

PERSPECTIVES FROM THE FIELD

Applying LEAN Process Management to the NEPA Process: The Simplified EA/CE

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The National Environmental Policy Act (NEPA) process and NEPA documents are constantly being assaulted as being too long, too cumbersome, too expensive, taking too long to accomplish, and not successfully accomplishing the goals of NEPA. Over the years, numerous efforts have attempted to reduce the overall cost, time, and size of NEPA documents. Unfortunately, most of these efforts have failed and, in many cases, actually have made things worse.

Lean process management is a tool that can be used to effectively identify opportunities to improve the NEPA process and NEPA documentation in a manner that does not compromise the principles and requirements of NEPA, but allows for more effective and efficient development of NEPA documents. The result can be NEPA documents that are shorter, but overall documentation that is more complete than what is being developed today. The simplified environmental assessment/categorical exclusion template developed for the Colorado Department of Transportation (CDOT) is an example of what this process can accomplish when Lean is applied to NEPA, and the results are staggering. In the pilot, CDOT achieved a 75% reduction in the size of the document and a 50% reduction in review time. The second project to use the template saw even better results.

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Lean Process Management

Lean Process Management was developed for Toyota by Taiichi Ohno as a tool for evaluating and improving automobile manufacturing processes. Lean is designed around a series of principles:

1. Exceed customer expectations.
2. Identify what brings value to the customer.
3. Understand your process.
4. Eliminate waste.
5. Control variation.

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Taken together, these principles provide a framework for evaluating processes in a manner that is designed to minimize loss of value in the product, while identifying and addressing those aspects of the process that do not lead to improved product delivery. Elimination of waste in the production process becomes the primary goal (waste being any point in the process in which an action or activity occurs to a product that does not add value).

The focus on the elimination of waste in the NEPA process is not groundbreaking. Development of NEPA manuals typically target the document-development process and seek to address waste by developing and clarifying processes and expectations. Form language is a means of controlling variation, and the use of concurrent reviews or NEPA/404 merger agreements are aimed to eliminate delay. Unfortunately, the NEPA industry is plagued with a level of waste in the system that has become a part of an accepted norm so prevalent that it overwhelms all efforts at incremental improvement.

Exceed Customer Expectations

Exceeding customer expectations sounds so simple. A pessimistic description might be that the customer receives their end product with fewer hassles than they expected, while a more optimistic definition would be that the end product is more valuable and effective at meeting the customer's needs than the customer anticipated. In fact, exceeding customer expectations requires significant consideration; it begins the thought process, and the failure to effectively consider this principle is the root cause of the failure of most NEPA improvement efforts. To be effective, one must be able to identify the different customers, know what the expectations are for each different kind of customer, and be able to know what product or products are being developed for each customer.

Modern NEPA documents are produced with five different customers in mind: the decision maker, the resource and regulatory agencies, the general public, interest groups, and the courts. Each of these customers has different expectations for what makes a successful NEPA document. Identifying and understanding these different expectations is critical to identifying how to improve the overall process.

Decision makers are looking to make a decision. In general, they want to make sure that the action that will be implemented (the preferred alternative) will solve the problem (purpose and need) at a cost that is acceptable (environmental consequences). They want to be able to

identify and follow the process, to know what additional steps and work may be necessary, and to be relatively certain that there is little opportunity for unknown factors to impact the decision going forward.

Resource and regulatory agencies are less concerned with the overall evaluation process. Instead, these agencies are tasked with implementing and managing specific regulatory requirements and implementing their own programs. As a customer, the agencies want to be able to see that their requirements have been met as they relate to their processes and that their programs are not being negatively affected. Preferably, they would like to see how the proposed action will benefit their programs. Resource and regulatory agencies have little interest in any aspects of the decision-making process that does not have a direct connection to their own agenda.

The general public is in many ways the most difficult customer to understand because of the wide variety of interests involved. However, this very complication is the defining feature of this customer. While in general, this customer might be interested in the decision-making process itself and the decision reached, the general public's biggest expectation is that they can identify what the project is going to do and determine how the project may affect them on a personal basis without having to spend a significant amount of effort to determine what information may be actually relevant to them.

Interest groups represent a focused area of interest to the public. Interest groups coalesce around a specific issue and want to know more specific information about that one issue. For example, the Sierra Club and the National Wildlife Federation are most focused on the impacts of activities on wildlife and other natural resources. A local parent-teacher association, meanwhile, is more concerned with impacts to local schools and education, and the Chamber of Commerce is focused on economic issues. Interest groups want to be able to identify impacts to their specific causes, and they want to be able to identify how potential impacts were identified and the evaluation process. If there are negative impacts, the special interests want to be able to evaluate the compensation being offered.

The courts are looking to see that the process meets the requirements laid forth. The courts have limited interest in the end decision, but are required to evaluate whether or not the process itself was sufficient as required by law. As a result, the courts are looking to be able to identify how the process was followed overall and to be able to identify what

information was used, what was done with the information, and how the final decision reflects the information and evaluations conducted.

Each of these customers is looking for something slightly different from the others, but there are some similarities that can be used to group customers together. The decision maker and the general public are both looking for something that allows them to understand the project quickly, to be able to identify issues succinctly without becoming bogged down in the details, and to be able to know where to find more complete information if necessary. The resource and regulatory agencies and interest groups are practically identical. Both are focused on specific issues and are looking for a complete and robust examination of the issues of specific interest to them, but do not want to have to wade through a lot of information that is not relevant to them. The courts share some of the same concerns as the agencies and interest groups, but their concern is more on the processes involved.

Modern NEPA documents try and address the expectations of all three of these major customer groups within the EA or EIS. However, this results in very large and complex documents that typically fail to meet the expectations of any of the customers. As a result, all parties are dissatisfied with NEPA overall, but they each have differing perspectives on improvement because value is different for each customer.

Identify What Brings Value to the Customer

Value is determined from the point of the customer, not the producer. Before improvements to the NEPA process can occur, those aspects of the process that bring value to the customer must be identified, and this means that the difference between what is value and what is not must be understood.

In a vulgar simplification, value is anything that the customer is willing to pay for, and anything else is waste. What this means is that anything that detracts from the process of giving the customer exactly what they want, is waste. Not all waste, however, is the same. Some waste relates to activities that are required; this is called necessary waste. For example, customers are not typically interested in the reporting requirements for compliance related to the use and disposal of hazardous materials, but these activities are required if the manufacturing process relies on the use of hazardous materials; such reporting requirements are necessary waste. This is different from delay in the process required for rework associated with mistakes or hold times because of duplicative or excessive approval requirements,

which is waste that serves no legitimate purpose (i.e., unnecessary waste).

Decision makers value reduction in risk associated with implementing an action. This means that the action will achieve the desired result and that the costs are identified and addressed to the extent possible, and where costs remain vague or unquantifiable, steps have been taken to try and control them to the extent possible. This reflects common elements of the NEPA document purpose and need, evaluating alternatives to determine the best course of action, and understanding environmental consequences and mitigation (implementation costs). In most cases, however, the decision maker is not looking for an in-depth description of the various analyses and the NEPA process. This customer values brevity and completion of the documentation process in a timely fashion. While a minimum level of document quality is expected, exacting detail in terms of language and document quality is generally not important to this customer. A professional document is expected, but exacting precision of the language is generally not important.

The general public has very similar value expectations as the decision maker. The ability to move through the document quickly, to be able to identify if an action is likely to affect them and to be able to know where to find more information if they want it represents the core values for the general public. Similar to the decision makers, the public expects a certain level of quality from a NEPA document, but specific language, formatting, and layout are generally not critical to them.

Interest groups value complete and respectful evaluation of the issues that are important to them. This is demonstrated by the identification of the facts that are important to a complete analysis of the impacts to their specific interest, as well as demonstrating that the impacts were evaluated in an appropriate manner. Damages are appropriately identified and compensation meets or exceeds the perceived damage. For the interest groups, any information that is unrelated to their specific issues is waste.

Resource and regulatory agencies reflect the same values as the interest groups, but differ in the fact that they are responsible for the implementation of laws and regulations. As such, the resource and regulatory agencies value information and organization that allows them to effectively and efficiently implement their mandates. Technical language and the correct application of regulatory requirements are necessary. Waste for the resource and regulatory

agencies is any information or process steps that they are unable to use to meet their statutory obligations.

Value for the courts relates to the demonstration that the required process for compliance with NEPA has been followed. To that end, the courts value a clear and concise demonstration of the process. Terms of art are important as they allow the courts to more effectively identify where particular information related to the process can be found. Because the courts may look at all of the process and at any of the aspects of the decision making, one might conclude that everything is of value. However, the courts do not want to wade through extraneous information in order to make their determinations. Anything that detracts from the ability of the court to identify relevant information and processes and make an expeditious determination as to the legal sufficiency of the process is waste.

Now that the various values for the different customers of the NEPA process have been identified, we can begin to see why there continues to be so much difficulty in developing NEPA documents. While the different values are not inherently contradictory, effectively addressing all of these values in a single document is not readily attainable. Reviewers may also tend toward different customers, leading to disagreement about what values are most important to address. If some of these customers could be eliminated, that would be beneficial, but that is not practical. A solution that in some manner meets all of the customer values must be identified. To do this, the process must be understood, and then waste can be addressed.

Understand Your Process

Much has been written and discussed about how the NEPA process is conducted, and the exact process used differs between agencies and can differ between sub-groups of the same agency. For example, the NEPA process used in Colorado by the Federal Highway Administration (FHWA) and the Colorado Department of Transportation is different from how NEPA is conducted by the FHWA and the Nebraska Department of Roads. Each state's Department of Transportation writes their own guidance documents on how to conduct NEPA, which may or may not be strictly adhered to by individual projects.

This is just one part of one federal agency. As a result, trying to describe in detail every NEPA process is impractical, but they do all share some similar traits. These similar traits can be thought of as the components required under the NEPA regulations and case law (e.g., Purpose and Need, Impacts,

Alternatives Analysis). However, beyond the terminology, even these components can differ significantly. Add to this that individual consultants have their own processes as they relate to NEPA activities and changing and evolving federal and state programs, and the ability to effectively demonstrate any process in a manner that is effective at the broad level may seem quixotic.

Ironically, however, we can simplify the process to a nearly comical level, and in this simplicity, we can begin to see how to address the fundamental customer problem faced by NEPA documents. At the gross level, the NEPA process consists of three fundamental steps:

1. Information is collected.
2. Information is evaluated.
3. The NEPA document is written.

Collecting information is the development of an understanding of the context of the decision. This includes information about the physical environment but also the regulatory requirements and the social and political environment surrounding the decision. Information includes understanding the issues surrounding the problem to be solved as well as the factors that will influence the costs and risks associated with addressing those problems.

Evaluating the information involves taking all of this information and determining how to use it effectively. This means identifying what information is pertinent to what issues and how those issues will be considered. Different methods of analysis may be considered and the decision maker must determine which method is most appropriate. Finally, the information is put to use and conclusions are made about the ability of an alternative to be successful and implemented, as well as the impacts of the decision to various resources.

The evaluations are then used to assemble the final NEPA document, which includes some of the collected information, aspects of the different evaluations, and other materials developed to better explain and demonstrate various aspects of the process.

But, looking at this, correlations between this gross-level process and the different customers becomes apparent. The activities related to evaluating information correlates closely with the interests of the interest groups and resource and regulatory agencies, and information collection reflects many of the values associated with the courts. In fact, this very general process describes three interconnected processes that result in different end products:

1. Information Collection = Administrative Record
2. Information Evaluation = Technical Reports
3. NEPA Document Development = EIS/CE/EA

If the Administrative Record is developed for the courts and the Technical Reports can be developed for various interest groups and regulatory agency customers, then the NEPA document can become focused on meeting the value requirements of the decision makers and the general public. As a result, any aspect of the NEPA document that does not demonstrate value to the decision maker or to the general public becomes waste.

Eliminate Waste

Lean identifies eight different areas of waste:

1. Waiting
2. Overproduction
3. Rework
4. Motion
5. Processing
6. Intellect
7. Inventory
8. Transportation

Many of the different improvement and streamlining efforts for NEPA can be traced back to one or more forms of the waste identified above. Electronic transmission between reviewers, for example, has largely eliminated the transportation costs associated with sending copies from one person to another, and more-advanced communication technologies have allowed people to effectively collaborate on the completion of NEPA documents without requiring people to move between locations as frequently as in the past.

Keeping in mind the customers being served by the NEPA document and what they value, areas of waste can begin to be addressed effectively and systematically. In NEPA, this begins by recognizing the basic unit of waste, words. Each word in a NEPA document has a process; it must be thought, written, reviewed, debated, rewritten, reviewed and debated again, and hopefully approved. While this process for any given word is short, it compounds exponentially so that by the time the entire document goes through the process, a lot of waste has been created. Past streamlining efforts tried to make this process more efficient without first recognizing a very basic fact: the best way to avoid the waste associated with this process is to not write a word.

To identify words that are unnecessary, and therefore do nothing but create waste, two rules are needed. First, everything that is written has value, and second, the value

created only exists the first time it is written. What this means is that if something already exists in the Administrative Record or in a Technical Report, then the value has already been realized and repeating this information in the NEPA document produces no additional value.

In the simplified EA/CE created for the CDOT, this begins with practically eliminating the Affected Environment chapter. This is replaced with a table that is focused on the customer, the decision maker, and the general public. The table identifies the issue, the extent of the impact, any necessary mitigation, and where additional information can be found (cite to technical report). It does not describe resources in detail, laws and regulations, or methods of evaluation. This information is already included in the appropriate technical reports and can be accessed if the customer desires.

This same system is applied to Purpose and Need and the other sections typical of a NEPA document. No information is lost, and the process is not shortchanged. However, the end result is staggering. In the pilot, a full 75% of the anticipated document size is lost, resulting in an EA for a new alignment highway that is less than 80 pages in length. The actual impact is even more impressive. The document is printed in landscape format on a normal 8.5" × 11" sheet of paper, but line spacing is increased resulting in a reduced amount of text that can be included per page; extensive use of tables and graphics further reduces the amount of writing, meaning that the actual writing in the document is reduced by a substantially larger margin than the mere page count might suggest. Because the amount of writing is so much less, the review time was substantially reduced as well, an estimated 50% reduction from the standard EA.

Control Variation

There will always be differences between NEPA documents. Controlling variation does not mean that all documents must be exactly the same or that a single template must be used. Rather, variation refers to products that differentiate from the mean. A bad variation is one that results in products outside the acceptable levels of variation and that are worse when measured against expected performance measures. A good variation is also outside of the acceptable levels, but in a positive direction based on the performance measures. These instances should be evaluated to determine what worked well and, where feasible, incorporate those lessons learned into the standard process.

A lot of the general work associated with NEPA streamlining and improvements tends to fall into the heading of

controlling variation. The problem continues to be that the lack of clear direction and purpose to the various components of the NEPA documentation means that more often than not, improvements for one customer result in reduced functionality for others.

Conclusions

The NEPA process does not produce just a NEPA document as a product, but multiple products that when taken together, form the NEPA documentation. By applying the principles of Lean process management, the NEPA professional can develop these series of products into an integrated product line in which each product is intended to serve a different customer and achieve value for that customer with the minimum amount of waste. Thus, the NEPA document (the EA, EIS, CE) can be focused to meet the needs of the decision maker and the general public without sacrificing the legal requirements for compliance with NEPA. By focusing on the elimination of unnecessary

words, phrases, or even whole chapters, the end product becomes more effective, and the amount of overall waste in the production is drastically reduced.

The simplified EA/CE developed for the CDOT begins this process by eliminating repetitive language, focusing the impact analysis for specific resources to the technical reports, and summarizing the information contained in those reports in a way that conveys to the decision makers and the public only the information that they are most interested in having, while providing a guide to where more complete information can be found if they want it.

In this way, the sources for variation in the NEPA process can begin to be more readily identified and controlled, resulting in improvement to the NEPA process that does not necessitate changes to legislation or regulation.

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