TEXAS A & M UNIVERSITY

DISASTER RESPONSE PLANNING

Course Objective

To offer the student insight into some of the policies and activities of emergency management.

Method of Evaluation

Grades will be determined by the following:

a) topical presentations in class
b) take-home midterm exam
c) take-home final exam
d) research papers

Topics for presentations and research papers will be determined by individual and/or class interests.

COURSE OUTLINE

I. Overview of Emergency Planning

A. Video #1: "Formulating Public Policy: Segment 1: Countdown to Disaster." 17 + min.

B. Video #2: "Why Plan." 22 min.

(See pages 8 and 9 for descriptions of videos.)

II. Preliminary Consideration of Available Information (material will be on reserve either at the library or in my office.)

A. Resource Materials

1. Federal Emergency Management Agency (FEMA) Publications

a. *Emergency Planning.* FEMA, IG 61, August 1983.

b. *Emergency Planning.* FEMA Student Manual, SM 235, September 1990.

c. *Introduction to Emergency Management*. FEMA Student Manual, SM 60, August 1983.

d. *Introduction to Emergency Management*. FEMA IG 60, August 1983.

e. *Job Aid Manual*. FEMA SM 61.1, August 1983.

f. *Mitigation Program Development Guidance*. FEMA, FEMA 122, March 1987.

g. *Model Community.* FEMA, SM 171.1, March 1988.

h. *Objectives for Local Emergency Management*. FEMA, CPG 1-5, July 1984.

i. *Guide for the Development of a State and Local Continuity of Government Capability.* FEMA, CPG 1-10, July 1987.

j. *Instructional Materials Package for Emergency Planning*. FEMA IG-61.1, August 1983.

k. *Preclass Activities*. FEMA, SM-61.2, August 1983.

l. *Guide for the Development of State and Local Emergency Operations Plans*. FEMA, CPG 1-8. September 1990.

m. *Guide for the Review of State and Local Emergency Operations Plans.* FEMA, CPG 1-8A, September 1988.

n. *Catalog of Activities of the Emergency Management Institute.* FEMA, 1990/91.

2. Textbooks

a. *Disaster Planning: Preservation of Life and Property.* Harold D. Foster. New York: Springer-Verlag, 1980.

b. *Natural Hazard Risk Assessment and Public Policy: Expecting the Unexpected.* William J. Petak and Arthur A. Atkisson. New York: Springer-Verlag, 1982.

c. *Natural Hazards and Public Choice: The State and Local Politics of Hazard Mitigation.* Peter Rossi, James Wright, and Eleanor Weber-Burdin. New York: Academic Press, 1982.

3. Texas Publications—Division of Emergency Management (DEM)

a. *Local Emergency Management Plan Development Handbook*. DEM, State of Texas. DEM-10, July 1990.

b. Annexes for DEM-10.

Annex A. Warning 12/87

B. Communications 7/86

C. Shelter/Mass Care 4/88

D. Radiological Protection 8/86

E. Evacuation 12/87

F. Fire and Rescue 9/85

G. Law Enforcement 9/85

H. Health and Medical 9/85

I. Emergency Public information 12/87

J. Damage Assessment 9/85

K. Public Works/Engineering 9/85

L. Utilities 9/85

M. Resource Management 12/87

N. EOC/Direction and Control 12/87

O. Human Services 9/85

P. Hazard Mitigation 12/87

Q. Hazardous Materials Response 12/87

R. Rescue 9/85

S. Transportation 9/85

c. *State of Texas Emergency Management Plan.* DEM, State of Texas, November 1988.

d. *Impact of Applying Hazard Mitigation to Seventeen Texas Disasters* 1976-1986. DEM, State of Texas, September, 1986.

4. Texas A&M University Publications

a. *Hurricane Contingency Planning for Hardin, Jasper, Jefferson, Newton, and Orange Counties*. Carlton Ruch and Janet Townes, Research Division, CAED, TAMU, College Station, September 1990.

b. *Hurricane Relocation Planning for Hardin, Jasper, Jefferson, Newton and Orange Counties*. Carlton Ruch, Sea Grant Program, TAMU, College Station, September 1983.

c. *Hurricane Vulnerability Analysis for Hardin, Jasper, Jefferson, Newton, and Orange Counties*. Carlton Ruch, Research Division, CAED, TAMU, College Station, September 1985.

d. *Official's Hurricane Evaluation Update and Decision-Making Aid* (Lake Sabine). Carlton Ruch and Janet Townes. Research Division, CAED, TAMU, College Station, 1990.

5. Journals and Papers

a. *Quarterly Status Report of Superfund Sites*. EPA, Region VI.

b. *FEMA Newsletter*. FEMA, Washington, D.C.

c. *DEM Digest*. Texas Department of Public Safety.

d. *Natural Hazards Observer*. Colorado: University of Colorado.

e. *Hazard.* Maryland: Research Alternatives, Inc.

6. Others

    a. *The Feasibility of Vertical Evacuation*. Ruch, Miller, Hatlich, Farber, Berke, and Stubbs, Institute of Behavioral Science, Boulder, 1991.

    b. *Catastrophic Coastal Storms*, Godshalk, Brower, and Beatley, Duke, Durham, 1989.

    c. *Greenhouse Effect and Sea Level Rise*. Barth and Titus, Reinhold, New York, 1984.

    d. *Airport Emergency Plan* Advisory Circular, Federal Aviation Administration, 1989.

    e. *Community Awareness and Emergency Response Program Handbook*, Chemical Manufacturers Association, Washington, D.C., 1985.

    f. *Disaster Preparedness Plans*, the University of Texas Medical Branch at Galveston, 1990.

    g. *American Red Cross Disaster Guidelines*.

    h. *Private Disaster Company Folder*.

    i. *City of Corpus Christi Emergency Management Plan*.

B. Classification of Disasters

1. Threefold

    a. Attack: biological, chemical, nuclear, and conventional war.

    b. Man made: epidemic; fire (accident, arson); hazardous material accident (fixed site, transport); nuclear and radiological (fixed site, transport); pollution; resource and energy disruptions or shortages; reservoir and dam breaks; major gas and water main breaks; major transportation accidents; mine disasters; pipeline explosions; terrorism; and civil disorders, riots, and strikes.

    c. Natural: drought; extreme cold; fire from lightning or spontaneous combustion (forest, range, other); flood and other water; landshift (earthquake, earthslide, or mudslide); snow and ice; tsunami and storm surge; volcanic eruption; wind (cyclone, hurricane, typhoon); tornado; sand and dust storms; severe fog and smog; and agricultural blight or infestation.

2. Twofold

    a. Technological

        1. Attack

        2. Man Made

    b. Natural

C. Four Phases of Emergency Management

1. Mitigation (long term)
2. Preparedness (to respond)
3. Response (to the emergency)
4. Recovery (short & long term - "mitigation")

III. Roles in Disaster Planning

A. Federal Emergency Management Agency (FEMA)—Video #3: "Just in Case." 27 min. Role of FEMA.

B. National Weather Service (NWS)—Video #4: "Terrible Tuesday." 23:30 min. Wichita Falls tornado in April 1979.

C. Governor's Division of Emergency Management (DEM)

1. Video #5: "Management of Allen." 15 min. State EOC operations.
2. Disaster Districts
   a. Head—Texas Department of Public Safety (TDPS).
   b. DEM represented by Regional Liaison Officer (RLO).
3. City and County Emergency Management—contacts are DEM and RLO'S.
   a. Directors (highest elected officials).
   b. Coordinators

D. The American Red Cross

IV. Topical Presentations

A. "Natural Hazard Mitigation Costs and Impacts." Petak and Atkinson, Chapter 6.

B. *The Impact of Applying Hazard Mitigation to Seventeen Texas Counties 1976-1986.*

C. "Policy Makers, Stakeholders, and Candidate Public Problems". Petak and Atkinson, Chapter 8.

D. "Constraints on Public Hazard Policy Making." Petak and Atkinson, Chapter 9.

E. "Public Policy Alternatives." Petak and Atkinson, Chapter 10.

F. *State of Texas Emergency Management Plan*. Division of Emergency Management, State of Texas, November 1988.

G. *Local Emergency Management Plan Development Handbook*. DEM, State of Texas, DEM-10, July 1990.

H. *City of Corpus Christi Emergency Management Plan*. Corpus Christi, Texas, 1985.

I. *Disaster Preparedness Plans*, The University of Texas Medical Branch at Galveston, 1990.

J. *Airport Emergency Plan*, Advisory Circular, Federal Aviation Administration, 1989.

K. *American Red Cross Disaster Guidelines*.

V. Functional Disaster Areas—Integrated Emergency Management System (IEMS)

A. Communications and Warning

1. Video #6: "Sixty Minutes to Meltdown": Part One: "Crisis at Three Mile Island." 60 min. Part Two: "After the Crisis." 30 min.

B. Damage Assessment

C. Health and Medical Services

D. Emergency Operating Centers—Video #7: "A Special Kind of Place." 20 min. An overview of an EOC Facility.

E. Evacuation

F. Fire Service

1. Video #8: "Trapped." 20 min. Rescue techniques.

2. Video #9: "Hazardous Materials Response." 30 min.

3. Video #10: "Blueprint for Safety." 16 min. Hazardous spill.

4. Video #11: "San Antonio Train Derailment." 174 min.

G. Law Enforcement

H. Resource Management

I. Public Information and Education—Video #12: "Gleaming in the Public Eye." 13 min.

J. Public Works

K. Radiological Defense

L. Rescue

M. Shelter

N. Social Services

VI. Disaster Case Studies—presentations by class members on selected disasters incorporating the four phases of disaster planning and the functional sectors.

VII. Hurricane Planning for the Texas Coast

A. Video #13: "Hurricane Training Tape." 120 min.

1. Evacuation Studies

2. Vulnerability Studies

3. Contingency Studies

B. Video #14: "Hurricane Alicia." 28:30 min.

C. Video #15: “48 Hours on Hurricane Gilbert.” 60 min.

VIII. The Concept of Vertical Evacuation

A. Structural Concerns

B. Legal Concerns

C. Political Concerns

D. Behavioral Concerns

IX. Military Support of Civil Defense

X. Superfund Amendments and Reauthorization Act of 1986 (SARA)

Video #16: “Town of Our Times.” 26 min.

Video #17: “The U.S. Industry.” 25:30 min.

POSSIBLE FIELD TRIPS

1. The Emergency Operating Center of the Governor’s Division of Emergency Management—Austin.
2. Brazos County Emergency Operations Center.

POSSIBLE GUESTS

1) Jack Cangelosie, Coordinator of Brazos County.
2) Al Stirling, Division Head, Oil and Hazardous Materials Training Division, Texas Engineering Extension Service, on SARA.
3) Thomas Urbanik II, Texas Transportation Institute, on nuclear evacuations.

VIDEO DESCRIPTIONS

Video #l: “Formulating Public Policy”: Segment I: Countdown to Disaster”: 17 + minutes. Video contains assorted film clips from different types of disasters.

Video #2: “Why Plan”: 1/2 . 22 minutes. Color. A Federal Emergency Management Agency Production. A look at five different types of disasters and the readiness of each area affected. Depicts how to complete an emergency plan. This film is used in conjunction with the Professional Development Series courses. Disasters shown are Mount Saint Helens Volcano eruption, the San Diego Air crash, California forest fires, Miami riots, and Hurricane Allen.

Video #3: “Just in Case”: 27 minutes. Role of FEMA.

Video #4: “Terrible Tuesday”: 16 mm. 23:30 minutes. Color, sound. The story of the tornado that struck Wichita Falls, Texas in April, 1979.

Video #5: 'Management of Allen - (State EOC Operations)": 16 mm.15 minutes. Color, sound. A look at Texas State Emergency Operating Center's actions during Hurricane Allen in 1980.

Video #6: "Sixty Minutes to Meltdown": Part One: "Crisis at Three Mile Island": 60 minutes. Part Two: "After the Crisis": 30 minutes.

Video #7: "A Special Kind of Place—Jackson, Mississippi/Hind Co. E.O.C.": 1/2 . 20 minutes. Color. An overall description of the E.O.C. facility. Features the deactivation procedures for the facility as well as staff functions. Describes equipment in the facility.

Video #8: "Trapped": 16 mm. 20 minutes. Black and white, sound. This is a Swedish-made rescue film in English which has been adapted for use in the United States. It emphasizes the need for many trained rescue workers and shows the special techniques required in rescue work.

Video #9: "Hazardous Materials Response": 1/2 . 30 minutes. Color. This is an introduction to the problems of hazardous material emergencies. Explains why it is so important for an emergency responder to be educated on the procedures to take in order to identify, handle, and control hazardous material emergencies. Describes how to perform these three procedures with all types of hazardous materials. Shows different hazardous material disasters from past history.

Video #10: "Blueprint for Safety": 16 mm. 16 minutes. Color, sound. 1982 DuPont Corporation Production. Scenario is a hazardous material spill as a result of a tanker carrying methanol colliding with another vehicle which causes a leak in the tanker. Shown are procedures to be implemented in the handling of such an incident.

Video #11: "San Antonio Train Derailment—Part I, II, & III": 1/2 . 2 hours, 54 minutes. Color. This 3 part video is raw aerial & ground footage of the train derailment which took place June 8, 1986 in northeast San Antonio, Texas and burned for 6 days. Tanker cars were transporting the highly flammable substance, Butadiene which is used in making synthetic rubbers and resins.

Video #12: "Gleaming in The Public Eye—Positive Media Relations in a Crisis": 1/2 . 13 minutes. Color. 1983. Using a hazardous material spill scenario, this video depicts how detrimental untrained personnel relaying information about an incident can be. Video shows the correct way media interviews should be handled. Illustrates the crucialness in planning ahead for interviews of this sort.

Video #13: "Hurricane Training Tape": 2 hours. This film explains how to use the evacuation, vulnerability, and contingency studies developed for the Texas Gulf Coast.

Video #14: "Hurricane Alicia": 16 mm. 28:30 minutes. Color, sound. Destruction caused by Hurricane Alicia which came ashore on Galveston Island in August, 1983, and caused damage from the coast inland to Houston.

Video #15: "48 Hours an Hurricane Gilbert": 1 hour.

Video #16: "Town of the Times": 16 mm. 26 minutes. Color, sound. Demonstrates the arguments, pro and con, when the Civil Defense Director faces resistance, false information, and

do-nothing attitudes. It also demonstrates results which can be achieved through concerted, directed community action behind a worthy undertaking.

Video #17: “Mutual Aid—The U.S. Industry”: 16 mm. 25:30 minutes. Color, sound. This film depicts a demonstration of coordination between the fire-fighting and rescue squads of various large industries located in a highly industrialized section of New Jersey. The climax of the film shows how these large companies and area towns combined their resources to combat a large fire set off in a catalyst-cracking plant of Standard Oil in New Jersey.

Video #18: “Denver Media Plan (Airport)”

Video #19: “Hurricane Hugo Debriefing”

Video #20: “Flight 1141”

PLAN 689
ORGANIZATIONAL AND COMMUNITY
PLANNING AND RESPONSE FOR DISASTERS
Spring 1995
Dr. Dennis Wenger

Office: Room 106B, Building C, Langford Architecture Complex
Phone: 845-7813
Office Hours: 2:00 PM - 4:00 PM, TR

Required Texts

Aufderheide, Eric. *Disaster Response: Principles of Preparation and Coordination*. (St. Louis, Missouri: C. V. Mosby Co.) 1989.

Drabek, Thomas. *Human System Responses to Disaster: An Inventory of Sociological Findings*. (New York Springer-Verlag) 1986.

Additional Readings

Additional readings from single item materials will be made available to the student at the cost of five cents/page for reproduction.

This course is intended to be an introduction to the field of disaster research. The study of the social and human aspects of disasters has a rather brief, but colorful, history. The analysis of disasters has come to focus upon four interrelated phases, including mitigation, preparedness, response and recovery. This course is going to focus primarily upon emergency preparedness and response at the individual, organizational and community levels of analysis. Very little attention will be given to the issues of mitigation and recovery. (These topics, and others, such as risk perception, will be addressed in other courses in the hazard emphasis area.) Our approach will be conceptual, in that we will address various theoretical and conceptual issues inherent in human preparedness and response to disasters. It will also be embedded within the research literature.

As such, we are all pilgrims on a journey that is rather new. This course has been offered previously at Texas A&M University, but it has never been presented at any other university in the United States. Therefore, flexibility and adaptability on the part of the student will be valuable traits. BE READY TO ADJUST.

The course will be organized around the following major topics:

I. Disaster Research and Conceptual Issues
II. Mitigation and Emergency Planning
III. Immediate Pre-Impact Activities
IV. Immediate Post-Impact Activities
V. Later Recovery and Reconstruction Issues

TOPIC I: DISASTER RESEARCH AND CONCEPTUAL ISSUES (about 2 weeks)

Aufderheide:	chapter 1 and pp. 49-54
Drabek:	pp. 1-20 and 406-423
Miller:	Individuals in Disaster (Chapter 9)*
Wenger:	Community Response to Disasters*

We will begin our quest with a brief overview of the history of disaster research in the United States and throughout the world. We will examine the concept of disaster by looking at various definitions of the term. For example, we will consider such distinctions as natural versus technological disasters; catastrophes versus disasters, versus emergencies, and various stress models. Finally, the characteristics of disaster agents will be examined.

TOPIC II: MITIGATION AND EMERGENCY PLANNING (about 3 weeks)

Aufderheide:	chapters 2 and 3
Drabek:	pp. 21-70 and 348-404

Brief attention will be given to the problems of stimulating adoption of mitigation and preparedness measures within communities. The concept of Crises Management Capabilities and Disaster Subcultures will be examined. Various established principles of effective disaster planning will be studied. Finally, the course will focus upon the issue of the organization and structure of emergency planning within local emergency management agencies.

TOPIC III: IMMEDIATE PRE-IMPACT ACTIVITIES (about 4 weeks)

Aufderheide:	chapters 5 and 9 and pp. 54-63
Drabek:	pp. 70-129
Miller:	Organizations, Communities and Societies in Disaster (chap. 10)*

A variety of immediate pre-impact activities and issues will be considered. Warning systems and human response to warnings will be studied. The findings of research on evacuation and panic will be examined. The critical issue of role conflict of emergency personnel will be empirically investigated. Finally, the ecology of the disaster area will be described.

TOPIC IV: IMMEDIATE POST-IMPACT ACTIVITIES (about 4 weeks)

Aufderheide: chapters 6 and 7
Drabek: pp. 132-198

The immediate post-impact behavior of individuals and organizations will be given extensive treatment. Disaster myths at the individual level will be discussed. Subsequently, a four-fold typology of organizational response to disaster will be presented. The specific problems inherent in search and rescue, emergency medical provisions, the integration of volunteers, and the handling of casualties will be catalogued. Media coverage of disasters will be considered. Finally, the effectiveness of the Incident Command System will be assessed.

TOPIC V: LATER RECOVERY AND RECONSTRUCTION ISSUES (one week)

Aufderheide: chapters 9 and 10
Drabek: pp. 200-250 and 250-316

The course will end with a brief discussion of external involvement in disasters. A model that examines local recovery from disasters in light of vertical and horizontal ties will be presented. Finally, the implications of disasters for producing social change and mitigation will be considered.

*Material will be provided by the instructor in class at a nominal fee.

Course Requirements

Mid-term Examination	100 points
Course Paper	100 points
Final Examination	100 points

Both examinations will be of a take-home essay format. The mid-term examination will come after Topic III. The Final Examination will be due during final examination week, but it will not be cumulative. The nature of the paper will be discussed in class during the first two weeks.

Plan 689-604
Analyzing Risk/Hazard & Public Policy
Spring 1994

Dr. G. Rogers
Office: 104c Langford (C)
Phone: 845-7284
Office Hours: By Appointment

Required Readings:

Glickman, Theodore S., and Michael Gough (Eds.), 1990, *Readings in Risk*, Resources for the Future, Washington D.C. (ISBN 0-915707-55-1)

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

Articles on Reserve (By topic)

Optional Books (worth reading):
Beck, Ulrich, 1992, *Risk Society: Towards a New Modernity*, Sage Publications London.

Rowe, William D, 1988, *An anatomy of risk*, New York, NY: John Wiley and Sons.

Lowrance, William W., 1976, *Of Acceptable Risk: Science and the Determination of Safety*, Los Altos, CA: William Kaufmann.

National Academy of Engineering, 1988, *Hazards: Technology and Fairness*, National Academy Press, Washington, D.C. (ISBN 0-309-03644-5)

Lawless, Edward W., 1977, *Technology and Social Shock*, New Brunswick, NJ: Rutgers University Press.

Wildavsky, Aaron, 1988, *Searching for Safety*, Transaction Publishers, New Brunswick. (ISBN 0-912051-18-3 (pbk.))

Course Description—This course focuses on the public policy and planning aspects of risk. Starting with the evaluation and development of risk analysis, including risk assessment, perception of risk, risk communication, as well as risk management. This course also examines the mitigation of risk, involving technology, emergency management, disaster preparedness and response associated with all hazards. This course emphasizes the relationship with and use of risk analysis in establishing public policy, public participation, emergency preparedness, hazard mitigation, and the management of risk.

Course Requirements:

In-class Midterm Exam	30%
Final Exam	30%
Term Paper	25%
Class Participation/Book Report	15%
Course Grade	100%

The term paper will be due the 12th week of class. However, prior to the completion of the paper an abstract/outline will be reviewed with the instructor on or before 4th week, and a bibliography and review of relevant literature will be provided and reviewed by 8th week of class. The term papers are to be "of article length and quality" and in a format appropriate for submission to a professional journal. The expected nature of the paper will be discussed in class.

Literature reports will be presented to class during the discussion of the related topics. These reviews will (a) communicate the essence of the article/book/report, (b) identify key arguments, strengths and weaknesses, if any, and (c) identify the key contributions of the book to hazard and risk management literature. In addition to the class presentation a 3-5 page written review will be handed in and shared with the class.

Schedule of Classes

1. Risk Definitions—What is risk?
   Fischhoff, B. Et al, "Defining Risk," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Morgan, G., "Probing the Question of Technology-Induced Risk," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Starr, C. "Social Benefit Versus Technological Risk," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   W. Rowe *Anatomy of Risk*, Wiley, New York, 1977 & Krieger, Malabar FL, 1988.

2. Risk Assessment—How risky is it?
   Ames, B., et al, Ranking Possible Carcinogenic Hazards," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Kates, R.W. *Risk Assessment of Environmental Hazard*, Wiley, New York, 1978.
   Keeney, R. et al, "Assessing the Risk of and LNG Terminal," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Rasmussen, N., "The Application of Probabilistic Risk Assessment Techniques to Energy Technologies," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Whyte, Anne V. and Ian Burton, *Environmental Risk Assessment*, Wiley, New York, 1980.
   Wilson, R., "Analyzing the Daily Risks of Life," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.

3. Cost-Benefit Analysis—How do we weigh the costs and benefits?
   Bentkover, J.D., V.T. Covello and J. Mumpower (eds) *Benefits Assessment: The State of the Art*, D. Reidel Publishing, Boston, Mass., 1986.
   Kelman, S., "Cost-Benefit Analysis: An Ethical Critique," in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.

4. Acceptable Risk—How Safe is Safe enough?
   Derby, S. and R. Keeney, "Risk Analysis: Understanding 'How safe is Safe enough?'," *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Fischhoff, B., et al, *Acceptable Risk*, Cambridge University Press, New York, 1981.
   Lowrance, W., *Of Acceptable Risk*, William Kaufmann, Inc. Los Altos CA, 1976.

5. Risk Perception: Cognitive Psychology Approach—How do people think about risk?
   Fischhoff, B. "Value Elicitation: Is there anything in there?" *American Psychologist* V. 46, p. 835-847, 1991.
   Furby, L. et al, "Public perception of electric power transmission lines," *J. of Environmental Psychology*, V. 8, p 19-43, 1988.
   Slovic, P, et al, "Rating the Risks," Environment, V. 21, p. 14-48, 1979; also in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
   Slovic, P, "Perceptions of Risk: Reflections an the Psychometric Paradigm," in Goulding and Krimsky, *Theories of Risk*, 1992.
   Slovic, P. et al, "The Psychometric Study of Risk Perception," in V. Covello, J. Menkes, and J. Mumpower, Plenum, *Risk Evaluation and Management*, New York, 1986.

6. Risk Perception: Social Structural Approach—How does who you are influence what you think about risk?
   Rogers, G.O., Theoretical Development

7. Social Structural Approach—How do experience and values effect perceived and acceptable risk?
   Rogers, G. "Residential Proximity, Perceived and Acceptable Risk", in R. Waller and V. Covello, (eds), *Low-probability/High-Consequence Risk Analysis*, Plenum Press, New York, 1984.
   Rogers, G. Life Events, Experience and Perceived Risk
   Rogers, G. "On Determining Public Acceptability of Risk," in Risk Analysis in the Private Sector, C. Whipple and V. Covello (eds.), Plenum, New York, 1985.

8. Public Perception of Risk—What do survey results tell us about risk and public policy?
   DeLuca, D.R., et al, "Public Perceptions of Technological Risks," in V. Covello, J. Menkes, and J. Mumpower, Plenum, *Risk Evaluation and Management*, New York, 1986.
   Earle, T. and M. Lindell, "Public Perception of Industrial Risks," in R. Waller and V. Covello, (eds), *Low-probability/High-Consequence Risk Analysis*, Plenum Press, New York, 1984.
   Gould et al, *Perception of Technological Risks and Benefits*, Russell Sage Foundation, New York, 1988.
   Harris, L. *Risk in a Complex Society*.
   Loewenstein, G. and J. Mather, "Dynamic Process in Risk Perception," *J. of Risk and Uncertainty*, V. 3 p. 155-175, 1990.
   Nehnevajsa, J., "Low-probability/High-Consequence Risks: issues in Credibility and acceptance," in R. Waller and V. Covello, (eds), *Low-probability/High-Consequence Risk Analysis*, Plenum Press, New York, 1984.

Rogers, G.O., Conditions of Acceptability.

9. Judgmental Heuristics—What are the biases that effect what people think about risk? Can they be avoided?
   Kahneman, D. and A. Tversky, "Choices, Values, and Frames," *American Psychologist*, V. 39, p341-350, 1984.
   Kahneman, D. and A. Tversky, "Prospect theory: an analysis of decision under risk," *Econometrica*, Vol. 47, No. 2, p. 263-291, March 1979.
   Kahneman, D. and A. Tversky, "Subjective Probability: A judgment of Representativness," *Cognitive Psychology*, V. 3, 430-451, 1972.
   Tversky, A. and D. Kahneman, "Availability: a heuristic for judging frequency and probability," *Cognitive Psychology*, V. 5, p. 207-232, 1973.
   Tversky, A. and D. Kahneman, "The Framing of decisions and Psychology of Choice," *Science*, V. 211, p. 453-211, 1981.
   Tversky, A. and D. Kahneman, "Judgment under Uncertainty: Heuristics and Biases", *Science*, V. 185, p. 1124-1131, 1974.
   Tversky, A., Elimination by Aspects," *Psychological Review*, V. 79, p. 281-299.

10. Risk and culture—How does culture effect risk perception, management and policy?
    Douglas, M. and A. Wildavsky, *Risk and Culture*, University of California Press, Berkeley, CA, 1982.
    Rayner, S. and R. Cantor, "How Fair is Safe Enough? The Cultural Approach to Societal Technology Choice, "*Risk Analysis*, V.7, p. 3-9, 1987.

11. Risk Communication—How can we communicate more effectively about risk? What does it mean to communicate more effectively?
    Covello, V. and F. Allen, *Seven Cardinal Rules of Risk Communication*, U. S. Environmental Protection Agency, Washington, D. C. 1988.
    Johnson, F. R., et al, "Informed Choice or Regulated Risk" in *Readings in Risk*, T. Glickman and M. Gough (eds), Resources for the Future, RFF, Washington D.C., 1990.
    Kasperson, R. E., et al, "The Social Amplification of risk" Risk Analysis, V. 8, p.177-187, 1988.
    Krimsky, S. and A. Plough, *Environmental Hazards: Communication Risk as a Social Process*, Auburn House Publishing Co., Dover, Mass., 1988.
    Mileti, D. and C. Fitzpatrick, "The Causal Sequence of Risk communication in the Parkfield Earthquake Prediction Experiment," Risk Analysis, V. 12, p. 393-400, 1992.
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