THE CONSENSUS BUILDING HANDBOOK

A Comprehensive Guide to Reaching Agreement

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RULENET

An Experiment in
Online Consensus Building

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When William J. Olmstead was a law student in Topeka, Kansas, he was frustrated at his inability to attend public hearings on affirmative action rules. His school refused to pay for the trip to the District of Columbia. Many years later, Olmstead himself had moved to Washington, where he occupied a senior position in the legal counsel's office of a major federal agency. Sitting in the heart of power, he was still bothered by the limitations inherent in the conventional regulatory process. He aimed to make the process more open and inclusive. *Negotiated rulemaking,* a consensus-based practice that directly involves stakeholders in forging administrative rules, had grown in popularity as a form of national policy setting. But full, early, and active public engagement was still a ways off. Computers, Olm lieved, might help cover some of tance.

Thus began an experiment that be known as RuleNet, an electroni ence on proposed modifications to fire protection rules conducted by clear Regulatory Commission 1996. This case study will explore nical and political dimensions of We begin our account with a co overview of the actors and iss played a role in shaping the pilot We proceed with an outline of R technological attributes to provid crete sense of how the comput structured interactions among the pating parties. We then detail the that contributed to what is widely

terized as RuleNet's mixed success. We conclude with a discussion of the strengths and limitations of online consensus building, based on the demonstration project.

■ *The Challenge of Regulating Nuclear Power: A History of Controversy*

More than 100 commercial nuclear power plants operate in the United States, generating approximately one-fifth of the country's electricity needs. The agency responsible for licensing and oversight of these facilities is the U.S. Nuclear Regulatory Commission (NRC), which was established as an independent body in 1974 to assume the regulatory functions formerly carried out by the Atomic Energy Commission (AEC). The mission of the new organization was defined as directing "the Nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, to promote the common defense and security, and to protect the environment" (U.S. NRC, 1997).

From its inception, the NRC has enjoyed little smooth sailing. Both its origins in the womb of the AEC and its organizational culture have contributed to persistent misgivings about the agency's independence from its licensees. The AEC was an avid promoter of nuclear development, and the NRC staff is strongly identified with a "priesthood of engineering" that doesn't always take seriously the risk-related concerns of a skittish public. Over the years, charges of regulatory capture have been aired repeatedly in Congress and in the media, where the NRC was often characterized as the "fox guarding the hen house." In the mid-1980s, the NRC found itself on the agenda of the U.S. House of Representatives Committee on Interior and Insular Affairs; 10 years later, it was on the cover of *Time* magazine (Pooley, 1996, p. 46). Each conducted its own brand of special investigation, and concluded that the NRC had "demonstrated an unhealthy empathy for the needs of the nuclear industry to the detriment of the safety of the American people" (Subcommittee on General Oversight, 1987). ❧

But demands for greater accountability and transparency from the public have been matched by complaints from manufacturers and operators of nuclear energy plants. In the 1970s and 1980s, the construction of more than 100 planned reactors was deferred or aborted. No orders have been placed since 1978 and some plants have shut down prematurely (Aron, 1997, p. 3). Representatives of the economically battered industry blame costly delays and failures of entire projects partly on inconsistencies and inefficiencies in the NRC's regulatory process. They decry its voluminous and ever-evolving guidelines. They also criticize what they describe as an excessive emphasis on strict compliance with administrative rules, an approach that, they allege, fails to discriminate between problems with severe and minor safety implications.[1]

Among the more hotly contested of a host of controversial nuclear-related issues is that of fire protection regulation pertaining to nuclear reactors. An unwieldy body of prescriptions has burgeoned in this area since a 1975 fire at the huge Brown's Ferry station in Alabama damaged essential equipment, causing the worst nuclear accident in the United States before Three Mile Island. ∞

∞ COMMENTARY

The Brown's Ferry fire caught the public's imagination because it was started by a workman's candle being used to check for drafts from the channels through which electric control cables passed through the containment shell. Suddenly, nongovernmental organizations (NGOs) and the public felt they could comment intelligently on what had previously been a highly technical field that was only accessible to nuclear physicists and other scientists.

—William Moomaw, *Environmental scientist*

To avoid future disasters, in 1981 the NRC implemented a regulatory framework to prevent, detect, control, and extinguish fires in nuclear plants. That framework was codified at 10 CFR 50.48 and CFR Part 50, Appendix R.[2] But as soon as it was promulgated, it was subjected to a rare legal challenge by industry and only barely survived judicial scrutiny. In subsequent years, reinterpretations of the underlying rules and thousands of exemptions granted to licensees produced a potpourri that made it daunting even for the regulators themselves to figure out the licensing basis for a particular plant.

The vast confusion that has reigned in the realm of fire protection is exemplified by the troubled history of Thermo-Lag 330, a plasterlike fire retardant material used by a majority of American nuclear plants. Thermo-Lag is used to coat electrical circuitry that controls emergency reactor shutdown. Appendix R requires that critical cables be insulated by barriers rated to withstand fire damage for three hours (or for one hour, in the presence of detection and automatic fire suppressant systems). Throughout the 1980s, Thermo-Lag was widely touted as the substance that best met such specifications, despite a series of

test findings that should have raised concerns. In the early 1990s, the long-simmering Thermo-Lag issue erupted, creating huge headaches for the NRC and nuclear operators. Among other things, the agency staff was berated by the NRC's own in-house inspector general for sluggishness in reviewing Thermo-Lag-related problems. In the end, the NRC acknowledged a pattern of product failure, declared Thermo-Lag "inoperable," and ordered its licensees to take remedial action. ◆

◆ COMMENTARY

The slow realization that Thermo-Lag might be a problem is echoed in the recent findings that fire retardant material in aircraft is insufficient to contain fires adequately. The bureaucratic responses are similarly slow as were those of the NRC.

—William Moomaw, *Environmental scientist*

By the fall of 1996, fire safety system overhauls were completed in less than half of the affected nuclear power units ("Faulty Insulation," 1996). In part, the slow progress during the intervening period was due to the significant financial burdens that the replacement of Thermo-Lag entailed. The total cost of replacing the material was estimated at $500 million—a further blow to an industry that was already buckling under strong competitive pressures. Trying to find a way out of the debacle, the NRC maintained that, given adequate alternative precautions, Thermo-Lag usage was of "low safety significance." On these grounds, the agency once again granted a series of exemptions—a move that stoked the ire of nuclear watchdog groups. The NRC also started paying increased attention to other aspects of fire protection—such as nuclear plants' fire hazard analyses, penetration seals, and lube oil collection systems—and indicated that it was prepared to contemplate changes in the fire protection regulatory framework more generally. The declared objective of such a redrafting exercise would be to make rules less prescriptive and more performance based.[3] The bitter debate over the cost and policy implications of fire safety regulations was far from resolution when a senior lawyer at the NRC decided to make a splash—and picked the weighty fire protection issue to do so.

■ The Genesis of RuleNet: Great Expectations

Over the past few years, national policymakers have attempted to "use the Internet" to bring government to the people" by making available electronically a wide range of federal information and services. But the NRC was the first federal agency to use sophisticated, interactive computer technology to involve stakeholders in the development of administrative rules. The pioneering spirit behind this initiative was William J. Olmstead, the agency's associate general counsel for licensing and regulation, who is universally described as entrepreneurial and visionary. Olmstead was a strong believer in alternative dispute resolution (ADR) and had served a two-year term as the head of the Administrative Conference of the United States (ACUS), an independent government agency charged with improving the procedural fairness and efficiency of federal regulatory programs. During his tenure as executive director of

ACUS, Olmstead had frequent interactions with mediator John Helie, then director of ConflictNet, a provider of ADR resources online. (Helie has since left ConflictNet to create Mediate.Com, a mediation information and resource center on the Web.) The idea of an electronic forum for regulatory negotiation germinated in the exchanges between the two men, and came to fruition in the mid-1990s in the shape of RuleNet.

RuleNet was Olmstead's answer to the Clinton administration's call for innovative and cost-effective governance. That call was given institutional force in the form of the National Performance Review (NPR), an ongoing effort to streamline bureaucracy under the leadership of Vice President Al Gore. The NPR had previously developed a system called REGNET, a program using computer networks to disseminate information relevant to federal regulations under consideration. Riding the same wave, the NRC first instituted the use of electronic bulletin boards, where interested parties could "post" comments on a proposed rule. That system was too rudimentary for the participants to interact directly among themselves or with the agency. However, a more ambitious design was the logical next step. Over the course of 1994, the idea of an online rulemaking process matured within the NRC and plans for the creation of an appropriate communications system advanced.

The substantive focus of the online rulemaking was a matter of some debate within the NRC. In selecting a topic, the staff grappled with the tension between strong appeal and manageability. The former prevailed when the choice fell on the question of whether, and how, performance-based regulations could be made applicable to fire safeguards in nuclear reactors. In early 1995, the nuclear industry had submitted a petition for rulemaking, known as Appendix S to 10 CFR Part 50, which was to replace Appendix R in whole or in part. Arguing that advances in fire-modeling and risk-forecasting techniques allowed for the identification of appropriate, situation-specific performance criteria, the proposed amendment called for greater regulatory flexibility in reaching fire safety objectives. The NRC had already solicited and received public comment on the petition in the conventional way. Olmstead (1996) saw the maturity of the fire protection issue as an advantage inasmuch as

1. There was a clearly defined topic of interest to the technical regulated community so that significant useful participation could be anticipated.

2. There was a baseline in the traditional paper-notice-and-comment process with which to compare results. ❧

❧ COMMENTARY

The criteria for choosing the fire issue seem sound. The subject of the rulemaking contains a range of highly technical and nontechnical issues such that people with a wide variety of specialized knowledge could be expected to participate. The issues are focused enough to be manageable, and having a prior paper record allows comparison with traditional approaches. A major advantage of the online process is the ability to provide rapid response to issues raised and questions asked by the participants in the consensus building process.

Olmstead and his colleagues on the NRC legal team expected that an online negotiation could enhance the quality of both the administrative rules that the agency devised and the process for generating them. RuleNet was designed as a three-month pilot project (with roughly six weeks devoted to the development and adaptation of appropriate online technology and six weeks allocated for the dialogue itself). Among its goals was testing the propositions that stakeholder discussions via the Internet could help speed up regulatory action and reduce its contentiousness. Proposals, Olmstead suggested, could be submitted and revised based on rapid feedback, while discord could be addressed as it emerged, before it festered and positions hardened. Above all, the Internet was touted as having the potential for broadening participation and democratizing decision making: No longer would regulatory negotiations be dominated by a small circle of power brokers and experts. Theoretically, anyone could weigh in—as long as he or she had an opinion and a modem.

The NRC published a vision statement in November 1995 that outlined the concept behind RuleNet. According to this document, the process would consist of several phases that moved from stating the problem, to imagining solutions, to formulating more concrete proposals, to debriefing and evaluation. It identified several decision-making mechanisms that would be available, such as caucusing, voting, and "consensus evaluation." It also envisioned recruiting professional neutrals to facilitate the online dialogue. As the technology design team based at Lawrence Livermore National Laboratories explained, the RuleNet system was intended to "encourage participants to share dialogue rather than to posture or express positions . . . the real value is not in people's knee-jerk reactions, but rather in the case-based and on-line expertise" (Information Technology and Security Center, Lawrence Livermore National Laboratory, 1996, p. 25).

Appropriately, RuleNet was inaugurated with a "virtual meeting" in cyberspace on January 5, 1996. A facilitated video conference discussion involved audiences gathered at one Sprint location and a handful of Kinko's copy stores across the country. A transcript was fed to the Internet, through which still more participants could follow the proceedings on their home or office computers with a delay of only a few minutes. Web users could also electronically interject comments and questions from their home or office computers. Despite the fact that NRC Chairman Shirley Jackson was on hand to give her imprimatur, the kickoff event was grander in design than in execution. The Kinko's copy shops made for rather cramped quarters and many of the messages that poured in merely stated that the record had stopped scrolling across the screen. The *New York Times* caught some of the involuntary humor in the scene in the following rendition:

"Press 'more' at the bottom of your screen," the facilitator, John Helie, advised, speaking to the camera. The comment was put on the Web. "Of course," he added, "They'll probably have to click on 'more' in order to get that information." (Wald, 1996, p. D-2)

The multimedia kickoff was an apt preview of things to come. On the one hand, it was a demonstration of the power and promise that the use of technology holds for consensus building. On the other hand, few new adventures proceed without hitches—and RuleNet would prove to be no exception.

■ The Technology Underlying RuleNet

Information technology is dazzling. Sometimes people exposed to it understand it too little and entrust it with too much. Obviously, the promoters of RuleNet focused heavily on computer capabilities. But the RuleNet team members' strong attention to tools also clouded their awareness of some flaws that slipped into the design of the consensus building process. The main stumbling blocks were not technical; in fact, technical problems were relatively minor irritants along the way. Rather, in the general excitement, the temptation to charge ahead without full consideration of the dynamics of the fire protection dispute proved irresistible and, ultimately, problematic. Political realities ended up getting in the way—realities not anticipated by some unflappable technological optimists on the NRC staff who assumed, for example, that "the software will summarize points" (interview with Elin Whitney-Smith, Washington, D.C., August 1998). In retrospect, Francis Cameron, special counsel for public liaison at the NRC and a close Olmstead associate, observed that it is apparent that some consensus building practices, such as convening, are equally important in an online setting. "Doing it electronically doesn't mean that you shouldn't have the focus, drive, and systematic effort you usually put into a consultative process."

The Tools of RuleNet

The address of the RuleNet World Wide Web site was http://nssc.llnl.gov/RuleNet. The visual image that graced its home page was a colorful drawing representing a power plant, a single-family house, and the nation's Capitol building, all interconnected through a whirl of telephone wires. Computer engineers at Lawrence Livermore National Laboratory (LLNL) had previously developed Internet software called NetForum, a multicomponent program used for electronic conferences and other interactions by a variety of clients. NetForum was adapted to suit the specific needs of RuleNet participants, as defined by the NRC. An LLNL team accomplished this through the design of tools that helped focus the dialogue, summarize information, and identify peripheral issues that should be brought into the center of the discussion. They became the primary means by which the facilitators and the technical support staff guided the flow of the negotiation and urged the group closer to consensus. Among the Web-based tools were the following:

- A "participant tool" allowed anyone to register for the NetForum and participate in discussions.

- "Frequently asked questions," or FAQs, provided some background information to the participants, as well as spelled out the "rules of engagement" that postings on the site had to follow. This allowed for doubts raised by participants to be clarified immediately, a marked improvement over the traditional paper process in which queries from the public are answered only with the release of the final rule, if ever.

- The "news tool" reported information about NetForum and ensured that participants knew when new postings appeared on the site; it also allowed participants to be up-to-date

on the progress made by different, parallel discussion groups.

- The "reference tool" allowed participants to contribute a document or to browse documents that had been sent in by other participants or loaded by the NRC. Appendix R, for example, was searchable in full text form.

- The "forum manager tool" arranged the postings of the participants and facilitators so as to make the dialogue easier to follow. All of the postings could be sorted by author, date, position on the issue being discussed, or subject.

- "RuleNet Commons" was a discussion forum open to everyone, including people who were not registered on the site. Additionally, it provided a place where postings deemed not appropriate by the moderator of Net-Forum could be posted.

- A "moderator tool" gave the moderators the power to review postings before they were posted to the NetForum space. If a posting was too inflammatory, it could be returned to the composer with a suggestion that it be rephrased. ∞

∞ COMMENTARY

The set of reference and discussion management tools, frequently asked questions, and other innovations should enhance any consensus building process whether available through the Internet or otherwise. The informational features should provide reassurance—or set off alarms—for those who are just browsing, and raise the level of those participating to a higher level. Is there any way of assessing whether that happened?

—William Moomaw, *Environmental scientist*

Another important feature of the Rule-Net technology was that it could operate as a "listserv" discussion in addition to a World Wide Web-based forum. In other words, once participants had registered, they could receive or write new messages in their e-mail programs instead of having to log on to the RuleNet site every time they wanted to intercede. While less fun and flashy than the graphics-enhanced Web page, e-mail technology adds convenience and immediacy to the communication.

Dialogue Structure and Content

Participants were meant to gear up for the discussion by perusing through a vast array of documents and position papers posted on the RuleNet site. The dialogue itself proceeded in three phases: an issue identification phase (January 5-16, 1996), a comment synthesis and proposal development phase (January 17-26), and an analysis and drafting phase (January 27-February 9). A facilitation team was on hand with a range of expertise; John Helie was recruited to serve as the lead mediator. Two "moderators" with extensive editorial and computer experience operated at his flanks. Site maintenance and troubleshooting were the responsibilities of technical staff at LLNL's Information Technology and Security Center (IT&S), where the NetForum program originated.

For efficiency's sake, the discussion was organized into separate "threads"—the cyberspace equivalent of breakout groups—each of which was focused around a specific question or proposal drafted by the facilitators. Feedback was catalogued and evaluated using a "consensus evaluation tool," a device that allowed stakeholders to register their approval or disapproval on a proposition, and the strength of their preferences and convictions. At any time, Helie could write a proposed consensus statement that would appear on the screen of all the registered users when they logged on. The participants would respond with a number from 1 through 6, with 1 representing complete agreement and 6 amounting to strong objection. The average would indicate the areas of strongest disagree-

ment. Users selected a number between 4 and 6, who were asked to follow up with a list of "sticking points"—issues that they thought required resolution before they could move down the numerical scale. These lists were visible only on the administrator page, which was not accessible to the regular participants. Helie would then put out a new statement that sought to incorporate the concerns raised by dissenters. The lower the average rating, the closer the group moved toward "consensus." If a group discussion appeared focused and harmonious, Helie would post a proposition that was likely to generate a lot of low scores. He could then call for a vote with the assurance that a majority would be in agreement. ✏

✏ COMMENTARY

The use of rolling weighted polling of positions is a technique that probably worked better in an Internet format than it possibly could in a face-to-face encounter.

—William Moomaw, *Environmental scientist*

In addition, graphics were built into the technology of NetForum to represent the thrust of a message in the main forum map. The participants themselves chose among the symbols that could accompany a comment. Among the icons appearing next to each contribution were

- a question mark: to request clarification;
- a large letter *A* for Answer: for contributions responding to posted questions;
- a shining lightbulb standing for "promising practice": to present actions taken in other situations that might offer a good way to realize a recommendation or address an issue;

- a large thumbs-up indicating agreement: to offer support of a proposition or argument set forth by someone else;

- a small speech balloon (as in a cartoon) with the words *Yes, but* inside it: to qualify a preceding comment by offering exceptions to or extensions of the argument it advances;

- a large yin-yang symbol: to offer alternate ways to implement a proposal or recommendation;

- a large thumbs-down indicating disagreement: to directly challenge a prior message;

- the word *New* in colorful letters: to begin a new line of discussion under an overall subject heading; and

- the word *None* in colorful letters: to indicate that the writer held no position on the specific issue being discussed. (Information Technology and Security Center, Lawrence Livermore National Laboratory, 1996, p. 27)

Looking at the entire flow of a particular discussion as calibrated by these icons, the moderators could assess the general mood and identify areas of agreement, controversy, or confusion.

■ *Phases of the Dialogue*

Phase 1

The dialogue began with a 10-day exploratory period. This time was allocated to problem definition and for the public to review the provided background information and ask clarifying questions. The initial queries put before the participants were very general in nature. One example was: "What are the pros and cons of allowing licensees to adopt revised regulations on their own schedule, and piece by piece instead of all at once?"[5] Extensive discussion ensued on this topic, and eventually the eight people who had been actively engaged in the back-and-forth used the "voting tool" to register their sentiments. It was clear from the results that there was a broad range of opinions among the participants but that the majority leaned toward opposition.

The second question aimed at listing the key elements of a potential performance-based fire protection rule. Proposals included training in fire safety for on-site personnel, leakage of significant doses of

radiation, disposal of nuclear waste, "safety-centricity" of managers, and licensees' commitment to openness and public engagement ("Options," 1996). A second consensus evaluation determined that the participants were of widely different opinions on this question as well.

Consensus evaluations were held on several additional questions, such as the following.

- How should the NRC go about ensuring that the new performance-oriented requirements actually work? What mix of modeling, risk assessment, validation and verification, and licensing will work the best, both for NRC and the licensees? (12 responses)

- Should a revised regulation cover only those systems necessary to achieve safe shutdown (with the rest of the fire protection-related requirements addressed elsewhere), or should it cover requirements for all functions related to fire protection? (17 responses)

- Should requirements for areas less important to the safety of the plant be relaxed/eliminated? Will a probabilistic risk analysis result in better focus and coherence in NRC's regulations by allowing resources to be used more effectively? ("Options," 1996, pp. 9-10) (48 responses)[6]

Phase 2

In Phase 2, participants were asked to brainstorm and propose solutions to the issues raised in the first phase. Based on the contributions that had been gathered, the RuleNet team crafted six questions designed to elicit proposals for alternatives to

existing regulations. To carry on effective, simultaneous discussions, six virtual parallel "working groups" were created at this stage. In summary, the themes of the miniforums were the following.

- What alternative approaches are available for dealing with the deficiencies in the fire protection rule? Should any rulemaking take place within the framework of a new "performance-based" rule?

- If some areas of fire protection were recognized as being of higher priority, what are some areas where benefits would accrue to licensees? If pilot programs were approved, what would be their framework and scope?

- If a prioritized approach is approved, what are some categories judged to be of higher safety significance?

- Assuming that a performance-based rule were adopted, what are regulatory alternatives for implementing such an approach? Are there examples that demonstrate the differences, and perhaps the respective benefits, of performance-based versus prescriptive rules?

- Recognizing that critics have pointed to problems in using probabilistic risk

analyses (PRAs) in the fire protection area, what alternatives are available for using PRAs in this field?

- If NRC's fire protection rules were to be changed, what risk-based performance alternatives are available to ensure that the facility's safe-shutdown methodology is adequately protected from the effects of fire?[7]

Each area of inquiry spawned a series of comments, structured in the forum map as a vertical chain or thread. Topics that attracted little interest were eventually dropped. But none of the miniconferences drew a very large audience: Almost half of all the messages sent came from the same handful of participants (including Olmstead, one very vocal independent fire consultant, and the designated industry representative). These exchanges were often highly detail oriented. Furthermore, in all of the parallel discussions, the same small and dedicated core of active participants chimed in. The electronic forum, then, may have generated its own problems of exclusivity but it also allowed people to be in multiple "rooms" at the same time—something that would be impossible in the physical world. ∞

∞ COMMENTARY

Organizing in phases and producing six parallel threads or virtual working groups is more likely to be a fruitful approach using this technology. Participants can cruise back and forth between threads, which would be impossible in real time.

—William Moomaw, *Environmental scientist*

Phase 3

At the end of these first two phases, the RuleNet team summarized the outcome of

the online talks in three key areas. One of these policy positions was quite crisp and strong in tone, one was tentative, and one was entirely noncommittal. The wording

depended on the degree of polarization on each issue that had emerged in the prior discussions. The recommendations that resulted were the following.

Fire protection requirements. "Fire protection features should be 'graded' according to the relative importance to plant safety . . . the fire threat for each fire area should be defined, and protection provided based on the threat rather than equal protection across the board."

Risk and fire modeling. "Risk information and fire modeling can be beneficial to develop a regulation to focus licensee activities on safety-significant activities in order to improve the cost effectiveness of plant fire protection programs without adversely affecting safety. However, to develop such a rule would require the necessary risk and fire models."

Regulatory flexibility. "No participant advocated that rulemaking was necessary as a solution to a public health and safety deficiency in the existing rule. Rather, some participants endorsed rulemaking as necessary to provide licensees with more flexibility in implementing fire protection regulations (although there was no agreement on how this should be done). Other participants thought that certain benefits could be achieved by working within the existing rule, for example, by ensuring that staff

interpretations of the existing rule were consistent or by ensuring that NRC enforcement guidance recognizes that not all fire protection requirements are equal in contributing to safety. Others did not believe that licensees could demonstrate that they were complying with the existing rule, and therefore, no rulemaking should be undertaken until this demonstration is made."

These synopses were posted to the Rule-Net site for participant review. A "caucus tool" had been devised to allow for separate consultations. Use of that option was actively encouraged at that point, but none of the stakeholders took advantage of it. Once again, a few participants dominated the discussion. Fifteen of the 25 fire protection-related contributions came from one person. Many of the other messages were informational requests more than substantive observations.

That does not mean no one was checking in, however: A fourth question dealing with the effectiveness of RuleNet itself triggered a lively discussion—41 messages—which highlights that the process was of significant interest. Evaluations were overwhelmingly positive and lauded the fact that RuleNet opened up government proceedings to public participation and scrutiny. Others emphasized that a cost analysis should be undertaken before the concept of online negotiations was further integrated into the regulation-setting process. ⊷

⊷ COMMENTARY

The positive response of participants is encouraging. It suggests that the process made them feel that their voices were being heard and that their interventions were having an effect. This is often not the reaction when parties introduce testimony in a static form and must wait for the rulemaking to learn if any of their input was heard or used.

—William Moomaw, *Environmental scientist*

Ground Rules

In many consensus building efforts, the exercise of defining ground rules collectively is the first step toward building trust and, it is hoped, an agreement. But in Rule-Net, the stakeholders had no role in process design. Most important, they had no input into what meaning to ascribe to *consensus* in the RuleNet setting. No clear decision rule was ever formulated or ratified by the participants. Furthermore, little effort was made to educate participants about the meaning and value of consensus-based decision making. Perhaps inevitably, some people missed the point: "They wrote summaries of the comments—leaving out the ones they didn't like—and called that 'a consensus,'" said one reactor engineer. "The consensus stuff was unnecessary. I mean, don't tell me what I'm telling you."

The RuleNet discussion was guided by one iron ground rule, though: No offensive language, no capitalization (which was construed as shouting), and no anonymous postings were admissible. When a comment was received from a participant during a real-time chat session, it immediately went through a content control device, known as a "Bozo filter," that checked it for certain words. The postings that cleared the automatic filtering were forwarded to the moderators, who acted as the final line of defense. If they encountered a potentially problematic posting, they would engage the author in a one-on-one dialogue. Although there was some grumbling about First Amendment rights, participants generally agree that the filtering mechanism was very successful in keeping nasty comments out of the public domain, and hence in keeping the tone courteous and professional.

■ Stakeholder Resistance: Many "Cruisers," Some "Lurkers," Few "Participants"

As we have seen, the choice of a high-profile safety issue as the subject of RuleNet was quite deliberate. Indeed, it had profound impact, especially in terms of stakeholder participation. The initial fear of the organizers was that they would be overwhelmed with contributions (a subject such as emergency planning has in the past elicited as many as 3,800 comments from the public at large) before they could eliminate the technological bugs in the system. But moderator Elin Whitney-Smith suggested they consider the opposite scenario: "You really have a problem if you have a party and no one comes." Her point was well taken, for the community of people who know and care about the intricacies of fire protection at nuclear power plants is a very restricted one. Framed in highly technical terms, the RuleNet debate left emotional, big-picture policy questions, such as the desirability of commercial nuclear power, out of bounds. The result was a process for the initiated few: reactor operators, antinuclear activists, fire protection engineers, and a handful of consultants and academics who specialize in fire safety concerns.

Usage statistics were compiled by the staff at LLNL to categorize the types of users of the RuleNet system. They created four different profiles: participants, registered lurkers, unregistered lurkers, and cruisers. Participants were active contributors to the system, lurkers spent time on the system but did not post messages, and cruisers came through the site on only a few occasions and did not spend a significant amount of time. This analysis showed that

for the full duration of the RuleNet project (November 20, 1995 to February 9, 1996), there were 28 participants, 6 registered lurkers, 313 unregistered lurkers, and 387 cruisers. An analysis of the e-mail addresses of the people passing through the system shows that the majority (14,165) of hits came from "gov" domains, slightly less (11,385) came from "com" domains, and a much smaller number (1,403) from "edu" domains. Only 20 registrants were active, regular participants (defined in terms of both frequency and substantive nature of their input)—and even they were a partial representation of the stakeholder categories that set the tone in the larger fire protection debate. For a number of different reasons, people affiliated with the nuclear industry, public interest groups, and the NRC contributed hesitantly or not at all.

At the outset, the weather didn't cooperate either: In early January 1996, an extraordinary snowstorm blanketed the capital, as if to prove, as John Helie put it, that "virtual reality still has some very messy ties to reality." Along with the cold spell, a government furlough kept people in their homes, where many did not have access to the Internet. The RuleNet dialogue shriveled as a consequence. During this lull, a memorandum was circulated that dealt the process a further setback. The Nuclear Energy Institute (NEI), an industry advocacy group that represents all nuclear plant operating licensees, issued a letter discouraging individual utilities and other industry organizations from participating in RuleNet. Fire experts and legal support staff operating in plants around the country were asked to follow the discussions and funnel their feedback to an NEI representative, instead of giving their input directly to the entire conference. This injunction was largely adhered to, as evi-

denced by the registration data: 24 percent of registrants identified themselves as having some relation with the commercial nuclear industry or the private sector. However, with one exception (a person who never received the memorandum asking him to stay off the site) these members did not post messages.

Doubtless, the NEI attempted to control the flow of information to avoid splits in the industry position as well as potentially embarrassing revelations about safety violations. If anyone could speak out freely, the industry group's internal decision-making structure risked being bypassed and undermined. Dissension among its ranks would thus potentially be made public before the organization itself had a chance to deal with it. But the NEI also substantiated its objections with reference to indeterminacy in the RuleNet process: "We believe that there are a number of significant questions that need to be resolved in the Rule-Net pilot effort," the letter explained. "For example, NRC's disposition of communications among participants, qualification of participants, potential influence by special interests, conduct of private versus open caucuses among participants, and representation by organizations versus individuals, etc. are some of the questions that have not been addressed by the Rule-Net procedures."[8]

Aside from questions about the credibility, authority, and expertise of individual contributors, NEI's main concern regarded the legal status of the RuleNet record. The official comment period on the fire protection rulemaking petition had expired. In fact, one of the documents that served as a departure point for RuleNet was one that contained NRC staff recommendations on the issue based on paper comments received in mid-1995 ("Options," 1996).

Just how would the RuleNet contributions fit into the existing administrative proceeding? Would they supersede the paper process or be treated as an adjunct? In fact, was the objective of RuleNet to produce a draft rule or was it merely an additional opportunity for affected parties to exchange information and find some common ground?

The rationale put forth by the industry for its partial boycott of RuleNet leaves some critics cold. Peter Craine, counsel for special projects at the NRC, while agreeing that some terms of RuleNet were ill defined, zeroed in on the heart of the matter—the question of representation: "It's about democracy," he said. "It's like saying, 'Of course only landowners should be allowed to vote; do you want some peasant to have an equal say in this?' " But participation was not forthcoming from nuclear watchdog groups either, despite the fact that they were not muzzled by some umbrella organization. Some activists charged that the NRC had already made up its mind on fire safety and would manipulate RuleNet to garner support for its position. Others objected to the use of computers in rulemaking, dismissing the exercise outright as a toy for "techies."[9] Still others bemoaned the lack of educational reference tools, such as links to glossaries, necessary for ordinary citizens to make sense of the mass of jargon-laden information.[10]

Last but not least, the NRC itself was not united in its enthusiasm for RuleNet. The technical staff doubted that RuleNet could cover any ground other than the well-worn paths that they had traveled with industry and nuclear watchdog groups on the fire safety issue so many times in the past. Given the abstruse nature of nuclear safety requirements, "We could send signals to the entire galaxy and not get more thoughtful input," said Gary Holahan, director of Division of System Safety and Analysis in the Office of Nuclear Reactor Regulation. Such profound skepticism was compounded by a hierarchical organizational culture that puts a premium on slow and painstaking deliberation. "It is very unusual for us to be giving written feedback to the world," said the NRC's chief fire engineer, Steven West. "There is a formal process for deciding even if we answer a question. RuleNet is wilder." Under normal circumstances, as many as 10 people may be involved in drafting a response to a query from the public—a standard operating procedure not conducive to the immediacy and spontaneity of expression that an online dialogue requires. In spite of repeated assurances, staff members felt uncomfortable broadcasting their own views, especially if these did not coincide with those of their superiors. "RuleNet seemed to propagate informal personal subjectivism," echoed Holahan. "It was an alien way of doing business." ❧

❧ COMMENTARY

The reaction of the NRC officials is very interesting. The degree and speed of response is different for them under RuleNet processes. But then this degree of consensus building may also be new to them.

—William Moomaw, *Environmental scientist*

Beyond the political ramifications of RuleNet, there were also practical constraints that dampened participation; a number of regular contributors cited time as a key limiting factor.

■ The Role of the Neutral: Mediation and Moderation

The RuleNet process needed the facilitation services of experienced conflict managers to urge the dialogue forward and to minimize frustration and name-calling. To be entirely effective, however, these process experts would have required substantial assistance from fire protection engineers familiar with the language, science, and theory of the field. The challenge of integrating technical expertise into the consensus building process, difficult in face-to-face situations, was complicated further by the text-only environment of online interaction.

The primary task of the facilitation team was to "take the temperature" and synthesize the main ideas that emerged in discussion. If controversy erupted on a particular topic, a report to that effect would be prepared for the newsletter (though the NRC itself retained final editorial control over the newsletter's content). Helie and the moderators attempted, through natural topic aggregations, to break down the complex technical questions into manageable topics. Navigating the legal and technical minutiae that make up NRC regulations was no small feat, however, and help was often not readily available: "It was like going to Mars and not knowing what Martians look like when they are having a good time," recalled moderator Chris Berendes.

In a virtual world of vertical discussion threads, as opposed to a real world of three-dimensional rooms, facilitators can easily get lost, overpowered by the prose of other contributors. To surface reasons for disagreement and crystallize consensus, a strong hand may therefore be required of online facilitators, not the light touch of the people who filled these roles in RuleNet. This appears to have been no fault of their own, but rather the result of a lack of clear definition of their role at the outset and conflicting expectations about who should take the lead: the dispute resolution process experts or the NRC fire engineers.

Third-party intervention online poses challenges different from those found in face-to-face negotiations. Some responsibilities, such as ensuring that all have an equal opportunity to speak and keeping time, fall by the wayside; other tasks can assume a great deal more importance. NRC lawyer Cameron observed that "when the process falls apart in cyberspace over a period of time, the lack of a facilitator doesn't seem as immediately critical as in face-to-face where it is obvious when things unravel." Still, an electronic conference has to be just as carefully monitored to keep discussions on track—perhaps more so, because many of the subtler cues based on body language will get lost between the lines. "In a normal process," Cameron continued, "you know what people bring to the process in terms of eloquence, intelligence, and emotionality. Instead, here you're never really sure who will be doing what." The Bozo filter was successful in eliminating verbal abuse from the discussion, but RuleNet provided little evidence that online communication is inherently less confrontational. Successive comments in a thread were as likely to diverge as to

converge, with participants sometimes fixating on minute points of disagreement in another's contribution. Mutual trust may also be harder to build between parties staring at a screen instead of into each other's eyes. "It's the old line 'I want to know if you smile when you say that,' " said Robert William Bishop, general counsel of NEI. ∞

∞ COMMENTARY

The role of the facilitator may be different in the RuleNet context, in that he is responsible for so many simultaneous threads and dimensions of the discussion. Capturing agreement is still a major role that needs to be played. The use of Bozo filters and other devices appears to have succeeded in lowering the temperature of exchanges so that substantive issues could be discussed, and a consensus built.

—William Moomaw, *Environmental scientist*

■ Outcome of RuleNet: An Assessment of the Pilot Project

RuleNet was neither an unqualified success nor an abject failure. Certainly, no major progress could be recorded in the task of overhauling fire protection regulation. In the summer of 1998, the NRC was still firing off reminders to utilities that Thermo-Lag deficiencies have to be corrected. Meanwhile, the controversy over the desirability of performance-based rules continues unabated—consensus is elusive both within the NRC and among the various pro- and antinuclear interests that have faced off on this issue. In a dramatic shift from its previous position, the nuclear industry announced that it was no longer interested in new rules. The reason given for this about-face was reduced confidence in the adequacy of the new modeling and risk assessment techniques that had been the centerpiece of the proposed Appendix S. Antinuclear activists continue to push for the NRC to abolish the myriad exemptions.

The NRC, caught in the uncomfortable middle, determined it should await the development of a new fire code by the National Fire Protection Association (NEPA) before taking further steps. That trade association is expected to develop a proposed standard by 2000. In the interim, nuclear plants that still use Thermo-Lag deploy a very low-tech countermeasure against potential blazes: Workers patrol important reactor areas on an hourly basis to detect incipient conflagrations.

In terms of concrete, substantive results, therefore, RuleNet turned up little. Few surprising opinions or creative solutions were offered, and few minds were changed. Then again, the brief process was never realistically expected to resolve an entrenched, technically complex dispute with strong political overtones. "It was Benjamin Franklin on the first balloon," NRC lawyer Craine summed up. Given the cocktail of intense emotions and antithetical positions, nuclear policy generally is rough terrain for consensus building—and fire protection rules have a particularly bitter

history. RuleNet's aspirations were more modest: a "baby step," as Olmstead called it, in the direction of revolutionizing negotiated rulemaking through the introduction of new, computer-based collaborative tools. By that yardstick, RuleNet accomplished its mission. With Olmstead's untimely death in 1998, the NRC lost the most determined promoter of the use of the World Wide Web as a forum for regulatory activity. But evidence that the pilot has indeed left its mark is that others are contemplating following in his footsteps: Moni Dey, a senior reactor systems engineer, for example, is hoping to use the Internet to conduct a peer review of a major report on fire safety analysis.

As mentioned above, respondents to a survey on RuleNet immediately after the conclusion of the project gave mostly positive feedback. A staff analysis partly based on these reactions asserted that the electronic rulemaking process had proved "superior to traditional notice-and-comment rulemaking from the perspective of allowing a fuller elucidation of the parties' positions" ("RuleNet," 1996). Still, it appears clear that at least in the short-term future, an online process can be useful as a supple-

ment, not a substitute, to traditional rule making procedures.

From a technological perspective, Rule Net may have been ahead of its time: The tools used were state-of-the-art at the tim RuleNet occurred. But the development o online technologies is advancing at a rapi pace, and what is available only two year later makes the NetForum software used i 1996 look very primitive. Common onlin tools such as chat rooms, audio, rudimen tary videoconferencing, whiteboards, an team document authoring software have al emerged in the past few years. Some o these tools might have proven very usefu in the RuleNet experiment.

A handful of important lessons emerge from the RuleNet experiment that can help shape future online consensus building ef forts:

Policy issues may lend themselves bette to electronic debates than complex, techni cally demanding or science-intensive ques tions. The subject of RuleNet was tha the lay public had neither the expertise no the interest to contribute. Instead, its targe audience was the usual cast of highly trained specialists. ◆◆

◇ COMMENTARY

I am surprised that one conclusion is that more technical issues such as fire standards at a nuclear reactor are less well dealt with in this format than are less technical policy issues. The opportunity to answer technical misconceptions without interrupting the flow of the ongoing dialogue would seem to give a Web-based process an advantage. The ability of those with concerns to participate is very much a technology choice question. Perhaps there needs to be a training system for those who wish to participate that is designed from the perspective of users and not providers. This is an example of the "computer manual problem."

—William Moomaw, *Environmental scientist*

Technology is a prop; it is not a substitute for the careful preparation and execution of a consensus building process. From convening to issue framing and from virtual meeting management to process evaluation, each step should be planned strategically to ensure buy-in from key stakeholders, sustain their commitment through the process, and make good use of the final output. Above all, the objectives of the process must be clearly spelled out, and the outcome should hold a clear place in the legal and administrative setting that is the context for such negotiations.

The choice of technologies is not neutral. It can have a significant impact on the extent of participation. E-mail is less sophisticated than the Internet, but it may still be accessible to a wider range of people. There is also a distinction between *pull* and *push* technologies: The former rely, as in RuleNet, on the target audience to seek out the pertinent Web site and repeatedly log on to participate in a dialogue; the latter label applies to features intended to draw stakeholders in and keep them up-to-date through automatic e-mail announcements and solicitations for reactions.

Mediators who operate in an online context should try to be assertive. Active management of the discussion and frequent interventions by the neutral lend the structure that an online dialogue requires as much as face-to-face interventions.

online processes can be resource intensive. Information technology reduces the need for mounds of paper and steep fares. But despite the speed and ease of long-distance electronic communication, it is not free. The NRC paid the LLNL an estimated $300,000 for the software required to run RuleNet. Beyond direct monetary expenses, an online consensus process also requires a significant time commitment from serious participants. One danger, therefore, is that a process of adverse selection kicks in. Because, as Vincent Brannigan, a professor of fire protection regulation at the University of Maryland pointed out, "The people on the Net may be all those who are not busy otherwise." Key stakeholders should therefore ideally be allowed to dedicate a part of their workday to an online process that is relevant to their own professional lives and/or to their employers. Obviously, that is possible only if these stakeholders have Internet access from their workplace, a requirement that was not met at the time of RuleNet even for some senior fire engineers of the NRC.

Technology-driven processes can make demands on people that run counter to the standard operating procedure or culture of the organization they work for. Unless this dynamic is recognized and adequately addressed, key stakeholders may not offer input as often or openly as would be desirable.

■ Notes

1. See, for example, testimony by Joe F. Colvin, president and chief executive officer of the Nuclear Energy Institute (NEI), and by James T. Rhodes, chairman and chief executive officer of the Institute of Nuclear Power Operations (INPO), before the Senate Environment and Public Works Environment Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety, July 30, 1998.

2. 45 *Federal Register* 76611, November 19, 1980; 46 *Federal Register* 44735, September 8, 1981, as amended at 53 *Federal Register* 19251, May 27, 1988.

3. 57 *Federal Register* 4166 (February 4, 1992) and 57 *Federal Register* 55156 (November 24, 1992).

4. Jim Van Wert, senior adviser for policy planning at the Small Business Administration (quoted in "Gov.net," 1996, p. 43).

5. From the RuleNet Web site: http://nssc.llnl.gov/RuleNet/Discussions/Topics_I.html.

6. From the RuleNet Web site: http://nssc.llnl.gov/RuleNet/Discussions/Topics_I.html, October 1998.

7. From the RuleNet Web site: http://nssc.llnl.gov/RuleNet, October 1998.

8. Letter by William H. Rasin, NEI, to the NEI Nuclear Strategic Issues Advisory Committee, dated December 1, 1995.

9. Robert Pollard, nuclear safety engineer of the Union of Concerned Scientists (cited in "Nuclear Agency," 1996).

10. Eileen Queen, spokeswoman of the Union of Concerned Scientists (cited in Wald, 1995).

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