundary for that resource (not the project boundary) and should link the analysis boundary to identified past, present, and reasonably foreseeable actions of relevance to the resource. As appropriate, the text should cite where readers can find a list and discussion of these past, present, and reasonably foreseeable actions. Finally, the discussion of cumulative effects should build on the measured indicators used to display direct and indirect effects on the resource.

   The preceding guidance on effects analysis is basic and has been clearly known for years, but resource specialists are still failing to provide clear and legally adequate (that is, well focused) discussions of cumulative impacts. In many cases, they dismiss cumulative impacts as not present (without the necessary explanation for their absence). In other cases, their discussions of possible cumulative effects fail to mention either the analysis boundary or related actions of relevance.

The preceding four examples show that document guidance for each contributor should be explicit. Sometimes, a team leader or manager argues that contributors need room to be creative. An EIS or EA is not creative writing; it is, or should be, a legally structured, factual document. As such, writers should be constrained by the overall design and structure of the document. Their submitted text should fit into assigned sections, and all information submitted should be consistent with text from other resource specialists.

**2. Construct a complete prototype (model) of the intended document.**

**A carefully done, complete prototype assists a team of writers to produce a high-quality document as efficiently as possible.** This is why I recommend that all EIS or EA teams begin their work with an early and very detailed prototype. Naturally, this prototype should incorporate all of the document features listed above in step 1.

I assume that, for efficiency, writers should have the model finished and in front of them before they begin writing a line of text. They should then draft text to fit the model. This approach contrasts with the traditional approach to writing. The traditional view was that writers should brainstorm text with little regard as to what the final version would look like. Traditional writers were encouraged to leave review and revision for later. Today's writers should write text that fits into the final draft with very little revision.

A complete model or prototype is a page-by-page design of the entire document. It includes all substantive headings down to the third or even fourth level. It sketches in possible graphics. And most importantly, it has notes and reminders to writers as to the desired content. Such notes might mention, for example, that the intensity of a potential impact needs to be interpreted in light of a related project objective (as listed in Chapter 1: Purpose and Need). A prototype does not have much finished text, and even notes and marginal reminders are likely to be only key words and phrases. Draft text comes weeks or months after the team has prepared the prototype as a planning step.

Prototypes have been an engineering tool for decades; in the engineering sense, a prototype is a working model, perhaps in miniature, of a proposed machine. A document prototype is similar except that it is not, strictly speaking, a working model.

A document prototype has traditionally been prepared in a hard copy, either in a three-ring binder or on separate sheets of paper (perhaps fastened to a wall). More recently, new developments in software have allowed teams to develop a prototype on a computer. The format is unimportant as long as all contributors can contribute to the overall design/architecture of the document and can see how their submitted text will fit into the overall document.

Document prototypes have been used successfully in the creation of many important documents. Proposals are perhaps the best example. A proposal answering a Federal Request for a Proposal usually needs to meet both a page limit and a tight deadline. Here is where a prototype is very useful in coordinating complex information from teams of 20 or 30 professionals.

Many of today's writers begin with an outline, but such outlines are often not detailed enough to be very useful. The purpose of a good outline is similar to a prototype, but a prototype is more detailed and more visual in its approach to the content. Other terms for prototypes include storyboards or paste-ups. Notice that prototypes, storyboards, and paste-ups all have a visual or spatial ingredient. Space is important because it should reflect the potential importance of a particular topic or subtopic.

Shipley Group training materials routinely include information about prototypes, and Shipley consultants usually introduce prototypes as a valuable planning tool for writers. Many traditionally trained professionals have not had first-hand experience with prototypes, and often they will resist using a prototype to plan a document. But those who have had experience with prototypes attest to their value as a time saving conceptual tool.

**3. Test the model's usability by reviewing its design links to the document features (from step 1).**

Step 3 links step 1 with step 2. Individual writers (and, as appropriate, teams of writers) should meet frequently to review progress on the document. These meetings should conceptually link the listed document features (from step 1) to the prototype/model (from step 2). As appropriate, writers of specific sections should show just how they are or will be responding to the criteria listed in the document features.

How should such reviews be conducted? Probably face to face is best, especially at early or conceptual stages (when much of the text still remains to be written). The review session might be little more than a turning of pages in the prototype as the writer or writers update the team leader or other team members as to their progress on a given section. Special attention should focus on the links between one section and another or between one writer's written text and another writer's similar text.

Review comments should be recorded on the evolving prototype, and writers should be encouraged to add their own comments and observations to the prototype. In this sense, the prototype is an evolving product.

Such oral review sessions have sometimes been called structured walkthroughs. The term is a good one because it says that the reviews are looking at the overall structure of the document and its sections. They are also conceptually walking through each section and subsection of the document.

Notice that step 3 occurs well before text is ready for more detailed review and proofreading. Later-stage reviews (especially detailed editing and proofreading) usually can occur without having face-to-face meetings. Instead, a reviewer's proofreading corrections are more efficient if provided as marginal notes or as corrections in a hard copy or in a computer file.

**4. Fix any flaws or legal glitches before the text is final.**

Step 4 means that the NEPA team leader and any contributors to an EIS or EA are fixing flaws as early as possible. I repeat, "as early as possible." Major flaws should be discovered and fixed before the text is close to being a full working draft.

The goal of all four steps is to catch errors as early as possible. This should be a NEPA writer's goal, and it was Daniel Jackson's goal for software development (as described in the opening to this article).

Conceptually, this timing is not what most NEPA writers expect to do. They expect their draft text to have <u>all</u> of the potential content information; then the team leader (or a NEPA writer/editor) has the job of paring down submitted text for inclusion in the EIS or EA. This traditional version of document preparation is not efficient. No wonder many writers routinely submit rambling draft text, expecting to have a writer/editor cut, chop, and rewrite text extensively.

If a document feature (from step 1) turns out to be wrong, both it and its appearance in the prototype should be fixed so that all contributors are able to submit text that avoids the problem. A writer's goal should be to submit correct text as early in the process as possible. Extensive revision should be unnecessary because it wastes time.

Similarly, legal review, which is an essential step, should occur as early as possible. An agency legal counsel might, for example, attend a structured walkthrough of the model. Such early participation is much more productive and efficient than for the legal counsel to wait until a full draft is done. If the full draft has problems, revisions will be both time consuming and costly. They are also likely to be discouraging to the EIS or EA team members, who have invested months or years in the writing of the draft.

**Project Monitoring and Feedback: A Possible Step 5**

I considered adding monitoring and feedback to the initial list of four steps. After all, this possible step 5 would complete the cycle of document preparation presented in steps 1 through 4. I decided not to make it a fifth step because steps 1 through 4 should all be done early, preferably before most text is written. In contrast, final monitoring and feedback can only occur when the team has finished an EIS or EA.

Whether considered a formal step or not, step 5 is a crucial learning step for both a NEPA team and, hopefully, for the team's manager/decision maker. After all, if personnel don't provide time for a debriefing on a completed EIS or EA, then lessons learned will be lost.

Too often, however, both a team and its manager are so relieved to get an EIS or EA out to the public, that they fail to do any sort of formal debriefing. Let me propose several questions for a formal debriefing effort:

1. What planning steps helped the team and individual writers to create usable text as efficiently as possible?

2. What tasks or activities caused delays in getting out the final EIS or EA? Which were within the team's control and which weren't?

3. When were senior managers and agency legal counsels involved in checking an EIS or EA for adequacy? Were these checkpoints early enough in the process to be efficient?

NEPA project management is a complex, unruly task in the best of situations. This complexity is why I recommend that NEPA teams make their documentation process as efficient as possible.