

A selected annotated bibliography of social science research on planning for and responding to hazardous material disasters

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Abstract

An annotated list of 75 references in the social science research on planning for and responding to hazardous material disasters is presented. The list is a selection representing as wide as possible coverage of mainly North American literature on the social aspects of hazardous material disasters in the chemical and nuclear industries. All phases of disaster planning are covered, i.e. mitigation and prevention, emergency preparedness, emergency response, and recovery, for both fixed site and transportation accidents involving hazardous substances.

Introduction

The following list of 75 references was compiled to provide interested parties with sources of social science research on preparing for and responding to hazardous material disasters. Work of this kind has been going on since the 1950s, although it has accelerated considerably in the last decade. While the following is a selective listing, an effort has been made to insure as wide a coverage as possible of the literature on the social aspects of hazardous material disasters, especially in the chemical and nuclear areas. While all the items listed are in the English language, an effort is made to cover studies on disasters outside of the North American continent. The older literature is cited as well as the more recent work. Items on both fixed sites and transportation accidents involving hazardous materials are included. In addition, all phases of disaster planning are represented, including mitigation and prevention, emergency preparedness, emergency response, and recovery.

Books, monographs and reports

1. *Albert, Michael and Louis Segaloff. Task Silence: The Postmidnight Alarm and Evacuation of Four Communities Affected by an Ammonia Gas Release. Philadelphia, PA: The Institute for Cooperative Research, University of Pennsylvania, 1962*

This is a case study of officials, rescue workers and evacuees in an incident requiring extensive warning activities so that all residents could be awakened and transported quickly. Using interviews and documentary data, the authors determine the individual and group response patterns and relate them to social and political characteristics of the four communities involved.

2. *Burton, Ian. The Mississauga Evacuation Final Report. Toronto, Ont., Canada: Institute for Environmental Studies, University of Toronto, 1981*

Based on six different surveys of citizens and business groups, semi-structured interviews with key actors, and documentary reports, a description and analysis is made of the responses of government, organizations and citizens to the event.

3. *Cutter, Susan L., William Solecki and Antony Mason. Emergency Response Planning for Acute Releases of Hazardous Substances: An Annotated Bibliography. New Brunswick, NJ: Department of Geography, Rutgers University, 1986*

A partially annotated listing of 176 items in the literature from the years 1960–1985 on planning for technological hazards.

4. *The Disaster at Feyzin. Paris, France: Center for the Psychological Studies of Disasters and Their Prevention, 1966*

A fire followed by three explosions at a major oil refinery just south of Lyon, France was studied through population surveys, in depth interviewing of key officials, and documentary analyses. Among the topics studied were the attitudinal and perceptual reactions of residents of the area, evacuation patterns, and the organizational response to the occasion.

5. *Drabek, Thomas. Disaster in Aisle 13: A Case Study of the Coliseum Explosion at the Indiana State Fairgrounds, October 31, 1963. Book and Monograph Series # 1. Newark, DE: Disaster Research Center, University of Delaware, 1968*

The focus of the research are the 12 major emergency oriented community organizations that responded to the explosion which killed 81 and injured around 400 people. The structures, activities and operational problems of each organization are described and analyzed. Also discussed are major intra and interorganizational changes which occurred in the year after the disaster.

6. *Dynes, Russell, A. Purcell, D. Wenger, P. Stern, R. Stallings and Q. Johnson. The Accident at Three Mile Island: Report of the Emergency Preparedness and Response Task Force. Washington, DC: US Government Printing Office, 1980*

A description and analysis of the emergency preparedness planning at the Three Mile Island nuclear plant as undertaken by social scientists as part of the Presidential Commission examination of the disaster. A detailed chronology of key events and communication patterns is given.

7. *Faupel, Charles E., Conner Bailey and Marcus Williams. Hazardous Waste and Emergency Planning: A Case Study of Sumter County, Alabama. Auburn, AL: Auburn University, 1987*

An examination of the emergency planning around the largest hazardous waste disposal site in the United States. Discussed in this case study are such issues as the clarification of task responsibilities, attempted resolvment of intergovernmental relationships and conflicts, and recognition of the interest of citizens.

8. *Flynn, C.B. and J. Chalmers. The Social and Economic Effects of the Accident at Three Mile Island: Findings to Date. Tempe, AZ: Mountain West Research Inc., 1980*

Using a telephone survey of 1,500 households, interviews of key informants, published documents, statistics, and newspaper articles, a report is presented indicating the effects in the first six months after the accident on: 1) the regional economy, 2) institutions, and 3) individuals. An examination was made of how much interruption of local production occurred and how much reduction there was in local income and employment. Consequences for the emergency preparedness system in the area were also looked at as well as how residents considered the issue of disaster planning. Additionally, an attempt was made to see how stressful residents considered the evacuation, as well as any longer run personal effects.

9. *Fowlkes, M. and P. Miller. Love Canal: The Social Construction of Disaster. Washington, DC: The Federal Emergency Management Agency, 1982*

Using interview data obtained from 63 randomly chosen homeowners in the area, this study reports on the behavioral response to the toxic waste disaster. The analysis primarily focuses on how self reported family health experiences and demographic factors shaped peoples' perceptions of what happened in the situation and how they responded.

10. Gray, Jane. *Three Case Studies of Organized Response to Chemical Disasters*. Newark, DE: Disaster Research Center, University of Delaware, 1981

A description and analysis of the organizational response to three different chemical disasters: an explosion and fire in a truck carrying phosphorous in an urban area, an explosion in a chemical plant in a very large urban area which released methylparathion fumes, and the derailment of train cars carrying dangerous chemicals including chlorine in a metropolitan area. Each event is described in terms of the nature of the event, the community characteristics, the type of disaster preparedness in place, the emergency resources available, and the organized response that occurred.

11. Hesbacher, Peter and Louis Segaloff. *Task Stagger: The Bayview Gas Scare*. Philadelphia, PA: Institute of Cooperative Research, University of Pennsylvania, 1961.

A description and analysis of the response by residents of a small southern town to toxic gas exposure. A major focus is on whether individuals and officials used traditional rather than more formal channels of communication in their reactions.

12. Kaplar, Richard (Ed.). *Chemical Risks: Fears, Facts, and the Media*. Washington, DC: The Media Institute, 1985

To determine how chemical health risks are reported, a content analysis was made of how three major American newspapers and the three major television networks covered the controversy over: 1) the use of EDB as a pesticide in the cultivation of grain and citrus fruits, 2) the derailment of a train carrying a variety of chemicals including vinyl chloride, and 3) the soil contamination by dioxin in Times Beach. These findings were compared with the results of an audience survey on their perception of the reporting of chemical risks.

13. Killian, Lewis. *A Study of Response to the Houston, Texas, Fireworks Explosion*. Washington, DC: Committee on Disaster Studies, National Academy of Sciences, 1956.

A report on a survey of the reaction and behavior of residents around a fireworks plant which exploded and burned and resulted in a mushroom shaped cloud arising above the site.

14. Lagadec, Patrick. *Major Technological Risks: An Assessment of Industrial Disasters*. Oxford: Pergamon Press, 1982.

The first part presents case studies of technological disasters associated with the explosion at Flixborough in England, the dioxin poisoning episode at Seveso in Italy, the oil spill from the Amoco Cadiz tanker, the Three Mile Island nuclear plant accident, and the derailment of a train with hazardous chemicals

at Mississauga, Canada. The second part of the book reviews the means and tools of management and the utilization of scientific findings for trying to improve safety in the technological area. The third part discusses the issue of risk from the perspective of different social actors such as plant operators, the public authorities, and citizens. In the last section, the question is asked whether what are often treated as technical issues of risk are not essentially political questions.

15. *Levine, Adeline. Love Canal: Science, Politics and People. Lexington, MA: Lexington Books, 1982*

A detailed examination of the disaster and its aftermath covering the early days of the toxic chemical dumpings, the political actions of government officials confronted with the crisis, the role of public health experts in defining the extent of the emergency, and the reactions of citizens who felt their safety and concerns were not adequately addressed.

16. *Marples, David. The Social Impact of the Chernobyl Disaster. New York, NY: St. Martin's Press, 1988*

A description of the victims of the disaster, its environmental impact in the zone around the affected area, its economic and political repercussions, the imagery of Chernobyl in the arts, the efforts at restoration and reconstruction, and the effects on the nuclear power debate in the Soviet Union.

17. *Perrow, Charles. Normal Accidents: Living with High-Risk Technologies. New York, NY: Basic Books, 1984*

After examining the social system failure at Three Mile Island, the question is raised why there have not been more similar emergency occasions elsewhere. Then the same analysis is made of the chemical industry, of marine transportation and other technological systems which because of their complexity are inherently risky and could result in catastrophic disasters.

18. *Prince, Samuel. Catastrophe and Social Change. New York, NY: Columbia University Press, 1920*

The first systematic social science study ever undertaken in the disaster area, it describes the initial response but primarily focuses on the consequences for social change from a massive ammunition ship explosion in the harbor of Halifax, Canada which killed about 2,000 residents.

19. *Quarantelli, E.L. Sociobehavioral Responses to Chemical Hazards: Preparations for & Responses to Acute Chemical Emergencies at the Local Community Level. Book and Monograph # 17. Newark, DE: Disaster Research Center, University of Delaware, 1984*

The volume summarizes four years of research which include field studies of the preparedness in 19 communities and the response in 20 hazardous chemical

incidents. Findings are reported on risk, vulnerability and threat perceptions at the organizational and community level, the availability and mobilization of appropriate resources, the social climate with respect to disaster planning, the existing patterns of community social organizations, and the planning process itself in the studied areas. With respect to responding to actual disasters, findings are reported on the effects of preparedness planning on emergency responses, impact and situational contingencies, the problems of first responders and their initial definitions of situations, the convergence and out-flow patterns that occur, and the similarities and differences between chemical and nonchemical disaster responses.

20. Quarantelli, E.L. *The Reality of Local Community Disaster Preparedness: Three Case Studies*. Newark, DE: Disaster Research Center, University of Delaware, 1981

The local preparedness planning for chemical disasters was examined in depth through field research in 19 American communities. Three of the case studies developed from that data are reported in this monograph. The community characteristics, the disaster vulnerability of the area, the relevant resources available to the community, the history of disaster planning in the area, and the current status of organizational preparedness for chemical emergencies are depicted for each case.

21. Quarantelli, E.L. *Transportation Accidents Involving Hazardous Chemicals Versus Those Involving Dangerous Nuclear Materials*. Miscellaneous Report # 20. Newark, DE: Disaster Research Center, University of Delaware, 1982.

This analysis compares and contrasts emergency planning considerations for both nuclear and chemical transportation disasters. Examined are the general risks from and possible scenarios of nuclear material transport accidents, the range of possible chemical hazard incidents in transportation, the common and distinctive response capacities needed for both types of emergencies, and policy implications for disaster management derived from the comparison.

22. Quarantelli, E.L., B. Phillips and D. Hutchinson. *Evacuation Behavior: Case Study of the Taft, Louisiana Chemical Tank Explosion Incident*. Newark, DE: Disaster Research Center, University of Delaware, 1983

Based on interviews with officials from 17 organizations involved in the response, a case study was written on the evacuation of 17,000 persons in the incident. An analysis is made of the relationship between preimpact planning and actual implementation at the time of the incident, and whether the existing disaster subculture in the area was more responsible for the nature of the evacuation than prior disaster planning.

23. *Scanlon, Joseph and Massey Padgham. The Peel Regional Police Force and the Mississauga Evacuation. Ottawa, Ont., Canada: Canadian Police College, 1980*

This volume presents a detailed account of the police operations and other organizational response to the hazardous chemical disaster occasion resulting from a train accident that resulted in the evacuation of 220,000 in a suburb of Toronto, Ont. Canada.

24. *Segaloff, Louis. Task Sirocco: Community Reaction to an Accidental Chlorine Exposure. Philadelphia, PA: Institute of Cooperative Research, University of Pennsylvania, 1961*

A case study which describes the reaction of two rural communities to a train wreck which produced a cloud of chlorine gas. Focus is on the initial perception of the threat, immediate rescue activities, the evacuation of two schools, and the mobilization and utilization of local resources.

25. *Shrivastava, Paul. Bhopal: Anatomy of a Crisis. Cambridge, MA: Ballinger Publishing Company, 1987*

After a general discussion of the characteristics and conditions responsible for industrial crises, a detailed case study of the disaster is presented that is based on field work and several hundred interviews in India and the United States. Particularly examined are the social and economic factors that led to the accident, the numerous controversies that arose in the aftermath, and how the Indian government, Union Carbide and the victims themselves saw the crisis.

26. *Tierney, Kathleen. A Primer for Preparedness for Acute Chemical Emergencies. Book and Monograph # 14. Newark, DE: Disaster Research Center, University of Delaware, 1980*

This monograph draws out the implications of the Disaster Research Center extensive studies of chemical disasters for disaster planning. It describes the attitudes, beliefs, norms, values and social structures of communities as these relate to preparing for chemical hazards. General principles of disaster planning are depicted. It is noted that good preparations apply across the board for most types of community crises. The final chapter suggests various measures, derived from research studies, on what local governments and chemical producers and transporters can do to facilitate and/or update local planning for major chemical disasters.

27. *Turner, Barry. Man-Made Disasters. London: Wykeham, 1978*

A descriptive examination and a theoretical analysis of the background and immediate conditions of three disasters (a human-created landslide, a truck-train accident, and a major fire) in Great Britain occasioned by human errors

and mishaps. Most of the focus is on organizational communication and decision making.

28. *Westgate, Kenneth. Flixborough, the Human Response. Bradford: Disaster Research Unit, University of Bradford, 1975*

A description and analysis of the emergency response to an explosion at a chemical plant in England. Focus is on the stressful situation in which survivors found themselves and how they responded as well as the warning system and safety regulations operating at the plant.

29. *Wilkins, Lee. Shared Vulnerability: The Media and American Perceptions of the Bhopal Disaster. Westport, CN: Greenwood Press, 1987*

A content analysis was made of the news reporting of the disaster by three wire services, three major American news magazines, several prestige newspapers, and network television in the United States. Topics examined include the nature of the coverage of the disaster, the sources cited in stories, and the differences in coverage within specific media or among media. National surveys were used to measure what Americans remembered about the event and mass media reports. The conclusion considers ethical implications raised by mass media coverage, the media's contribution to the growing doomsday mythology surrounding science, and how this bears on democratic decision making and emergency planning.

Refereed journal articles and papers published in series

1. *Bartlett, G., P. Houts, L. Byrnes and R. Miller. The near Disaster at Three Mile Island. International Journal of Mass Emergencies and Disasters, 1 (1983) 19-42*

Based on telephone and questionnaire surveys of adults and high school students in the area, a presentation is made of factors associated with a negative response to the accident and with the likelihood of having to evacuate.

2. *Battisti, Francesco. Some conditions for the social perception of pollution in environmental disasters. Mass Emergencies, 3 (1978) 201-208*

The conditions which determine perception as well as those which hinder awareness in two kinds of pollution disasters are discussed.

3. *Bhargava, Ashok. The Bhopal incident and Union Carbide: Ramifications of an industrial accident. Bulletin of Concerned Asian Scholars, 18 (1986) 2-19*

A discussion of the economic and other social impacts of the disaster: includes a description of the conditions responsible for the accident, the physical effects on humans and animals, the medical response, the corporate responsi-

bility and response of the chemical company, the response of the Indian government, and issues of liability, compensation and litigation.

4. Bogard, William. *Evaluating chemical hazards in the aftermath of the Bhopal tragedy. International Journal of Mass Emergencies and Disasters*, 5 (1987) 223-242.

This paper questions whether evaluations of risks in the chemical industry based upon simple extrapolations from past industry performance can be adequate. Examines whether future policies to regulate the industry must explicitly consider the long-term uncertainties, irreversibilities, catastrophic potentials, and dependencies created by the development of new chemical technologies.

5. Bromet, E., D. Parkinson, H. Schulberg, L. Dunn and P. Gondek. *Mental health of residents near the Three Mile Island reactor: A comparative study of selected groups, Journal of Preventive Psychiatry*, 1 (1982) 225-276

This reports on a comparison of the mental health of mothers with preschool children within ten miles of the plant, workers at another nuclear plant in the state, and psychiatric patients. An attempt is made to explain why no relevant differences were found among the workers and patients, but some among the mothers.

6. Brown, James. *Probing the law and beyond: A quest for public protection from hazard product catastrophes. George Washington Law Review*, 38 (1970) 431-462.

This is a discussion of the complicated legal issues involved in major accidents and disasters from chemical agents in the United States.

7. Brown, Phil. *Popular epidemiology: Community response to toxic waste-induced disease in Woburn, Massachusetts. Science, Technology and Human Values*, 2 (1987) 78-85

After a description of the hazard risk in the community, a comparison is made with other communities where popular epidemiological attempts were also made, that is, where laypersons gathered statistics and other information in an effort to account for the spread of diseases and to learn how to react to the toxic risks.

8. Covello, Vincent. *The perception of technological risk: A literature review. Technological Forecasting and Social Change*, 23 (1983) 285-297

An examination of the social and behavioral science literature on how risk is perceived by different kinds of social actors.

9. *Comfort, Louise, J. Abrams, J. Camillus and E. Ricci. From crisis to community: The Pittsburgh oil spill. Industrial Crisis Quarterly, 3 (1989) 17-39*

This article examines the effects of multiple interdependent social systems in a metropolitan community in escalating a tank collapse at an oil company's storage site to a full scale crisis spanning two weeks and three states, and adversely affecting the lives of 830,000 people.

10. *Cuthberton, Beverley, and Joanne Nigg. Technological disaster and the nontherapeutic community: A question of true victimization. Environment and Behavior, 19 (1987) 462-483*

Having or developing a therapeutic community has been proposed as a useful mechanism for adapting to the trauma and stress experienced by disaster victims. Using data from two hazardous technological occasions—the aerial application of pesticides and the disposal of asbestos tailings—this paper examines whether such a community is as likely in those kinds of events as it is in natural disasters.

11. *Duclos, P., L. Sanderson, F. Thompson, B. Brackin and S. Binder. Community evacuation following a chlorine release in Mississippi. Disasters, 11 (1987) 286-292*

A study was conducted on the evacuation behavior following a derailment of a train carrying chlorine in a rural area. Examined were the factors associated with the evacuation behavior of residents, including how they were warned and conditions which encouraged or discouraged leaving the threatened area.

12. *Faupel, Charles and Conner Bailey. Contingencies affecting emergency preparedness for hazardous wastes. International Journal of Mass Emergencies and Disasters, 6 (1988) 131-154*

A case study was made of the emergency preparedness activities at the largest hazardous waste landfill within the United States. Three features that might affect preparedness were examined: 1) the specialized nature of hazardous waste, 2) the politicization of the hazardous waste industry, and 3) the jurisdictional dilemmas created by the merger of public and private roles in emergency preparedness.

13. *Flynn, C. Reaction of local residents to the accident at Three Mile Island. Pp. 49-63. In: D. Sills, et al. (Eds.) Accident at Three Mile Island. Boulder, CO: Westview Press, 1982*

Using data collected from seven different population surveys, an examination was made of the variation in the response of individuals to the accident. Details are given with respect to those who evacuated and those who did not and the reasons for their behavior. Some attention is paid to the observation that while many residents suffered considerable stress from the lack of infor-

mation and ambiguity surrounding the occasion, a significant minority were not worried then or later regarding radioactive emissions.

14. Friedman, Sharon. *Blueprint for breakdown: Three Mile Island and the media before the accident. Journal of Communication, 31 (1981) 116-128*

This article focuses on the roles of the mass media and the nuclear power company before the accident as well as the communication breakdown that occurred at the time of the emergency.

15. Goldsteen, R. and J. Schorr. *The long term impact of a manmade disaster: An examination of a small town in the aftermath of the Three Mile Island nuclear reactor accident. Disasters, 6 (1982) 50-59*

While some analysis is made of the evacuation behavior at the time of the accident, the paper primarily looks at the long term effects of the disaster in terms of its effects on trust in public officials, the perceptions of citizens on their vulnerability to future nuclear threats and the perceived consequences for their physical and mental health.

16. Gray, Jane and E.L. Quarantelli. *The behavior of first responders and their initial definitions of acute chemical emergencies. Disaster Management, 4 (1984) 6-12*

Drawing from field studies of 20 hazardous chemical incidents, a discussion is presented of the problems, including impact and situational contingencies, faced by first responders from emergency organizations to such situations.

17. Harrald, John and William Wallace. *An analytic approach to planning the response to technological disasters. Industrial Crisis Quarterly, 2 (1988) 257-270*

In this paper the authors apply a model designed to aid in planning responses by organizations to releases of hazardous substances, to chemical spills in New York harbor.

18. Hohenemser, Christoph and Ortwin Renn. *Chernobyl's other legacy. Environment, 30 (1988) 5-15*

The radiation fallout from Chernobyl and the expected health consequences is related to changes in the world in public attitudes about nuclear power, to the extent of protective action achieved, and to the level of commitment to nuclear power in several countries.

19. Ikeda, Kenichi. *Warning of disaster and evacuation behavior in a Japanese chemical fire. Journal of Hazardous Materials, 7 (1982) 51-62*

A large warehouse facility storing a great quantity of chemical materials caught fire in a major Japanese city, forcing thousands to evacuate. This paper

assesses the effects the warning information transmitted to the threatened population had upon compliance with an evacuation order.

20. LaPlante, Josephine and J. Stephen Kroll-Smith. *Coordinated emergency management: The challenge of the chronic technological disaster. International Journal of Mass Emergencies and Disasters*, 7 (1989) 134–151

Chronic disasters present a special problem for emergency management because authority to act is diffuse and often lodged in the United States within a variety of agencies operating at different levels of government. An examination is made of the possible similarities and differences in social behavior between chronic technological disasters and what has been found about reactions to acute natural disaster occasions.

21. Lindell, Michael and Ronald Perry. *Evaluation criteria for emergency response plans in radiological transportation. Journal of Hazardous Materials*, 3 (1980) 335–348

The evaluation of eight identified criteria takes the form of examining the meaning and role of emergency planning in general, reviewing the process as it is used in connection with both natural and other disasters, and explicitly considering unique aspects of the radiological transportation setting.

22. Liverman, D. and J. Wilson. *The Mississauga train derailment and evacuation, 10–16 November, 1979. The Canadian Geographer*, 25 (1981) 365–375

Using both mail and phone surveys of 581 households, a study was made of the characteristics of the evacuation behavior in the disaster. The paper discusses how evacuation messages were received, reasons for leaving the area, the level of spontaneous evacuation, the destination of those that left, and effects on individual attitudes.

23. Mazur, Allan. *The journalists and technology: Reporting about Love Canal and Three Mile Island. Minerva*, 22 (1984) 45–66

By exploring the sequence of events leading to the establishment of these two disasters as major “media events” this article analyzes how the quantity and quality of news coverage can greatly influence the significance of these events. An examination is also made of why these two occasions received such heightened mass media attention whereas less attention was paid to incidents of even more seriousness.

24. Otway, Harry, P. Hastrup, W. Cannell, G. Gianitsopoulos and M. Paruccini. *Risk communication in Europe after Chernobyl: A media analysis of seven countries. Industrial Crisis Quarterly*, 2 (1988) 3–15

This article reports on comparisons made among European mass media coverage of the Chernobyl disaster, how well information from official sources was

conveyed, and what was reported about technical topics such as radiation exposure and effects.

25. *Patterson, Philip and Lee Wilkins. Routinized reporting of technological accidents: Television coverage of the Chernobyl disaster. International Journal of Mass Emergencies and Disasters, 6 (1988) 27-46.*

An analysis is made of how television networks in the United States covered the disaster and what kind of information was used in reporting the accident. Particular attention is given to how the Soviets were depicted in handling the disaster.

26. *Perry, Ronald. Population evacuation in volcanic eruptions, floods and nuclear power plant accidents: Some elementary comparisons. Journal of Community Psychology, 11 (1983) 36-47*

The author looks at the evacuation response in three different environmental threat occasions: 1) the eruption of the Mt. St. Helens volcano, 2) a riverain flood in Fillmore in the state of Washington, and 3) the Three Mile Island nuclear plant accident. The last situation differed somewhat from the first two because both citizens and emergency managers were more relatively unfamiliar with the threat, and because conflicting reports were given regarding the dangers at the nuclear plant. An examination is made of how this might have affected the evacuation.

27. *Pilisuk, M., S. Parks and G. Hawkes. Public perception of technological risk. The Social Science Journal, 24 (1987) 403-413*

The article reports on the findings from a public opinion survey in three California cities which assessed the extent of public concern over risks associated with modern technologies. Also examined is the relationship between political participation in preparing for the risks and the extent of concern expressed over the risks.

28. *Ponting, J. Rick. It can't happen here: A pedagogical look at community coordination in response to a toxic gas leak. Emergency Planning Digest, 1 (1974) 8-13*

A toxic gas leak occurred during routine servicing of an oil well in central Alberta, Canada. An examination is made of how a nearby small town reacted to the event, especially the efforts at coordination of the organizational response.

29. *Ridington, Robin. When poison gas comes down like a fog—a native community's response to culture disaster. Human Organization, 41 (1982) 36-42*

A comparison and contrast is made of the Canadian Indian values and perceptions about a poison gas leak from an oil well, and those that are manifested by people from industrialized societies.

30. Rubin, David. *How the news media reported on Three Mile Island and Chernobyl. Journal of Communication, 37 (1987) 42-57.*

This article compares the flow of information in the mass media in the United States following the two nuclear plant accidents. Looked at were what sources of information were sought, the effects of reporting on accuracy, and if worst-case scenarios were used.

31. Sandman, Peter and Mary Paden. *At Three Mile Island. Columbia Journalism Review, 18 (1979) 43-58*

This is an account of the assignments of two reporters covering the accident. Discussed are the roles of prominent individuals and organizations during the crisis. Additionally, a "media" version of the happenings before, during and after the emergency is provided.

32. Shrivastava, Paul. *Preventing industrial crises: The challenge of Bhopal. International Journal of Mass Emergencies and Disasters, 5 (1987) 199-201*

In this article the Bhopal disaster is set within the larger theoretical context of industrial crises. The varied actions taken by at least three different groups of stakeholders—governments, corporations and communities—are discussed and how they might affect consideration of alternative public policy options.

33. Tuler, Seth. *Individual, group and organizational decision making in technological emergencies: A review of research. Industrial Crisis Quarterly, 2 (1988) 109-38*

Emergency response systems for hazardous technological emergencies are generally composed of many organizations with varying degrees of control over information and resources. Using the example of nuclear power plant accidents, four critical categories of performance shaping factors that can result in decision failures are identified: structural, affective, informational, and task and resource characteristics. The literature is reviewed in the article to see how such factors might have important negative influences on performance.

Turner, Barry. *The organizational and interorganizational development of disaster. Administrative Science Quarterly, 21 (1976) 378-397*

To study the conditions under which large scale intelligence failures occur, an examination was made of the data from public inquiries into organizational behavior occurring in three major disasters. In the paper a sequential model of intelligence failure is presented.

35. Walsh, Edward. *Resource mobilization and citizen protest in communities around Three Mile Island. Social Problems, 29 (1981) 1-21*

This article examines the emergence of citizen protest groups after the disaster, and considers them in the light of different theories about social movements.

36. Wilkins, Lee. *Media coverage of the Bhopal disaster: A cultural myth in the making. International Journal of Mass Emergencies and Disasters*, 4 (1986) 7-34

This is a report of an examination over a two month period of 12 print, international news services and network television coverages of the disaster. It is indicated that a new myth of societal extinction through industrial accident resulting from carefully designed political and economic policies is being set forth. The implication of this for citizen participation in policy decisions is examined.

37. Wilkins, Lee and Philip Patterson. *Risk analysis and the construction of news. Journal of Communication*, 37 (1987) 80-92

A content analysis was made of 952 print and broadcast stories following the Bhopal and Chernobyl disasters. Examined were if both disasters were treated as novel and unique occasions, or as predictable consequences of industrial development.

38. Yutzy, Daniel. *Some organizational and community activities after an explosion at the Thompson Chemical Company Attleboro, Massachusetts. Research Note #2. Newark, DE: Disaster Research Center, University of Delaware, 1964*

This presents a description of the organized response to a fixed site chemical incident and fire. Discussed are organizational alerting, mobilizing, coordinating, and communicating activities and problems, as well as public versus organizational perception of tasks and some aspects of evacuation behavior.

39. Zimmerman, Rae. *Understanding industrial accidents associated with new technologies: A human resource management approach. Industrial Crisis Quarterly*, 2 (1988) 229-256.

The introduction of new technology makes unusual demands upon human resources. In order to identify the resource needs related to accidents, a diagnostic framework for screening the events preceding emergencies is developed. This framework is illustrated with three disasters that occurred in the context of new technology, namely the gas release at Bhopal, an explosive release of aldicarb oxime in a plant in West Virginia, and an explosion at a nuclear fuel reprocessing plant in Oklahoma which released uranium hexafluoride which formed hydrofluoric acid that resulted in casualties.

Collection of articles

1. Gray, Jane and E.L. Quarantelli (Eds.). *Special Issue: Social Aspects of Acute Chemical Emergencies. Journal of Hazardous Materials*, 4 (1981) 309-394

H. Fawcett. The changing nature of acute chemical hazards: A historical perspective.

- J. Helms. Threat perception in acute chemical disasters.
 K. Tierney. Community and organizational awareness of and preparedness for acute chemical emergencies.
 T. Gabor. Mutual aid systems in the United States for chemical emergencies.
 J. Gray. Characteristic patterns of and variations in community responses to acute chemical emergencies.
 H. Whittaker. State perspectives on hazardous materials management.
 E. Wilson. A selected annotated bibliography and guide to sources of information on planning for and responses to chemical emergencies.

2. *Kates, Robert, C. Hohenemser and J. Kasperson (Eds.). Perilous Progress: Managing the Hazards of Technology. Boulder, CO: Westview Press, 1985*

Relevant articles include:

- R. Kates, C. Hohenemser and J. Kasperson. Introduction: Coping with technological hazards.
 K. Kasperson, R. Kates and C. Hohenemser. Hazard management.
 P. Slovic, B. Fischhoff and S. Lichtenstein. Characterizing perceived risk.
 R. Harriss, C. Hohenemser and R. Kates. Human and nonhuman mortality.
 J. Tuller. Economic costs and losses.
 R. Harriss and C. Hohenemser. Airborne mercury.
 C. Hohenemser, R. Kasperson and R. Kates. Nuclear power.
 R. Kates. Hazard Assessment: art, science and ideology.
 B. Fischhoff, P. Slovic and S. Lichtenstein. Weighing the risks.
 B. Johnson. Tales of woe: A literature review.
 A. Goldman. Controlling PCBs.

3. *Kleindorfer, P. and H. Kunreuther (Eds.). Insuring and Managing Hazardous Risks: From Seveso to Bhopal and Beyond. New York, NY: Springer Verlag, 1987.*

- P. Lagadec. From Seveso to Mexico to Bhopal: Learning to cope with crises.
 G. Naschi. Engineering aspects of severe accidents with reference to the Seveso, Mexico City and Bhopal cases.
 F. Pocchiari, V. Silano and G. Zapponi. The Seveso accident and its aftermath.
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