Transparency and Trust:

The Challenges of Environmental Risk Communication in a Weak Economy

Effective environmental risk communication must include not only delivering important and appropriate messages, but developing strategies to deal with the myriad psychological and cultural factors that affect public perception of risk. Risk communication is at its best when the audience is well understood and the messages target their concerns; this means that it is critical to appraise the values, beliefs, knowledge, and to probe the underlying factors that may play a role in message delivery (Horlick-Jones and Prades, 2009; . One approach in assessing the important factors that contribute to risk perception is to gather information from community members closest to environmental risks. The purpose of this research was to examine local opinions and concerns about a Department of Energy (DOE) facility that is housed in Appalachia, Ohio.

The Portsmouth Gaseous Diffusions Plant (PORTS) is located in Piketon, Ohio, a rural area in the southeastern part of the state. Construction of the plant began in 1952 in response to a federal mandate to build facilities to enrich uranium for use in nuclear weapons. By 1956, construction at the site was completed and uranium enrichment began with the plant employing a considerable number of people within the region and its surrounding communities, at its peak, in July 1954, 20,749 people were employed in construction at the plant (McCaffree, 1957). In the 1960s, the plant continued to enrich uranium, however, its purpose shifted from defense to supplying fuel for nuclear energy production. This was a period of growth in nuclear power

generation in the U.S., and the federal facilities that were the sources of weapons-grade nuclear materials became the source of nuclear fuel for these plants.

When PORTS was serving as a hub of activity for national defense purposes, public perception of the risk from nuclear facilities was tempered by fear of international conflict and a sense of patriotism. As the mission of PORTS shifted to servicing nuclear power plants in the 1960s and 70s, PORTS remained a major source of jobs and economic development for the region, at one point providing employment for more than 2,000 people in region with very low population density and not many other major sources of high-paying jobs.

Public perception of the risks from nuclear power began to shift in the early 1980s following accidents at Chernobyl in the Ukraine and Three-Mile Island in Pennsylvania. These accidents combined with the dwindling market for nuclear energy (Norman, 1984) led to the decades-long controversy about how to manage the radioactive waste that was generated by the nuclear power plants. The term "nuclear" became synonymous with risk and the evidence emerged that the public was increasingly afraid of any potential exposure to radiation (Havenaar, 2009).

One of the first studies to identify how perception of risk relates to public concern was published in 1979 by Slovic, Fischoff, & Lichententein. The researchers examined ratings of risk from 30 environmental issues among 4 distinct groups of people. Three of the groups were considered local laypersons and included college students, League of Women Voters members, and business people who comprised an "active club." The fourth group was a panel of national experts in risk assessment and environmental science. The results of this ratings exercise were quite remarkable, especially in terms of how nuclear power was rated. College students and the

League of Women Voters members rated nuclear power as the most risky issue, higher than motor vehicles and smoking, while experts rated it 20th on the list of 30 issues. Although the Slovic et al. study is more than 30 years old, it serves as the foundation for debate about why there is a divide between public perception of risk and scientific assessment of risk.

Among the reasons that contribute to levels of concern, or complacency, with environmental risk, are factors that allow people to filter their perception based on the nature of the risk. These factors were identified by Slovic, Fischoff, & Lichententein in the same 1979 article and include: 1) voluntariness of risk; 2) immediacy of effect; 3) knowledge of those exposed; 4) knowledge of science; 5) control over risk; 6) newness of the risk; 7) catastrophic potential; 8) commonness; and 9) severity of the consequences. Public evaluation and rating of risk is influenced by a continuum of these 9 characteristics. For example, the risks that are perceived to involuntary, dreaded, and unknown to the people who are most exposed, are likely to be rated higher risks than those that fall are voluntary, common, and understood. This is the reason that nuclear power and radiation is often perceived by the public as more risky than more common, and perhaps more dangerous exposures, such as motor vehicles and smoking.

One of the major findings of the early research in risk perception was that there are differences between public perception of risk and scientific assessment of these same risks. The disparity between science and public perception became a focal point of discussion during the 1990s after the United States Environmental Protection Agency (USEPA) published the *Unfinished Business* Report (USEPA, 1987). *Unfinished Business* presented a list of 31 environmental issues ranked by agency scientists based on risk assessment to human health. This report contributed to the data that environmental risks that scientists evaluate to be most important are out of synch with public perception of risk which contributes to environmental

policies that are often based more on public fear than science (Slovic, 2003; Morrone and Lohner, 2002). In the context of nuclear power, the gap between public perception of risk and expert assessment of these risks has been identified as at least partly based on differences in ideologies (Sjöberg, 2000).

Bridging the divide between scientists and the public has been the focus of the field of risk communication which has evolved from simply delivering information to the public, to creating conditions for dialogue with the public. Creating these conducive conditions is especially important since risk has been redefined from "a probability of harm," to a "hazard plus an outrage." Peter Sandman, a renowned expert in risk communication developed this definition and still argues that one of the main mistakes that risk communicators make is in focusing on the hazard side of the equation rather than the outrage side (Sandman, 2007). He explains that the risks that actually harm people are very different than the risks that upset people, and risk communicators need to address why people get upset, or not, in the first place.

Environmental psychologists identify the "outrage" factor as a "the affect heuristic" which is explains how people use their intuition and feelings rather than logic to evaluate risk (Slovic and Peters, 2006). Since environmental issues are often highly complex as well as highly emotional, feelings can overshadow facts in controversial situations, creating numerous challenges in not only communicating risks, but in setting environmental policy. One of the most important factors that may escalate the emotional forces surrounding specific environmental concerns can be found in the concept of trust.

Trust in sources of information has been identified as a key factor in identifying why people perceive risks the way they do and is contributes to affect portion of risk evaluation (Fitzpatrick-Lewis et al., 2010). In the context of risk perception, the role of trust has been

examined in a variety of perspectives. Trust in regulators, for example, has been associated with a lower perception of environmental health risk (Krewski et al., 2008; Lee et al., 2005). Corporations are also developing new ways to communicate risk with the public in order to address pervasive trust issues, although there could be both positive and negative outcomes of these new approaches (Gouldson, Lidskog, & Wester-Herber, 2007). Mistrust in researchers who conduct the studies or in the methods of these studies can influence how the results are interpreted by laypeople (Scammell et al., 2009). When it comes to exploring the relationship between trust and perception, there is a broad body of research that examines this relationship in the context of nuclear power.

One interesting characteristic of federal nuclear facilities is that many of these are located in small, rural communities in the U.S. This is mainly due to the amount of land that was needed to house these facilities, the existing infrastructure, as well as the need to locate in areas with low population density if there should ever be an accident. The result of siting massive wartime nuclear facilities in these small communities is that they quickly became the predominant economic engine by providing numerous high-paying jobs to people who had little alternatives. Ultimately, the local economic dominance of these facilities has created a dichotomy in levels of trust related to dependency on the plant for livelihood (Williams, Brown, & Greenberg, 1999).

Even though trust can influence public perception, it may be less important than cultural and economic conditions in the local community (Lidskog, 2001). Since PORTS has been a major player in the economics of the region in which it is housed, it is likely that there are additional factors that are important in understanding public perception. Therefore, the purpose of this qualitative study was to explore perceptions related to PORTS among key informants and residents who live near the facility. The information learned from these data will be used to

inform the development of future communication strategies in order to better inform the community about the future of the site.

Methods

Key Informant Interviews

A media content analysis of local newspapers was completed to initially identify key informants (Morrone, Basta & Somerville, under review) and purposeful sampling (Patton, 2002) was conducted to recruit others. Eight interviews were conducted in June and July 2010 with individuals from a variety of backgrounds, including: current and former plant employees, elected officials, local environmental activists, and economic and community development organizations. Semi-structured interview guides were developed to explore the following issues: connection to the plant, current involvement with the plant, community perceptions of the plant, credible sources of information about the plant, communication channels used to access information about the plant, and current community priorities.

The semi-structured guide provided standardized the questions for all participants, but also to allow the researchers the freedom to probe further when more clarification was needed (Patton, 2002). All interviews were conducted face-to-face, lasted between 30 and 60 minutes, and were audio-recorded following consent from the participants. One of the authors and at least one other individual were present at all of the interviews. The audio tapes were transcribed for further analysis and only the researchers have access to identifiers for each of the interviews.

Focus Groups

The purpose of the focus groups was to clarify themes identified during the key informant interviews. Focus group participants were recruited from county fairs in Jackson, Pike, Ross and Scioto counties in July and August 2010. A traveling booth was displayed at each county fair and was staffed by at least one research member or project staff during the evening hours. The booth displayed information about the community outreach portion of the PORTS project. If an individual was interested in being a part of a focus group, he/she was able to leave contact information on a postcard and was told he/she would be contacted in the future. We received approximately XX cards and all individuals were contacted; XX agreed to participate in the focus groups.

To enhance recruitment efforts, an advertisement about the focus groups was placed in the local newspapers. Nine individuals participated in the Ross County focus group, 10 from Pike County, and 7 from Jackson County. Semi-structured focus group discussion guides were used to facilitate the discussion about the following topics: community priorities, personal understanding/connection to the plant, and communication and information received about the plant. At each focus group, three members of the research team were present, including a moderator and two note takers. All focus group discussions were audio recorded with the consent of the participants. Each of focus group lasted 60 minutes and was held at a local restaurant in the respective county. Participants were provided food and a $30 gift card for their participation.

Data Analysis

Analysis of all the key informant interviews and focus group discussions began during and after data collection and occurred in several phases. Immediately following an interview or

focus group, the research team involved with the data collection would discuss findings and themes. Next, all of the audiotapes were transcribed verbatim, identifiers were removed, and references to individuals were removed to preserve confidentiality. Then, using thematic analysis, the researchers reviewed the transcripts, and coded data related to the questions asked (Patton, 2002). The units of analysis were sentences, phrases, or paragraphs. These codes were organized into larger categories of responses. Next, these codes and responses were reviewed by the authors. If discrepancies occurred, then differences were discussed and clarified until a consensus was reached. This process was done in the effort to reduce bias, and to obtain the richest possible data set. All of the study protocols were approved by the Institutional Review Board at Ohio University.

Results

Participants

Limited demographic data were collected from the interview and focus group participants as to not inhibit their willingness to share information. All of the interview participants and the focus group participants were Caucasian or White and the majority were male (89% (n = 8) of key informants and 70% (n = 19) of the focus group participants). Most of the participants had lived in Southern Ohio all of their lives; however, the length of time ranged from as little as 3 years to as many as 61 years. The participants in the focus groups represented a broad range of interested community members; including current and former plant employees, individuals who lived near the facility, individuals who knew someone who had worked at the plant, as well as a few community members with no connection to the plant.

Themes

The results very clearly illustrated that residents in the 4-county region welcomed the A-plant in their communities because it has been the largest employer in Southern Ohio for the past 50 years. However, when participants were asked about their perceptions of the plant, secrecy, mistrust, and lack of information all emerged as salient themes. Therefore, the four themes that will be discussed are: 1) PORTS: A symbol for job creation, 2) secrecy and mistrust surrounding the plant, 3) skepticism and mistrust related to DOE and engaged community groups, and 4) the need for more information and communication about the plant.

Theme One – A-Plant: Symbol for Job Creation

Even when some of the participants expressed concern about environmental issues related to the plant, most were still content to have the A-Plant in their "backyard" because it has provided economic opportunity for residents. Since the A-Plant has been the largest employer in the region for the past 50 years, it was associated with economic stability and the promise of future job creation and sustainability. As one former employee mentioned, "Money was good. The work wasn't hard…they didn't harass you too much." This sentiment was mentioned by former and current employees who had worked at the plant who discussed the great pay and benefits associated with their jobs.

> "(The plant represents) a lot of good jobs and a lot of good money. I came from a junkyard, no education, nothin'. I bought me a farm, raised two kids, put 'em both through college. Got masters degrees. Without that plant down there, I'd still be workin' in the junkyard or a sawmill somewhere fixin' diesel trucks." – Focus group participant

Other participants discussed the importance of the plant to the counties surrounding the facility. It was mentioned by several participants that it was not uncommon for individuals to drive 60+ miles to the plant, which further highlighted the importance of the A-Plant to several Southern Ohio counties.

> "It's been really, really important, okay, to uh, Scioto and Pike County, Highland County, Vinton County, Jackson County. We've still got uh, fellas that drive from Ironton (KY) every day, and from across the river." – Focus group participant

All participants mentioned the need for sustainable jobs creation in their counties; however many felt betrayed by politicians and their "failed promises" for job creation. "The fact that politicians come around every two or four years, and promise thousands of jobs at the A-plant site uh, related to projects that never were and never will be feasible, and never will happen." However, despite this "betrayal," the A-Plant still served as economic "hope" for job creation.

> "People first and foremost are concerned about jobs and to a large extent that's the reason you find a lot of people in that area who are happy to have the plant there and are willing to bring in a nuclear reactor because it means jobs or at least they think it means jobs." – Focus group participant

Theme Two – Secrecy and Mistrust Surrounding the Plant

When asked about the A-Plant specifically, all of the participants had heard of the site and knew where it was located, but the majority still felt uninformed by past, current, and future activities. While many of the participants had lived in region their entire lives and knew friends or family members who had worked there, they still admitted they felt that day-to-day operations at the plant were kept a secret. As one interviewee stated, "The people that don't know anything about it (A-plant) will never know anything about it because it's just never shared." Even the participants who had worked at the site repeatedly mentioned "secrecy" and felt that as a result there were many rumors that were perpetuated about the plant. As one former employee stated, "A lot of times the guys, even the guys that worked out there, we weren't, we weren't notified of everything. We didn't know."

Other participants shared their perceptions that DOE intentionally kept the happenings at the plant a secret, and while they understood the importance during the Cold War, they still felt that DOE was intentionally keeping things a secret. Even current employees commented on the situation that has continued to contribute to the secrecy.

> "DOE has tried very hard to keep these things quiet. Years ago there was even policy that if you worked for the plant you didn't tell people what you did and if you did it was grounds for termination." – Interview participant

> "I do not understand why there isn't more information shared…I hold a very high level clearance, and you know, there's things that could be shared that are not, and that leaves this perception that we're trying to hide stuff. And, I don't think that's true." – Focus group participant

A participant, who was not originally from Ohio, spoke about the secrecy about the plant from an outsider perspective, which was quite similar to individuals who have lived in the region their entire lives.

> "We chose to (move) down here, and here 70% of the people worked at the A-plant. Didn't say anything about nuclear or anything like that. Or, you know, you're driving around some of the roads around the A-plant, and they have these air circulation filters that collects the air constantly to, I don't know if it's, if it's gonna tell you there's a leak, it's gonna be a little bit late. You know, I don't know what they, what those things are for." – Pike County Focus Group

Furthermore, a few of the participants shared personal experiences related to secrecy; especially related to stories that they had heard from friends or family who worked at the plant. Many of the participants mentioned that these stories contributed to the continued secrecy, and often, mistrust related to the site.

> "I'd probably find lots of stuff…that's in none of their documents but when you go out and talk to people you find out that information. I found out that at the switch house they had a huge explosion and… they were called about what they found and that's knowledge you get from talking to people and finding out what they did, what they saw." – Interview participant

When asked about what was being done at the plant, some of the participants mentioned that uranium enrichment had been conducted there, but few were able to elaborate. Some of the participants were unsure as to whether they were still enriching uranium there, and as one focus

group participant put it, "I know it's a place where they process uranium, or they used to. I don't even know if they still do now." Even some of the former employees who worked at the plant were unaware of that uranium enrichment process or that it was being conducted at the site.

> "They finally started teachin' everybody the uranium enrichment process, and you see the people in the classroom just go, "Oh! I didn't know that. I've been here 30 years, and I didn't know that." But, that was part of the secrecy that they had. They did not tell us anything." –Focus group participant

Theme Three– Skepticism and Mistrust Related to the Government and Related Interest Groups

Another theme that was apparent from the discussion was mistrust related to government agencies and community interest groups that were formed in response to the plant. This theme is certainly linked to the secrecy surrounding the plant and it is possible that some of the mistrust and skepticism have developed in response to secrecy, feelings of deception, and misinformation from the plant, DOE, and other organizations. The lack of trust directed toward these groups was apparent from a variety of participants, including former employees.

The following individuals spoke specifically about mistrust and misinformation related to their Site Specific Advisory Board (SSAB), which that was created by DOE to serve as a community advisory board.

> "They had about 6 or 7 people resign from their board because they finally got frustrated with DOE keeping them in the dark about certain things and basically trying to hand guide them in other areas. So from my perspective the whole idea of a citizens advisory board is a sham that DOE wants to control." - Interview participant

Many of the participants mentioned trust issues that were directed toward DOE and the Ohio EPA.

> "DOE has a tremendous legacy of mistrust. DOE has lied to this community for 50 years, about what went on at that, that, that plant site. And, DOE is never gonna regain trust, and it's never

> gonna get in a position of doing good education, where there's a good communication with the community until DOE comes clean about the history." –Focus group participant
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> "We had a report that supposedly came from the Ohio Department of Health, this is back in the 1990's, that said the cancer rate in Pike County was like 10 times higher. And I said what, it scared you to death until you found out that it was all made up, it wasn't true." – Interview participant
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> "You can't get any information from the Ohio EPA. I called up there about that spill that we were talking about on Huntington Pike; they didn't know a thing about it. Or, they wouldn't tell me a thing about it… on a continuing basis, in terms of trustworthiness." – Focus group participant

Still other participants mentioned trust issues with other community interest groups that have formed in response to the plant. For example, the following participants shared their distrust for a local economic development group. .

> "I don't like 'em. I don't trust them. I think that they uh, they don't have the actual community in mind. They're, they're a private corporation. And, they're, they're fueled by profit. And, uh, the profit goes in their pockets, and I don't believe they uh, they, you know, they actually care what happens to the community." –Focus group participant
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> "[this group] has also been part of the two consortiums that have proposed a nuclear reprocessing plant, a nuclear waste storage facility, and the nuclear reactor. They claim to be a community group. They're actually part of the contractor community. They have gotten millions of dollars from DOE. It is entirely a conflict of interest. We believe it's illegal. And, [the group]I needs to be challenged. They do no community work whatsoever. And, they do not represent this community." –Focus group participant

Theme Four – Need for More Information/ Open Communication about the Plant

Most of the participants mentioned that they followed news about the plant from a variety of sources and that they trusted the Environmental Protection Agency (EPA), the Ohio EPA, and the local newspapers over the local officials to give them credible information about the plant. However, they clearly wanted more open communication with DOE about what has happened in the past, what is happening currently, and what will happen in the future.

> "I'm comfortable with the Ohio EPA, in terms of talking with various representatives that have shown up at board meetings, the individuals who are working in conjunction with DOE in place of USEPA for the oversight of the facility, I've gotten much more comfortable with them than I have the DOE." – Interview participant

Other participants expressed the need for more information, especially in the context of job creation. It was mentioned several times about the hope for jobs and that participants thought it would be helpful to receive more information about the potential for future jobs at the site.

> "They want information if it concerns the possibility, the possibility of a job for them in the future. So, they want to know if there's something going on down there at the A-plant, especially if it looks like there is going to be a job. 'Cause, they really do want to know if there's information for that." – Focus group participant

Some of the participants were not even aware that uranium enrichment stopped in 1991 and that clean-up is now going on at the site. To that end, several participants mentioned that it would be beneficial to community members if they could read credible information in a newspaper or on a website about the clean-up that is currently going on at the site.

> "It would be really, really good if all the people of southern Ohio had the opportunity to read in the newspaper and on their website, just what is going on at the plant in the clean up now, and the new contractor that is coming in with their ten year contract. And, and specifically the ground water clean up that they're doing is really, really, really extensive right now. It's just amazing the big hole they got dug down there. And, yes, the public uh, would be interested in, in seeing that, because it's all been hush-hush, and the perception of secrecy, okay?" – Focus group participant

It was apparent from talking with participants that some felt that they had no voice in the operations at the plant and so they felt uncomfortable discussing the plant without knowing whether decisions had been made about the future state of the site. These individuals expressed a need for more communication about what decisions have been made, or if they have been made, about what will happen at the site in the years to come.

> "There seems to be a lack of sharing of information. You don't know what decisions have been made, you know? It's kind of weird to me that the developing, what we're doing here is, we don't know what they decided to do down there in terms of what they're gonna, what they want there or, or what's feasible to have there, once they make that decision." – Focus group participant

Discussion

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