

**U.S. Department of Energy**  
Washington, D.C.

**ORDER**

**DOE O 225.1A**

Approved: 11-26-97

**SUBJECT: ACCIDENT INVESTIGATIONS**

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1. OBJECTIVE. To prescribe requirements for conducting investigations of certain accidents occurring at Department of Energy (DOE) operations and sites; to prevent the recurrence of such accidents; and to contribute to improved environmental protection and safety and health of DOE employees, contractors, and the public.
2. CANCELLATION.
  - a. DOE 225.1, ACCIDENT INVESTIGATIONS, of 9-25-95.
  - b. DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 10-17-90, Paragraphs 1 through 5, 6a (1) through (10), 6b, 6d, 6f (1) through (8) and the second misnumbered 6f, and Chapters I and II.
  - c. Cancellation of the above Orders and paragraphs does not, by itself, modify or otherwise affect any contractual obligation to comply with such an Order. Canceled Orders which are incorporated by reference in a contract shall remain in effect until the contract is modified to delete the reference to the requirements in the canceled Orders.
3. APPLICABILITY.
  - a. DOE Elements. Except for the exclusions in Paragraph 3c, below, this Order applies to all DOE elements.
  - b. Contractors.
    - (1) Except for exclusions in Paragraph 3c, below, the Contractor Requirements Document, Attachment 1, sets forth the requirements to be applied to all contractors awarded contracts for the operation, management, maintenance, construction, demolition, or remediation of a DOE-owned or DOE-leased facility.
    - (2) Contract compliance with the Contractor Requirements Document will be required to the extent set forth in the contract. Contractors shall continue to comply with the requirements of the paragraphs of the Order identified in Paragraph 2, above, that are canceled by this Order until their contracts are modified to delete the reference to the requirement of those canceled Order paragraphs.

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**DISTRIBUTION:**  
All Departmental Elements

**INITIATED BY:**  
Office of Environment, Safety  
and Health

- (2) Contract compliance with the Contractor Requirements Document will be required to the extent set forth in the contract. Contractors shall continue to comply with the requirements of the paragraphs of the Order identified in Paragraph 2, above, that are canceled by this Order until their contracts are modified to delete the reference to the requirement of those canceled Order paragraphs.
- c. Exclusions. Activities conducted under the authority of the Director, Naval Nuclear Propulsion Program, as described in Public Law 98-525.

#### 4. REQUIREMENTS.

- a. Categorization. DOE field elements shall categorize the type of investigation in accordance with the algorithm in Attachment 2, to determine if a Type A or Type B investigation is required. Categorization of all Type A and Type B accident investigations shall be reported in a timely manner to the Office of the Deputy Assistant Secretary for Oversight (EH-2). Categorization shall be made expeditiously, taking into account that timeliness is crucial to conducting an accurate investigation, preserving the accident scene and evidence, and identifying causal factors. (See Attachment 3 for definitions.)
- b. Notification of Other Agencies. Public law or regulation assigns other agencies responsibility for investigating certain types of accidents that could occur at DOE facilities or as a result of DOE activities. In some cases, DOE may have a memorandum of understanding with another agency to this effect. The Appointing Official shall determine whether applicable memoranda of understanding have been executed through Headquarters or field elements. The Appointing Official shall notify local agencies with which the Department has memoranda of understanding or which have responsibilities or interests related to the accident under investigation. Notification of other than local agencies having agreements with Headquarters shall be made through the Office of the Deputy Assistant Secretary for Oversight.
- c. Conducting the Investigation. A Type A investigation is conducted for the more serious accidents and is appointed and managed by the Office of the Assistant Secretary for Environment, Safety and Health; A Type B investigation is appointed and managed at the Field level. However, the elements of the investigation and the report format are the same. Accident investigations categorized as either Type A or Type B shall be conducted as follows:
  - (1) Appoint the Accident Investigation Board.
    - (a) The Appointing Official (see Paragraph 5, Responsibilities) shall formally appoint DOE employees to a DOE Accident Investigation Board within three calendar days of the accident categorization. If the appointment of a Type A

or Type B Accident Investigation Board is delayed beyond three calendar days, the rationale for the delay must be documented and provided to the Assistant Secretary for Environment, Safety and Health (EH-1). The Board shall consist of an Accident Investigation Board Chairperson and three to six members, at least one of whom shall be a DOE Accident Investigator. The Appointing Official or his/her representative shall brief the Board on their roles and responsibilities and other pertinent information within three calendar days of their appointment.

- (b) The Board appointment shall be in writing and shall include the scope of the investigation, individuals being appointed, special provisions of the investigation, and a specified completion date for the final report (nominally 30 calendar days from date of appointment). The scope of the investigation shall include gathering facts, analyzing causes, developing conclusions, and developing judgments of need pertaining to DOE and contractor organizations and management systems that could have or should have prevented the accident. The scope shall include all levels of the organization up to and beyond the level of the Appointing Official.
- (c) The DOE Accident Investigation Board Chairperson shall:
  - 1 Be a DOE senior manager with demonstrated managerial competence, preferably a member of the Senior Executive Service, or at a senior general service grade level determined to be appropriate by the Appointing Official;
  - 2 Be knowledgeable of DOE accident investigation techniques and experienced in conducting accident investigations through participation in at least one Type A or Type B investigation, or have equivalent accident investigation experience, as determined to be appropriate and documented by the Appointing Official; and
  - 3 Have attended an accident investigation course of instruction that is based on current materials developed by the Office of the Deputy Assistant Secretary for Oversight. This requirement is effective October 1, 1998.
- (d) DOE Accident Investigation Board members shall be DOE employees with subject matter expertise in areas related to the accident, including knowledge of the Department's Safety Management System Policy and integrated safety management system. At least one member shall be a DOE Accident Investigator. The Board may be supported by appropriate advisors and consultants as determined by the Accident Investigation Board Chairperson.

Investigative and technical expertise may be requested from the Office of the Deputy Assistant Secretary for Oversight.

- (e) The DOE Accident Investigation Board Chairperson and members shall:
- 1 Report only to the Appointing Official or his/her representative identified in the letter/memorandum of appointment during the investigation;
  - 2 Be independent of the direct line management chain responsible for day-to-day operation or oversight of the facility, area, or activity involved in the accident; and
  - 3 Not include both a supervisor and his or her subordinate.

(2) Investigate the Accident.

- (a) The Board shall be responsible for conducting a thorough investigation of all individuals, organizations, management systems, and facilities having a stake in or potential impact on the accident, as well as the operation or oversight of the facility, area, or activity involved in the accident, including all levels of the organization up to and beyond the level of the Appointing Official.
- (b) The Board shall determine the facts of the accident by examining the accident scene, examining DOE and contractor documentation, interviewing witnesses and other personnel directly associated with the accident, and performing engineering tests and analyses as appropriate. The Board shall also examine policies, standards, and requirements that are applicable to the accident being investigated, as well as management and safety systems at Headquarters and in the field that could have contributed to or prevented the accident.
- (c) The Board shall analyze the facts and identify causal factors and judgments of need. The Board shall assure that all causal factors (including root causes) have been identified, that the conclusions are supported by the facts and analysis, and that the judgments of need are consistent with the facts and conclusions.
- (d) The Board shall evaluate the effectiveness of safety management systems (as defined by DOE P 450.4, SAFETY MANAGEMENT SYSTEM POLICY), the adequacy of policy and policy implementation, and the effectiveness of line management oversight as they relate to the accident.
- (e) Prior to completion of the investigation, the Board shall conduct an internal review of the investigation process to ensure that:

- 1 All of the pertinent facts, standards, and requirements relating to the accident have been identified, a thorough analysis of them has been conducted, and causal factors have been determined; and
- 2 Judgments of need have been stated and can be supported by the facts.

(3) Report Investigation Results.

- (a) The Board shall report investigation results without determining individual fault or proposing punitive measures. The report shall contain judgments of need based upon objective analysis of the facts, root and contributing causes, and DOE or contractor management systems that could have prevented the accident.
- (b) The Board shall offer the facts section of the draft investigation report to the affected DOE and contractor line management to allow a review for factual accuracy prior to completion of the report.
- (c) Prior to completion of the investigation, the Board shall:
  - 1 Conduct a review of the report to ensure its technical accuracy, completeness, and internal consistency;
  - 2 Ensure that the report includes results from an analysis of management control and safety systems that may have contributed to the accident; and
  - 3 Ensure that a review of the report is conducted by qualified and authorized personnel to determine that it does not contain classified or unclassified controlled nuclear information, or information protected by the Privacy Act. Documentation that these reviews have been conducted shall be retained as part of the investigation file.
- (d) The Board Chairperson and Board Members shall sign and date the final investigation report and, if appropriate, include a minority report section should any Board member wish to offer an opinion different from that of the Board.
- (e) The Board shall submit the investigation report to the Appointing Official for acceptance within the time frame established by the Appointing Official. Once the accident investigation report is accepted by the Appointing Official, the report is considered final, and the Board is released from its responsibilities.

- d. Investigation Closeout. The Appointing Official shall close Type A and Type B investigations after ensuring the following:
- (1) DOE and contractor line organizations affected by the investigation have had an opportunity to review the facts section of the draft report for accuracy and provide their comments to the Board.
  - (2) A statement signed and dated by the Appointing Official is included in the final report accepting the investigation report, including the Board's conclusions and judgments of need.
  - (3) The Board Chairperson and the Head of the Field Element have conducted a formal briefing of Headquarters and field line management, as well as the Assistant Secretary for Environment, Safety and Health (for Type A investigations), on the outcome of the investigation.
  - (4) The final report is published and distributed within seven calendar days of report acceptance by the Appointing Official. One copy each shall be provided to the affected Secretarial Officer(s), operations office and/or field element, and appropriate Headquarters program office(s). One copy shall be provided to the Assistant Secretary for Environment, Safety and Health. One copy and an electronic version of the final report shall be provided to the Office of the Deputy Assistant Secretary for Oversight. The final report shall also be distributed to senior managers of organizations identified in the judgments of need with a request for their organizations to submit corrective action plans, nominally within 30 calendar days from report acceptance by the Appointing Official.
  - (5) Lessons learned from the accident investigation are developed and disseminated DOE-wide within 90 calendar days of acceptance of the investigation report by the Appointing Official, except for delegated Type A investigations [see Paragraph 5a(5)(f)].
  - (6) Corrective action plans are completed, and corrective actions are implemented to satisfy the judgments of need identified in the final investigation report.

## 5. RESPONSIBILITIES.

- a. Assistant Secretary for Environment, Safety and Health (EH-1).
- (1) Serves as Appointing Official of Type A Accident Investigation Boards, unless this responsibility is specifically delegated to the Head of a Field Element, subject to conditions specified in the memorandum of delegation and Board appointment.

- (2) Reviews all delegated Type A accident investigation reports before acceptance by the Appointing Official and provides comments to the Appointing Official. This review shall ensure that an objective investigation was conducted and that the report clearly and concisely conveys the results of the investigation, including: (a) the accident description (what happened), (b) the causal factors (why it happened), and (c) the judgments of need (what can be done to prevent a recurrence).
- (3) Grants waivers of the requirement to conduct Type A or Type B accident investigations for accidents that meet the criteria for such investigations in the Categorization Algorithm in Attachment 2 to this Order.
- (4) Charters limited scope investigations for occurrences, incidents, or accidents based on recommendations from the Office of the Deputy Assistant Secretary for Oversight.
- (5) Through the Office of the Deputy Assistant Secretary for Oversight (EH-2):
  - (a) Develops and maintains DOE accident investigation policies, procedures, standards, and guidelines, and oversees their implementation.
  - (b) Recommends to the Assistant Secretary for Environment, Safety and Health whether or not an occurrence, incident, or accident warrants a limited scope, Type B, or Type A accident investigation. This recommendation is based on an assessment of the significance of the occurrence, incident, or accident.
  - (c) Recommends to the Assistant Secretary for Environment, Safety and Health approval or disapproval of requests for waivers of the requirement to conduct Type A and Type B accident investigations.
  - (d) Analyzes accident data to assist in identifying trends and conditions surrounding the initiation or occurrence of accidents.
  - (e) Performs complex-wide analyses of accidents to guide and focus oversight efforts based on analyzed safety impact and Department-wide significance.
  - (f) Develops and disseminates lessons learned from all Type A and limited scope accident investigations.
  - (g) Develops and disseminates information on uniform DOE accident investigation techniques and ensures training is provided to DOE Accident Investigation Board Chairpersons and DOE Accident Investigators.

- (h) Maintains a list of prospective DOE Accident Investigation Board Chairpersons, DOE Accident Investigators, and technical subject matter experts.
  - (i) Provides investigative and technical subject matter expertise to Appointing Officials, Board Chairpersons, and points of contact, as requested.
  - (j) Reviews and provides comments to Appointing Officials on corrective action plans resulting from Type A and Type B investigations.
  - (k) Verifies completion of approved corrective actions and satisfaction of judgments of need.
  - (l) Reviews Type B accident investigation reports and provides comments to the Appointing Official.
- b. Secretarial Officers.
- (1) Cooperate with the Board during the investigation.
  - (2) Review draft Type A and Type B investigation reports for factual accuracy within the time frame allowed for the investigation.
  - (3) Approve corrective action plans resulting from Type A and Type B investigations for satisfaction of judgments of need identified by the Board.
- c. Heads of Field Elements.
- (1) Determine whether adequate protection can most effectively be achieved by continuing to operate under the terms of existing contracts requiring compliance with old Orders or by modifying the contract to incorporate the requirements of revised Orders. Field elements are responsible for determining that implementation of new rule or Order requirements will provide adequate protection prior to requesting contract modifications that delete old Order requirements from contracts.
  - (2) After incorporating this Order into contracts, ensure its implementation and identify a single point of contact to act as liaison with the Office of the Deputy Assistant Secretary for Oversight on matters pertaining to the DOE Accident Investigation Program.



- (3) Categorize the type of accident investigation to be conducted in accordance with Attachment 2. The categorization of all Type A and Type B accident investigations shall be reported in a timely manner to the Office of the Deputy Assistant Secretary for Oversight.
- (4) Serve as Appointing Officials for Type B or delegated Type A Accident Investigation Boards.
- (5) Ensure establishment of accident investigation capability by trained contractor readiness team(s) (see Attachment 1). This includes the responsibility for providing training required to assure readiness to assist in DOE accident investigations.
- (6) Ensure readiness teams and emergency management personnel coordinate or integrate their activities to facilitate an orderly transition of responsibilities for the accident scene.
- (7) Provide cooperation with and assistance to DOE Accident Investigation Boards.
- (8) Ensure that a sufficient number of DOE Accident Board Chairpersons and DOE Accident Investigators are available to implement this Order for both Type A and Type B accident investigations and, upon request, provide them to other DOE sites.
- (9) Review draft Type A and Type B investigation reports for factual accuracy within the time frame allowed for the investigation.
- (10) Develop lessons learned for Type B accident investigations when serving as the Appointing Official.
- (11) Initiate actions to address applicable lessons learned from investigations conducted at other DOE sites.
- (12) Ensure that corrective action plans are:
  - (a) Developed to address judgments of need identified by the Board and submitted to the responsible Secretarial Officer (program office) and to the Office of the Deputy Assistant Secretary for Oversight, nominally within 30 calendar days of report acceptance by the Appointing Official;
  - (b) Submitted to the responsible Secretarial Officer for approval;

- (c) Submitted to the Office of the Deputy Assistant Secretary for Oversight for review;
  - (d) Implemented and tracked to completion.
- (13) Provide biannual (in January and July of each year) status reports of accident investigation corrective actions to the Office of the Deputy Assistant Secretary for Oversight until all corrective actions are completed.
- d. Appointing Officials.
- (1) Formally appoint DOE employees to Type A or Type B Accident Investigation Boards within three calendar days of categorization of the accident. The appointment must be in writing and shall meet the requirements of Paragraphs 4c(1)(a) and (b) of this Order.
  - (2) Ensure that the Board's authority is clear in investigating all potential causes of a given accident, including individuals, organizations, and management systems up to and beyond the level of the Appointing Official.
  - (3) Ensure the Board is briefed on their roles and responsibilities [stressing the Board's authority indicated in Paragraph 5d(2)] and other pertinent information within three calendar days of their appointment.
  - (4) Accept the investigation report by signing and dating a statement to this effect which is subsequently incorporated into the final report. Once accepted, the report is considered final and the Board is released from its responsibilities.
  - (5) Publish and distribute the accident investigation report within 7 calendar days of report acceptance in accordance with the distribution indicated in Paragraph 4d(4).
  - (6) Develop lessons learned for dissemination throughout the Department within 90 calendar days of report acceptance.
- e. Board Chairpersons.
- (1) Manage the investigation process, direct the Board members in their activities, and represent DOE in all matters regarding the accident investigation.
  - (2) Ensure that a thorough and competent investigation is completed.
  - (3) Notify the Director, Office of Enforcement and Investigation (EH-10), of any potential Price-Anderson enforcement concerns identified during the investigation.

- (4) Notify DOE, Federal, state, or local investigative or law enforcement agencies of suspected unlawful activity identified during the accident investigation.
  - (5) Coordinate Board activities with all organizations having an interest in the accident.
  - (6) Ensure that the Board is supported by appropriate advisors and consultants who provide specialized expertise as deemed necessary.
6. WAIVERS. A request for waiver of any responsibility for conducting a Type A or Type B Accident Investigation in accordance with the Accident Investigation Categorization Algorithm (Attachment 2) may be prepared by the Head of a Field Element when it is determined that there would be no substantial lessons learned from conducting the investigation. The request for waiver must contain the rationale for the request and shall be submitted to the Office of the Deputy Assistant Secretary for Oversight. The Office of the Deputy Assistant Secretary for Oversight will review waiver requests and either recommend approval or disapproval of the requests in writing to the Assistant Secretary for Environment, Safety and Health, who will make the final determination in writing. Copies of the request for waiver and the approval or disapproval will be maintained both by the Office of the Deputy Assistant Secretary for Oversight and the Head of the Field Element.
7. CONTACT. Questions concerning this Order can be directed to the Office of Oversight, Office of Environment, Safety and Health, 301-903-3777.

BY ORDER OF THE SECRETARY OF ENERGY:



ARCHER L. DURHAM  
Assistant Secretary for  
Human Resources and Administration

## **CONTRACTOR REQUIREMENTS DOCUMENT**

### **Type A and Type B Accident Investigations**

1. In the performance of this contract, contractors shall support Type A and Type B investigations of accidents at sites under their cognizance. Type A and Type B investigations are conducted by formally appointed DOE Accident Investigation Boards comprised of DOE employees, supplemented by advisors and consultants.
2. Contractors shall establish and maintain readiness to respond to accidents, mitigate the consequences, assist in collecting and preserving evidence, and assist with the conduct of the investigation. This shall include preserving the accident scene to the extent that it is under the control of the contractor, documenting the accident scene through photography and other means, providing office space and equipment for the Accident Investigation Board, meeting regularly with the Board for discussions of issues surrounding the accident, and providing general administrative assistance.
3. Contractors shall also prepare, implement, and track to completion approved corrective action plans that satisfy judgments of need identified by the Accident Investigation Board.

## ACCIDENT INVESTIGATION CATEGORIZATION ALGORITHM

1. INTRODUCTION. Accidents shall be analyzed and characterized expeditiously, as indicated in Paragraph 4.a of the Order, to determine if either a Type A or Type B investigation shall be conducted based on the criteria indicated below. Uncertainty in categorization shall be mutually resolved by the Office of the Deputy Assistant Secretary for Oversight and the Heads of Field Elements. All accidents not meeting the criteria for a Type A or Type B investigation shall be categorized, investigated, and reported in accordance with the requirements of DOE O 231.1, ENVIRONMENT, SAFETY AND HEALTH REPORTING and/or DOE O 232.1, OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION. Investigations required by these Orders may provide indicators of future, more severe accidents, which when identified and corrected early can prevent more serious accidents.

Onsite accidents meeting the Type A or Type B criteria involving Federal or contractor employees driving government or personal vehicles while on official government business shall be investigated unless the Head of the Field Element requests and receives a waiver from EH-1 in accordance with the requirements of Paragraph 6 of this Order.

Offsite accidents meeting the Type A or Type B criteria involving Federal or contractor employees driving government-owned or rented vehicles shall not be investigated unless the Head of the Field Element determines an investigation is appropriate based on circumstances surrounding the accident or the potential for significant lessons learned.

The following categorization criteria shall apply to any accident resulting from DOE, its contractor, or subcontractor operations.

2. HUMAN EFFECTS.
  - a. Accidents Requiring Type A Investigations.
    - (1) Any injury or chemical or biological exposure that results in, or is likely to result in the fatality of an employee or member of the public (fatal injury is defined as any injury that results in death within 30 calendar days of the accident; see 49 CFR 830.2).
    - (2) Any accident where three or more DOE, contractor, or subcontractor employees, or members of the public incur a serious injury (as defined in 49 CFR 830.2) that requires hospitalization for more than 48 hours, commencing within 7 calendar days from the date the injury was received; results in severe hemorrhages; results in severe damage to nerves, muscles, tendons, or internal organs; results in second or third degree burns affecting more than 9 percent of the body surface; or has a high probability of realizing a permanent total disability due to injuries, chemical exposures, or biological exposures received.
    - (3) A single individual radiation exposure (see 10 CFR 835.202, Occupational Exposure Limits for General Employees) resulting in:
      - (a) A total effective dose equivalent of 25 rem or more;

- (b) A dose equivalent to the lens of the eye of 75 rem or more;
- (c) A shallow dose equivalent to an extremity or skin of 250 rem or more;
- (d) The sum of the deep dose equivalent for external exposure and the committed dose equivalent to any organ or tissue other than the lens of the eye of 250 rem or more;  
or
- (e) A dose equivalent to the embryo or fetus of a declared pregnant worker of 2.5 rem or more.

b. Accidents Requiring Type B Investigations.

- (1) Any accident that results in the hospitalization of one or more DOE, contractor, subcontractor employees or members of the public for five continuous calendar days or longer due to serious injury (as defined in 49 CFR 830.2), occupational illness (except members of the public), chemical exposure, or biological exposure.
- (2) Any one accident resulting in five or more lost-workday cases.
- (3) A series of accidents involving five or more lost-workday cases occurring within a one-year time period that involve identical or similar facilities, systems, equipment, materials, or procedures. This criterion is intended to cover injuries, illnesses, and exposures that reveal a pattern and cause for concern.
- (4) A single radiation exposure to an individual that results in:
  - (a) A total effective dose equivalent of at least 10 rem but less than 25 rem;
  - (b) A dose equivalent to the lens of the eye of at least 30 rem but less than 75 rem;
  - (c) A shallow dose equivalent to an extremity or skin of at least 100 rem but less than 250 rem;
  - (d) The sum of the deep dose equivalent for external exposure and the committed dose equivalent to any organ or tissue other than the lens of the eye of at least 100 rem but, less than 250 rem; or
  - (e) A dose equivalent to the embryo or fetus of a declared pregnant worker of at least 1 rem but less than 2.5 rem.

3. ENVIRONMENTAL EFFECTS.

- a. Accidents Requiring Type A Investigations. Release of a hazardous substance, material, waste, or radionuclide from a DOE facility (onsite or offsite), in an amount greater than five times the reportable quantities specified in 40 CFR Part 302, that results in serious environmental damage.

- b. Accidents Requiring Type B Investigations. Release of a hazardous substance, material, waste, or radionuclide from a DOE facility (onsite or offsite), in an amount equal to or greater than two times but less than five times the reportable quantities specified in 40 CFR Part 302, that results in serious environmental damage.

4. PROPERTY EFFECTS.

a. Accidents Requiring Type A Investigations.

- (1) Estimated loss of, or damage to, DOE or other property, including aircraft damage equal to or greater than \$2.5 million or requiring estimated costs equal to or greater than \$2.5 million for cleaning, decontaminating, renovating, replacing, or rehabilitating structures, equipment, or property.
- (2) Any apparent loss, explosion, or theft involving radioactive or hazardous material under the control of DOE, contractors, or subcontractors in such quantities and under such circumstances to constitute a hazard to human health and safety or private property.
- (3) Any unplanned nuclear criticality.

b. Accidents Requiring Type B Investigations.

- (1) Estimated loss of, or damage to, DOE or other property of less than \$2.5 million but more than \$1 million, including aircraft damage, and costs of cleaning, decontaminating, renovating, replacing, or rehabilitating structures, equipment, or property.
- (2) The operation of a nuclear facility beyond its authorized limits resulting in the consequences identified in paragraphs 2, 3, or 4 of this attachment.

- c. Cost Estimates of Accidents Requiring Type A or Type B Investigations. When estimating the cost of an accident, the methods in DOE Guide 430.1-1, Cost Estimating Guide, should be used.

5. OTHER EFFECTS.

- a. Accidents Requiring Type A Investigations. Any accident or series of accidents for which a Type A investigation is deemed appropriate by the Secretary or the Assistant Secretary for Environment, Safety and Health.
- b. Accidents Requiring Type B Investigations. Any accident or series of accidents for which a Type B investigation is deemed appropriate by the Secretary; Assistant Secretary for Environment, Safety and Health; Associate Deputy Secretary for Field Management; Cognizant Secretarial Officer; or Head of the Field Element. This includes, for example, Departmental cross-cutting issues and issues warranting the attention of local news or interest groups.

## DEFINITIONS

DOE Accident Investigator. An individual who understands DOE accident investigation techniques and has experience in conducting investigations through participation in at least one Type A or Type B investigation. Effective October 1, 1998, DOE Accident Investigators must have attended an accident investigation course of instruction that is based on current materials developed by Office of Deputy Assistant Secretary for Oversight.

Appointing Official. A designated authority responsible for assigning Accident Investigation Boards for Type A and Type B investigations, with responsibilities as prescribed in Paragraph 5d of this Order.

Causal Factor. An event or condition in the accident sequence necessary and sufficient to produce or contribute to the unwanted result.

Heads of Field Elements. First-tier field managers of the operations offices, the field offices, and the Power Marketing Administrations (Administrators). Field elements is a general term for all DOE sites (excluding individual duty stations) located outside of the Washington, D.C. metropolitan area.

Judgments of Need. Managerial controls and safety measures necessary to prevent or minimize the probability or severity of a recurrence of an accident.

Lesson Learned. A “good work practice” or innovative approach that is captured and shared to promote its repeated application. A lesson learned may also be an adverse work practice or experience that is captured and shared to avoid recurrence.

Limited Scope Investigation. An accident investigation, chartered by the Assistant Secretary for Environment, Safety and Health, that is reduced in scope, duration, and resources from that normally associated with a Type A or Type B investigation.

Readiness Team. Trained personnel who are available to perform initial investigative response activities immediately following an accident.

Root Cause. The causal factor(s) that, if corrected, would prevent recurrence of the accident.