Social Distrust as a Factor in Siting Hazardous Facilities and Communicating Risks

Roger E. Kasperson
Clark University

Dominic Golding
Resources for the Future

Seth Tuler
Clark University

Conflicts regarding the siting of hazardous facilities in the U.S. have often led to an impasse due to numerous problems, particularly including social distrust. To address this situation, this article proposes a multidimensional conception of trust, including cognitive, emotional, and behavioral aspects, and involving themes of expectations about others, subjective perceptions of situations, and awareness of taking risks. Four key dimensions of trust are perceptions of commitment, competence, caring, and predictability. Distrust arises from violations of expectations that people have in social relations. Research has shown a broad loss of trust in leaders and in major social institutions in the U.S. since the 1960s, together with growing public concern over health, safety, and environmental protection. These trends combine to make hazardous-facility siting highly controversial. This article recommends key steps in risk communication and hazardous-facility siting that are aimed at dealing as effectively as possible with social distrust.

Siting conflicts are as much a part of organized human experience as politics itself. Historically, such conflicts typically centered upon competition among places to obtain desired functions, as with the location of railroads and state

Correspondence regarding this article should be addressed to Roger E. Kasperson, CENTED, Clark University, Worcester, MA 01610.
capitals in early American political history or the siting of national capitals elsewhere (e.g., Brasilia or Islamabad), or desired facilities (e.g., "clean" industries in residential suburbs), or sometimes federal contracts or grant awards. More recently, disagreement and controversy have erupted over where to locate facilities or functions such as prisons, cemeteries, taverns, "adult" bookstores, drug treatment centers, or town dumps with undesired (or risky) characteristics. With widespread urbanization and technological development, with increasing pressure upon land use, and with growing concern over environmental and health protection, siting controversial facilities of all sizes and kinds has become increasingly difficult, and has emerged as a national policy problem of major significance (Popper, 1983). Nowhere are the difficulties greater than with the perplexing issue of how and where to locate radioactive and other hazardous waste storage and disposal facilities.

The public policy stakes should not be underestimated. After four decades of the commercial use of nuclear power, the failure to put into operation a smoothly functioning disposal "back end" of the nuclear fuel cycle continues to haunt the prospects for one of the nation's major energy sources and to threaten international security in a petroleum-scarce world. Spent nuclear fuel is accumulating in the United States at 110 operating commercial reactors and threatens to exceed the capacity of available on-site temporary storage space at some nuclear plants. Meanwhile, concern over radioactive waste stands at the top of public misgivings about nuclear power. Even when the wastes involved are low-level radioactive wastes, prospective waste site developers are confronted by angry local opponents, buttressed by widespread public anxiety over potential risks, linkages with national opposition groups, and traditions of local control over land use in the United States. Meanwhile, public opposition in Nevada has delayed, if not stymied, the national program for high-level waste disposal.

The situation with hazardous wastes, and perhaps even nonhazardous solid wastes, is equally serious. With 66,000 hazardous waste generators and 50,000 hazardous waste shipments per year (Piasecki & Davis, 1987), it is clear that, even with major strides in waste reduction and recycling, numerous new land disposal facilities will be needed. Yet the recent record of siting efforts for such facilities affords little optimism. A national survey by the New York Legislative Commission on Toxic Substances and Hazardous Wastes (1987) revealed an unsuccessful record of outcomes: only 1 of 33 existing commercial landfills had been given an operating permit since 1980; only one commercial hazardous waste incinerator had received a permit and become operational since 1980; and of 81 applications for waste management facilities received since 1980, only 6 had been successful. Meanwhile a national survey by Cambridge Reports (1990) revealed that a 62% majority of respondents opposed placing a new landfill in their community and a 53% majority believed current landfill technologies were unable to protect groundwater supplies.
This siting impasse has been the subject of substantial diagnosis and analysis (Colglazier & Langum, 1988; English & Davis, 1987; Greenberg, Anderson, & Rosenberger, 1984; Kasterson 1986a; O'Hare, Bacow, & Sanderson, 1983). While the specific items vary somewhat by analyst, key aspects of the siting problem include the following list:

Lack of a systems approach. No less than waste management itself, facility siting is part of a systems activity. It involves a network of waste generators, treatment, processing, storage, and disposal facilities, interconnected by waste transportation links. And, of course, other unwanted facilities are also being sited. Whereas the developer sees waste facility siting in terms of the individual facility, publics see it in the context of other facilities and previous locational decisions.

Risks and uncertainty. While considerable consensus exists that well-designed and well-managed waste management facilities pose only limited risks to nearby publics, residual risks and associated uncertainties do exist. The long duration of the hazard and the presence of irreducible uncertainties make risk communication very difficult. Compounding the uncertainties is the generally inadequate knowledge base to decide which locations are generally best for specific hazardous wastes (U.S. Office of Technology Assessment, 1983, p. 20).

Public perceptions of risks. Whatever the actual public health and environmental risks posed by new and potentially hazardous facilities, they pale in comparison with public perceptions of them. National public opinion polls taken through the 1980s consistently reveal hazardous wastes at or near the top of the public's agenda of serious environmental concerns (Kasterson, Emani, & Perkins, 1990). Indeed, a 1980 national poll that found only 10%-12% of the American public willing to live a mile or less from either a nuclear power plant or a hazardous waste site (U.S. Council on Environmental Quality, 1980) remains remarkably contemporaneous over a decade later. A recent national survey, for example, found that the closest that a facility could be built to respondents before they said they would actively protest or move to another location was a median distance of 60 miles for nuclear plants, 100 miles for a chemical waste landfill, and 200 miles for an underground nuclear waste repository (Flynn, 1990, p. 6). The factors underlying these perceptions of danger have been quite extensively charted in psychometric research, and include such considerations as the perceived "newness" and "dread" of the associated hazard, its "severity" and "catastrophic potential," and the extensive media coverage and "memorability" (Slovic, 1987; Slovic, Fischhoff, Lichtenstein, 1982). Increasing evidence suggests that these perceptions are contributing to stigmatization of the places and communities where such wastes are found. (Edelstein, 1988).
Inequity in risk allocation. Exacerbating these concerns is the mismatch between the concentration of risks and burdens in the host community for a noxious facility and the diffuse distribution of benefits. In one of the few thorough empirical analyses of distributional equity at a hazardous waste site (in West Valley, NY), Kates and Braine (1983) painted a complex picture of gains and losses over more than a dozen locations stretching across the United States, and a concentration of losses in the host community and region. The degree of mismatch can reach quite dramatic proportions, as is evident in the distribution of locations of nuclear high-level waste generation in relation to their potential disposal site in Nevada (see Fig. 1). This lack of concordance between benefits and burden is compounded by the opportunism frequently exhibited by those siting facilities in locating unwanted facilities in “down and out” communities where high unemployment rates and limited access to political power undermine community opposition (Greenberg et al., 1984; U.S. General Accounting Office, 1983).

Social distrust. The complexity of the above problems points to the need for high levels of public trust and confidence in the institutions and people responsible for siting hazardous facilities and managing the risks. It is quite apparent, however, that the requisite social trust rarely exists. Where prospective risk bearers harbor suspicions over the fairness of the siting process and doubt the trustworthiness of those responsible for protecting them, the conditions exist for intense conflict and impasse. Because of the far-reaching impacts of social distrust on prospective solutions, this article examines more fully its meaning and ramifications before exploring how siting and risk communication strategies might better address it.

The Concept of Trust

Trust is a concept widely identified as important to social interactions, but rarely well defined or characterized. The social importance of trust stems, in large part, from its contribution to cooperative behavior and information flow. Intellectual perspectives on trust emanate from diverse academic quarters—psychology, sociology, political science, economics, and mass communication. Theoretical conceptualizations from these disciplinary perspectives share a number of common features and dimensions, as well as a considerable amount of loose use. The commonalities can shed light on different types of trust and how they develop among people in social interactions. Trust has been defined in several distinctly different ways:

—“a generalized expectancy held by an individual that the word, promise, oral or written statement of another individual or group can be relied on” (Rotter, 1980, p. 1).
Fig. 1. Locations and projected volumes of spent nuclear fuel through the year 2000. (Source: Rasky, 1987).
— "the degree of confidence you feel when you think about a relationship" (Rempel & Holmes, 1986, p. 28).
— "the generalized expectancy that a message received is true and reliable and the communicator demonstrates competence and honesty by conveying accurate, objective, and complete information" (Renn & Levine, 1991, p. 181).
— "a set of expectations shared by all those involved in an exchange" (Zucker, 1986, p. 54).
— "members of that system act according to and are secure in the expected futures constituted by the presence of each other or their symbolic representations" (Lewis & Weigert, 1985, p. 965).
— "a person’s expectation that an interaction partner is able and willing to behave promotively toward the person even when the interaction partner is free to choose among alternative behaviors that could lead to negative consequences for the person" (Koller, 1988).

These definitions share some general themes, suggesting the need for a broad-based, multidimensional conception of trust. Important attributes of trust include the following:

1. **Expectations about others and orientations toward the future.** Trust allows people to interact and cooperate without full knowledge about others and future uncertainties.
2. **A notion of chance or risk taking.** To trust also implies that one has confidence that others will act voluntarily in a manner that is beneficial, even if not certain.
3. **Subjective perceptions about others and situations.** These include perceptions of the intentions and attributes of others (e.g., commitment, competence, consistency, integrity, honesty), their motivations, qualities of the situation (e.g., the availability and accuracy of information), risks, and uncertainties. In risk communication programs, trustworthiness can depend on judgments about the quality of a message, its source, and the structure and performance of institutions (Midden, 1988).

The literature treating the concept of “trust” provides a number of possible conceptualizations of its functions and dynamics. Social psychological research on trust, for example, typically focuses on behavioral and cognitive aspects of people’s interactions. Researchers seek to identify situational variables that affect levels of trust among people. This approach is closely related to discussions of trust from the perspectives of economics and political science (e.g., Butler, 1983; Deutsch, 1973). On the other hand, personality theorists have conceptualized trust as something internal to an individual (e.g., Blakeney, 1986; Rotter, 1980). Here, trust is viewed as a psychological construct or trait that indi-
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Individuals develop, depending on their personal experiences and prior socialization (Lewis & Weigert, 1985, p. 975). Trust, then, is clearly linked to the degree of confidence, predictability, faith, or cooperation that prevails in a given situation.

Sociologists, by contrast, have approached trust as a property of groups or collectives. In this view, the primary function of trust is not psychological, because, aside from its role in social relationships, individuals would have no innate need to trust (Lewis & Weigert, 1985). Moreover, when trust is regarded as a purely psychological state, it is easily confused with other psychological states (hope, faith, behavioral prediction) and is dealt with by methods that have reductionistic consequences, in that they substitute individual behavior for more complex, interactive social phenomena (Lewis & Weigert, 1985, p. 976).

In both the psychological and sociological approaches, trust is viewed as an important prerequisite for effective orientation and action at both the interpersonal and societal levels of interaction. For example, trust allows one to predict a partner's intentions in both familiar and novel uncertain situations. Political and economic exchange relies to a large degree on the trust that reduces complexity in social interactions by limiting the number of legitimate or acceptable options among persons (Bradach & Eccles, 1989; Luhmann, 1980).

At the level of larger social groups and societal processes, such "background" factors as social norms, rules, shared symbols and interpretive frames, and structural properties of institutions have been identified as important to the development of trust. Approaches to the study of these issues are based on research in other areas, including persuasion (Renn & Levine, 1991), economic and political behavior (Bradach & Eccles, 1989; Lewis & Weigert, 1985; Zucker, 1986), organizational development (Dwivedi, 1988), and organizational communication from a transactional perspective (Blakeney, 1986).

To a large degree, trust as a psychological and sociological orientation relies on faith, and faith is an orientation that involves emotions. Faith is important to procedural justice, for example, because trust involves beliefs about neutrality, benevolence, and fairness even in situations where they are not required (Tyler, 1989). However, many psychological, political, and economic perspectives conceptualize trust very narrowly in terms of individual cognition and rational, calculative behavior. In our view, trust needs to be seen as a social phenomenon, composed of multiple dimensions, each possessing distinct cognitive, affective, behavioral, and situational manifestations (Koller, 1988; Lewis & Weigert, 1985). Thus, it is possible to conceptualize different types of trust:

—Cognitive trust provides a foundation upon which an individual can discriminate among those perceived to be trustworthy, distrusted, or unknown. Since such trust requires a degree of familiarity with situations that lie between total ignorance and total understanding (Luhmann, 1980), some cognitive leap of faith is involved.
—*Emotional trust* provides a basis for this cognitive leap of faith. Its contribution consists of an emotional bond among those participating in a relationship, which is strongest in close primary relationships (e.g., love and friendship).

—*Behavioral trust* is a behavioral enactment in social relationships. To trust is to act as if the uncertain future actions of others were certain and predictable, even where the violation of these expectations may produce negative consequences (Lewis & Weigert, 1985). Behavioral acts can influence cognitive and emotional trust. Cognitive trust, for example, may grow with increasing behavioral enactments of trust.

These different types of trust reflect varying combinations of rationality and emotion. The emotional content of trust, for example, is presumably higher and more important in primary than in secondary group relations. By contrast, in secondary group situations, social trust depends more on rationality because of the widespread anonymity of individuals in demographically large and structurally complicated social systems. The mix of emotional and rational contents of trust thus may affect the development and loss of trust. The stronger the emotional content of trust relative to the cognitive content, for example, the less likely it is that contrary behavioral evidence may weaken the existing pattern of trust (Lewis & Weigert, 1985, p. 972).

While a number of functional theories attempt to explain what trust is, few provide insight into the dynamics of trust at the level of society. Many argue that trust is gained slowly through incremental increases stemming from properly conceived and timed acts on the part of each person in a relationship (Shapiro, 1987). The general social climate also structures the conditions under which institutions must operate for gaining or sustaining trust. In a positive social climate, people may invest more trust in institutions from the beginning and may be more forgiving when this trust is abused. In a negative social climate, by contrast, people may be very cautious in investing trust in *any* social institution (Renn & Levine, 1991, p. 205). Social change and disruption associated with immigration, internal migration, economic instability, and social conflict can disrupt and change expectations and the bases of social trust (Zucker, 1986).

Trust also depends heavily on the performance of social institutions. The characterization of trust as a complex interaction of cognitive, emotional, and behavioral properties underscores the important contributions of individual or group perceptions as well as their interaction with macrosocial forces. Luhmann (1980) contrasted the *interpersonal trust* that prevails in small, relatively undifferentiated societies with the *system trust* that prevails in the bureaucratic institutions of modern, complex societies; he argued that the shifting nature of trust from the former to the latter is one of the hallmarks of our times. It is also probably the case that trust in larger, more complex societies rests on higher
levels of cognitive trust, whereas trust in smaller, more immediate groups rests on higher levels of emotional trust (Lewis & Weigert, 1985).

These conceptions contribute to several insights into the nature of social distrust. Distrust appears to arise from violations of expectations that people have in social relations, and it occurs on cognitive, affective, or behavioral levels. Violations of expectation, in turn, occur at both the individual level (such as in close interpersonal relationships) and the social level (as when politicians violate constituent expectations). In general, the literature suggests that trust is hard to gain and easy to lose (Rothbart & Park, 1986). Slovic, Layman, and Flynn (1990) noted, for example, that a single act of embezzlement is sufficient to convince us that an accountant is untrustworthy, and that even 100 subsequent honest actions may do little to restore our trust in the individual. A recent National Research Council (1989) panel on risk communication, viewing the "tremendous" credibility problems of the Department of Energy, concluded that "one year of being honest with the public is not enough" (p. 120). On the individual psychological level, Rempel, Holmes, and Zanna (1985) have argued that trust may be lost in the reverse order or sequence from that in which it developed.

Trust is probably never completely or permanently attained, but rather requires continuous maintenance and reinforcement. Distrust reflects the suspicion that violated expectations in one exchange may generalize to other transactions. To distrust, then, involves an attribution of intentionality that spreads from limited cases through a broader realm of interactions or exchanges. Renn and Levine (1991) distinguished five analytical levels related to trust and confidence that vary in degree of complexity and abstraction—trust involving a message, personal appeal, institutional perception, institutional climate, or sociopolitical climate. They argued that the lower levels (i.e., message, personal appeal) are embedded in the higher ones (i.e., institutional perception, institutional performance) and that conditions that operate on the higher levels also affect lower levels of trust and confidence. Thus, consistent violations of trust at lower levels will, they argued, eventually affect the next higher level. Similarly, distrust at higher levels will tend to shape options for gaining or sustaining trust at lower levels.

**A Characterization of Social Trust**

Drawing upon these previous writings, we define social trust as a person’s expectation that other persons and institutions in a social relationship can be relied upon to act in ways that are competent, predictable, and caring. Social distrust thus is a person’s expectation that other persons and institutions in a social relationship are likely to act in ways that are incompetent, unpredictable, uncaring, and thus probably inimical.
Four key dimensions of social trust, in our view, are essential to capture the range and depth of trust-related behavior. Each dimension is necessary and plays an important role in the development and maintenance of social trust; none is sufficient in itself, however, to assure the existence of such trust. These four dimensions are as follows:

1. **Commitment.** To trust implies a certain degree of vulnerability of one individual to another or others, to an institution, or to the broader social and political system. Thus, trust relies on perceptions of uncompromised commitment to a mission or goal (such as protection of the public health), and fulfillment of fiduciary obligations or other social norms. Perceptions of commitment rest on perceptions of objectivity and fairness in decision processes, and the provision of accurate information. Commitment, however, does not entail blind progress toward predefined goals, nor insufficient awareness of and response to changing circumstances.

2. **Competence.** Trust is gained only when the individual or institution in a social relationship is judged to be reasonably competent in its actions over time. While expectations may not be violated if these individuals or institutions are occasionally wrong, consistent failures and discoveries of unexpected incompetence and inadequacies can lead to a loss of trust. In particular, risk managers and institutions must show that they are technically competent in their mandated area of responsibility.

3. **Caring.** Perceptions that an individual or institution will act in a way that shows concern for and beneficence to trusting individuals are critical. Perceptions of a caring attitude are an especially important ingredient where dependent individuals are critical. Perceptions of a caring attitude are an especially important ingredient where dependent individuals rely upon others with greater control or authority over the situation and the individual’s opportunities and well-being.

4. **Predictability.** Trust rests on the fulfillment of expectations and faith. Consistent violations of expectations nearly always result in distrust. It should be noted, however, that predictability does not necessarily require consistency of behavior. Complete consistency of behavior would require unchanging actions or beliefs, even in the face of contradictory information, and also more consistency in values and related behavior than most individuals, groups, or institutions possess.

This conceptualization of trust emphasizes that individual perceptions, specific situational or institutional contexts, and general societal and systemic factors all play important roles in the development of different types, levels, and nuances of social trust (see Fig. 2). Thus, the nature of an individual’s or a
group's interaction with individual members of organizations, with institutions as a whole, as well as their experience in society more generally, all affect the "goal" of social trust. This suggests a "nested hierarchy" for analyzing the dynamics of social trust and distrust in any given situation (illustrated in Fig. 2), in which both vertical and horizontal flow constantly occurs. Trust, in our view, operates simultaneously at the cognitive, emotional, and behavioral levels. Fulfillment and maintenance of trust, accordingly, requires that these dimensions be validated at all three levels by the personal observation and experience of the trusting individual. Thus, general societal processes, situation-specific experiences, and continuing validation affect the levels of trust or distrust in institutions, and by extension, influence the possibility of developing or recovering trust. These issues are addressed later in this article when policy and procedural implications are examined.

The unpleasant reality must be noted that actions to build trust on one dimension or level may entail a corresponding loss of trust on another dimension or level. To improve public perceptions of caring, for example, an institution could increase the openness of its decision process and information. Yet since
scientific research often proceeds through incomplete results, false starts, and gradually developing data bases, openness of information that proves to be in error could increase public perceptions of science's unreliability or lack of competence, leading to decreased levels of social trust. In fact, substantial uncertainty exists as to whether improvements along one dimension of trust will outweigh decreases in trust along another. Similar observations could be made about compatibilities among levels of trust. Such is the paradox for the facility developer or the risk communicator!

Observations from Experience

Empirical studies lend credence to the above conceptual discussion and to the nested hierarchy of social trust dynamics just described. It is apparent from this research that important changes in social trust have occurred over time at the societal level in the U.S. and that these changes establish an important context in which institutions concerned with the processing and handling of environmental risk issues and the siting of risk facilities must function. Three observations are particularly germane.

Observation 1. A broad-based loss of trust in the leaders of major social institutions and in the institutions themselves has occurred over the past three decades. Following World War II, public opinion surveys revealed a general rise in public confidence in various social institutions and their leaders to a peak in the early to mid-1960s. Over the next decade, however, public confidence dropped precipitously, to expressed levels of confidence only about half of what they had been a decade earlier (see Fig. 3). Since that time, public confidence has oscillated in response to important events but has generally remained at a low level, and all social institutions have been affected (see Fig. 4). The factors contributing to these long-term declines are imperfectly understood but are thought to include the Vietnam War, the revelations of environmental degradation in the late 1960s and 1970s, social protest, the Watergate scandal, and the energy crises and economic recessions of the 1970s (Lipset & Schneider, 1983; Rourke, Free, & Watts, 1976). Lipset and Schneider (1983, p. 66) concluded that unemployment and inflation particularly affect levels of social trust, and that business and government bear the brunt of the public disaffection. Even the optimism of the early Reagan years was unable to restore the levels of public confidence that prevailed during the early 1960s or to reverse the long-term erosion of the 1965–1980 period.

It is highly likely, however, that these events are embedded in, and contribute to, a broader web of basic attitude and aspiration changes in American society. Thus, better education and greater affluence increased people's aspirations concerning their desired share of public resources and welfare, while the
Fig. 3. Confidence in institutional leadership in seven periods from 1966 to 1982, from 24 Louis Harris and National Opinion Research Center surveys. Figures in parentheses show the average percentage expressing "a great deal of confidence" in the leadership of ten institutions, averaged across all polls taken in that period. After Lipset and Schneider (1983).
increased complexity of social issues and the pluralization of values and lifestyles may have contributed to a growing dissatisfaction with the performance of social institutions (Renn & Levine, 1991). Then, too, the apparent broadening and deepening of environmental values and the growing public concerns over the risks of technology during the past two decades have had their impact; indeed some see the changed aspirations and growing social disaffection in the U.S. as the reflection of basic changes in American culture (Douglas & Wildavsky, 1982; Wildavsky & Dake, 1990). Others (Lipset & Schneider, 1983) attribute falling confidence to a suspicion of those in power, based upon a rational public assessment of the actual performance of institutions. At the same time, it is notable that the disenchantment with institutions and their leaders (level 2 in Fig. 2) has not translated into systemic distrust; dissatisfaction with the performance of institutions has not yet led to support for fundamental changes in the economy, government, or social processes in the United States. Moreover, people’s personal experiences with institutions appear more positive than the generalized assessment of the institutions (Lipset & Schneider, 1983).

Observation 2. Growing public concern over health, safety, and environmental protection has accompanied the erosion of social trust. The 1970s were also a decade during which the environmental movement spread throughout the various regions and social groupings of American society. Prior to 1970, the environmental movement was strongly elitist in its base, but by the end of the 1970s all major social and economic groups espoused environmental values
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(U.S. Council on Environmental Quality, 1980). Similar patterns were apparent in changing attitudes toward technology and health risks (Harris & Associates, 1980; Weinstein, 1988). Many authors have noted that, as Americans have increased their longevity and enjoyed declining risks from accidents and natural hazards, they have paradoxically become more concerned about their health and safety. An active environmental and public-interest community and increasingly sophisticated mass media have assiduously detailed the "downside" of technology and the many failures of regulatory agencies. It may be that the greater affluence of postindustrial society has shifted the "worry beads" of society away from those primary concerns of eking out an economic subsistence and the familiar threats of famine and pestilence, toward heightened concern with the more subtle threats of chemicals in the environment and unhealthy diets and lifestyles (Kates, 1986). Whatever the causes, some risk analysts (e.g., Lewis, 1990; Wildavsky, 1988) by the 1980s began to fret over whether the U.S. was becoming a "nation of hypochondriacs," and the U.S. Environmental Protection Agency (1987, 1990) sought to reduce the extent to which public concern rather than expert knowledge drove its agenda of effort and allocation of resources.

Observation 3. Both of the above processes interact and reach particularly intense expression in hazardous-facility siting and controversial risk management. The public concern over threats to health and safety and the lack of social trust in risk managers interact to spark intense public opposition and protest in hazardous facility siting. The litany of public response to hazardous facilities is now a familiar one: a public agency or private developer announces a site search and screening process, candidate sites are chosen, local opposition erupts in the prospective site communities, and eventually the siting process is immobilized and the search is delayed or discontinued. The search for a low-level radioactive waste site in New York State illustrated this sequence when, in 1990, a "posse" of local opponents swept down on state officials engaged in site characterization, while elderly local residents chained themselves to a bridge in protest. Such actions in response to potential facilities widely viewed by experts as posing only very minimal threats to their host communities have been characterized by an alphabet soup of acronyms (LULUs—locally unwanted land uses; NIMBY—not in my backyard; NIMTOF—not in my term of office), which suggest selfish behavior on the part of publics seeking to escape social responsibility or impelled to hysterical reactions to risks conjured up by fertile imaginations.

In fact, such acronyms are both misleading and self-serving. Controversies over hazardous-facility siting, and over some well-publicized risks (such as ethylene dibromide, EDB, in food and Alar on apples), are less about risk than they are about institutions. They are, in essence, "social trust crises." Where publics are highly concerned over potential risks, there must be trust that deci-
sions will be made with scrupulous fairness and uncompromised commitment to
the protection of the public if potential risk bearers are to accept, or at least
tolerate, the imposition of risk. The lack of such trust is quite apparent in the
results of surveys taken during siting controversies. In Nevada, for example,
where a high-level nuclear waste repository is under investigation at Yucca
Mountain, a 1988 survey of residents in the Las Vegas metropolitan area (Mush-
katel, Pijawka, & Dantico, 1990) found that none of the institutions involved in
the siting process received strong trust ratings (see Table 1). Respondents judged
the Governor of Nevada as most trustworthy (40% for trust categories 6 and 7),
whereas they viewed the president and Congress of the United States with a
substantial mix of trust and distrust.

Two years later in the siting controversy, social trust had apparently eroded
still further. A 1990 poll of Nevada residents by the Las Vegas Review Journal
found that only 29% of respondents agreed or agreed strongly with the statement
that “the federal government will be honest in the scientific research it does to
determine if nuclear wastes can be safely stored at Yucca Mountain,” whereas
68% disagreed or disagreed strongly. In regard to trust in the objectivity of
the developers, 52% of respondents agreed or agreed strongly with the statement
that “the nuclear waste facility will be built at Yucca Mountain no matter what the
scientific research shows.” Several interviews reported by the newspaper (Las
Vegas Review Journal, 1990) suggest issues bearing upon social distrust:

I don’t trust any government agency, explicitly . . . . Our government agencies have a
history of not being honest and keeping information from us; they think it’s best we do not
know. (Faye Duncan-Daniel, adult-education teacher)

I do have some difficulty with DOE’s credibility, primarily because they are extremely
influenced by Congress, and Senator Bennett Johnson (D-LA) has been very, very ada-
mant about the nuclear waste repository. And I think this has biased the DOE . . . . It’s
my feeling from newspapers and magazines the process has been politicized. So we’re not
looking at developing an independent scientific review. Instead, we’re looking at mandat-

Table 1. Percentage of Respondents Expressing Various Degrees of Trust
That Officials’ Decisions Will Protect the Public Safety (N = 535)

<table>
<thead>
<tr>
<th>Trust level</th>
<th>President</th>
<th>Congress</th>
<th>Governor</th>
<th>State legislature</th>
<th>City/county</th>
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<tr>
<td>No trust</td>
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<td>6</td>
<td>22</td>
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</tr>
<tr>
<td>Complete trust</td>
<td>7</td>
<td>12</td>
<td>4</td>
<td>14</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Mushkatel et al. (1990, p. 95).
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I don’t know whether I trust DOE. But I know one thing, they are failing miserably to communicate all the facts to the public. (B. Mahlon Brown III, private attorney and former U.S. Attorney for Nevada)

The Government didn’t do Love Canal safely, so why should I trust them? (Ann Vigue, personnel manager for a food distribution company)

It is instructive that the newspaper ran its eight-part series (October 21–28, 1990) on the proposed repository under the heading “Yucca Mountain: A Question of Credibility.” Professional analysts and scholars appear to agree. In its assessment of the nuclear waste program, the U.S. Office of Technology Assessment (1985) found a lack of public confidence to be “the single greatest obstacle” (p. 10) to further progress, while such experienced analysts as Luther Carter (1987) and Slovic and colleagues (1991) have reached similar conclusions as to the “crisis of confidence” that pervades the nuclear (and other hazardous) waste siting program.

Given the high conditions of social distrust that characterize the arenas in which hazardous-facility siting and communication about risk occur, what can be done?

Decision Processes Geared to Social Distrust

The basic answer to this question by most practitioners, often supported by social analysts, is to work harder to undo this distrust. This resolve finds additional energy in the frustration over the discrepancy between expert and public assessment of risk, where experts, propelled by a technical focus on the health risk, cannot help but believe the public would change “if only they knew the facts!” And, of course, officials are convinced that “when people see that I am not like my predecessors, they will come to believe me.” And thus photocopy machines work overtime to produce information, brochures aim at reassuring skeptical publics, “public information” budgets proliferate, “public relations” staffs grow, and nonstop public meetings occur to carry forth the new “openness” of the agency.

Attempts to communicate about controversial risks or to site hazardous facilities predicated upon well-intentioned efforts to regain social trust are, in our view, naive at best and self-defeating at worst. As indicated above, the loss of social trust is a broad, fundamental societal phenomenon that affects all social institutions and public orientations toward particular policies or decision arenas. Second, the burden on social trust is unusually demanding in risk communication and hazardous-facility siting cases because of the inevitable technical uncertainties, expert disagreements, and deep-rooted concern over the risks. Third, social trust is multidimensional in its content so that views on various attributes of
managerial "trustworthiness" are involved. Finally, while the dynamics of trust recovery are not well understood, it appears that the rebuilding process, once social trust is lost, may require a lengthy process of confirmatory experience along multiple dimensions of performance. Even minor trust-eroding events or slips of the tongue may impede substantial progress in procedures or cases that merit trust.

Thus, the allure of recovered trust misleads. Instead, a clear-eyed approach is needed that explicitly recognizes that the recovery of social trust is probably impossible within the time frame of most risk communication and facility siting efforts. An explicit assumption that high levels of social distrust will continue despite the best of efforts could lead to very different, and more effective, decision processes. Accordingly, the remainder of this article explores the implications of a redefined context and a different set of assumptions for risk communication and hazardous facility siting.

**Risk Communication**

In situations of high social distrust, any narrow conception of risk communication will almost certainly be inadequate. The goal of risk communication cannot be merely the transmission of factual information, nor can it be the narrow aim of enlightenment or the promotion of behavioral change. Since doubts may exist about some or all of the dimensions of trust—commitment, competence, caring, and predictability—risk communicators should seek broad public participation. In particular, they should aim to mobilize the personal and institutional experiences and judgments of risk bearers and other interested parties, as well as to make use of multiple communication sources and channels (Sorensen, 1984). The risk communicator will need to develop a strong *listening capacity* in order to discern issues about the distribution of risks and benefits, the adequacy of proposed solutions in socioeconomic terms, and potential vested interests. Social debate about proposed facilities or controversial risks typically stretches beyond institutional issues to tap more fundamental concerns about underlying values and overall world views (Kasperson & Palmlund, 1989).

Thus, the risk communicator must be sensitive to the social fabric of participants and the symbolic meanings embedded in discourse and language (Kasperson, Renn, & Slovic, 1988; Short, 1984). Also, it is important to recognize that purposeful risk communication occurs in a context of multiple and diffuse social communication (Krimsky & Plough, 1988). The key task for the communicator is to foster the growth of an environment in which exchanges of information and ideas can take place in a meaningful fashion, and interested participants can make their own evaluations and judgments. Two-way communication, widely espoused but rarely achieved, is essential in identifying any consensus or key points of contention.
Key elements in the design of a risk communication program, then, will include the following five aspects, which are discussed further below: identifying the needs that risk communication should address; assessing the content of the debate (facts, distrust of institutions, values/worldview); developing an overall process for the communication effort, including attention to the roles and capacities of the communicator and the participants; designing the risk communication strategies and techniques (e.g., messages); and adopting an ongoing monitoring and evaluation system.

A needs assessment is the first step. The need to know cannot be defined solely by the expert or the communicator. Rather, an open process of two-way exchange of information is necessary to elicit what various publics believe they need and want to know. Such a process will reveal that there is no "monolithic" public, of course, but a number of interested publics with differing concerns, expectations, and cultural agendas (Kasperson, 1986b; Rayner & Cantor, 1987). The assessment must be sufficiently flexible and broad based to accommodate the full range of public concerns, which do not necessarily relate narrowly to risk and are often neglected in traditional, technical risk assessments. They include such issues as losses in property values and quality of life, erosion of the sense of community, disrupted social relations, and stigma. In needs assessments, the analyst should err on the side of inclusiveness of issues and needs, recognizing the imperfections in the methodologies of risk assessment and social impact analysis, and the high levels of irreducible uncertainty surrounding expert judgments (Freudenburg, 1988). An openness to criticism and a transparency in decisions can improve perceptions of caring and commitment.

The content of the risk debate may be expected to go beyond even these broad issues of risk and impact, and to include questions of means and ends (Kasperson, 1986a, p. 276). For developers or communicators, public participation is primarily a means to accomplish a particular end; for members of the public, participation is often an end in itself. Social conflict over facilities and risks is often not a conflict over risk per se, but rather a political conflict over access to power and resources, and who will allocate how much risk to whom. Debates over risk are thus typically debates about technology and ethics in their broad social context, and about the roles to be played by risk and risk managers in a democracy (Otway, 1987; Ruckelshaus, 1985). These are issues critical to public perceptions of uncompromised commitment to safety.

The design of the risk communication process should, as suggested above, explicitly recognize the levels of social distrust that exist. The key to the design of a process geared to social distrust is the sharing of power, that is the empowerment of risk bearers, in the management of the risk or the facility. Power sharing can positively affect trust along all four of its key dimensions. Sandman (1985) made several suggestions directly relevant to this goal. First, the communicator or developer must acknowledge that the host community or region has substantial
power to prevent or delay the siting process, even though members of the public (and perhaps developers) may believe otherwise. Such acknowledgment may help reduce community feelings of anger and resentment, and put the dialogue on a more equal footing. Second, the community must be involved in all negotiations from the beginning and throughout the process, and all plans and positions should be presented as provisional. The traditional approach to siting—decide, announce, and defend—will serve only to generate conflict, anger, and additional distrust. Presenting positions as provisional removes some of the burden on social trust, allows all parties the freedom to maneuver, and provides members of the public with the knowledge that they do have power over the process and the ultimate decision.

The process should incorporate indigenous and independent expertise as well as the means to act on this information (Kasperson, 1986b, p. 277). Providing the risk bearers with the ability to appoint their own independent experts to interpret and validate risk assessments and to develop risk monitoring programs will enhance their sense of control. Independent verification of the claims of the developer and the siting authority removes the need for trust in others in order for the process to go forward.

The process in conditions of high social distrust must, therefore, be “information rich” at all times. As much relevant information as possible should be available to the public from the beginning, with ready access to experts and policymakers for clarification and elaboration. And the agency or corporation should err on the side of presenting too much information. “Failure to disclose a relevant fact can poison the entire process once the information has wormed its way out—as it invariably does . . . . Any information that would be embarrassing if disclosed later, should be disclosed now” (Sandman, 1985, pp. 460-461). In the absence of provided information, the public will actively seek answers from other (often unreliable) sources to fill the “information void.” Responsible agencies and developers will have little or no control over the quality of such information, while the failure to provide desired information will lead to public perceptions of a cover-up (or, in our terms, a lack of uncompromised commitment). Though the early release of still-developing information can also lead to problems and erode trust (as noted above), on balance, damage associated with openness is easier to address than damage associated with concealment.

In regard to risk communication strategies and methods, it is essential to recognize that since many different publics exist, a variety of strategies will be necessary to reach the full spectrum of social groups. Paradoxically, those most affected by the risk may be the least likely to participate in the process and may possess the fewest resources to protect themselves. Special attention is required, therefore, to ensure that their concerns are fully addressed. A wide variety of risk communication techniques exists, each relevant to particular risk and social
circumstances. But it is difficult to predict which participatory technique may be most effective in a given situation. There is a general consensus, however, that public hearings are ineffective, alienating, and often erosive of social trust (Checkoway, 1981). Other more promising methods exist, including Delphi procedures, role playing, gaming simulation, focus groups, and planning cells. Each of these provides an opportunity for diverse interests to participate in focused processing in informal settings, where issues can be confronted and explored in some depth. Throughout, negotiation is the central process for reconciling conflicts. Risk communicators must be acutely aware that publics and experts see risk through different lenses. The task of the risk communicator is thus not to pass judgment nor to approve or disapprove of public perceptions, but to recognize the reasons for the divergences and to act on them.

Finally, monitoring and evaluation are indispensable resources in a process adapted to social distrust. In environments of high distrust, interpreting what is happening and how multiple interests are responding is highly problematic and prone to failures. Thus, it is essential to mount an ambitious program of participatory evaluation that begins even before the initiation of the communication or siting program, so that appropriate baseline information and broadly agreed-upon procedures can be established. Ongoing evaluation can be structured as another form of responsibility and power sharing, and can be closely linked to a dynamically changing communication program linked to evaluation results (Kaspersion & Palmlund, 1989).

**Hazardous-Facility Siting**

Given that host publics typically have strong fears about the hazards associated with noxious facilities, that inequities are difficult to overcome, and that high levels of social distrust exist, a process is needed that has sufficient robustness to address squarely the public concerns and yet deliver a needed facility site. In our view, the intertwining of risk, equity, and distrust calls for a process that is hierarchical in content, sequential in design, and plural in power sharing.

*Resolution of the safety issues* is the first and most basic task confronting facility siting and development. From previous risk and facility-siting studies, it is apparent that efforts to proceed based on a technical assessment of risk (i.e., "our risk assessment shows that we will meet the emission standard") and to attempt to win public confidence are destined to failure in most cases. The crux of the issue here is the large difference between the technical and public assessments of risk, often exacerbated by the inevitable equity problems that arise (Freudenburg, 1988). Reassurances about risk in a climate of social distrust are unlikely to be convincing, and indeed may be alienating. The alternative is to
take steps to resolve the safety concerns among risk bearers and host community publics as much as reasonably can be done, whether they are warranted or not by a purely technical assessment. The definition of concerns to be addressed should be sufficiently broad to capture those that may arise from the interaction between technical risk considerations and social processes (Kasperson et al., 1988). This is likely to involve "overbuilding" the safety systems of the facility and including concerned publics in the content of that overbuilding. Negotiation over the facility design and the selection of the contractor and operator, as well as independent community review of the planned facility, are all helpful. If some particular issue emerges (e.g., what are the safeguards in case of an earthquake?) that becomes a driver of public concerns, an independent study by a jointly selected expert may be undertaken. An agreement might also be developed by which a host community has the capability to monitor facility performance and to have recourse under specific conditions to seeking facility shutdown if emission standards are violated. The recommended strategy, in essence, is to resolve as broad a range of public concerns over risk as is reasonable. Such an approach does not, of course, guarantee that a site will be successfully agreed upon, but it does provide facility developers a seat at the table so that the other issues can be discussed. This approach has been a central part of the success in Sweden in siting various nuclear facilities (Parker, Kasperson, Andersson, & Parker, 1986), and in the Oak Ridge negotiation with Tennessee over interim nuclear waste storage facilities (Peele, 1987). Until important progress has been made on the risk issue, a dialogue with host publics about other issues is not possible (Creighton, 1990).

In this strategy, it is essential that a systems and historical perspective be maintained. While developers generally see the siting process as a here-and-now, single-facility problem, publics typically have long memories and employ broader contexts. So the locations of previous controversial facilities and the sites of facilities generating wastes (for example) become important ingredients in shaping public responses. Thus, approaches to facility siting will assist in developing a dialogue if they can demonstrate that the burden of hazardous facilities will be shared over time by the whole population of the political jurisdiction, and that the location of the last controversial facility provides a context for the current decision.

If the risk issues have been effectively engaged (if not totally resolved), then the equity problems can be addressed. These problems will involve both procedural and outcome equity issues. In both cases, the emphasis should preferably be on reducing the inequity wherever possible, for it is morally better to avoid harm and injustice than to compensate for it (Derr, Goble, Kasperson, & Kates, 1986). This emphasis is also critical for perceptions of caring and of commitment to public protection. Key procedural aspects that are needed to assure basic
procedural equity have been noted above. To them should be added efforts to achieve evidentiary equity—i.e., steps taken to assure that host-community pub-
lies possess needed information and independent analytical resources, and that
the burden of proof for demonstrating safety and the suitability of the site rests
upon the developer and not the potential risk bearers (Colglazier, 1991). In
regard to outcome equity, the distribution of benefits and burdens will be critical,
since host communities for hazardous facilities characteristically experience a
disproportion of harms and burdens in relation to benefits. In particular, steps
may be taken to reduce potential harms through the provision of planning re-
sources and property-value guarantees, while benefits can be enlarged through
preferential employment and purchasing practices. A well-conceived program of
inequity reduction can do much to narrow the net level of negative impacts and to
increase the social acceptability of the site.

It is at this juncture, and only at this point in the sequence, that the use of
resources for compensation and incentive becomes appropriate. The failure to
recognize that compensation cannot substitute for safety assurance and inequity
reduction has contributed to the design of socially unacceptable siting programs,
such as those involving auction and bidding schemes, in which prospective host
communities are asked to bid a dollar price at which they would be willing to
accept the facility. Inevitably the approach of compensating for risk rather than
reducing risk greatly exacerbates social distrust by its adverse effects on percep-
tions of two of the four dimensions of trust—uncompromised commitment to
health and safety, and caring about local persons. If, on the other hand, deter-
mined efforts involving the community have been made to reduce risks and
adverse impacts and to narrow uncertainties, compensation for the remaining
adverse burden and incentives for the community to help society solve a problem
become acceptable. The level of compensation should be administratively set to
avoid prolonged and often alienating bargaining, but the form and content of the
compensation package should be negotiated with host-region publics to assure its
maximum social value and acceptance. If a voluntary solicitation for sites is part
of the siting process, consideration should be given to providing a right to “opt
out” at any time in the process, as an incentive for candidate communities to stay
involved, and to provide time for full community consideration to occur and for
local advocates to emerge.

Final Observation

While successful risk communication and siting programs will always de-
pend upon both historical experience and the regional political culture and in-
stitutions, the strategies outlined above are sensitive to a context of high social
distrust and provide some potential for success under what are inevitably very
imical conditions for addressing controversial public (or private) decisions. Initiatives based upon the explicit recognition of high social distrust may, through empowerment, risk clarification, and negotiation, ultimately prove to be much more effective in the long-term recovery of social trust than approaches that assert that such trust is merited a priori, and that attempt to combat long-term trends and convert ingrained attitudes in the relatively short time periods that characterize siting decisions.

References


ROGER E. KASPERSON has written widely on issues connected with technological hazards, risk communication, radioactive wastes, and global environmental change. For the past ten years, he has directed a series of research
projects, funded by the National Science Foundation, the Russell Sage Foundation, and the United Nations University, dealing with technological risk management, industrial management of hazards, and ethical and policy issues involved in risk management.

DOMINIC GOLDING is a fellow in the Center for Risk Management at Resources for the Future. He received his Ph.D. in geography from Clark University, where his research focused on the social issues of risk assessment and risk management, especially with regard to nuclear power. His current research interests include the history and development of risk research, environmental equity, risk communication, and community risk profiles. He is co-editor with Sheldon Krimsky of Social Theories of Risk.

SETH TULER is a Ph.D. candidate in the Environment, Technology, and Society Program at Clark University, and he previously worked as a research associate at the university’s Center for Technology, Environment, and Development. His research interests include the social-psychological aspects of risk perception and decision making, and he has worked as a consultant on emergency response planning for hazardous facilities and risk communication for public and occupational risk reduction programs.