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TRYING TO MAKE AN UNWANTED FACILITY PALATABLE

William C. Metz, Ph.D.*
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Il. 60439
708/252-3271

ABSTRACT

Finding suitable accommodations for the temporary storage and permanent disposal of this nation's low- and high-level radioactive waste is proving an ever more difficult task in this era of volatile technology and science debate over the merits of the nuclear fuel cycle. Local constituencies become deeply immersed in the complex debate whether the site is chosen through a technical site selection process or is a voluntary entry. Rural communities with candidate sites need to initially shift their focus away from this, often acrimonious, debate; instead, the first discussion priority for such rural communities should be to develop a dynamic vision of their own economic and environmental future. The second discussion priority should be to determine if the array of accompany incentives and benefits hosting this facility would afford the community the opportunity for vision fulfillment. If so, total focus should, then, be given to understanding and resolving to the satisfaction of the constituents issues related to nuclear technology, isolation of radioactive materials, management of risk, storage and disposal facility need, perceived and actual risk, oversight and power sharing authority, engineered safety barriers, and public trust. Too often, the nuclear-related science and technology debate is first, and the pragmatic discussion concerning the vision of the future is never accomplished.

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INTRODUCTION

A decade has passed since implementation of the Low-Level Waste Policy Act of 1980 and the Nuclear Waste Policy Act of 1982; however neither act has achieved the siting success that they were mandated to perform. Siting efforts have primarily employed three selection methods: (1) technical siting using screening criteria, (2) voluntary siting using incentives and benefits as inducements, and (3) legislated site delineations. Responsibility for these siting attempts was vested in an assortment of quasi-public corporations, associations, state and federal agencies, commissions, authorities, advisory committees, citizen advisory committees, boards of directors, management boards, negotiators, state legislatures, and Congress.

The development of facility siting has been saturated with new theories, models and assumptions, analyses of the dynamics of siting, and assessments of empirical examples of successful and unsuccessful siting efforts.[1,2,3,4] The states involved with low-level radioactive waste siting and the U.S. Nuclear Waste Negotiator have received a wealth of recommendations on devising and implementing a process to attract a suitable volunteer or to satisfactorily compensate a selected host. The respective siting processes have been redesigned, modified, and altered to accommodate these often conflicting recommendations, yet expediency and effectiveness have been absent in achieving successful facility sitings.

Although those responsible for siting are focused on complying with the regulatory frameworks and processes of siting, the potential host jurisdictions are keyed too strongly on the complex, sophisticated, controversial nuclear-related technology and science issues. In their search for answers about radioactivity, the need for the facility, the facility itself, and the transport of radioactive waste, jurisdictions have listened

to conflicting advice, often contentious, from outside experts, consultants, advisors, "interpreters," and professionals from national organizations and state and federal agencies. The local populations are then faced with a myriad of strong and volatile emotions, misinformation, intentional and unintentional misinterpretations, personal biases, conflicting opinions, actual and perceived fears, and personality clashes that often obscure the facts. This initial, consuming pursuit by a community for technical and scientific understanding of the issues, diverts a jurisdiction from what should be of primary importance: deciding on a dynamic vision of its economic and environmental future.

A desired jurisdiction for siting a facility is rural, has a low population density, and exhibits suitable, qualifying environmental characteristics. Many attributes that make a jurisdiction a viable candidate also saddle it with poor prospects both in the fierce national competition for increased economic development and in its ability to aggressively protect and enhance the region's natural environment. The change afforded by these controversial facilities is ubiquitous and more versatile than the benefits accompanying the usual economic development from an industrial and business relocation. Depending on the cost of any incentives offered by a local community to induce such a relocation, industries and businesses may provide only minimal tax revenues and not the guaranteed array of benefits and innovative incentives available to a prospective community and region for hosting a nuclear facility.

This paper proposes an alternative prioritizing of discussions of relevant concerns by host communities as a first step in revitalizing siting processes involving nuclear-related facilities. This alternative will meet many facility detractors who will fear or feel it is unfair to delay the nuclear-related science and technology debate; however, that debate is not initially productive for the community. Local governments face hard economic and environmental decisions in these rural communities with limited resources and decision-making capabilities relevant to resolving local concerns. The use of outside funding and expertise is crucial in examining available future economic and environmental options and making decisions concerning the future. Because both monetary and nonmonetary resources are often provided in siting processes, communities can internally perform research and request outside technical assistance to discern several future scenarios, tenable and untenable. They can convene local forums to assess the scenarios and, ultimately, create a consensus vision of the future. Then, they can determine what means would be necessary and acceptable to activate that vision. Finally, on the basis of scientific and technical judgements and social assessments, a community must assess and determine whether hosting a nuclear-related facility to realize that vision is acceptable in terms of the many economic, environmental, and social trade-offs. The community, not outside experts and organizations, should have the control and ability to decide if the controversial facility is palatable.

SITING PROCESSES FOR UNWANTED AND CONTROVERSIAL FACILITIES

The responsibility for siting controversial and unwanted low-level radioactive waste disposal facilities was assigned to the states in 1980; since then, problems have increased and license application costs have escalated. It was assumed that five or six compacts would emerge as states banded together to resolve this common problem and share the burden, replacing the present three disposal facilities. Because intense public anxiety has confounded technical and scientific assurances over the ability to isolate radioactive waste from the environment and a political divisiveness exists between states, there are nine compacts and four independent states.[5] The contentious process is creating far more sites than are needed. Estimated costs for acquiring a site license have steadily risen to between $50 and 100 million. Unsuccessful siting efforts, such as in Illinois, have cost close to $90 million, and the process must begin again.[6,7]

Most low-level radioactive waste disposal facility siting efforts are using a siting process based on technical and scientific qualifications because viable volunteers have not emerged. Thus, candidate site locations are being selected on the basis of an exclusionary and avoidance criteria of specified characteristics, before preference criteria with a relative or weighted importance are applied. As each siting effort selects a small number of candidate sites, the chosen hosts are subjected to acrimonious polarizations among the populace, exacerbated by well-funded regional and national opposition groups, on the technical and scientific merits of these nuclear-related facilities. Local politicians and decision makers are generally overwhelmed by the wide-ranging nature and complexity of nuclear science and technology issues, as well as the emotionalism and vehemence of the opposition.[8]

The responsibility for siting a temporary high-level radioactive waste storage facility is split between the Office of the Nuclear Waste Negotiator, the Secretary of

Energy, and Congress; siting a permanent disposal facility additionally involves the President. The Office of the Nuclear Waste Negotiator, an independent and autonomous federal entity, is attempting to find a state or federally recognized Indian tribe willing to host a repository or a Monitored Retrievable Storage (MRS) facility at a technically qualified site on reasonable terms. On October 7, 1991, the Negotiator mailed a description of his new voluntary siting process, "An Invitation to Dialogue and Participation," to state governors and tribal leaders for review. In his cover letter, he stated "I invite your expression of interest in one of the most innovative and visionary federal initiatives ever created."[9]

If the Negotiator is unsuccessful in attracting volunteers, then characterization activities at a congressionally selected repository site will continue to determine site suitability at the Yucca Mountain site, and the Secretary may conduct a site selection survey and evaluation for an MRS under Section 144 of the Amendments Act. The Secretary can focus site selection activities at select federal facility sites or engage in a national site survey that includes private lands.

Siting processes for all nuclear-related facilities are encumbered with increasing national opposition to the nuclear fuel cycle facilities, a strong distrust of government authorities, and powerful, well-funded antinuclear opponents. The word "nuclear" has become an anathema to any nuclear-related facility siting effort. Because of divisive political conflicts, an inability to overcome environmental and social objections, and a lack of decision-maker courage in the face of determined public opposition, thousands of hospitals, pharmaceutical makers, and electric utilities are in peril and face the possibility of closure or having to relocate their operations to a state where disposal facilities are available. (10) Utilities will be forced to construct and operate temporary low- and high-level radioactive storage facilities on-site at over 70 power plant sites.

THE ASSOCIATED INCENTIVES AND BENEFITS IN PERSPECTIVE

As an inducement to attract volunteers and address many of their concerns, associated incentives and benefits are included within each low- and high-level siting process. These provide for, among other things, state and local oversight and power sharing, environmental and safety monitoring, options for promoting economic growth, increased governmental services and facilities, protection of public health, infrastructure improvements, and a measure of financial equity and compensation for accommodating a nonlocal problem. The inducements are both monetary and nonmonetary. Some take the form of guarantees and indemnifications, involving protection against declines in area property values and area product demand; others seek to ensure a high level of local procurement and labor participation. Opponents of a facility denounce inducements as bribes; however, proponents view them as opportunities for the community and region.

Controversy surrounds the process by which a specific set of benefit, incentive, term, condition, compensation and equity positions for potential hosts are determined: Who leads? In confronting the issue, the Office of the Nuclear Waste Negotiator convened a panel on March 11, 1991, to provide guidance on what constitutes legitimate and appropriate benefits and whether they should be discussed with or offered to a prospective host.[11] During panel discussions, concern was expressed about the Negotiator developing a detailed menu of benefit and incentive options to which a potential host community might be entitled. An alternative approach supported a preliminary or "skeletal" list of benefit and incentive options which would form the basis of a minimum set of demands from which a host community would being negotiations. Additionally, some felt that any list might actually offer more than a host might otherwise have requested; better to develop the interactively with the actual host. The attitude, then, behind the criticism of a list was to keep potential hosts ignorant of their options in hopes that they would settle for less. Yet, in order to encourage interest in the siting process. potential hosts have to have an awareness of the magnitude and magnanimity of what they might be entitled to dependent upon their own specific needs, concerns, and perspectives. Incentives addressing health, safety, and environmental concerns are crucial to acceptance; incentives boasting economic and environmental benefits are what attracts interest and participation.

Current low- and high-level waste siting legislation and procedures address incentives and benefits in three ways: (1) offer local and state jurisdictions inducements that are specifically detailed, (2) present a base of options from which negotiations can ensue to address specific needs and concerns, and (3) leave incentives open to negotiation. There has to be a balance in being willing to offer enough incentives to encourage interest and attract participants for time delays are expensive and not being over indulgent and excessive. Discussions of incentives and benefits needs to be frank and open leading to a reasonable agreement, avoiding any accusations of the parties being disingenuous or lacking in candor.

At present, the question being posed by potential host jurisdictions focuses on the highly-charged, emotionally negative, state and federal policy "gorilla" aspects of the siting activity is "Should we consider hosting a low- or high-level radioactive waste facility which is accompanied by incentives and benefits?" Ideally, the question should rephrased in a more positive, participative manner to include an emphasis on the possible fulfillment a community's vision by reflecting the full equation: "In order to seek fulfillment of our economic and environmental vision, should we evaluate hosting a low- or high-level radioactive waste facility, thus receiving the accompanying incentives and benefits?" While determining a vision of its economic and environmental future, a host jurisdiction can initially review what its needs and requirements would be and, in general, what relevant social, science, technology, operational, control, economic, environmental, health, political, ethical, and safety concerns have to considered and resolved.

Resolution of most concerns involving facility management entails a potential host developing and strictly enforcing a set of agreed-upon terms, conditions, and straightforward commitments. If concerns are raised over facility construction, operation and closure, then a range of oversight and control authorities could be demanded. If concerns exist regarding safety, public health, and environmental pollution, then independent or state-supervised monitoring should be made available. Engineered barriers, defenses in depth, and redundant systems could be requested to ensure facility integrity and future isolation of radioactive materials. If worries arise about losses in surrounding property and agricultural product values, then a procedure guaranteeing against loss and providing reimbursement could be implemented.

Designing economic and environmental benefits and incentives to accompany a controversial facility requires an ability to conceptualize a range of innovative solutions and opportunities. These are best developed within a process that responds to a vision and that reviews the community wish list. Although rural jurisdictions have needs within similar categories such as education, economic base, employment, health care, infrastructure, and environment, not every jurisdiction desires the same exact benefit or incentive due to varying circumstances and aspirations. Responding to local and state problems would be impossible to achieve or replicate through the present revenue alternatives and government sources normally available, even if the jurisdiction was the recipient of new economic growth. Innovation and tailoring inducements to a host jurisdiction's vision are essential elements in making the benefit and incentive package equitable and as compensation for hosting a nonlocal problem.

Disparities in the geographic scope and depth of incentives and benefits have been seen in the present economic interests of potential hosts. Some potential hosts are concerned only with their local economic interests, while a few seek to incorporate a regional economic focus to their negotiations by dispersing accompanying facility locations. This can increase the political support afforded to the host in its pursuit of the facility. Some hosts encourage all manner of growth, others prefer only to halt a present general economic decline, target a certain sector for expansion, or protect a status quo. Some desire a local school system affording the maximum amount of educational and facility opportunities, supplemented with collocated research and development facilities and affiliated university programs. Others want a more basic school system, replacing outdated and inadequate facilities as a benefit. Some want to attract visitors through elaborate science and technology centers and history and natural science museums. Many want local job training and procurement preferences for local businesses. Available health care has been a rural problem, and most visions propose to solve that with new or expanded local or regional facilities. Other differences occur in discussions on the types and amounts of infrastructure desired and the purposes they are to accommodate.

Disparities also exist in the environmental interests of potential hosts. Many prefer to heal old environmental scars left by uranium, coal, or other mineral mining activities and the destruction of other natural resources, such as woodlands, wetlands, rivers, and prairie, locally or regionally. Others prefer to promote present agricultural production. Environmental protection can include setting aside large tracts of land to return to a natural habitat. A few would want to promote natural resources through enhancing area recreational opportunities.

Incentives could be geared to respond to the most simple concerns. Facility managers could be required to reside in the closest subdivision or suitable house to the facility. An agreement could also be developed by astute constitutional and contract lawyers to ensure continued receipt of any agreed-upon compensation to counter any concern over policy and benefit alterations due to changes in Congress or the President. Further, trust funds could be established to allow payments to be extended beyond the period of facility operation or to contain funds to cover any environmental damage or economic impact, real or perceived.

A review of low-level waste disposal facility siting processes revealed that eight siting efforts offer a prescribed set of incentives and benefits, both monetary and nonmonetary, for a potential host. Two siting efforts mandate a floor or minimum that jurisdictions can expect but allow negotiation for additional incentives. Two other siting efforts leave the issue of incentives and benefits open to negotiation, with no mention of a minimum or maximum.

The high-level waste program offers a set of benefits from the 1982 legislation and an opportunity to negotiate a reasonable package of incentives and benefits from the 1987 Amendments Act. The Office of the Negotiator has chosen the approach of talking frankly about possible terms, conditions, and equities that can be negotiated to the mutual benefit of the jurisdiction and the nation. A "sophisticated package of opportunities that will include but not emphasize money, the opportunity for participation and shared control, economic expansion and indirect benefits, maybe some heal'h care" was created. A notice was then published in the Federal Register, June 5, 1991, as an example, to show what possible negotiation options were available. Options include federal contributions, such as infrastructure improvements, environmental improvements, public assistance programs, higher education programs, healthcare programs, proposed collocation of other federal projects, general economic development, transfer of federal properties, tax subsidy or property value protection, public recreation projects, direct financial assistance, local employment or products purchasing agreements, and other types of assurances, equity, or assistance desired. Actual descriptions or compilations of empirical examples of incentive implementations have not been offered by the Negotiator, therefore, many potential hosts have not been sufficiently stimulated to express an interest. There can also be an intimidation factor of potential hosts by states and their political leaders who see little reason to afford a rural community, with negligible voting power to better themselves.

Most communities involved in the siting processes never completely explore the range of possible incentive and benefit opportunities available to them. A dialogue is crucial in terms of defining the economic, environmental, health and safety, and social issues and concerns and whether incentives can be negotiated to address them. All too often, the siting debate narrowly focuses on scientific and technological concerns about the facility and the overriding fears and anxieties expressed by the opposition, rather than how the public as a whole could benefit from the siting.

CANDIDATE ECONOMIC AND ENVIRONMENTAL CONCERNS

By their very nature, many rural communities who primarily rely on the mining and agriculture sectors and single-plant or branch industries are beset with economic and environmental problems. A rural area rarely has a strong diversified industrial tax base, fully infrastructured industrial parks are almost nonexistent, government-supported services and facilities are strained, school facilities and programs are limited, and young workers generally leave to find suitable employment. Changes in the national and international marketplace, federal and state programs and funding authorizations, and regulatory environment lead to the economic vulnerability of rural communities and regions. Rural area environmental concerns reflect the dependence on agriculture and their aggressive or passive exploitation of their natural resource base. Environmental conditions are affected by market, regulatory, and climate fluctuations. Declines in the mineral industry have greatly affected both the economic and environmental conditions of many rural regions. No panacea exists for the economic and environmental problems of rural areas.

Many rural communities have unrealistic hopes that they, out of the thousands of rural communities in similar situations, will attract enough new industries and businesses to solve all their economic problems. Amenities are an important evaluation factor by industries and businesses considering relocation and are promoted by planners and local authorities as a means to attract new economic growth. Although flexibility of location has increased because of improvements in transportation, technology, and telecommunications, no major movement of industries and businesses into rural areas has occurred. A recent survey comparing the roles of amenities in the location behavior of manufacturing and business service activities showed significant differences in amenity sensitivities.[12] Business service establishment and manufacturing headquarter and research and development facilities are attracted to amenity-rich locations, often on the periphery of larger urban areas, with easy access to markets, attractive quality-of-life attributes, highly skilled labor, suitable housing selection, quality education systems, and desirable natural environments. Important siting factors for manufacturing plants are low business taxes, competitive wage rates, attractive facility and energy costs, availability of suitable premises, and a pro-business attitude by state and local governments. At the local level, when specific sites are chosen, amenities and inducements increase in importance as factors in the final decision. Most economic growth in

a rural area can be attributed to local entrepreneurs or branch siting managers who have inherent familiarity with the chosen location.

The environmental quality of an area is often at the mercy of shifting internal and external forces, many of which a community has little control over. Market demands, environmental regulations, state and federal agency priorities, personal and corporate goals, and company financial conditions can encourage or halt the harvesting or mining of natural resources, as well as affect restoration activities of disturbed lands. The schedule for cleaning up polluted environments and protecting habitats is driven by state or federal funding priorities, lawsuits, and voluntary or regulatory-driven remediation efforts. Present statutory authorities and taxing powers entrusted in local communities and rural jurisdictions are limited and not capable of resolving major internal environmental degradations.

Nuclear facilities currently located in rural and semirural areas continue to benefit their host communities. In recent analyses concerning the possible economic impacts of nuclear-related facilities because of the associated perceptions of risk, no identifiable social and economic consequences could be found. Demographic growth has occurred in communities adjacent to nuclear power plants at a rate three times the national average.[13] Recreational activities have not witnessed any negative repercussions, for example, skiing, white-water rafting, theme parks, boating, fishing, and beach tourism, have expanded near numerous nuclear facilities. Their presence not caused negative perception-based impacts; on closure there has not been any parallel surge in area growth.[14] Independent Spent Fuel Storage Installations (ISFSI) are now being planned and constructed at nuclear sites and at federal facilities, with no apparent consequential perception-based effects on area or regional tourism, agricultural products, industry, or real estate. Even the Three Mile Island accident had no measurable negative real estate or local business effects.[15]

CONCLUSION

The increasing public discomfort and anxiety with nuclear waste issues and the entire nuclear fuel cycle will be resolved or abate soon. Siting new facilities has become almost impossible if the facility's nuclear scientific and technological issues are placed at the forefront of all siting debates. In recent surveys of the national population, about one fourth of those surveyed felt that all nuclear power plants should be immediately shut down, and more than 60% felt that no new nuclear power plants should be constructed.[16] However, people in increasing numbers live, work, and vacation close to nuclear facilities, as well as near nuclear waste transport corridors, while professing a fear and an unwillingness to do so,[17] thus bringing into existence an apparent paradox. Researchers need to study this confounding issue of stated intent and predicted behavior, determining whether (1) people have quietly acquiesced to a widespread but unwanted condition of being near nuclear things, (2) do not really mean what they say, or (3) a subtle shift in population has occurred so that those feeling uncomfortable have relocated away from nuclear-related facilities and routes.

The unrelenting controversy and vehement opposition to present and proposed nuclear-related facilities will continually derail current siting efforts. Negative images and public perceptions of risk associated with nuclear things represent an inherent mindset based on a bundle of thoughts influenced by such factors as personal and cultural values, individual equity and risk evaluations, levels of trust accorded federal agencies and institutions, personal and professional education and training, association of fear with things nuclear and radioactive, changing dynamics of image salience, an antitechnology and antimaterialism sentiment, questions of moral accountability, political and social influences, and life experiences and preferences.[18,19,20] The basis for the imagery and perceptions must be understood, unraveled and addressed, as well as placed in perspective, to begin to confront the anxieties expressed in survey data. Expending a small amount of funds to educate the public about the science and technology of nuclear waste does not confront the broad range of public concerns or the vehement opposition and has little chance of creating an advocacy position in a local populace.

Assisting local communities, host jurisdictions, and Indian tribes to help them develop a vision of their economic and environmental future should be given primacy in all siting effort for low- and high-level radioactive waste storage and disposal sites. Then, prospective hosts can assess whether a facility being sited can assist them in achieving that goal through an innovative use of incentives and benefits or whether that vision can be achieved realistically via alternative sources. If the inducements that accompany a controversial facility are a viable means, then the prospective host needs to thoroughly understand and evaluate the scientific and technological issues related to the nuclear fuel cycle and isolation of radioactive materials to the satisfaction of their constituents.

The acrimonious debate on scientific and technological issues that at the outset has consumed and polarized each siting effort needs to be delayed. Ideally, the local populace should be involved with a more positive, participative approach which reflects the full siting equation: "In order to seek fulfillment of our economic and environmental vision, should we evaluate hosting a low- or high-level radioactive waste facility, thus receiving the accompanying incentives and benefits?" If the response is yes, it affords economic and environmental opportunities to local and regional populations far superior to any that would accompany other facilities. The facility should be bounded by a rigid set of agreed-upon terms, conditions, and covenants, monitored jointly by state and local inspectors and independent experts. Irrefutable guarantees of safety and protection of the public health should be legislatively mandated.

An unwanted controversial facility may become palatable if a prospective host and the respective state have the political courage to look to the future and then determine if it promotes fulfillment of that vision. Communities, states, and Indian tribes are not persuaded or amenable to being hosts on the basis of altruistic themes such as resolving the intergenerational issue of waste disposal, removing a barrier to the resurgence of nuclear energy, resolving a national waste crisis, or allowing medical treatment and hospital and university research activities to continue. On the contrary, hosts should be duly rewarded for solving a nonlocal problem and all host anxieties and concerns fully respected and addressed.

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