

# RISK COMMUNICATION AND MANAGEMENT

## IN THE TWENTY-FIRST CENTURY

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### ABSTRACT

*Risk management and risk communication in Europe have undergone profound changes over the past twenty years or so. This paper briefly outlines the changes that have occurred over time and discusses some of the resulting teething problems that have taken place and which now need to be addressed.*

### INTRODUCTION

It is fair to say that European regulation can be divided into an old model of regulatory decision making, that I label consensual, and a new model of regulatory decision making that I label participatory-transparent.<sup>1</sup> The old model of regulatory decision making, put in place as early as 1842 in the United Kingdom following the passage of the Factory Laws had the following features (e.g., see Ashby and Anderson 1981; Brickman, Jasanoff, and Ilgen 1985; Kelman 1981; Lundqvist 1980; Vogel 1986):

- a. It was based on consensual styles of regulation in which policymakers and industry met behind closed doors and made regulatory decisions; and
- b. It was elitist in nature, with regulatory decisions made in consultation with a number of elite groups including heads of industry, senior regulators, and representatives from trade unions. These groups were seen to represent society at large.

This model of regulatory decision making was also inherently flexible. Regulators made a point of working out possible problems with the regulatees, be it at national and or local level. For example in the annual report of the British Alkali and Clean Air Inspectorate in 1973 it states that “[t]he Chief Inspector, with the help of his deputies, lay down the broad national policies and, provided they keep within their broad lines, inspectors in the field have plenty of flexibility to take into account local circumstances and make suitable decisions” (Vogel 1986, 82).

The old consensual model of regulatory decision making was widespread throughout Europe, ranging from Sweden, to Germany, France, and the UK, and it was by in large praised by academics, industry, and regulators. As the journal *Chemical and Industry* in its regular reviews of the then UK Alkali Inspectorate argued in 1949, “[t]he alkali inspectors are a remarkable body of men. Any inspectors who are not looked upon by the inspected as having only nuisance value must be remarkable, and that is most certainly the case with the alkali inspectors. They have to

administer an Act and a number of Orders which could easily become an intolerable nuisance to industry were they not intelligently and helpfully administered” Ashby and Anderson 1981, 103).

Similarly, a number of academic studies produced in the early 1980s praised the old model. In one thorough review comparing and contrasting chemical controls in three European nations as well as the United States, the authors argue that “[w]hile US agencies are hampered by inexperience and by frequent changes in the upper echelons, European bureaucracies, particularly those with technical expertise, remain better insulated against the winds of electoral politics. Regulatory agencies are staffed by professional civil servants who are not subject to removal with every change in government. At the same time they are steeped in the history and tradition of bureaucratic decision making . . .” (Brickman, Jasanoff, and Ilgen 1985, 305).

The general public accepted these arrangements. As late as 1979, for example, only 4 percent of British respondents in a survey on public perceptions toward regulators felt that a close collaboration between industry and the regulator was improper (Hayward and Berki 1979). In addition, at this time there was widespread public trust throughout Europe toward policymakers and regulators. The public seldom became involved in the policymaking process nor were they expected to do so. Environmental groups who were not part of the establishment, such as Greenpeace and Friends of the Earth, tried to get their voices heard but in more cases than not they were not listened to by the powers that be. The top-down form of risk communication, in which regulators/government communicated in a one-way fashion to the public, was the *modus operandi*.

### **DECLINING LEVELS OF PUBLIC TRUST**

Since these academic studies of the 1980s, the risk communication and management climate in Europe has changed tremendously. The primary reason for this change has to do with the erosion of the general public’s trust toward industry and regulators. There have been a number of explanations of why the public’s trust toward these bodies has decreased so dramatically, including the rise of 24-hour television and the Internet leading to the public not having to take policymakers’ comments for granted, to the centralization of government, and the amplification of risk by the media (Giddens 1990; Nye, Zelikow, and King 1997).

That said, the single most important factor to the decline in public trust has to do with the sheer number and size of regulatory scandals that have plagued Europe over the last fifteen years or so (Lofstedt and Vogel 2001). Among the more significant scandals include the Belgian dioxin crisis of the summer of 1999, the tainted blood scandal in France, and the UK and European BSE (Mad Cow Disease) crisis in the 1990s. These scandals should not be underestimated. The Belgian dioxin crisis which involved dioxin entering the Belgian food supply via contaminated animal fat used in animal feed supplied to Belgian, French, and Dutch farms, for example, had significant repercussions. Because the Belgian government did not promptly go public with the knowledge of the crisis, it was accused of a self-serving cover-up leading to the resignations of two cabinet ministers and the ousting of the ruling party in a national election (Lok and Powell 2000).

The BSE crisis, in which UK government ministers continued to reassure the public that BSE was not transmissible to humans even after it had begun to cross species barriers, also had significant repercussions. John Major, the prime minister at the time of the BSE crisis, viewed it as the worst crisis since the 1956 Suez debacle, while the then European Commissioner for Agriculture Franz Fischler viewed BSE as the biggest crisis the European Union had ever had (Ratzan 1999).

In terms of decline in public trust, in a fifteen-year period from the early 1980s to the mid 1990s, according to the World Values Survey, the public's confidence in parliament has fallen significantly in many European countries (Newton and Norris 2000) (see table 1).

TABLE 1

The Decline in Public Trust

	<i>Early 1980s - %</i>	<i>Mid 1990s - %</i>
Finland	65	33
Germany	51	29
Spain	48	37

In the countries where I have conducted most of my research, namely the UK and Sweden, the public's trust toward policymakers has fallen. In the UK, polls indicate that the public's trust decreased from 39 to 22 percent in the period 1974-1996 (House of Lords 2000), while trust in Swedish policymakers has declined from 65 percent in 1968 to 30 percent in 1999 (Holmberg and Weibull 1999).

The issue of falling trust levels is important. First, past research indicates that it is much easier to destroy trust than to build it (Slovic 1993). It is therefore highly unlikely that regulators in the UK, for example, will be able to rebuild public trust levels to the same height as they were prior to the BSE scandal, although one should note that the falling trust levels have tapered off. Second, in research that Paul Slovic, myself, and others have done over recent years shows that public trust is one of the most important explanatory variables of the public's perceptions of risk (Lofstedt 1996). That is, if the public trusts regulators they will perceive risks to be less than when they do not trust regulators. In fact, there is a correlation between low public-perceived risk and a high level of public trust and vice versa. In sum, as the public becomes increasingly distrustful, the public is increasingly risk averse.

This is one of the primary reasons why there is such a high level of public concern in the UK with regard to a wide range of scares ranging from food safety issues (Is it safe to eat farmed Scottish salmon or not?) to public health (Should my child get the MMR jab?<sup>2</sup>). Hence, in countries such as the UK, where public distrust is rampant, it is not surprising that risks and various alarms dominate the news.

## THE NEW MODEL OF REGULATORY DECISION MAKING

As the levels of public trust toward regulators and policymakers have declined, researchers such as Giandomenico Majone have concluded that the consensual model of regulatory decision making in Europe is now dead (Majone and Everson 2001). The number and size of the scandals throughout Europe made this model unacceptable in the eyes of the public. In the ashes of the consensual model, a new model of regulatory decision making has taken shape.

This model, developed in an ad hoc and very much muddling through fashion, and which is arguably more advanced in some nations (such as the UK) than others (such as Sweden), has the following characteristics (European Commission 2001; Lofstedt 2004; Royal Commission for Environmental Pollution 1998; UK Strategy Unit 2002):

- a. It aims to be more inclusive than exclusive, encouraging greater public and stakeholder participation in the policymaking process, either via citizen panels or citizen juries or by having stakeholders participate in policymaking round tables.
- b. It calls for regulatory strategies to be completely open and transparent (e.g., putting draft recommendations on the Internet) and for regulators to be accountable for any policy that they propose.
- c. Regulators are asked to take more account of environmental and social values and to use the precautionary principle and other risk-averse measures more frequently.
- d. It aims for a distinct separation of risk assessment (science) from risk management (policymaking).
- e. Science has received a different role. The media increasingly questions scientific findings, and many stakeholders and the public take the view that scientists are just another stakeholder.

The marked change of events is well summarized by the Health and Safety Executive in its study, *Reducing Risks, Protecting People* (1999) when it states: “The need for public explanation of the basis for decisions about the regulation of risks now arises in wide areas of public policy-making. In former times, the issue hardly ever featured, at least outside the circle of technical specialists” (iii). Similarly, the conversion to the new model of regulatory decision making is well argued by the UK Strategy Unit’s 2002 report on risk when it states that “[d]epartments and agencies should make earning and maintaining public trust a priority in order to help them advise the public about risks they may face. There should be more openness and transparency, wider engagement of stakeholders and the public, wider availability of choice and more use of ‘arm’s-length’ bodies such as the Food Standards Agency to provide advice on risk decisions” (3).

## THE TEETHING PROBLEMS

Not everyone is happy with the new model of regulatory decision making. Many scientists and regulators would welcome a return of the consensual style of regulatory decision making. It is

clear, however, that Western Europe will be unable to revert to it due to the nature and depth of the regulatory scandals that have taken place. That said, the new model of regulation, at least as implemented in Europe, is not problem free. There are a series of teething problems that have resulted from this European experimentation. These teething problems have to date not been dealt with adequately in either a theoretical or practical fashion. So, what are some of the issues? I will now discuss the characteristics of the new approach of regulatory decision making.

### Greater Public and Stakeholder Participation

Regulators operating in this model of decision making are encouraged to seek greater public and stakeholder participation. Although this is indeed a worthwhile goal it needs to be made clear that achieving this objective is not problem free. Participants tend to be self-selecting. Most people, believe it or not, do not want to participate in policymaking. They prefer to go home after work, put their feet up, have a glass of wine with their loved ones and discuss the day, rather than participate in a citizen panel.

There are many examples of this. A few years ago I was involved in evaluating a citizen panel project in the North Blackforest in Baden Wurttemberg (Germany) (Lofstedt 1999). Using random sample techniques, the research group there invited some 5,440 citizens to participate in the panels. Of those asked, 198 actually accepted and 191 participated, giving a response rate of 3.5 percent. Those that did participate had, on the whole, two things in common—they were left of center politically and they had time to spare—in effect, not representing the majority of the Christian Democratic Union-leaning Baden Wurttemberg population. Although these panels came up with a sensible outcome in the end, to almost everyone's disbelief, the issue is still one of self-selection. How can we encourage the silent majority to participate even when they do not want to? This is an issue that needs to be addressed, otherwise the UK government's public participation efforts, be they with regard to the siting of a nuclear waste depository or determining whether the country should grow genetically modified (GM) crops, will be a waste of time and money.

One way to address the conundrum of the self-selection process is to focus more on face-to-face ethnographic interviews rather than engage in mass public dialogue campaigns, as this would better uncover how the public actually perceives the risk in question. These types of studies, based on cognitive mapping, or mental models process, developed by Baruch Fischhoff and others, coordinate the knowledge of diverse experts as well as securing public understanding of the analytical results leading to better (proactive) risk communication strategies (Morgan et al. 2002).

Past research indicates that involving the public and stakeholders in the policymaking process does lead to greater public trust. There are two primary explanations for this. First, as Thomas Schelling (1960) noted, when the public and the stakeholders have been brought into the policymaking process early on they feel ownership of the outcome of the exercise. Second, if policymakers have taken note of the public's and stakeholders concerns, these same groups feel listened to and are more likely to accept a decision (Renn, Webler, and Wiedemann 1995).

However, upon further reflection, this is not as clear-cut as it seems. In many cases, for example, involving stakeholders can actually increase distrust in the policymaking process rather than the other way around.

Some years ago I evaluated a risk communication exercise for the Swedish National Chemical Inspectorate with regard to banning the use of antifouling paints by pleasure boat owners (Lofstedt 2001). Part of the inspectorate's risk communication exercise focused on engaging a number of stakeholders, such as the Swedish Yacht Club Association, to ensure stakeholder buy-in. The exercise misfired as the stakeholders argued forcefully that the boat owners would oppose and disobey any ban. These stakeholders mentioned, for example, that they were sure that their members would consider sailing to Estonia and buying even nastier chemicals than what were available in Sweden, or buying antifouling paints via the web from other European countries. The associations also questioned the science that the ban was based on and told the Chemical Inspectorate that they felt unfairly picked on. In sum, the various Swedish boating federations were trying to inject distrust into the inspectorate's decision for a ban to kill it off. They were ultimately unsuccessful, however, as the results of my study and subsequent analyses indicated that the Swedish boat owners wanted to protect the environment as much as possible and that they would be happy to comply. In this case the stakeholders wanted to promote their agenda at the price of destroying the boat owners' trust in the policymaking process of the Swedish Chemical Inspectorate.<sup>3</sup>

### Regulatory Strategies Should Be Open and Transparent

Policymakers throughout Europe and elsewhere argue that the policymaking process should be as transparent as possible (European Commission 2001; UK Strategy Unit 2002). This includes placing policy deliberations on the Internet, making actual correspondence between policymakers, the public, and lobbyists publicly available, and encouraging scientists to participate to a greater degree in the public eye. It is difficult to disagree with this. Many of the past regulatory scandals in Europe came to fruition primarily because the regulatory policymaking process was nontransparent, with decisions made behind closed doors and where the principal actors did not take into account a wide array of social and environmental values. Indeed, the issue of wider transparency in policymaking is crucial in the eyes of many policymakers to rebuild public trust (European Commission 2001).

A transparent process, however, is not problem free. A series of issues arise. First, it encourages the public, both directly and indirectly, to make their own decisions about what food they should eat, what car they should buy, and what policymakers they should believe in, based either directly on information available via the web or through the lens of the media rather than from the regulators themselves. This means that the public increasingly has to make risk management decisions based on a number of criteria, many of which are unscientific—for example, a stakeholder's ability to speak or an individual's charisma or looks.

It is because of this type of environment that the public in the UK, for example, has become so concerned about the MMR vaccine. Also, is it in the regulators' best interest to see risks

amplified when they should in fact be attenuated? In the farmed Scottish salmon scare, for example, this was caused by a number of U.S. scientists trying to act as policymakers. That is, using their study which showed higher levels of PCBs in farmed salmon from Scotland than from wild salmon caught off the coast of Alaska, and then applying U.S. EPA food consumption guidelines, set for anglers catching recreational fish rather than U.S. FDA, UK Food Standards Agency (FSA), or WHO guidelines, they concluded that the farmed salmon was unsafe to eat. This study, in the name of transparency, was quickly circulated throughout Europe and the U.S., leading to widespread concern that one should not eat farmed salmon, despite the significant health benefits of doing so. Is it in this case reasonable to expect the public, let alone the media, to compare regulatory guidelines from different agencies in different countries as a basis to decide whether farmed salmon is safe to eat?

Greater transparency also leads to the development of so-called policy vacuums (Powell and Leiss 1997). The proposing and making of regulations are in many cases about issues management. In the days of consensual style regulation, regulatory decisions were not announced before a consensus had been reached, in effect stifling any possible debate regarding whether the regulation was needed in the first place. Today, in a transparent environment, the conflicts and deliberations are for everyone to see, and more importantly, for everyone who wants to, to try to influence. This causes information vacuums, as those in power, the regulators, are not always quick enough to respond concretely to a regulatory uncertainty, thus leaving it vulnerable to attack by more trusted bodies. For a body to exert its influence in this new environment it needs to have three things going for it; namely, public trust, a well-toned communication machine, and speed on the ground (for a great discussion, see Leiss 2001).

In the UK, it is increasingly the NGOs who have earned as well as mastered these skills at the cost of regulators and industry. In many cases this is not a problem, as the interests of the NGOs are not dissimilar to those of the government, but in some cases it can be. There are many examples of UK regulators indirectly losing control of the regulatory agenda because of this policy vacuum, ranging from the recent ghost ship fiasco, to the GMO debate and the siting of a nuclear waste depository. If the regulators want to regain the public's trust in an era of increased policy transparency, they will have to address these three key factors.

Increased transparency in the policymaking process also leads to the growth of scientific pluralism (Jasanoff 1990). As scientists start airing their grievances in public rather than behind closed doors as in the past, the likelihood of one group of scientists being pitted against another in the media increases exponentially. One example of this was at the height of the Swedish acrylamide scare in April 2002, at which time findings from rodent studies put forward by toxicologists showing that acrylamide was a possible human carcinogen were publicly questioned by epidemiologists, leading to a rise of public distrust toward scientists (Lofstedt 2003).

## The Use of the Precautionary Principle and the Growth of Risk Aversion

In the new model of regulatory decision making, driven by public distrust, regulators are becoming increasingly risk averse. Concerned about a new possible scandal lurking around the corner, they take the view that it is better to be safe than sorry. In the risk-averse world, one regulatory philosophy that has become increasingly fashionable is that of the precautionary principle.

What the precautionary principle actually means, however, is difficult to pinpoint, as studies indicate up to nineteen formulations (Sandin 1999), although suffice it to say that the most common usage of it is that one needs to take action when an activity raises threats to the environment or human health. Many member state countries, most notably Germany and Sweden, have used the precautionary principle with some degree of success for thirty years (Lofstedt, Fischhoff, and Fischhoff 2002), and a recent study by the European Environment Agency espoused the virtues of it (EEA 2001). Even the European Commission has become involved regarding the meaning of the precautionary principle, and in the year 2000 published a communication to clarify its meaning, concluding that the principle should be placed within an existing framework of risk management (European Commission 2000).

There is now a concern within elements of the European Commission and elsewhere that it may be misused, so rather than being an added tool to a risk assessors tool box it becomes a law unto itself. Questionable rulings over the past few years include the European Commission's decision to ban the importation of groundnuts from Africa, citing the precautionary principle (although scientific studies indicate that eating these ground nuts increases the rate of liver cancer by 1 death in 100 million people) (Majone 2002). If the use of the precautionary principle is to remain a credible regulatory tool, then it needs to be used within the parameters set out by the European Commission's communication, as its misuse will lead to public and stakeholder distrust of European regulators and worse policymaking overall.

## Separation of Risk Assessment from Risk Management

In Europe, the delineation of risk assessment and management was for many years unclear, because the focus was more on determining the criteria of the risk management process while still taking into account that it can be influenced by social values (Fairman 1999; Fairman, Mead, and Williams 1998; Royal Commission for Environmental Pollution 1998). Over the past three years there has been a fundamental shift in this thinking. In 1998 the RCEP argued that scientists should not be seen to be making policy, and hence risk assessment should be separated from risk management.

The European Commission has also argued that this is necessary in order to restore public trust in the policymaking process (e.g., Byrne 2000). Initial European research does support Byrne's claims. For example, a 2002 poll conducted on 3,000 consumers in the UK for the FSA, the agency in charge of risk assessment, indicated that 60 percent of the consumers now claim to be very or somewhat confident in the agency's role in protecting health with regard to food safety.



This is a 10 percent increase in consumer confidence levels since 2000 (FSA 2003). Similarly, results from the U.S., and in this case the U.S. Environmental Protection Agency in the early 1980s, does indicate that a separation of risk assessment from risk management did increase public trust in the regulatory body.

The issue, however, is whether this is always a good thing. In 1996, the U.S. National Research Council published a report entitled *Understanding Risk*, which argued that the two areas should be combined, taking the view that all types of actors should be involved in the risk characterization process and that there should be continuous feedback throughout the whole risk management cycle. Other policymakers take the view that a separation is not practically possible, as the scientists in charge of the risk assessment should at least offer their advice to the policymakers in charge of the risk management process.

### The Role of Science

In the new model of regulatory decision making, scientists do not play the prominent role that they once did. Rather, scientific results today are increasingly questioned by the media, stakeholders, the public, and other scientists claiming contrary evidence (O'Brien 2000). There are several reasons for this demotion, one of which having to do with past scandals. With regard to BSE, for example, scientists were wrong to categorically state in the late 1980s that there was no link between BSE and vCJD (the human variant). In addition, studies indicate that public information is important and should not be quickly discounted by scientists. One study that strongly supports this case had to do with government scientific experts pitted against Cumbrian sheep farmers, who had seen their sheep contaminated by radiation after the Chernobyl accident. The research showed that the procedures for the affected sheep, provided by scientists at the Ministry of Agriculture Food and Fisheries (MAFF) and other government bodies, did not consider the sheep farmers' local knowledge. As the MAFF scientists turned out to be wrong and the sheep farmers right, it led to the scientists losing their credibility in the eyes of the sheep farmers (see Wynne 1992, 1996).

However, the question remains how often does this occur? Should scientists have only equal weight with local knowledge or stakeholder intuitions? Is the sheep case more of an exception to the rule? These questions are difficult to answer, but one clearly needs to take into account the consequences of downplaying scientific results in the setting of regulations. For example, by not focusing enough on the scientific dimension, the media has amplified the controversy around the MMR jab as a national health risk, with more than 50 percent of the public now confused as to whether there is a link between the jab and child autism (although this may now be shifting following Wakefield's study being recently discredited) and concerns around whether British industries should be involved in boat disposal. In sum, ignoring science can be perilous.

## CONCLUSIONS

The new model of regulatory decision making, as outlined in this article, is here to stay. The levels of public distrust toward authorities are simply too high to consider anything else. Yet there are many issues that still need to be analyzed and resolved. If policymakers are encouraging greater public participation in the policymaking process, how can we reduce self-selection bias? How can we ensure that the stakeholders participating in the policymaking process really want to build trust? How can we ensure that transparency in policymaking does not lead to unnecessary amplification of risks and public confusion? What is needed to halt the misuse of the precautionary principle? These and related issues key to the formation of the new regulatory model need further attention and analyses in order to ensure the development of a better regulatory framework for Europe, taking into account the needs for improving public health and the environment.

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## NOTES

1. The idea of dividing regulation into old and new models comes from an excellent article by William Leiss (2000) who applies it to Canada's risk management experience.
2. The MMR jab refers to the measles, mumps and rubella vaccine. There has been a heated debate in the UK as to whether infants should be given this vaccine, as one UK scientific study suggested a link between the MMR vaccine and autism. Although this study (initially published in *Lancet* in 1998) was based on a small sample size and has yet to be replicated in either the UK or anywhere else in the world, it led to massive media and public outcry. In fact, today some 50 percent of the UK general public believe that there may be a link between autism and the MMR vaccine, even though a vast majority of medical experts dispute such a link. Public concern about the MMR vaccine has led to take-up levels of the vaccine falling in the UK from approximately 90 percent in 1998 to just over 80 percent in 2002.
3. It should, however, be made clear that on the whole and in many cases the policy preferences of interest group members are more likely to reflect those of the general public than those of the leaders of these special interest groups. One of the main reasons for this is that the leaders of the special interest groups must justify themselves and therefore take a more radical position than that of their members (Downs 1957; Ellis and Thompson 1997; Zald and McCarthy 1987).

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## REFERENCES

- Ashby, E., and M. Anderson. 1981. *The Politics of Clean Air*. Oxford, UK: Oxford University Press.
- Breyer, S. 1993. *Closing the Vicious Circle*. Cambridge, Mass.: Harvard University Press.
- Brickman, R., S. Jasanoff, and T. Ilgen. 1985. *Controlling Chemicals: The Politics of Regulation in Europe and the United States*. Ithaca, N.Y.: Cornell University Press.
- Byrne, D. 2000. "Food Safety: Continuous Transatlantic Dialogue Is Essential." *European Affairs* 1: 80-5.
- Downs, A. 1957. *An Economic Theory of Democracy*. London: Harper Collins.
- Ellis, R. J., and F. Thompson. 1997. "Culture and Environment in the Pacific Northwest." *American Political Science Review* 91: 885-97.
- European Commission. 2000. *Communication from the Commission on the Precautionary Principle*. COM 2000 1 Final. Brussels: European Commission.
- . 2001. *European Governance: A White Paper*. COM 2001 428 Final. Brussels: European Commission.
- European Environment Agency (EEA). 2001. *Late Lessons from Early Warnings: The Precautionary Principle 1896-2000*. Copenhagen: EEA.
- Fairman, R. 1999. "A Commentary on the Evolution of Environmental Health Risk Management: A US Perspective." *Journal of Risk Research* 2:101-13.
- Fairman, R., C.D. Mead, and W.P. Williams. 1998. *Environmental Risk Assessment: Approaches, Experiences, and Information Sources*. Copenhagen: EEA.
- Food Standards Agency (FSA). 2003. *Consumer Attitudes Survey 2002*. London: FSA.
- Giddens, A. 1990. *The Consequences of Modernity*. Cambridge, UK: Polity Press.
- Hayward, J., and R. Berki. 1979. *State and Society in Contemporary Europe*. Oxford, UK: Robertson.
- Health and Safety Executive. 1999. *Reducing Risks, Protecting People*. Consultation Document. London: Health and Safety Executive.
- Holmberg, S., and L. Weibull, eds. 1999. *Ljusnande Framtid*. Gothenburg, Sweden: SOM Institute, University of Gothenburg.

House of Lords. 2000. *Select Committee on Science and Technology: Science and Society*. London: Stationary Office.

Jasanoff, S. 1990. *The Fifth Branch: Science Advisors as Policy Makers*. Cambridge, Mass.: Harvard University Press.

Kelman, S. 1981. *Regulating America, Regulating Sweden: A Comparative Study of Occupational Safety and Health Policy*. Cambridge, Mass.: MIT Press.

Leiss, W. 2000. "Between Expertise and Bureaucracy: Risk Management Trapped at the Science-Policy Interface." in G.B. Doern and T. Reed, eds., *Risk Business: Canada's Changing Science-based Policy and Regulatory Regime*. Toronto: University of Toronto Press: 49-74.

—. 2001. *In the Chamber of Risks*. Montreal: McGill-Queen's University Press.

Lofstedt, R.E. 1996. "Risk Communication: The Barseback Nuclear Plant Case." *Energy Policy* 24: 689-96.

—. 1999. "The Role of Trust in the North Blackforest: An Evaluation of a Citizen Panel Project." *Risk: Health, Safety and Environment* 10: 10-30.

—. 2001. "Risk and Regulation: Boat Owners' Perceptions of Recent Antifouling Legislation." *Risk Management: An International Journal* 3: 33-46.

—. 2003. "Science Communication and the Swedish Acrylamide 'Alarm'". *Journal of Health Communication* 8: 407-30.

—. 2004. "The Swing of the Regulatory Pendulum in Europe: From Precautionary Principle to (Regulatory) Impact Analysis." *Journal of Risk and Uncertainty* 28: 237-60.

Lofstedt, R.E., B. Fischhoff, and I. Fischhoff. 2002. "Precautionary Principles: General Definitions and Specific Applications to Genetically Manipulated Organisms (GMOs)." *Journal of Policy Analysis and Management* 21: 381-407.

Lofstedt, R.E., and D. Vogel. 2001. "The Changing Character of Regulation: A Comparison of Europe and the United States." *Risk Analysis* 21:399-406.

Lok, C., and D. Powell. 2000. "The Belgian Dioxin Crisis of the Summer of 1999: A Case Study in Crisis Communication and Management." Guelph, Ontario: Department of Food Science, University of Guelph.

Lundqvist, L.J. 1980. *The Hare and the Tortoise: Clean Air Policies in the United States and Sweden*. Ann Arbor: University of Michigan Press.

- Majone, G. 2002. "What Price Safety? The Precautionary Principle and Its Policy Implications." *Journal of Common Market Studies* 40: 89-106.
- Majone, G., and M. Everson. 2001. "Institutional Reform: Independent Agencies, Oversight, Coordination and Procedural Control." in O. DeSchutter, N. Lebessis, and J. Paterson, eds., *Governance in the European Union*. Luxembourg: Office for the Official Publications of the European Communities: 129-68.
- Morgan, M.G., B. Fischhoff, A. Bostrom, and C.J. Atman. 2002. *Risk Communication: A Mental Models Approach*. New York: Cambridge University Press.
- National Research Council. 1996. *Understanding Risk*. Washington, D.C.: National Academy Press.
- Newton, K., and P. Norris. 2000. "Confidence in Public Institutions: Fear, Culture, or Performance?" in S. Pharr and R. Putnam, eds., *Disaffected Democracies: What's Troubling the Trilateral Countries?* Princeton, N.J.: Princeton University Press: 52-73.
- Nye, J.S. Jr., P.D. Zelikow, and D.C. King, eds. 1997. *Why People Don't Trust Government*. Cambridge, MA: Harvard: Harvard University Press.
- O'Brien, M. 2000. *Making Better Environmental Decisions: An Alternative to Risk Assessment*. Cambridge, MA: MIT Press.
- Powell, M., and W. Leiss. 1997. *Mad Cows and Mother's Milk*. Montreal: McGill-Queen's University Press.
- Ratzan, S., ed. 1999. *The Mad Cow Crisis: Health and the Public Good*. London: University College London Press.
- Renn, O., T. Webler, and P. Wiedemann, eds. 1995. *Fairness and Competence in Citizen Participation*. Dordrecht, Netherlands: Kluwer.
- Royal Commission for Environmental Pollution. 1998. *Setting Environmental Standards*. London: Stationary Office.
- Sandin, P. 1999. "Dimensions of the Precautionary Principle." *Human and Ecological Risk Assessment* 6: 445-58.
- Schelling, T. 1960. *The Strategy of Conflict*. Cambridge, Mass.: Harvard University Press.
- Slovic, P. 1993. "Perceived Risk, Trust and Democracy." *Risk Analysis* 13: 675-82.
- UK Strategy Unit. 2002. *Risk: Improving Government's Capability to Handle Risk and Uncertainty*. Summary Report. London: Strategy Unit, Cabinet Office.

Vogel, D. 1986. *National Styles of Regulation: Environmental Policy in Great Britain and the United States*. Ithaca, N.Y.: Cornell University Press.

Wynne, B. 1992. "Sheep Farming After Chernobyl: A Case Study in Communicating Scientific Information." in B.V. Lewenstein, ed., *When Science Meets the Public*. Washington, D.C.: American Association for the Advancement of Science.

Wynne, B. 1996. "May the Sheep Safely Graze? A Reflexive View of the Expert-Lay Knowledge Divide." in S. Lash, B. Szerszynski, and B. Wynne, eds., *Risk, Environment and Modernity: Towards a New Ecology*. London: Sage: 44-83.

Zald, M.N., and J.D. McCarthy. 1987. *Social Movements in an Organisational Society: Collected Essays*. New Brunswick, N.J.: Transaction Publishers.

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