To measure the success of ongoing efforts to involve the public in government decision making, it is crucial to first define what is meant by "success." In a recent study, the authors asked participants in US Department of Energy (DOE) public participation programs nationwide to help identify different attributes of success and to rate their importance. Based on our analysis of the responses, we suggest that future evaluations focus on a set of seven distinct attributes that, in combination, accurately portray the accomplishments of public participation efforts.

Avant de mesurer le succès des efforts répétés entrepris dans le but d'impliquer davantage le public à la prise de décision, il est crucial de définir ce qu'on entend par " succès ". Dans le cadre d'une étude récente, les auteurs demandent aux participants aux programmes nationaux publics du Ministère de l'énergie américain d'identifier différents attributs du succès et de les classer en ordre d'importance. En se fondant sur l'analyse des réponses, nous suggérons qu 'à l'avenir les évaluations mettent l'accent sur une série de sept facteurs distincts qui, combinés, expriment de manière exacte les réalisations qui découlent des efforts de participation du public.

Defining Success for Public Participation Programs

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Introduction

Public participation in decision-making has become very common at all levels of government in the United States and is being used with increasing frequency in the private sector as well. Recent reports by the National Research Council and the Commission on Risk Assessment and Risk Management, established jointly by the White House and Congress, conclude that risk decisions must increasingly be structured in such a manner as to involve stakeholders meaningfully in the processes and activities leading to decisions and, perhaps, through the implementation of those decisions (Phibbs 1996a and 1996b).[1] Thus, the public participation efforts undertaken by decision-making organizations are increasingly recognized as a vital part of our common efforts to resolve national and sub-national problems.

This article reports key findings from a recent

1/ In this article, we refer to the various individuals and groups who have an interest in the outcome of a particular decision as "stakeholders." This term applies whether or not the interested person or group is directly involved in a given public participation effort. We can distinguish among participating and non-participating stakeholders, as well as among stakeholders who are "internal" and "external" to the agency with primary decision-making responsibility.

study on measuring the success of public participation programs that Oak Ridge National Laboratory (ORNL) performed for the Office of Intergovernmental and Public Accountability within the US Department of Energy's (DOE) Office of Environmental Management (EM). While the full ORNL report on which this article is based (Carnes et al. 1996) culminated with the development of performance-based indicators that could be used in future evaluations of EM's public participation programs, this article focuses on the underlying question of what is meant by "successful" public participation—which must be resolved before any evaluation can be performed. Although our study examined public participation efforts sponsored by DOE, we believe that the findings presented here can be useful to those attempting to understand and measure the success of programs undertaken by any number of public or private sector organizations.

The success of DOE's public participation efforts at its EM sites can be conceptualized in a number of different ways. For instance, one could say that a successful program is one that allows full and active stakeholder representation. One could also say that a successful program is one that results in the minimization of adverse environmental impacts, or one in which key decisions are accepted as legitimate by stakeholders. Each of these statements describes a specific attribute of success, focusing on a particular facet or characteristic of successful public participation programs. These statements could also be referred to as "conceptualizations" or "definitions" of success, but we will use the term "attribute" to convey the idea that we are describing individual aspects of success, none of which—by itself—definitively describes program success. And using the term "attribute" helps emphasize that the various concepts of success presented here are not mutually exclusive.

The next section of this article provides some additional background to characterize the context of EM's policy environment and decision making problems and the role of public participation in its decision making, followed by a discussion of the methods we used to collect information on a broad range of possible attributes of successful public participation. This discussion is followed by a description of each different attribute, a discussion of how these attributes were rated by a variety of stakeholders, a brief examination of other possible attributes, and recommendations for an abbreviated set of attributes of success to use in future evaluations of public participation programs.

Decision Environment for the Office of Environmental Management

The primary EM program mission is to protect human health and the environment. EM is organized around four central functions–waste management, environmental restoration (including remedial actions and decontamination and decommissioning of surplus facilities), technology development, and facility transition and management. These functions are implemented at Headquarters and field sites. EM's implementation of its mission and functions is particularly difficult in light of a number of challenges currently facing the office. These challenges include:

- converting the nation's largest industrial complex from defense nuclear materials production to environmental management;
- replacing a legacy of secrecy and mutual distrust between DOE and its stakeholders with a relationship characterized by open communication and mutual trust and respect;
- developing and using safer and more cost-effective waste management, remediation, decontamination, and decommissioning technologies;
- establishing consensus definitions of what "clean" means, and setting standards for assessing when a site is clean;
- working with stakeholders to define and understand risk management and to integrate risk and "how clean is clean" determinations in deciding the future use of surplus DOE sites; and
- making difficult decisions, with stakeholder input, that balance budget constraints with other important objectives while simultaneously solving regulatory conflicts.

The range and complexity of problems facing EM, and the decisions that must be made to solve these problems, are considerable. They may range from how to decontaminate a single building at a single site and remediate environmental contamination resulting from activities in that building to managing and disposing of DOE's spent nuclear

fuel throughout the entire complex.

Resolving these problems is made even more problematic by the fragmented nature of the institutional environment in which EM operates. Part of this institutional environment, the federal governmental system, has multiple layers of national, state, tribal, and local government agencies and other representatives (e.g., US Congress and state, tribal, and local legislative and regulatory bodies) with varying levels of influence and authority over DOE decision making. In DOE's case, its approximately 130 sites with environmental restoration and/or waste management operations are located in 32 states and Puerto Rico. Although in many cases DOE may be able to deal with a single state, tribal, or local government at a time, whenever DOE anticipates inter-site activities, coordination, consultation, and regulatory requirements expand significantly.

In addition to those stakeholders with constitutional or statutory responsibilities and authorities, EM acknowledges that its stakeholders include: environmental groups; labor unions; community organizations; citizens, including Native Americans, who live near DOE sites or in the same state; other interested members of the public; and every taxpayer in the nation. Although these groups and individuals do not have legal authority over DOE decision making, EM recognizes these stakeholders as important participants in its decision making.

Research Problem

Determining whether an activity has succeeded is often problematic. Such a determination depends fundamentally on how success is defined and how one determines or measures whether success has been achieved according to that definition. For its part, EM has stated that it believes that successful public participation will result in decisions that:

- are technically feasible;
- are economically feasible;
- are environmentally sound;
- are health and safety conscious;
- address public concerns and values; and
- can be implemented.

While these decision outcomes might be reasonable as a "long-term" definition of success, uncertainties regarding the lag times and causal pathways associated with these concepts make their measurement difficult in the short term. Moreover, this outcome-oriented definition of success may or may not be consistent with the views of EM's diverse stakeholders (see above). These stakeholders might accept some or all of the components of EM's definition, but might also include other procedural as well as substantive elements. They might, for instance, include issues such as (1) winning and securing as many objectives as possible for themselves (i.e., self-interest); (2) getting a fair settlement and "having things come out right" (i.e., distributive justice); and/ or (3) having the problem resolved through a procedure they view as fair (i.e., procedural justice). In short, these stakeholders may define success in terms of *their* principal objectives and agendas and may be more or less sensitive to EM's multiple objectives.

Developing attributes of successful public participation is influenced not just by the specific facets of success on which one might choose to focus but also by how the major problems are stated. As indicated in Figure 1, public participation is embedded within particular problems and their contexts and within associated decisions and their contexts. Although a government agency can and does structure problems, decisions, and their contexts for its stakeholders prior to their involvement, it is important to understand and assess the extent to which internal and external stakeholders have common conceptions of what the problem is and how it relates to other problems and what decision needs to be made and how it relates to other decisions.

Decisions obviously can be and have been made by DOE and other agencies without explicitly or proactively incorporating stakeholder concerns. Thus, although agencies have historically been required to incorporate input from regulatory agencies, decisions could be made without the non-regulatory stakeholder involvement shown in Figure 1. In the context of current EM and DOE policy, however, the decision making environment can be envisioned as shown in Figure 1 *with* the full accompaniment of public participation activities and outcomes. Once these activities have been completed and stakeholder concerns have been considered by the decision-making authority, a decision is rendered (i.e., decision output) and im-

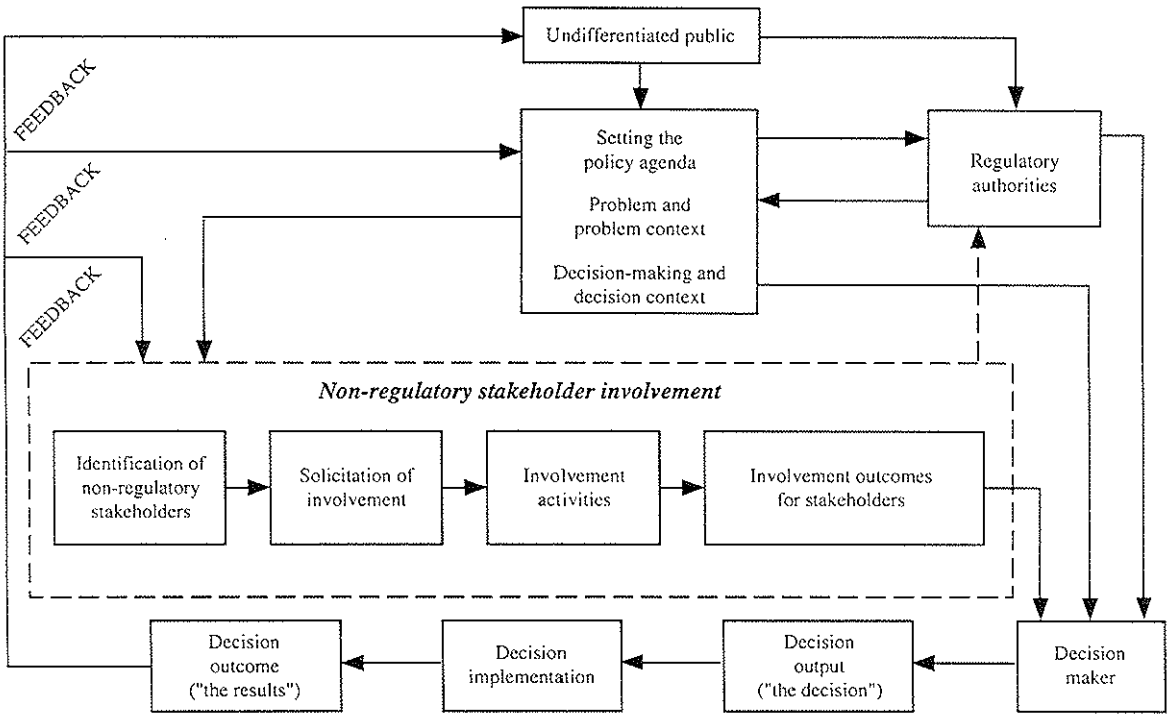

Figure 1: A decision-making framework incorporating public participation.

plemented. Once implemented, the outcome of the decision is monitored to determine if the decision and its implementation resolved the problem at hand; if necessary, the decision and implementation are adjusted through feedback loops. Of course, it is possible that the initial decision (or proposal) cannot be implemented if sufficient opposition to the decision emerges.

Research Approach and Methods

The basic approach taken in this effort was to ask internal and external stakeholders to help identify attributes of successful public participation in EM activities. Prior to eliciting comments from stakeholders, however, we conducted a review of the relevant literatures to develop a conceptual framework or schema in which to embed our investigation (see above), to see how the success of public participation efforts had been defined and measured in previous evaluations, and to help identify the key stakeholder groups to interview. These reviews included research associated with public and stakeholder participation (e.g., Alinsky 1946; Arnstein 1969; Hutcheson and Shevin 1976; Lowi, Ginsberg, et al. 1976; Milbrath 1981; Kraft 1988; and Cvetkovich and Earle 1994), bureaucratic systems (e.g., Yates 1982; Hilgartner and Bosk 1988; Baumgartner and Jones 1993; Bosso 1994; and Rochefort and Cobb 1994), democratic theory and theories of justice (e.g., Schattschneider 1960; Fisher and Ury 1983; Tyler 1990; Lindblom 1990; and Shklar 1990), and program evaluation research (e.g., Rosener 1978; Young, Williams, and Goldberg 1993; Syme and Sadler 1994; Lach, Hixson, and Ramonas 1995; and MaGuire 1995). We also examined various DOE reports (e.g., Beck, Kelly, and Forbes 1995; US DOE 1994a; US DOE 1994b; US DOE 1994c) for characterizations of DOE sites and their environmental management problems and activities. Based on this literature review and prior professional experience, we designed an open-ended oral data collection protocol to elicit stakeholder views regarding the meaning of successful public participation (see below).

We selected nine of the approximately 130

DOE sites and EM programs as our sample for data collection. This sample was drawn to obtain substantial variety in terms of geographic location, types of environmental management activities, current life-cycle stage of those EM efforts, and public participation mechanisms utilized. Background information on these characteristics of potential study sites came from published reports (US DOE 1995a, US DOE 1995b) and discussions with knowledgeable professionals familiar with DOE's EM activities. Five DOE facilities were selected for intensive site visits: the Fernald Environmental Management Project in Ohio; the Savannah River Site in South Carolina; the Oak Ridge Reservation in Tennessee; the Sandia National Laboratories in New Mexico; and the Ambrosia Lake Uranium Mill Tailings Remedial Action (UMTRA) project, also in New Mexico. In addition, telephone interviews were conducted with key stakeholders at four additional sites: the Weldon Spring Site Remedial Action Project in Missouri; a Formerly Utilized Sites Remedial Action Program (FUSRAP) site in Wayne, New Jersey; the Stanford Linear Accelerator Center (SLAC) in California; and the West Valley Demonstration Project in New York. In order to focus our and our respondents' attention on the relationship between public participation and decision making, our research efforts at each site focused on the entire range of public participation efforts associated with a specific EM activity or logically connected set of activities, rather than on the full range of EM activities that may be associated with a particular site (see Table 1). The nine sites represented different stages of environmental remediation and waste management, including: planning, studying, and organizing for cleanup or waste management; decision making; actual cleanup or waste treatment, storage (including containment); completion and closure; and disposal. They also displayed a range of objectives in addition to the principal one of cleaning up or managing whatever contaminants were at issue.

Based on our reviews of DOE documents (US DOE 1994a; US DOE 1994b; US DOE 1994c, US DOE 1995a, US DOE 1995b) and discussions with public participation specialists associated with each site, we identified key stakeholder groups for each site. The key stakeholder groups from which we chose representatives to interview at the study sites are the following:

- State and local government officials (e.g., elected office-holders, paid staff, and appointed board members);
- DOE project managers and public participation staff (variously called community relations, public affairs, public information, and other titles);
- Project managers and public participation staff for the Management and Operations contractor managing the case study facility for DOE (e.g., Lockheed Martin Energy Systems at Oak Ridge);
- Non-government groups concerned with environmental protection, public safety, and health issues;
- Federal and state environmental regulators (e.g., the US Environmental Protection Agency and state departments of health or environmental protection–typically one of the state permitting agencies);
- Business organizations (e.g., local chambers of commerce);
- Civic clubs and organizations (e.g., the League of Women Voters);
- Owners of property near the facility with a direct financial stake in the outcome of the EM activity;
- Native American tribal governments;
- Labor unions; and
- Other interested parties.

This purposive sample, focusing on types of participants who are typically involved in environmental decision-making processes rather than on representatives of the general public or other social groupings, was selected to provide variation in stakeholder types and to make the most effective and efficient use of our resources. We found that interviews with approximately 12 to 15 representatives of stakeholder groups were necessary to cover the distribution of views at each site adequately.

An open-ended oral data collection protocol was used during the first two site visits—one to Fernald and one to Savannah River. Using the information gathered at these sites in late October and early November of 1995, we refined the open-ended oral protocol, designed a supplemental written survey, and used these new instruments to collect data from stakeholders at all subsequent sites. We also sent the written survey to all respondents previously interviewed at Fernald and

Table 1: Sample of DOE sites and EM decisions.

DOE site (location)	Subject of EM decision(s)
• Fernald Environmental Management Project (Fernald, Ohio)	• Cleanup of entire site, and off-site versus on-site disposal of high-level and low-level radioactive and chemical wastes
• Savannah River Site (Aiken, South Carolina)	• Treatment of contaminated ground water in F and H fields
• Oak Ridge Reservation (Oak Ridge, Tennessee)	• Mercury contamination in East Fork Poplar Creek
• Sandia National Laboratories (Albuquerque, New Mexico)	• Consolidated treatment, storage, and containment of hazardous wastes in a Corrective Action Management Unit (CAMU) and Treatment Unit (TU)
• Ambrosia Lake Uranium Mill Tailings Remedial Action (UMTRA) Project (Ambrosia Lake, New Mexico)	• Surface cleanup of uranium mill tailing site
• Stanford Linear Accelerator Center (Stanford, California)	• Removal of polychlorinated biphenyls (PCBs) from soils in the IR-G drainage channel
• Weldon Spring Remedial Action Project (Weldon Spring, Missouri)	• Cleanup and decommissioning of entire site
• West Valley Demonstration Project (DOE portion) (West Valley, New York)	• Vitrification of high-level radioactive wastes
• Wayne Formerly Utilized Sites Remedial Action Program (FUSRAP) (Wayne, New Jersey)	• Treatment of off-site thorium contamination

Savannah River so that we would have comparable data for all sites.[2] Among other things, the written survey was designed to elicit respondent preferences to specific attributes of success.

Description of Attributes Rated by Stakeholders

We asked survey respondents to rate 16 different attributes on the basis of how important they believed each one to be for evaluating the success of the DOE public participation programs with which they had been involved. Then, in a follow-up question, we asked each respondent to list the five attributes that they considered *most* important for evaluating DOE's public participation efforts. Table 2 shows the attributes of success that we used in the survey, grouped into five broad subject areas: (1) the decision-making process; (2) effects of public participation on stakeholder understanding and attitudes; (3) effects of public participation on environmental management decisions; (4) effects of environmental management decisions on site conditions; and (5) effects of environmental management decisions on stakeholders' objectives. We believe that, among them, the 16 attributes cover all major stakeholder perspectives and provide a reasonably thorough listing of the ways in which success can be conceptualized for DOE's public participation efforts. Further, each attribute is broad enough to be useful in evaluating a wide range of public participation efforts associated with a variety of environmental management programs.

Attributes of Success that Focus on the Decision-making Process

The decision-making process allows full and active stakeholder representation. This attribute addresses the opportunities that various interested parties have to present their views to DOE. This is an important component of what is sometimes referred to as "procedural justice," because it deals with how open or "accessible" the process is to the full range of participants. However, this attribute does not indicate how seriously DOE decision-

2/ Preliminary suggestions for definitions (later called attributes) of successful public participation were elicited from interviewees at Fernald and Savannah River and combined with elements identified in research literatures from political science, sociology, and program evaluation, among others. These attributes were reviewed and adapted for use in the written survey, where opportunity was also provided for respondents to identify any other attributes of successful public participation.

Table 2: Attributes of success for DOE's public participation programs used in survey

I. The Decision-Making Process
- The decision-making process allows full and active stakeholder representation
- DOE is presented with comprehensive and thoughtful input by the public
- The decision-making process is accepted as legitimate by stakeholders

II. Effects of Public Participation on Stakeholder Understanding and Attitudes
- The public understands DOE's environmental management problems and associated actions
- The public understands the connection between clean-up costs and environmental benefits
- DOE understands public concerns
- The public has trust and confidence in DOE and the DOE facility

III. Effects of Public Participation on Environmental Management Decisions
- Key decisions are influenced by the public
- Key decisions are improved by public participation
- Key decisions are accepted as legitimate by stakeholders

IV. Effects of Environmental Management Decisions on Site Conditions
- Environmental management costs are minimized
- Adverse environmental impacts are minimized
- Adverse impacts are distributed equitably among the public

V. Effects of Environmental Management Decisions on Stakeholders' Objectives
- Stakeholder (DOE and non-DOE) objectives for a particular public participation effort are met
- DOE's site-specific mission is accomplished
- The overall objectives of non-DOE stakeholders are met

makers treat the input they receive from various stakeholders nor how much effect this input has on the decisions that are ultimately reached.

DOE is presented with comprehensive and thoughtful input by the public. This attribute focuses on federal decision-makers' elicitation of information from other stakeholders. However, as with the previous attribute, this one does not address the issue of how seriously public input is treated nor its effect on subsequent decisions.

The decision-making process is accepted as legitimate by stakeholders. This attribute describes the judgment of the various interested parties as to the fairness of the procedures by which key decisions are made. This attribute goes beyond the involvement of the various stakeholder groups to examine the acceptability of the entire decision-making process.

Attributes of Success that Focus on Effects of Public Participation on Stakeholder Understanding and Attitudes

The public understands DOE's environmental management problems and associated actions. This attribute focuses on how well DOE does at imparting information about its environmental management situation and proposed responses to the other stakeholders. By itself, this attribute addresses educational, rather than interactive, aspects of public participation efforts.

The public understands the connection between clean-up costs and environmental benefits. This attribute is very similar to the preceding one, except that it captures how well the public is educated about the trade-offs that frequently must be made between clean-up costs and environmental quality, rather than about the overall EM program.

DOE understands public concerns. This attribute is the counterpart to those attributes of success that focus on how well the public understands DOE issues and concerns. It also is very similar to the second attribute in the preceding category (DOE is presented with comprehensive and thoughtful input by the public), except that it goes beyond the mere receipt of stakeholder input to address the comprehension of that information.

The public has trust and confidence in DOE and the DOE facility. This attribute focuses on public confidence in DOE and in the correctness of

its actions, and often is thought of as being directly related to how much resistance DOE is likely to encounter in performing those tasks that are vital to its mission.

Attributes of Success that Focus on Effects of Public Participation on Environmental Management Decisions

Key decisions are influenced by the public. The focus of this attribute is on the effect of public input on DOE's decisions and associated actions.

Key decisions are improved by public participation. This takes the previous attribute and adds a value component. Now, it is no longer enough for the public to influence a decision, but that decision has to be influenced in a manner that is considered positive by the parties involved.

Key decisions are accepted as legitimate by stakeholders. This is similar to the last attribute in the first general category (the decision-making process is accepted as legitimate by stakeholders), except that this one focuses on substantive decisions rather than on the process by which they are reached.

Attributes of Success that Focus on Effects of Environmental Management Decisions on Site Conditions

Environmental management costs are minimized. This attribute focuses on the costs of environmental clean-up—which is important to DOE project managers and other cost-conscious stakeholders—without examining how effective DOE's actions are or how appropriate the public considers them to be.

Adverse environmental impacts are minimized. This attribute is the mirror image of the attribute discussed above, in that it focuses on environmental quality without focusing on the associated costs.

Adverse impacts are distributed equitably among the public. This attribute frames success in terms of how the negative effects associated with environmental management efforts are spread throughout the impact region. This issue often is considered under the rubric of "environmental justice" and reflects a concern that adverse impacts not be disproportionately placed upon minority or low-income communities.

Attributes of Success that Focus on Effects of Environmental Management Decisions on Stakeholders' Objectives

Stakeholder objectives for a particular public participation effort are met. This attribute focuses on what DOE and all other stakeholders hope to accomplish through public participation, and gauges success in terms of how well these objectives are satisfied.

DOE's site-specific mission is accomplished. This attribute describes success in terms of the accomplishment of DOE's goals. While the previous attribute examines how well the goals for a specific public participation effort are met, this one focuses on DOE's mission for the site in question (e.g., the safe management of all on-site wastes) and how well that mission is served by the public participation efforts under study.

The overall objectives of non-DOE stakeholders are met. This attribute is an analogue to the one discussed immediately above. In this case, however, the overall mission of the external stakeholders is addressed rather than DOE's mission.

Stakeholder Responses to Attributes

All 106 individuals who completed the written survey were categorized according to their main organizational affiliation, as shown in Figure 2.[3] Representatives of non-regulatory state and local government agencies—composed of elected officials, paid staff, and appointed board members—accounted for just under one-fourth of all survey respondents. Nearly one-fifth of those completing the survey were DOE contractors, and almost as many were employed directly by DOE.[4] Almost one-eighth of the survey respondents were members of non-government environmental and health groups, and just under one of every ten people completing the survey was classified as a state or

3/ The 106 completed surveys represent a response rate of approximately 77%.

4/ Of the DOE and DOE-affiliated respondents, 47.3% were primarily involved with public participation, 39.5% were project management staff, and the remaining 13.2% were heavily involved with both public participation and project management.

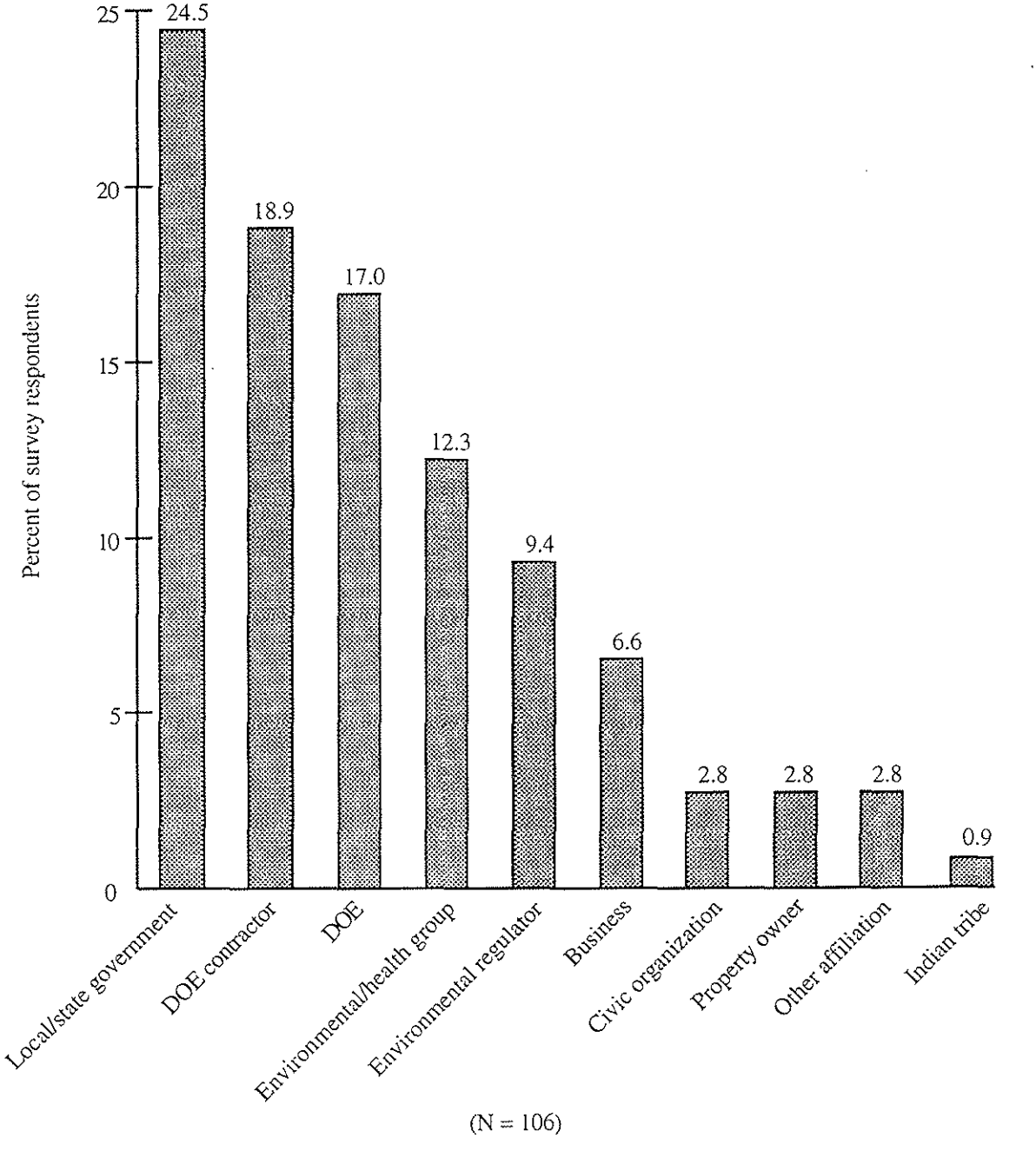

Figure 2: Distribution of survey respondents, by organization type.

federal environmental regulator. One of every 15 survey respondents represented business interests, such as local chambers of commerce. Substantially smaller numbers of respondents were classified as being primarily affiliated with one of the other stakeholder groups: civic organizations, nearby property owners with a direct financial stake in the outcomes of the EM effort, Indian tribal government, or other interested parties.

For all respondents completing the written sur-

Table 3: Stakeholders' mean rating for each attribute of success

Attribute of success	Mean rating
The decision-making process is accepted as legitimate by stakeholders	4.46
DOE understands public concerns	4.35
The decision-making process allows full and active stakeholder representation	4.31
Key decisions are accepted as legitimate by stakeholders	4.28
The public has trust and confidence in DOE and the DOE facility	4.15
Key decisions are improved by public participation	4.00
The public understands the connection between clean-up costs and environmental benefits	3.90
The public understands DOE's environmental management problems and associated actions	3.88
Key decisions are influenced by the public	3.85
Adverse environmental impacts are minimized	3.85
DOE is presented with comprehensive and thoughtful input by the public	3.80
DOE's site-specific mission is accomplished	3.75
Stakeholder (DOE and non-DOE) objectives for a particular public participation effort are met	3.67
The overall objectives of non-DOE stakeholders are met	3.55
Environmental management costs are minimized	3.30
Any adverse impacts are distributed equitably among the public	3.23

vey, the mean ratings describing the perceived importance of each attribute for evaluating the success of DOE's public participation efforts are shown in Table 3. On the five-point scale that was used—with one being "not important" and five being "essential"—six items received a mean score of four ("very important") or greater. In descending order from highest mean rating to lowest, these are: (1) the decision-making process is accepted as legitimate by stakeholders; (2) DOE understands public concerns; (3) the decision-making process allows full and active stakeholder representation; (4) key decisions are accepted as legitimate by stakeholders; (5) the public has trust and confidence in DOE and the DOE facility; and (6) key decisions are improved by public participation. No attribute received a mean score of less than three ("moderately important"), but the two least-favored attributes were relatively close to that mark: environmental management costs are minimized; and any adverse impacts are distributed equitably among the public.

In addition to asking respondents to rate the importance of the various attributes of success, we asked which five attributes they considered to be *most important* for evaluating DOE's public participation efforts. We attached great significance to this latter question, because it required stakeholders to weigh the relative merits of all 16 attributes and declare which they considered most important. Figure 3 shows the percentage of all survey respondents who included each item in their list of the five most important attributes of success. Three attributes stood out as clearly more important than all the rest:

- the decision-making process is accepted as legitimate by stakeholders;
- DOE understands public concerns; and
- the decision-making process allows full and active stakeholder representation.

Each of these attributes was on the "top five" list for over three-fifths of all respondents. Not surprisingly, these are the same attributes identified above as receiving the three highest mean ratings on our five-point scale. Another block of three attributes—while not as widely mentioned as the first three—emerged as being very important to a substantial number of respondents. These attributes are: the public has trust and confidence in DOE and the DOE facility; key decisions are accepted as legitimate by stakeholders; and key decisions are improved by public participation. These attributes, which were on the "top five" lists for about two-fifths of all respondents, are the same as those receiving the fourth through sixth highest mean ratings on the previously mentioned scaled question concerning attribute importance.

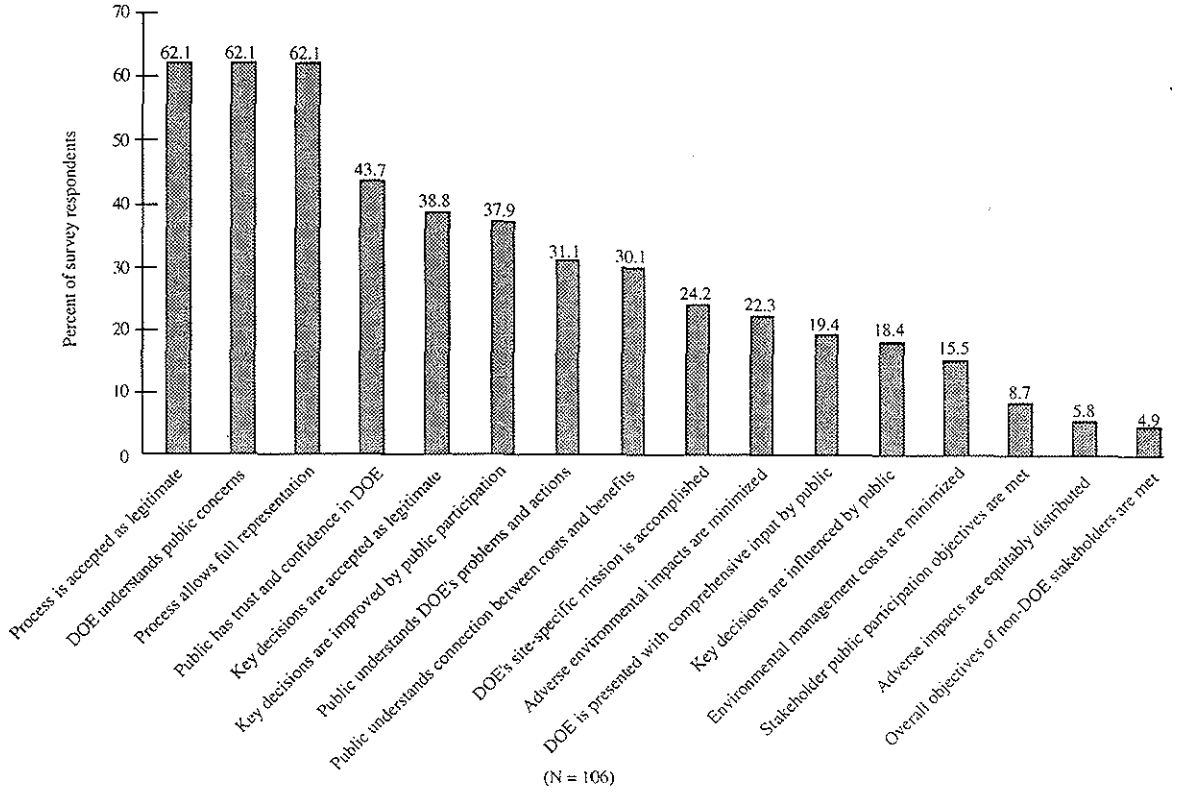

Figure 3: Percent of all survey respondents including each attribute of success in their "top five" list.

Disaggregating survey results by organizational type is necessary to see if differences emerge among the different types of stakeholders in terms of the attributes that they favor. We found that the top three attributes listed above ("the decision-making process is accepted as legitimate by stakeholders;" "DOE understands public concerns;" and "the decision-making process allows full and active stakeholder representation") were among the most frequently mentioned items in the "top five" lists for nearly every type of organization represented. The next two most popular attributes ("the public has trust and confidence in DOE;" and "key decisions are accepted as legitimate") also did well with most organization types, but there was not the unanimity, or near-unanimity, of opinion that we found for the first three items. And the sixth most popular attribute ("key decisions are improved by public participation") was among the five attributes appearing most frequently on the "top five" lists of *half* of the most common stakeholder groups. A few other attributes frequently appeared on the "top five" lists for one or two stakeholder groups. Most notably, "DOE's site-specific mission is accomplished" was among the most frequently mentioned "top five" items for DOE and business groups.

When disaggregating the survey responses by *site*, we find that the three most popular attributes described above were also among the five items appearing most frequently on the "top five" lists of virtually every site.[5] The three next most popular attributes also were among the most frequently listed "top five" items for many of the sites.

Other Possible Attributes

In addition to asking respondents to rate the importance of 16 different attributes of success, the written survey provided the opportunity to suggest

5/ "The decision-making process allows full and active stakeholder representation" is the only one of the three attributes that was not among the most frequently listed "top five" items at every site, and this was missing only at a single location.

"other" attributes. Of the 106 individuals who completed the survey, 17 described other attributes of success. Most of these other attributes were quite similar to the attributes listed in the survey, differing in wording or emphasis but not in concept. Three of the suggested attributes, however, were sufficiently different from the other 16 to warrant further consideration. In addition, a fourth new attribute, suggested by our ongoing literature review, was examined. These four "other" attributes are: "the public is presented with comprehensive information by DOE"; "various stakeholders understand one another's concerns"; "DOE and the public understand the long-term environmental consequences of the decision"; and "existing conflicts are resolved." Each is discussed briefly below.

"The public is presented with comprehensive information by DOE" is an analogue to an attribute that appeared in the survey: "DOE is presented with comprehensive and thoughtful input by the public." That survey item was given relatively low ratings by most respondents, indicating that the provision of information is less important to stakeholders than are other attributes. Also, because this new attribute falls under the general category of "the decision-making process" and that category is well-represented by two top-ranking attributes, it is unlikely that this new item would contribute significantly to our understanding of public participation success.

"Various stakeholders understand one another's concerns" combines two existing attributes: "the public understands DOE's environmental management problems and associated actions" and "DOE understands public concerns." This new attribute, therefore, could substitute for *two* well-received attributes and adds the concept—previously not addressed—of different internal and external stakeholders understanding each other.

"DOE and the public understand the long-term environmental consequences of the decision" is similar, but not identical, to "the public understands the connection between clean-up costs and environmental benefits." It also covers much the same subject matter as another attribute: "adverse environmental impacts are minimized." Neither of these attributes was highly rated by survey respondents. Finally, this suggested attribute is also related to the survey attributes dealing with understanding by DOE and the public of each others' concerns, problems, and activities, at least to the extent that DOE and its stakeholders have expressed their concerns related to long-term environmental consequences. We conclude that the use of this new attribute is unlikely to address the central concerns of the interested parties in ways not already covered by attributes listed in the survey.

The last new attribute is "existing conflicts are resolved." While not identical, this attribute covers much the same ground as "the public has trust and confidence in DOE and the DOE facility," since the development of trust and confidence is likely to be accompanied by an easing of conflict. However, the value of conflict resolution by itself can be difficult to interpret. In addition to indicating public satisfaction, the cessation of conflict could also mean that external stakeholders are unhappy but resigned and have given up trying to influence DOE, or that they are pursuing alternative approaches to influencing DOE's actions.

Key Attributes to Use in Future Evaluations

The stakeholders' ratings of attributes demonstrated remarkable agreement both within and across internal and external stakeholder groups. That agreement allowed us to assemble a subset of attributes focusing on the *decision-making process*, *mutual understanding* among internal and external stakeholders, *trust and confidence* in DOE and its local manifestations (i.e., individual DOE facilities, field offices, and activities, projects, and programs), the *decisions* themselves, and *mission accomplishment*. Based on the information and analysis presented in the preceding sections, we suggest the use of seven attributes of success in future evaluations of DOE's public participation programs: (1) the decision-making process allows full and active stakeholder representation; (2) the decision-making process is accepted as legitimate by stakeholders; (3) DOE and other stakeholders understand each others' concerns; (4) the public has trust and confidence in DOE and the DOE facility; (5) key decisions are improved by public participation; (6) key decisions are accepted as legitimate by stakeholders; and (7) DOE's site-specific mission is accomplished. As shown in Table 4, the first two of these attributes fall under the

Table 4: Recommended Attributes of Success to Use in Future Evaluations

The decision-making process
• The decision-making process allows full and active stakeholder representation
• The decision-making process is accepted as legitimate by stakeholders
Effects of public participation on stakeholder understanding and attitudes
• DOE and other stakeholders understand each others' concerns
• The public has trust and confidence in DOE and the DOE facility
Effects of public participation on Environmental Management decisions
• Key decisions are improved by public participation
• Key decisions are accepted as legitimate by stakeholders
Effects of Environmental Management decisions on stakeholders' objectives
• DOE's site-specific mission is accomplished

category of the decision-making process, the next two address effects of public participation on stakeholder understanding and attitudes, the following two deal with effects of public participation on environmental management decisions, and the last one concerns effects of environmental management decisions on stakeholders' objectives. In line with the input provided by a broad range of stakeholder groups, our collection of suggested attributes places more emphasis on process, understanding, and decisions than on directly measuring the *effects* of the decisions that are made. Apparently, most respondents believe that if the process is fair, if understanding and trust are enhanced, and if good decisions are reached, then the ultimate effects of the decisions will be acceptable.

Nearly all of the attributes suggested here were considered very important by most stakeholder groups, and any attribute that was unimportant to a given group tends to be balanced by one or more attributes that were highly relevant to that same group. The only attribute in our final list that was not broadly embraced by survey respondents is the last item: "DOE's site-specific mission is accomplished."[6] However, many respondents did note that stakeholders needed to be involved actively in developing mission statements. Moreover, we believe that this attribute is essential because DOE, as the agency sponsoring the public participation efforts in question, needs to know how these programs affect its underlying mission. In addition, evaluating the extent to which DOE's site-specific mission has been accomplished lends itself to the use of performance indicators that examine how site conditions (e.g., environmental management costs, adverse environmental impacts, and the distribution of those impacts) have been affected—a topic that is not broached by any of the other attributes that we suggest.

In addition to addressing the concerns of a broad range of stakeholders, the combined set of attributes that we are suggesting is appropriate for describing what was accomplished at all of our study sites, despite the fact that there was substantial variation among them in the scope and timing of their environmental management activities. Sites that are not as far along as others in terms of their EM activities will yield less definitive results when measuring the attributes concerning decisions and objectives, but the inclusion of numerous attributes addressing the decision-making process and stakeholder understanding assures that a meaningful evaluation will still be possible. Because of its good fit with our nine study sites, we believe that our suggested set of seven attributes will be appropriate for evaluating the large majority of EM sites around the country. Of course, in the event that unusual site conditions or stakeholder concerns make one or more of the seven attributes inappropriate or suggest that other attributes might be more useful, individual evaluators could choose their own combination of attributes, selecting from the full set discussed earlier in this article.

When performing an evaluation of a particular public participation effort, we believe that each of the attributes discussed above should be considered separately, rather than weighting them to come up with a single tally of success. Not only is it ex-

6/ Although one of our suggested attributes—"DOE and other stakeholders understand each others' concerns"—was not directly considered by survey respondents, it is a combination of two attributes that were highly regarded by a broad range of stakeholders.

tremely difficult to come up with a widely acceptable weighting system that is meaningful for all interested parties, but focusing on a single "success score" rather than on multiple attributes of success can be very misleading and also obscures the rich descriptiveness of what was accomplished according to various perspectives.

Conclusions

Our research—and particularly our interactions with representatives of many different stakeholder groups at nine DOE sites with diverse environmental problems—shows that it is possible to define success in ways that are meaningful to a wide variety of interested parties operating in disparate social and environmental contexts. We conclude that performance-based evaluations of public participation efforts are possible, and we recommend the use of the combined set of attributes of success discussed above to accurately and thoroughly describe what has been accomplished.

While our understanding of public participation efforts and their evaluation are rooted in the literature, the seven attributes of success that we recommend for use in future evaluations are drawn largely from the experiences of a broad range of stakeholders with first-hand experience in the public participation arena. The seven attributes suggested here were judged to be appropriate and important by many different types of interested parties at diverse sites around the country. By defining success in the manner suggested, evaluators and other interested parties can gain an in-depth understanding of program performance on a number of different dimensions. All of the attributes presented here are designed for use in site-specific evaluations that examine how well a given public participation effort has done, with a strong emphasis on the perceptions and behaviors of direct participants and other affected community members.

Periodic evaluations of public participation activities should result in improved understanding and performance of public participation efforts. We believe that the attributes of success suggested here could—with minor modifications—provide an appropriate foundation for evaluating public participation programs undertaken by many different public and private sector organizations. We hope that other sponsors of public participation efforts and the many stakeholder groups involved with those activities will find the results of this study of DOE programs relevant to their own circumstances and will benefit from the findings that we have presented.

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