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**Community Emergency Response to Nuclear Power Plant
Accidents: A Selected and Partially Annotated Bibliography**

Gregory Youngen

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Table of Contents

Introduction.....	1
Emergency Planning and Response.....	2
Medical Aspects of Radiation Accidents	14
Evacuation of Populations	19
Impacts on Food and Agriculture.....	23
Monitoring Radiation Releases.....	24
Social and Psychological Impacts on Affected Populations.....	28
Intergovernmental Relations and Communication.....	30
Nuclear Power Risks and Liability.....	32
Chernobyl and Three Mile Island Accident Studies.....	36

Introduction

The role of responding to emergencies at nuclear power plants is often considered the responsibility of the personnel onsite. This is true for most, if not all, of the incidents that may happen during the course of the plant's operating lifetime. There is however, the possibility of a major accident occurring at anytime. Major nuclear accidents at Chernobyl and Three Mile Island have taught their respective countries and communities a significant lesson in local emergency preparedness and response. Through these accidents, the rest of the world can also learn a great deal about planning, preparing and responding to the emergencies unique to nuclear power.

This bibliography contains books, journal articles, conference papers and government reports on emergency response to nuclear power plant accidents. It does not contain citations for "onsite" response or planning, nor does it cover the areas of radiation releases from transportation accidents. The compiler has attempted to bring together a sampling of the world's collective written experience on dealing with nuclear reactor accidents on the state, local and community levels. Since the accidents at Three Mile Island and Chernobyl, that written experience has grown enormously.

The United States Nuclear Regulatory Commission, along with the Federal Emergency Management Agency, has issued guidelines requiring state and local governments in the vicinity of nuclear power plants to develop emergency preparedness and response plans to be followed in case of accidental radiation releases. It is hoped that this bibliography will assist those planning officials, as well as other government and law enforcement officials, in developing plans for this unlikely, yet potentially catastrophic, event.

Many of the citations in this bibliography are government reports and are available from the National Technical Information Service in Springfield, Virginia. Other international documents may be obtained from the sources listed in the appendix.

Chapter 1

Emergency Planning and Response

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Aldrich, David C., and David M. Ericson. *Public protection strategies in the event of a nuclear reactor accident: Multicompartment ventilation model for shelters*. FEMA TD-14. Washington, D.C.: Federal Emergency Management Agency, 1981.

Antonelli, A., and L. Frittelli. "General principles for planning countermeasures following a major accidental environmental contamination by radioactive or toxic material." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 445-447. Vienna: IAEA, 1986.

Results of a case study on the optimization of remedial measures for population and environmental protection following a major release of radioactive material.

Bazza, A., et al. "Radiological emergencies arising from accidents in Italy." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium, Rome, Italy, 4-8 Nov. 1986*, 501-506. Vienna: IAEA, 1986.

Describes the functions of the Nuclear Safety and Health Protection Directorate in Italy.

Bengtsson, Gunnar. "Application of intervention levels in Sweden after Chernobyl." In *Radiation Protection Practice, 7th International Congress of the International Radiation Protection Association (IRPA-7)*, 968-971. New York: Pergamon, 1988.

Includes a table of countermeasures, the factors entering into the decision, implementation and results.

Benzenberg, G. E. "Fire protection: Adopting a coordinated approach." *Nuclear Engineering International* 31 (Apr. 1986): 30-32.

Bindon, F. J. L. "Fire fighting at Chernobyl and fire protection at UK nuclear power stations." *Nuclear Engineer* 28, no. 1 (Jan./Feb. 1987): 21-23.

Overview of fire fighting techniques used at Chernobyl and problems associated with the radiation hazards. British fire protection at nuclear power plants, including community involvement of police, fire and ambulance services are discussed.

British Nuclear Fuels, Ltd. *Sellafield site (including Drigg) emergency scheme manual*. Sellafield, UK: 1987.

Available from NTIS: DE88-753609.

Burke, Richard P., and Carolyn D. Heising. *In-plant considerations for optimal offsite response to reactor accidents*. NUREG/CR-2825. Albuquerque, N.M.: Sandia National Laboratory, 1982.

Buzzelli, G. "Nuclear emergency planning comes of age." *Power* 130 (Mar. 1986): 35-38.

Cencetti, S., G. Melandri, and L. Paterlini. "Information for the population living near the nuclear power plant of Caorso." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 543-545. Vienna: IAEA, 1986.

Description of the emergency warning signals given to the local population in the event of a nuclear accident.

Clarke, R. H. "Principles for the establishment of intervention levels for the protection of the public in the event of serious nuclear accidents." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 373-384. Vienna: IAEA, 1986.

Cooley, Michael J., and Karen K. Thompson. "Emergency preparedness training for local communities." In *ANS Topical Meeting on Radiological Accidents—Perspectives and Emergency Planning, Sept. 15-17, 1986, Bethesda, Md.*, 363-365. Oak Ridge, Tenn.: Oak Ridge National Laboratory, 1987.

Description of Detroit Edison and Monroe County (Mich.) training program for local emergency workers. Videos, slide/tape shows and narrated slide presentations were produced to address the worker-specific training needs of county emergency workers. Available from NTIS: DE87-007690.

Cutter, Susan L. "Airborne toxic releases: Are communities prepared?" *Environment* 29, no. 10 (July/Aug. 1987): 12.

Includes related articles on emergency planning and response to disasters.

DeVito, D. A., et al. "Emergency management and the nuclear terrorism threat." In *Preventing Nuclear Terrorism: The Report and Papers of the International Task Force on Prevention of Nuclear Terrorism*, 416-432. Lexington, Mass.: Lexington Books, 1987.

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Egavov, Y. A. "Criteria for making urgent decisions on measures to protect population in case of accidents at nuclear power plants," Radiation Safety and Protection of Nuclear Power Plants Collection of articles. Moscow. *Enersoatomizdat* no. 9, 1985.

Fetter, Steven A., and Kasta Tsipis. "Catastrophic releases of radioactivity." *Scientific American* (Apr. 1981): 41-47.

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- Good, D. E. "Hanford fire department hazardous material response program." In *Fire Protection Conference, 25 Aug. 1987, Chicago*. Springfield, Va.: NTIS, 1987.

Available from NTIS: DE88-009192.

- Hamard, J., et al. "Basic principles for emergency preparedness." In *Proceedings, Radiological Protection Advances in Theory and Practice, Third International Symposium, Society of Radiological Protection, Inverness, Scotland, 6-11 June 1982*, 221-226. Harwell: National Radiological Protection Board, 1982.
- Henderson, O. K. "Emergency preparedness and response in the Commonwealth of Pennsylvania—the Three Mile Island incident." In *Planning for Rare Events: Nuclear Accident Preparedness and Management, Proceedings of an International Workshop, Jan. 1980*, 63-69. New York: Pergamon, 1981.

A review of the sequence of events at TMI, along with the emergency response mechanisms and legal basis in effect at the time of the accident. Also lists some of the lessons learned from the experience.

- _____. "Radiological emergency response planning in Pennsylvania." In *Current Nuclear Power Plant Safety Issues, Proceedings of an International Conference Organized by the IAEA and Held in Stockholm, Sweden, 20-24 October 1980*, 333-341. Vienna: IAEA, 1981.

The importance of flexibility in emergency plans is addressed. As a result of the TMI accident, there has been an increase in the awareness of the importance of emergency plans.

The standardization of procedures, and emphasizing and identifying the need for assigning responsibilities is also discussed.

Hildebrand, M. *Disaster planning guidelines for fire chiefs*. Washington, D.C.: International Association of Fire Chiefs, 1980.

Hill, M. D., and M. J. Crick. "Derived emergency reference levels for the introduction of countermeasures in the early and intermediate phases of accidental releases to the atmosphere." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 421-434. Vienna: IAEA, 1986.

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Jamgochian, M. T. "Regulatory aspects of emergency planning." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 523-527. Vienna: IAEA, 1986.

An overview of the advances made in the U.S. regarding emergency planning and look ahead at regulatory issues of the future.

Jankowski, M. W., D. A. Powers, and T. S. Kress. "Onsite response to the accident at Chernobyl." *Nuclear Safety* 28, no. 1 (Jan.-Mar. 1987): 36-42.

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A computerized system consisting of base geographic information upon which analytical models are superimposed. It currently supports FEMA's work in off-site preparedness around nuclear power facilities, and is being developed to deal with a full range of hazards where emergency evacuation or population movement is required. Available from NITS: DE87-007690.

Jensen, M., and J. C. Lindhe. *Activities of the Swedish authorities following the fallout from the Soviet Chernobyl reactor accident*. Stockholm: National Institute of Radiation Protection, 1986.

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Kelly, G. N. "The Importance of the urban environment for accidental consequences." *Radiation Protection Dosimetry* 21, no. 1/3 (1987): 13-20.

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Koch, J., and J. Tadmor. "Model of population protection as applied to an urban area for a hypothetical nuclear power plant accident." In *Israel Health Physics Society Annual Meeting, 1987, Program and Abstracts of Lectures*. Tel Aviv: Israel Health Physics Society, 1987.

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Martin, J. A., Jr. "Objectives of emergency response and potential benefits of evacuation and shelter." In *Proceedings of the Mid-Year Topical Symposium of the Health Physics Society 6-10 January, 1985, Colorado Springs, Colo.* Health Physics Society, 1985.

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Miller, Kenneth L., and William Weidner, eds. *CRC handbook of management of radiation protection programs*. Boca Raton, Fla.: CRC Press, 1986.

This volume of the series, *CRC Handbook of Radiation Measurement and Protection* emphasizes various aspects of radiation safety from regulatory and management viewpoints. Chapters written from past experience such as litigations and TMI cover emergency planning and management in radiation accidents.

Morentz, James W. "Computer-assisted emergency preparedness and response." In *ANS Topical Meeting on Radiological Accidents Perspectives and Emergency Planning, Sept. 15-17, 1986, Bethesda, Md.* Oak Ridge, Tenn.: Oak Ridge National Laboratory, 1987.

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Natarajan, A., et al. "A Simulator for training emergency response personnel." In *Emergency Planning and Preparedness for Nuclear Facilities: Proceedings of an International Symposium, Rome, Italy, 4-8 Nov. 1986*, 315-322. Vienna: IAEA, 1986.

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National Emergency Training Center. *Nuclear plant incident: Kit*. EMTC Case Study no. 1. Emmitsburg, Md.: NETC, 1984.

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Newsom, D. E. "On-line modeling tutorials for emergency managers." In *Summer Computer Simulation Conference, Seattle Wash., July 25, 1988*.

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Raufer, R., and R. Fiessner. "Off-site emergency planning exercises in Illinois." *Nuclear Engineering International* 29 (Feb. 1984): 39-43.

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Sanders, M. E. "Spin-offs from radiological emergency preparedness programs to generic emergency management." In *Emergency Planning and Preparedness for Nuclear Facilities, Proceedings of an International Symposium in Rome, Italy, 4-8 Nov. 1986*, 529-537. Vienna: IAEA, 1986.

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Shleien, B. *Preparedness and response in radiation accidents*. Health and Human Services Publication FDA 83-8211. Rockville, Md.: U.S. Department of Health and Human Services, 1983.

Snihs, Jan O., and B. Ake Persson. "Emergency preparedness in Sweden after nuclear safety improvements and the Chernobyl accident." In *Radiation Protection Practice, 7th International Congress of the International Radiation Protection Association (IRPA-7)*, 976-979. New York: Pergamon, 1988.

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Stephan, J. G., et al. "Emergency planning lessons learned from a review of past radiological accidents." In *Radiation Protection Practice, 7th International Congress of the International Radiation Protection Association (IRPA-7)*, 980-983. New York: Pergamon, 1988.

A study of the causes of nuclear accidents, from the 1950s to the present, indicate that most are human error-related.

Strachan, S. J., et al. "A Real-time assessment system for reactor accidents." *Nuclear Engineering International* 29 (July 1984): 27-30.

Suzuki-Yasumoto, M. "National nuclear emergency planning in Japan." In *Proceedings, IAEA Seminar on Radiation Emergency Preparedness (Health Physics and Medical Aspects) Kalpakkam, India 30 Nov.-11 Dec. 1981*. Report RCC-55. Kalpakkam: Reactor Research Centre, 1982.

Terrien, Ernest J. *Hazardous materials and natural disaster emergencies: Incident action guidebook, standard operating procedures for response and after action report*. Lancaster, Pa.: Technomic, 1984.

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Thomas, K., and B. F. M. Bosnjakovic. "Nuclear accident response and population protection in the Netherlands: Philosophy, solutions and problems." In *Planning for Rare Events: Nuclear Accident Preparedness and Management, Proceedings of an International Workshop, Jan. 1980*, 135-146. New York: Pergamon, 1980.

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_____. *Emergency reference levels: Criteria for limiting doses to the public in the event of accidental exposure to radiation*. NRPB ERL-2. Harwell: The Board, 1981.

_____. *NAIR: Handbook on the national arrangements for incidents involving radioactivity*. Rev. ed. Chilton: The Board, 1987.

Provides an overview of administrative and operational aspects of emergency response. Includes an index of police forces, hospitals and other establishments prepared to handle contaminated casualties under NAIR. Appendices on radiological protection, instruments, and disposal of radioactive materials are also provided. Available from NTIS: DE88-752752.

U.S. Code of Federal Regulations. "Emergency planning and preparedness for production and utilization facilities." 10_CFR 50.47 and Appendix E. Washington, D.C.: GPO, updated yearly.

U.S. Department of Defense. Defense Civil Preparedness Agency. "What the planner needs to know about fallout." In Chapter 6 of *DCPA Attack Environment Manual*. Washington, D.C.: GPO, 1973.

U.S. Department of Energy. *DOE Nuclear Reactor and Facility Safety Conference, Rockville, Md., 27 Feb. 1 Mar., 1984*. Oak Ridge, Tenn.: DOE Office of Scientific and Technical Information, 1984.

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U.S. Environmental Protection Agency. *Manual of protective action guides and protective actions for nuclear incidents*. EPA520/1-75-001. Washington, D.C.: The Agency, 1975, rev. 1980.

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U.S. General Accounting Office. *Areas around nuclear facilities should be better prepared for radiological emergencies*. Gaithersburg, Md.: The Office, 1979.

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This report provides information concerning the actions that utilities and FEMA take to notify emergency planning zone residents of the procedures to be followed if a nuclear accident occurs.

U.S. Nuclear Regulatory Commission. *Clarification of TMI action plan requirements: Requirements for emergency response capability*. NUREG-0737 supp. 1, no. 1. Washington, D.C.: The Commission, 1983.

_____. "Emergency planning and preparedness for nuclear power reactors." In *U.S. Nuclear Regulatory Commission Regulatory Guide 1.101*. Washington, D.C.: The Commission, 1977 (Rev.1, 1977; rev.2, 1981.)

_____. *Examination of offsite radiological emergency protective measures for nuclear reactor accidents involving core melt*. NUREG/CR-1131. Washington, D.C.: The Commission, 1979.

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In order to protect public health, safety and environmental quality, the NRC developed these guidelines to assign responsibility for responding to any potentially threatening incident involving NRC licensed nuclear power plants.

_____. *Pilot program: NRC severe reactor accident incident response training manual*. 5 vols. NUREG 1210. Oak Ridge, Tenn: Oak Ridge National Laboratory, 1987.

Vol. 1 "Overview and summary of major points."

Vol. 2 "Severe reactor accident overview."

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U.S.S.R. Ministry of Health. *Analysis of the radiological consequences of the accident at Chernobyl Nuclear Power Plant for the population of the European region of the USSR*. WHO Information Document A40/INF.DOC.9, May 1987. Moscow: The Ministry, 1987.

The official Soviet report on what happened at Chernobyl.

U.S.S.R. State Committee on the Utilization of Atomic Energy, comp. *The Accident at the Chernobyl Nuclear Power Plant and its consequences*. Report presented at the International Atomic Energy Agency Experts' meeting, Vienna, Aug. 25-29, 1986. Vienna: IAEA, 1986.

Varley, James. "Report from Chernobyl." *Nuclear Engineering International* 33, no. 404 (Mar. 1988): 18-22.

Description of the recovery operations and the mobilization of natural resources used to overcome the logistical and technical problems in Chernobyl's aftermath.

Volchok, Herbert L., and Nancy Chieco, eds. *A Compendium of the Environmental Measurement Laboratory's research projects related to the Chernobyl nuclear accident*. EML-460. New York: U.S. Department of Energy, Environmental Research Laboratory, 1986.

Wilson, Richard. "A Visit to Chernobyl." *Science* 236, no. 5 (June 26, 1986): 16-35.

Describes how the Soviets are coping in the aftermath of the Chernobyl disaster.

Appendix

A list of sources for obtaining publications from government agencies and other sources.

- HMSO - Her Majesty's Stationery Office
Publications Centre, Agency Section
51 Nine Elms Lane
London, SW8 5DR
- IAEA - International Atomic Energy Agency
Order from: UNIPUB, 4611-F Assembly Drive,
Lanham, MD 20706-4399
- NTIS - National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
- OECD - Organization for Economic Cooperation & Development
Nuclear Energy Agency
38 Boulevard Suchet, F-75016
Paris, France
- GPO - U.S. Government Printing Office
Superintendent of Documents
Washington, DC 20402
- WHO - World Health Organization
Order from: UNIPUB, 4611-F Assembly Drive
Lanham, MD 20706-4391

1987-1988

- No. 206 *URBAN DEVELOPMENT GUIDANCE SYSTEMS: CONCEPTS, TOOLS, TECHNIQUES; AN ANNOTATED BIBLIOGRAPHY*, by Valerie Capels. December 1987. \$12.00.
- No. 207 *AN ANNOTATED BIBLIOGRAPHY AND INDEX COVERING CPL BIBLIOGRAPHIES 1-207, JANUARY 1979-DECEMBER 1987*, compiled by Patricia Coatsworth, Mary Ravenhall, and James Hecimovich. December 1987. \$20.00.
- No. 208 *LAND INFORMATION SYSTEMS AND LAND USE PLANNING: AN ANNOTATED BIBLIOGRAPHY OF SOCIAL, POLITICAL AND INSTITUTIONAL ISSUES*, by Harvey M. Jacobs with research assistance from David S. Kough, and Scott L. Cassingham. January 1988. \$12.00.
- No. 209 *THE IMPACT OF POLITICAL AGENDAS ON THE DELIVERY OF HEALTH CARE: A SELECTED AND ANNOTATED BIBLIOGRAPHY*, by Gerald J. Perry. January 1988. \$12.00.
- No. 210 *IMPACT FEES: A BIBLIOGRAPHY*, by Robert Baldwin. January 1988. \$10.00.
- No. 211 *THE APPLICATION OF COMPUTERS TO LANDSCAPE ARCHITECTURE: A SELECT BIBLIOGRAPHY*, by Michael R. Hodges. February 1988. \$10.00.
- No. 212 *CITIZEN PARTICIPATION IN PLANNING: A BIBLIOGRAPHY*, by Fred Frankena and Joann Koelln Frankena. March 1988. \$12.00.
- No. 213 *ENVIRONMENTAL ETHICS: A SELECTED BIBLIOGRAPHY FOR THE ENVIRONMENTAL PROFESSIONAL*, by Deborah A. Simmons. March 1988. \$10.00.
- No. 214 *ENVIRONMENTAL CONSCIOUSNESS—NATIVE AMERICAN WORLDVIEWS AND SUSTAINABLE NATURAL RESOURCE MANAGEMENT: AN ANNOTATED BIBLIOGRAPHY*, by Annie L. Booth and Harvey M. Jacobs. April 1988. \$16.00.
- No. 215 *GROUNDWATER QUALITY: TRENDS TOWARD REGIONAL MANAGEMENT; A REVIEW OF THE LITERATURE*, by Catherine H. Powell. April 1988. \$10.00.
- No. 216 *LAND VALUE TAXATION AND URBAN LAND USE PLANNING: AN ANNOTATED BIBLIOGRAPHY*, by Susan L. Roakes and Harvey M. Jacobs. May 1988. \$12.00.
- No. 217 *THE U.S. AGRICULTURAL POLICY DEBATE: AN ANNOTATED BIBLIOGRAPHY*, by Jim Schwab. May 1988. \$12.00.
- No. 218 *URBAN DESIGN AND CRIME: A PARTIALLY ANNOTATED BIBLIOGRAPHY*, by Cortus T. Kochler. June 1988. \$12.00.
- No. 219 *BIRDS AND POWER LINES: A BIBLIOGRAPHY*, by George A. Goult. June 1988. \$10.00.
- No. 220 *RESOURCE RECOVERY: A PARTIALLY ANNOTATED BIBLIOGRAPHY*, by Elaine Gray. July 1988. \$12.00.
- No. 221 *INTERDISCIPLINARY RESEARCH: AN ANNOTATED BIBLIOGRAPHY*, by Annie L. Booth. July 1988. \$12.00.
- No. 222 *HOUSING ACTIVITY IN DEVELOPING COUNTRIES: A REPRESENTATIVE BIBLIOGRAPHY ON EMERGING TRENDS*, by Charles A. Setchell. August 1988. \$10.00.
- No. 223 *ACID RAIN: INDUSTRIAL POLLUTION*, by Elaine Gray. August 1988. \$12.00.
- No. 224 *OZONE IN THE TROPOSPHERE AND THE STRATOSPHERE: A PARTIALLY ANNOTATED BIBLIOGRAPHY*, by Dennis A. Jenks. September 1988. \$12.00.
- No. 225 *RESIDENTIAL RELOCATION: THE INDIVIDUAL PROCESS OF CHANGING DWELLINGS*, by Peter R. Walker. September 1988. \$12.00.

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