

# U.S. Department of Energy

Washington, D.C.

# ORDER

DOE 5484.1  
2-24-81

**SUBJECT:** ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION  
REPORTING REQUIREMENTS

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1. PURPOSE. This Order establishes the requirements and procedures for the reporting of information having environmental protection, safety, or health protection significance for Department of Energy operations.
2. SCOPE. This Order applies to all Department of Energy contractor operations where, under the contractual arrangements for the work to be performed, the Department of Energy has established control over environmental protection, safety, and health protection program content. The provisions of this Order also apply to Federal operations but not to the Federal employee occupational safety and health program (as defined in DOE 3790.1). This Order will serve as guidance for the Federal employees occupational safety and health program until it is specifically amended to apply directly to that program.
3. REFERENCES.
  - a. DOE Procurement Regulation 9-50.704-2, which provides environmental protection, safety, and health protection contract clauses.
  - b. Accident/Incident Investigation Manual, ERDA 76-20, which provides guidance for conducting Department of Energy accident investigations.
  - c. ERDA Guide to the Classification of Occupational Injuries and Illnesses, ERDA-76/45-7, which provides guidance for recording and reporting occupational injuries and illnesses.
  - d. 29 CFR 1904, Recording and Reporting Occupational Injuries and Illnesses, which provides the Occupational Safety and Health Administration (OSHA) standards for recording and reporting of occupational injuries and illnesses.
  - e. 29 CFR 1960, 10-21-80, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, Subpart I, Recordkeeping and Reporting Requirements, which provides Occupational Safety and Health Standards for recording and reporting Federal employee occupational injuries and illnesses.
  - f. DOE 5480.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION PROGRAM, of 5-5-80 which establishes the environmental protection, safety, and health protection program for the Department.
  - g. 49 CFR 173, General Requirements for Shipments and Packaging.

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**DISTRIBUTION:**  
All Departmental Elements  
Federal Energy Regulatory Commission

**INITIATED BY:**  
Operational and Environmental  
Safety Division

2-24-81

- h. Privacy Act, PL 93-579.
- i. Freedom of Information Act, PL 90-23.
- j. A Guide for Environmental Radiological Surveillance at Energy Research and Development Administration Installations, ERDA-77-24, March 1977.
- k. Effluent Information System (E IS) and Onsite Discharge Information System (ODIS) User's Manual, October 1977.
- l. Quality Criteria for Water, 1976, Environmental Protection Agency.
- m. Guidance for Air Quality Monitoring Network Design and Instrument Siting, January 1974, Environmental Protection Agency.
- n. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) , May 1978, Environmental Protection Agency.
- o. Guide to Sampling Airborne Radiative Materials in Nuclear Facilities, American National Standards Institute, N13.1.
- p. Standard Methods for the Examination of Water and Wastewaters, 14th Edition, 1976, American Public Health Association.
- q. American Society of Testing Materials (ASTPI) Standards, Parts 23 and 31, Water and Atmospheric Analysis, 1970.
- r. Manual of Methods for Chemical Analysis of Water and Wastes, 1974, Office of Technology Transfer, Environmental Protection Agency.
- s. 40 CFR 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants.
- t. 40 CFR 141, Interim Primary Drinking Water Regulations: Radioactivity, June 28, 1976.
- u. DOE 5632.2, PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIALS, of 2-16-79 which establishes minimum protection standards for special nuclear materials.
- v. 40 CFR 125, Policies and Procedures for the National Pollutant Discharge Elimination System.
- w. DOE 3790.1, OCCUPATIONAL SAFETY AND HEALTH PROGRAM FOR FEDERAL EMPLOYEES of 12-11-80.

#### 4. DEFINITIONS.

- a. Occurrence. Any deviation from the planned or expected behavior or course of events in connection with any Department of Energy or Department of Energy-controlled operation if the deviation has environmental protection, safety, or health protection significance.

- b. Trained Investigator. An individual who has completed the Department of Energy Accident Investigation Workshop.
- c. Substantial. Clearly outside normally accepted or experienced bounds.
- d. Department of Energy Contractor. Any Department of Energy prime contractor or subcontractor subject to the provisions of the Department of Energy Procurement Regulation 9-50.704-2 or other contractual provisions (e.g., cost-shared) where the Department of Energy has elected to enforce environmental protection, safety, and health protection regulations by specific negotiated contract requirements.
- e. Notification. The actions taken to notify cognizant Department of Energy officials of an occurrence, and the subsequent actions taken at successive levels within the Department of Energy to notify the Secretary of an occurrence.
- f. Investigation. A detailed, systematic search to uncover the "who, what, when, where, why and how" of occurrences and to determine what corrective actions are needed in order to prevent a recurrence.
- g. Investigation Report. A clear and concise written account of the results of the investigation.
- h. Contracting Officer. An official designated to enter into or administer contracts and make related determination and findings.
- i. Terminated Employee. An individual employed by the Department of Energy or a Department of Energy contractor who terminates his employment; an individual assigned to work in the Department of Energy or Department of Energy contractor facility, but not employed by the Department of Energy or a Department of Energy contractor, who completes his work assignment in the facility; an individual who transfers to another Department of Energy or contractor facility or office; an individual who begins a leave of absence of greater than 12 months' duration; all monitored employees of contractors whose contracts with the Department of Energy are terminated.
- j. Visitor. Any individual visiting a Department of Energy or Department Energy contractor facility under circumstances requiring that he be monitored for radiation exposure.
- k. Recorded Exposure. That number, zero and above, which is recorded as representing a specific individual exposure to ionizing radiation determined in accordance with established health physics principles and Order DOE 5480.1, Chapter XI, requirements.
- l. Positive Exposure. Any recorded exposure greater than the established minimum sensitivity of the monitoring device or the measuring technique employed.

- m. Dose Commitment. Dose commitment is the dose equivalent (reins) received by specified organs during a period of one calendar year which was the result of an uptake of a radionuclide by a person occupationally exposed.
- n. Radiation Records Repository. The Department of Energy centralized data base which maintains occupational radiation exposure information for individuals monitored while engaged in activities associated with the Department of Energy or Department of Energy contractor operations. The Repository includes similar data for the Atomic Energy Commission and the Energy Research and Development Administration activities.
- o. Effluent. Airborne and liquid wastes discharged from a Department of Energy site or facility following such engineered waste treatment and all effluent controls, including onsite retention and decay, as may be provided. This term does not include solid wastes, wastes for shipment offsite, wastes which are contained (e.g., underground nuclear test debris) or stored (e.g., in tanks) or wastes which are to remain onsite through treatment or disposal.
- p. Effluent Monitoring. Collection and analysis of samples and other measurements for the purpose of establishing the type and concentration of radioactive and nonradioactive pollutants in liquids and airborne discharges from Department of Energy facilities.
- q. Environmental Monitoring. Sample collection and analysis of environmental media, i.e., air, water, soil, foodstuff, biota, etc., from the environs of Department of Energy sites for the purpose of assessing effects of Department of Energy operations at that site on the local environment. Generally, environmental monitoring is required to determine compliance with applicable environmental radiation standards.
- r. Onsite Discharge. Airborne and liquid wastes discharged to onsite treatment or disposal systems, e.g., sewage lagoons, retention ponds, and cribs, for retention, settling, decay, or storage onsite.
- s. Department of Energy Site.
  - (1) A Department of Energy-owned or -controlled tract used for Department of Energy operations:
    - (a) Containing one or more facilities (excluding tracts used primarily for substations and transmission towers, and similar utility facilities), or
    - (b) At which one or more major Department of Energy operations or program activities are being carried out.

- (2) A Department of Energy-controlled site is one which is leased or otherwise made available to the Government under terms which afford to the Department of Energy rights of access and control substantially equal to those which the Department of Energy would possess if it were the holder of the fee (or pertinent interest therein) as agent of and on behalf of the Government.

5. POLICY AND OBJECTIVES.

- a. It is the policy of the Department of Energy that timely notification of occurrences involving Department of Energy and Department of Energy contractor operations be made to responsible authority; that all occurrences be investigated; that reports be submitted to responsible Department of Energy officials; that management take responsive action; and that there be consistency in the treatment of such occurrences.
- b. The objectives of the information reporting system are:
  - (1) To investigate and evaluate occurrences to determine their causes and the appropriate measures to prevent recurrences and improve the safety of the Department of Energy and Department of Energy contractor operations.
  - (2) To obtain early, complete, and factual information on occurrences as a basis for: (a) reports to the Secretary, Congress, and other Federal agencies; and (b) where appropriate, informing the public.
  - (3) To assure the gathering of adequate information on which to base management action.
  - (4) To provide a basis for the improvement of codes, guides, and standards used in the Department of Energy and Department of Energy contractor operations.
  - (5) To establish a procedure for the development and reporting of occupational radiation exposure information to the Radiation Records Repository that will be of assistance to the Department of Energy in determining that radiation doses to individuals are maintained at the lowest levels technically and economically practicable.
  - (6) To monitor, evaluate, and report onsite discharges, liquid and airborne effluents, and environmental conditions in the vicinity of Department of Energy sites to assess the levels of radioactive and nonradioactive pollutants and their impact on the public and the environment.

RESPONSIBILITIES AND AUTHORITIES.

a. Assistant Secretary for Environment:

- (1) Appoints Headquarters investigation boards and establishes the scope of Headquarters investigations.
- (2) Accepts Headquarters investigation boards' reports.
- (3) Directs corrective actions based on Headquarters investigation 'boards' recommendations.

b. The Director, Operational and Environmental Safety Division:

- (1) Develops policies, procedures, standards, and guidelines for notification, investigation, and reporting of occurrences in the Department of Energy and Department of Energy contractor operations.
- (2) Establishes requirements and prescribes procedures for the collection and compilation of data and reports related to occurrences and other information of environmental protection, safety, and health protection significance.
- (3) Recommends Headquarters or field investigations (when not otherwise required by this Order) for occurrences which have an overall impact on Department of Energy programs.
- (4) Recommends members for Headquarters investigation boards to the Assistance Secretary for Environment.
- (5) Reviews the reports of Headquarters and field investigation boards to:
  - (a) Determine whether the investigations and the reports meet Department of Energy standards for thoroughness, objectivity, and independence.
  - (b) Assure prompt identification and correction of injury and property damage causes.
  - (c) Assure appropriate distribution of the reports in those instances where the lessons learned are potentially applicable to other Department of Energy and Department of Energy contractor sites.
- (6) Recommends to the Assistant Secretary for Environment the acceptance of the reports of Headquarters investigation boards and the necessary corrective actions based on the boards' reports and other appropriate considerations.

- (7) Assures that the corrective actions that are directed by the Assistant Secretary for Environment are satisfactorily completed.
- (8) Accepts field investigation reports and, if appropriate, recommends to heads of field organizations additional corrective actions.
- (9) Informs the Secretary and the Assistant Secretary for Environment, the appropriate Congressional Committees, other Federal agencies, the Inspector General and other appropriate Headquarters offices and divisions of significant occurrences in the Department of Energy and Department of Energy contractor operations.
- (10) Maintains, consolidates, and summarizes information regarding occurrences in the Department of Energy and Department of Energy contractor operations in order to:
  - (a) Provide basic safety statistics used in evaluating safety program performance.
  - (b) Provide safety information to the Secretary, the Congress, Department of Energy offices, Department of Energy contractors, other Federal agencies, and the public.
  - (c) Provide a basis for identifying needed improvements in safety codes, standards, and regulations.
  - (d) Identify areas where research or development work is needed for safety evaluation or control purposes.
- (11) Develops and maintains a cadre of Department of Energy trained accident investigators who are available to participate as members of Headquarters and field investigation boards.
- (12) Circulates investigation reports for review by appropriate Headquarters divisions and offices when the recommendations for corrective actions involve or may affect activities under their jurisdiction.
- (13) Conducts and coordinates all activities associated with operation and maintenance of the Department of Energy Radiation Records Repository, including:
  - (a) Submission of radiation exposure data to the Repository.
  - (b) Processing of requests for exposure information from the Repository.
- (14) Establishes and interprets Department of Energy environmental and effluent monitoring and reporting requirements.

- (15) Reviews and approves field organization recommendations as to which sites need not perform routine effluent or environmental monitoring and reporting. This approval authority does not extend to monitoring and reporting required by Federal, state, and local laws, regulations, and permits.
- (16) May waive specific Department of Energy effluent and environmental monitoring and reporting requirements for existing sites if not otherwise required by law or permit conditions.

c. The Director, office of Health and Environmental Research:

- (1) Provides, upon request, personnel monitoring devices for Department of Energy Headquarters employees who are planning to visit facilities not operated by the Department of Energy or Department of Energy contractors where they might encounter radiation exposure.
- (2) Furnishes copies of the results of monitoring to the Director, Operational and Environmental Safety Division, and to the head of the appropriate office or division, Headquarters.

d. Inspector General:

- (1) Reviews and recommends policies and standards for notification, investigation, and reporting of occurrences, in the Department of Energy and Department of Energy contractor operations.
- (2) Reviews Department of Energy notification, investigation, and reporting of occurrences for adequacy and consistency with the requirements of this chapter and, as appropriate, reports results of such reviews to the Secretary.
- (3) Conducts investigations as required by the Secretary.
- (4) Concurs in the membership of all Headquarters investigation boards recommended by the Director, Operational and Environmental Safety Division.

e. Heads of Offices and Divisions, Headquarters:

- (1) Review reports of occurrences for operations for which they are cognizant in order to determine if any instructions or procedures for which they are responsible need revision. Those responsible Headquarters officials having contractor organizations directly under their jurisdiction will assume the same responsibilities as heads of field organizations in paragraph 6f below. The Deputy Assistant Secretary for Naval Reactors shall assume, for Naval Reactor's activities, the same responsibilities as heads of field organizations.

- (2) Notify within 24 hours after receipt of exposure information, any Department of Energy employee in their organization of any radiation exposure received which exceeds the dose equivalent standards specified in Order DOE 5480.1, Chapter XI.
- (3) Assure that employees in their organization obtain a personnel monitoring device prior to visiting facilities not operated by the Department of Energy or Department of Energy contractors where exposure to radiation is possible, and instruct Department of Energy employees who might unexpectedly visit a contractor or licensed facility without a monitoring device to use the personnel monitoring device provided by the facility and to request that any resultant exposure information along with the individual's name, social security number, and date of birth be sent to the Department of Energy Headquarters, Attention: Director, Operational and Environmental Safety Division.
- (4) Assign a staff member to act as liaison for the purpose of notifying the Office of Health and Environmental Research of their anticipated needs for personnel dosimeters and to facilitate the movement of dosimeters to and from the Office of Health and Environmental Research.

f. Heads of Field Organizations and Other Contracting Officers:

- (1) Establish procedures to assure proper notification (internally and to Federal, state, regional, and local agencies), investigation, and reporting of occurrences as required in this Order.
- (2) Identify occurrences which are to be investigated by field organization boards. Appoint field investigation boards and establish the scope of their investigations including limitations, if any. Heads of field organizations may desire to use Department of Energy personnel from other offices. Arrangements for use of such personnel may be made by contacting the Director, Operational and Environmental Safety Division, or communicating directly with another field organization. If arrangements are made with another field organization, the Operational and Environmental Safety Division should be advised.
- (3) Review reports of field investigation boards and order additional investigation, if necessary.
- (4) Transmit reports of field investigation boards to the Operational and Environmental Safety Division with copies to the Inspector General and other appropriate Headquarters officials. Transmit with each report a field organization evaluation of the report including a statement of the corrective actions which have been taken or are planned by the field organization.
- (5) Assure that corrective actions are satisfactorily completed and so advise the Operational and Environmental Safety Division with copies to the appropriate Headquarters program organization.

- (6) Assure that, except for necessary emergency actions, the scene of any occurrence requiring or possibly requiring a Headquarters or field organization board investigation is not disturbed until the investigation board concurs that recovery or normal operations may be resumed.
- (7) Assure that Headquarters and field investigation boards receive the necessary logistic and administrative support.
- (8) Direct the preparation and release of public statements on occurrences, where deemed appropriate.
- (9) Assure that all individuals under their jurisdiction are:
  - (a) Notified within 24 hours after receipt of exposure information of any radiation exposures that exceed the dose equivalent standards specified in Order DOE 5480.1, Chapter XI.
  - (b) Provided, upon written and signed request, with a summary of their reported occupational radiation exposures. Such report shall be furnished within 30 days from the time the request is made, or within 30 days after the exposure has been determined, whichever is later.
- (10) Prepare an Annual Summary of Fire and Other Property Damage Experience Report and submit it to the Director, Operational and Environmental Safety Division on or before March 15 of each year.
- (11 ) Determine when preoperational and environmental surveys are required to obtain background and baseline data in advance of start up of any new site or a new facility or process at an existing site; review and approve the preoperational survey program prior to its implementation; and review and approve the report of the survey results prior to start up of the new facility or site operation.
- (12) Assure that the Department of Energy facilities and sites under their purview conduct the effluent and environmental monitoring and reporting programs in accordance with the requirements of this Order and as necessary to determine compliance with all applicable Federal, state, and local effluent standards and permit conditions and report to the local, state, and regional environmental protection agencies, the public and Department of Energy Headquarters on the status of such compliance.

- (13) Recommend to the Director, Operational and Environmental Safety Division, with the concurrence of the Director(s) of the responsible program office(s), when routine environmental monitoring and reporting is not required (programs to be waived) or is to be terminated at Department of Energy sites. Requests for approval to terminate any environmental monitoring and reporting activities should include an explanation, with supporting data, as to why the site is not expected to have significant releases or a significant effect on the environment. For any site holding an exemption from environmental reporting requirements, the respective field organization head or contract administrator shall assure that an annual environmental summary is prepared as required by Chapter III, paragraph 4c of this Order, and copies forwarded to the Director, Operational and Environmental Safety Division.
- (14) May grant an exemption from monitoring and reporting for those effluents which meet all of the following criteria:
  - (a) Do not routinely contain and are not a potential source of accidental releases of significant quantities or concentrations of radioactivity or nonradioactive pollutants in relation to applicable standards.
  - (b) Are of no health and safety or environmental significance.
  - (c) Are not required to be maintained by other Federal, state, or local pollution control agencies or regulations. (The Operational and Environmental Safety Division will assist in the interpretation of "significant" as used above, and elsewhere in this Order, on a case-by-case basis as requested.)

g. Members of Headquarters and Field Organization Boards of Investigation:

- (1) Report directly to the Department of Energy appointing official during the investigation.
- (2) Understand the scope of the investigation including the limitations, if any, prior to initiating the investigation. If necessary, the board should discuss the scope of the investigation with the appointing official or his designee.
- (3) Conduct an investigation and prepare an investigation report which satisfies the requirements in this Order.
- (4) Transmit the report with a cover memorandum which includes the board's recommendations to the appointing official within a specified period of time.

h. Requestors of Radiation Exposure Information:

All requests for exposure information for individuals from the Department of Energy Records Repository should be directed to the Director, Operational and Environmental Safety Division. Exposure information which identifies the individual will be disclosed only upon written authorization of the individual or his duly authorized representative pursuant to the Privacy Act of 1974 and the Freedom of Information Act. The release of summary statistical information reported in accordance with this Order is governed by Chapter 3101, "Public Information Program."



William S. Heffelfinger  
Director of Administration

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CHAPTER I

NOTIFICATION OF OCCURRENCES

1. IMMEDIATE NOTIFICATION. Notification to Headquarters Emergency Operations Center of the following occurrences shall be made as soon as sufficient information is obtained to indicate the general nature and extent of the occurrence:
  - a. Any fatal or imminently fatal injury or illness involving a Department of Energy Jr Department of Energy contractor employee or a member of the public due to an occurrence associated with a Department of Energy or Department of Energy contractor operation. (Type A investigation.)
  - b. Any one occurrence (involving either occupational injuries or illness) in a Department of Energy or Department of Energy contractor operation which results in five or more lost workday cases. (Type A investigation. )
  - c. Estimated "loss or damage to Department of Energy or other property amounting to \$100,000 or more, or estimated costs of \$100,000 or more required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property. (Type A investigation, if the costs exceed \$250,000. See Chapter V of this Order "Criteria for Determining DOE Property Valuation and DOE losses.")
  - d. Any occurrence involving a nuclear explosive under Department of Energy jurisdiction which results in an explosion, fire, the spread of radioactive material, personal injury or death, or damage to private property. (Type A investigation. )
  - e. Any accidental releases of pollutants which result or could result in significant effect on the public or on the offsite environment, e.g. , need to relocate people, substantial fish kill, requirements for corrective action in the environment, requests that downstream water supply intakes be shut down, etc. (Type A investigation. )
  - f. Any accidental releases of pollutants designated by the Environmental Protection Agency as "hazardous" and requiring activation by the Environmental Protection Agency or the U.S. Coast Guard of the National Oil and Hazardous Substances Pollution Contingency Plan to effect removal or corrective measures. (Type A investigation. )
  - g. Any apparent loss or theft of radioactive or nonradioactive material in such quantities and under such circumstances that it could constitute a hazard to the health and safety of individuals. Where this involves the possible theft of Government property, the Federal Bureau of Investigation shall be notified by the Office of Safeguards and Security for a decision as to acceptance of investigation jurisdiction. For apparent losses of source material, special nuclear material, and such other material included in the category "Special Nuclear Materials," see Order DOE 5632.2. (Type A investigation. )

- h. A single or annual accumulated whole-body exposure of an individual to 25 rem or more of radiation, a single exposure of the skin of the whole body of an individual to 75 rem or more of radiation, a single exposure of the forearms of an individual to 150 rem or more of radiation, or a single exposure of the hands or feet of any individual to 375 rem or more of radiation. (Type A investigation. )
- i. Any internal uptake of radioactive material which on the basis of a small number of early assay data could result in a dose or dose commitment in excess of 5 times the pertinent annual standard set forth in the chapter. For whole body dose, 5 rem is the pertinent annual standard. (Type A investigation. )
- j. Any nuclear criticality achieved in a system not intended to reach criticality. (Type A investigation. )
- k. Any release of radioactive material to controlled or uncontrolled areas in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the respective concentration guides specified for such materials in the Order DUE 5480.1, Chapter XI "Standards for Radiation Protection." (Type B investigation. )
- l. Any release of radioactive material offsite that could reasonably be expected to result in an annual dose or dose commitment to any member of the general population greater than the annual standards set forth in Order DOE 5480.1, Chapter XI, "Standards for Radiation Protection." (Type B investigation. )
- m. Any occurrence which is likely to give rise to an inquiry by members of the public or press, if the field organization head involved considers the inquiry to be of sufficient importance to notify Headquarters. (Level of investigation shall be determined by the head of the field organization. )
- n. Any occurrence where a press release is made or where information is provided to the news media, other Federal agencies, or state or local authority, either by the field organization or a Department of Energy contractor. (Level of investigation shall be determined by the head of the field organization. )
- o. Any radiological assistance occurrence. (Level of investigation shall be determined by the head of the field organization.)
- p. Any request to an offsite authority for emergency assistance involving a nuclear operation. (Level of investigation shall be determined by the head of the field organization.)
- q. Any discovery of significant radioactive or nonradioactive contamination in the onsite or offsite environment attributable to current or past Department of Energy operations.

- r. Any aviation related occurrence involving: a fatality or fatalities; lost workday injuries to crew members, ground crew, or other personnel assigned to aviation operations; injuries to passengers or members of the general public; downtime for aircraft; an explosion or fire involving an aircraft; substantial damage to property, and classified, radioactive, high explosive or other hazardous cargo. (Level of investigation for these occurrences not already requiring Type A or B investigation shall be determined by the head of the field organization. ) Investigations shall comply with all applicable Federal Aviation Administration, Department of Transportation, and National Transportation Safety Board regulations, and with state accident reporting requirements.
2. NOTIFICATION WITHIN 72 HOURS. Notification to Headquarters of the following occurrences shall be made within 72 hours of the occurrence.
    - a. Estimated loss or damage to Department of Energy or other property amounting to between \$50,000 and \$100,000 or estimated costs within these limits required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property. (Type B investigation is required for loss or damage between \$50,000 and \$250,000. See Chapter V of this Order, "Criteria for Determining DOE Property Valuation and DOE losses.")
    - b. Any occupational illness which results in inpatient hospitalization. (Type B investigation. )
    - c. Any series of occupational illnesses with the same or similar causes involving five or more persons of which at least one is a lost workday case. (Type B investigation. ) If the occurrence results in five or more lost workday cases then a Type A investigation must be performed. See paragraph 16 of this Chapter.
    - d. Any occupational illness which is a lost workday case involving more than 5 days away from work. (Type B investigation. )
    - e. Any radiation exposure to an individual which in 1 calendar quarter exceeds the following (Type B investigation):
      - (1) 5 rem to the whole body.
      - (2) 15 rem to skin of whole body or thyroid.
      - (3) 30 rem to the forearms.
      - (4) 75 rem to the hands or feet.
    - f. Any internal uptake of radioactive material which on the basis of a small number of early assay data could result in a dose or dose commitment in excess of the pertinent annual standard set forth in the Order DOE 5480.1, Chapter XI, "Standards for Radiation Protection." For whole-body dose, 5 rein is the pertinent annual standard. (Type B investigation.)

- g. Any unplanned nuclear excursion in a reactor, whether or not terminated by protective actions, which is clearly outside the routinely accepted and experienced bounds for that reactor. (Type B investigation.)
  - h. Any vehicle transporting radioactive material that is known by the shipper or the receiver to have been found on arrival at a Department of Energy or Department of Energy contractor facility to be contaminated in either the interior or exterior above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization.)
  - i. Any shipment of radioactive material that arrives at a Department of Energy contractor facility damaged to the extent that there is substantial reduction in the effectiveness of the package; from which radioactive contents are leaking or may have leaked; or contaminated above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization.)
3. INFORMATION REQUIRED IN NOTIFICATIONS MADE IMMEDIATELY OR WITHIN 72 HOURS.
- a. For immediate notifications, as soon as sufficient information is obtained to indicate the general nature and extent of the occurrence, the reporting official shall notify the Emergency Operations Center by telephone (301-353-5555 or FTS 233-5555). All calls on this emergency number are tape recorded. A confirming teletype shall be sent as soon as possible.
  - b. For the immediate notification confirmation and the 72 hour notification, a teletype shall be directed to the Director, Operational and Environmental Safety Division, with copies to the appropriate programmatic division director and to the Inspector General and the Director, Office of Public Affairs. If possible, the teletype shall state:
    - (1) Time, date, location, contractor, general nature of the occurrence, and its major consequences.
    - (2) Whether a press release has been issued or is contemplated.
    - (3) Whether known facts eliminate need for investigation by a Department of Energy board.
    - (4) Known significant details of the occurrence, the consequences, programmatic and public effects, injuries, property damage, action taken for emergency control and amelioration, status of actions to initiate investigation on, and comments on possible causes of occurrence.
    - (5) If appropriate, the names and titles of proposed investigation board, advisors, and consultants.

c. The following information shall be obtained and filed on occurrences which take place during the transportation of radioactive materials:

- (1) Identification of the shipper and receiver.
- (2) Identification of service used for shipment, i.e., public vehicle or common carrier and mode of shipment (truck, rail, air, or waterway). Include the name of the carrier and the specific vehicle or car number.
- (3) Location of occurrence.
- (4) Driver's account or report of the occurrence.
- (5) Identification of the packaging by model, special permit, specification, or certificate number.
- (6) Type and quantity of material in each package, and total quantity in the shipment(s).
- (7) Nature of package and vehicle contamination, if any.
- (8) Radiation levels detected (direct) and amount if removable contaminants (microcuries per 100 square centimeters).
- (9) Personnel exposure and contamination, how determined, and action taken.
- (10) Extent of contamination and estimated cost of cleanup.
- (11) Nature of packaging failure, if any.
- (12) Source of contamination if the package is undamaged.
- (13) Nature of any defects or deterioration of the packaging.
- (14) Evidence of improper package handling.



CHAPTER II

INVESTIGATION REQUIREMENTS

1. TYPES OF INVESTIGATIONS.

- a. Type A Investigations - shall be conducted by a Department of Energy Headquarters or field organization board. Standards for the appointment of the board, for conducting the investigation, and for preparing the investigation report are in paragraph 2 below. In addition, any other occurrence that Headquarters or the head of the field organization determines to be of sufficient severity or to have significant impact on the Department of Energy program may be investigated by a Department of Energy Headquarters or a field organization board. Under certain circumstances the head of the field organization involved, with the concurrence of the Director of the Operational and Environmental Safety Division, may decide that a field organization board of investigation is not necessary even though it is required by this Chapter; for example, the facts regarding the occurrence are known or another Federal agency is conducting an acceptable investigation.

(1) Investigation of occurrences by Headquarters.

- (a) Investigation of occurrences required by the Assistant Secretary for Environment to be conducted by Headquarters will be made by the Inspector General or by a Department of Energy board of investigation, appointed by the Assistant Secretary for Environment.
- (b) For investigations to be conducted by the Inspector General, the Inspector General shall direct the Assistant Inspector General for Investigations, and where appropriate, one or more technical experts to investigate the occurrence and to prepare an investigation report. Investigation procedures and preparation of the report shall be in accordance with paragraph 2 below.
- (c) The Assistant Secretary for Environment shall appoint the members of a Headquarters board with advice from the Director, Operational and Environmental Safety Division. Appointment of the board, investigation procedures, and preparation of the report shall be in accordance with paragraph 2 below. The Assistant Secretary for Environment shall accept the Headquarters investigation board's report.

- (2) Investigation of Occurrences by a Field Organization. Investigations of occurrences required by the field organization shall be conducted by a Department of Energy board of investigation appointed by the head of the field organization, to consist entirely of Department of Energy personnel unless it is determined by the head of the field organization and the Director, Operational and Environmental Safety Division, that the facts concerning the occurrence are known and no Department of Energy board of investigation is necessary.
- b. Type B Investigations - shall be conducted by a Department of Energy board appointed by the head of the field organization to consist of Department of Energy or contractor personnel or both, at the discretion of the field organization head. Standards for the appointment of the board, for conducting the investigation and for preparing the investigation report are in paragraph 2 below.
- c. Type C Investigations - shall be conducted by Department of Energy contractor personnel when their operations are involved and by Department of Energy personnel when Federal operations are involved. Standards for these investigations beyond those in this part shall be established by the individual management.
- d. Submission of Type A and Type B Investigation Reports.
- (1) The investigation board shall submit the investigation report to the appointing official within the amount of time prescribed by that official. The investigation report shall be transmitted by a memorandum which contains, but is not limited to, the board's recommendations.
  - (2) The appointing official shall submit 4 copies of the investigation report to the Operational and Environmental Safety Division within 45 days, with one copy to the appropriate program division director. In addition, one copy of the Type A investigation report shall be submitted to the Assistant Secretary for Environment, and one copy to the Inspector General.
  - (3) If the investigation report cannot be submitted within 45 days, the Operational and Environmental Safety Division shall be notified as to the reason for the delay and the anticipated date of submission.
  - (4) Investigation reports shall be accompanied by a memorandum signed by the head of the reporting office which contains, but is not limited to, the actions taken, or to be taken, as a result of the findings.

e. Submission of Type C Investigation Reports.

- (1) All occupational injuries and illnesses shall be investigated to determine corrective action appropriate to minimize or preclude similar injuries and illnesses. A report shall be made on Form 5484.3, Supplementary Record of Occupational Injuries and Illnesses, Attachment 1, for occupational illnesses as defined by the Occupational Safety and Health Administration, and for lost work day cases and nonfatal cases without lost work days as defined-in 29 CFR 1904.
- (2) All accidents involving Government-owned, -rented, or -leased vehicles (including Interagency Motor Pool vehicles) or privately owned vehicles while operated on official business shall be investigated and the number of such occurrences reported on Form 5484.4, Tabulation of Property Damage Experience, Attachment 2. The investigation for each accident causing \$250 or more damage and/or injury shall be recorded on SF-91A, Investigation Report of Motor Vehicle Accident, Attachment 3, and copies submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of the month following the end of the quarter in which the accident occurred.
- (3) All accidents resulting in Department of Energy or other property damage or loss shall be investigated. The investigation for each loss exceeding \$500 shall be recorded on Form 5484.5, Report of Property Damage or Loss, Attachment 4, and copies submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of the month following the end of the quarter in which the accident occurred.
- (4) All radiation exposures of individuals which in one calendar quarter exceed the following shall be reported by memo to the Operational and Environmental Safety Division:
  - (a) 3 rem to whole body.
  - (b) 5 rem to skin of whole body or thyroid.
  - (c) 10 rem to forearms.
  - (d) 25 rem to hands or feet.

2. STANDARDS FOR INVESTIGATION.

a. Appointing ~~the~~ Board

- (1) A board of investigation shall consist of three to five members, one of whom is appointed as chairman.

- (2) All members of Type A investigation boards shall be Department of Energy employees. Type B investigation boards may consist of Department of Energy employees, Department of Energy contractor employees, or both, at the discretion of the head of the field organization. Department of Energy employees appointed to a Type A investigation board, and Department of Energy and Department of Energy contractor employees appointed to a Type B investigation board shall work for, and report to, the appointing official during the investigation.
  - (3) At least one of the members of the board shall be a trained accident investigator.
  - (4) All competencies should be considered in appointing each board, including managerial, scientific, professional, and investigative.
  - (5) The use of necessary consultants or advisors who are experts in certain areas or who are familiar with the operations or management of the program involved in the occurrence is encouraged. These persons may be contractor personnel.
  - (6) A superior and his subordinate shall not serve on the same board.
  - (7) Employees directly related to the operation or activity involved in the occurrence shall not serve on a board.
- b. The Investigation Report. The purpose of the investigation report is to convey in clear and concise language the results of the investigation (the facts surrounding the occurrence, the analysis of these facts, and the conclusions). The investigation report constitutes a record of the occurrence by which the investigation is measured as to thoroughness, accuracy, and objectivity, and to which reference may be made at a later date. In addition, any corrective actions directed by the appointing or the reviewing official will be based largely on the contents of the report.
- (1) General. The investigation report shall consist of, but is not limited to, four sections: summary, facts, analysis, and conclusions.
    - (a) The summary is a brief account of the essential facts of the occurrence and the investigators' conclusions. The facts section consists of a recitation of the factual information determined in the course of the investigation. It should relate the "who, what, when, where, why, and how," of the occurrence. The analysis section of the report is based on the factual information developed and consists of the reasoning of the investigators which support the conclusions. The conclusions section consists of the findings, the probable causes of and contributing factors to the occurrence, and the judgments of needs.

- (b) The investigation report shall fully cover and explain the technical elements of the causal sequences of the occurrence and shall also describe the management systems which should have, or could have, prevented the occurrence, e.g., the hazard review system and the quality assurance program for safety, including the monitoring of actual operations.
- (c) The investigators' recommendations for corrective actions to prevent a similar occurrence shall not be contained in the report but shall be included in the cover memorandum that transmits the investigation report to the appointing official.

(2) Outline of the Report.

- (a) Cover. The cover and title page shall state the subject and date of occurrence, the date of the report, and the security classification. The cover and title page shall not include distribution lists, internal organization nomenclature, name of organization participating or preparing the report, or other such information.
- (b) Table of Contents. The table of contents shall identify the sections and subsections of the report, illustrations, charts, and appendixes with their report page number designated.
- (c) Scope of Investigation. This statement shall set forth the issues or objectives to be investigated and any special limitations or instructions to the board.
- (d) Summary. This section shall be written in such a manner that the reader, who may be relatively unfamiliar with the subject matter, can obtain the essential facts, the findings, and the probable causes and contributing factors with a minimum of effort and time. The summary shall not contain information that is not discussed elsewhere in the report.
- (e) Facts. This section of the report shall cover the major areas of investigation in a uniform manner and in a reasonable, logical sequence. Another good investigation board should be able to reproduce this section.
  - 1 Make this section factual. Do not include any conclusion in this section.
  - 2 Give the reader a good understanding of the accident.
  - 3 Stress the areas of the accident investigation bearing on the causal consideration.

- 4 Establish a complete and substantive basis for the analysis and conclusions sections of the report. This assures both accuracy and completeness. It also eliminates the tendency to introduce new facts in the analysis and conclusions sections.
- 5 Stress the areas which form the basis for corrective measures.
- 6 Inform the reader, where appropriate, that additional information on a subject is contained elsewhere in the report. Use a footnote or note of reference naming the section or appendix where such material can be found.
- 7 Do not omit any relevant fact for any reason whatever, i.e., that it might conflict with some preconceived notion of the investigator or interfere with the dissemination of information (bulletins, news releases, etc.). Investigators must, at all times, be critical of their own reasoning to assure a completely objective and independent account of the occurrence. Examples of information to include are:
  - a Pertinent background information, where available, i.e., brief description of facilities, climate, history, etc.
  - b Description of injury, exposure, or loss due to occurrences, as well as the property damage or decontamination costs.
  - c Physical evidence.
  - d Chronological account of events.
  - e Physical hazards and review of safety controls.
  - f Technical data accumulated.
  - g Related events not in the causal sequence, but revealing deficiencies (to be placed at the end of the section).

(f) The Analysis.

- 1 This section of the report is intended to present an analysis of the factual material contained in the investigation. Its purpose is to show the reader the interpretation of the facts, conditions, circumstances and inferences which support the findings, probable causes, and judgments of needs. This section should include a discussion of the causal sequences, and due consideration should be given to charting the relationship of events and causal factors. Speculated events, facts in controversy, denial of allegations, and what could not be determined should also be discussed in the analysis section.
- 2 Do not put additional facts in this section. This section is for analysis of the facts.
- 3 Make the analysis lead up to the findings, probable causes, and judgments of needs. The qualified reader should be able to anticipate the causal factors from the analysis.
- 4 Make the analysis "accident prevention-worthy" not blameworthy.

(9) Conclusion.

- 1 Findings. This subsection consists of the significant facts and the analytical conclusions of the investigators.
  - a Organize findings sequentially, preferably in chronological order, or in logical sets of sequences, e.g., hardware, procedures, people, organization.
  - b Make analytical conclusions which can be understood on the basis of the facts and the subsequent analysis.
  - c Keep findings to a minimum number. They are a recap of the significant facts and the analytical highlights, not the entire sequence of events.
  - d Keep findings as short as possible and, to the extent possible, put only one highlight in each finding.
- 2 Probable causes. The statement of probable causes shall consist of a series of relatively simple statements which summarize the causes and contributing factors, including any systemic factors.

- 3 Judgments of needs. This section consists of the investigators' conclusions as to the kinds of managerial controls and safety measures believed necessary and sufficient to prevent, or to minimize the probability or severity of, a recurrence. These judgments provide the basis for the subsequent recommendations for corrective action. These statements should be clear, concise, direct, and should be based on the weight of the substantive evidence.
- (h) Signatures. The chairman and members of the board shall sign the report. Any board member has the right to set forth a dissenting position to the report. A dissenting position shall be stated in a letter to the board chairman and shall be transmitted to the appointing official with the investigation report.
- (i) Minority report. If there is a minority report, it should be limited to the analytical highlights and conclusions which are at variance. The minority report should be signed.
- (j) Board authority. This is the letter (board appointment) which established the investigation board. It shall include the names, employer, job titles, positions of board members, and the authority for the investigation. It should also detail the scope of the investigation including the limitations, if any.
- (k) Appendix. (Exhibits). Material that is pertinent but need not be made a part of the written report in order to understand or use the report shall be included as exhibits to the report, and shall follow the body of the report. These may include written statements, witnesses' statements, letters, laboratory analyses, memoranda, pictures, death certificates, etc. Medical records and legal opinions shall not be included in the report. Only material that a reader may want to evaluate or material that is in controversy should be included in the appendix. All such material should be identified the same; e.g., "Exhibit "Appendix .". Where more than one such item is used, they shall be numbered in sequence as introduced in the report, i.e., "Exhibit A," "Exhibit B," etc. Every exhibit shall be introduced in the report in appropriate sequence and, at the time introduced, there shall be a brief recitation of its contents. Long, detailed, complex exhibits shall be avoided.

- (3) Recommendations. The natural followup to the judgments of needs is the recommendations. Each board shall arrive at recommendations intended to prevent similar occurrences. The utmost care should be exerted in forming the recommendations so that all are clear-cut, feasible, logical, and applicable in the field for which they are intended. These recommendations shall be transmitted to the appointing official in the cover memorandum for the investigation report. The purpose in separating the recommendations from the body of the report is to reflect the actual implementation process. The head of the field organization, the Operational and Environmental Safety Division, the Secretary, and finally Congress may add to or modify recommendations. In practice, higher authorities have often added or strengthened recommendations. They have seldom, if ever, deleted recommendations. Recommendations concerning major policies or large funding requirements are properly reserved for the Secretary or the Congress.

3. CORRECTIVE ACTIONS.

- a. Immediate Corrective Actions. These are the immediate measures taken by the Department of Energy or Department of Energy contractors that are necessary to prevent a second occurrence. They are needed since the long range corrective actions resulting from the investigation are usually not transmitted for implementation until 6-8 weeks after the date of the occurrence.
- b. Recommendations of the Board. Headquarters and field investigation boards shall formulate appropriate recommendations for corrective actions to prevent the recurrence of a similar type of event and to correct any systemic problems that contributed to the occurrence. These recommendations shall be transmitted to the appointing official in the cover memorandum.
- c. Corrective Actions from the Appointing Official. The recommendations of the board are reviewed by the appointing official. Any additional corrective actions that the official considers appropriate; for the operation involved and for other Department of Energy operations with a similar accident potential shall be included in the memorandum transmitting the investigation report to the Director, Operational and Environmental Safety Division.
- d. Corrective Actions from Headquarters. The recommendations of the board and the corrective actions of the appointing official are reviewed by Headquarters. If necessary, major policy issues will be discussed with the Secretary. Any additional corrective actions suggested by Headquarters shall be included in the memorandum to the appointing official which accepts the investigation report. Copies of the investigation report and a memorandum with appropriate corrective actions shall also be transmitted for consideration to all Department of Energy field organizations whose contractors conduct operations with a similar potential.

- e. Closing the Case. When all proposed actions are complete, the appointing official shall inform the Director, Operational and Environmental Safety Division, with copies to the Inspector General and the appropriate programmatic division director(s), that the case is closed. Only those occurrences investigated by Type A and Type B boards must be closed officially.

CHAPTER III

EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS

1. MONITORING NEW SITES, PROCESSES, AND FACILITIES. An environmental survey shall be conducted prior to actual start up of a new site, facility, or process which has the potential for adverse environmental impact, or which will process, release, or dispose of pollutants. The preoperational survey should begin about 2 years, but not less than 1 year before start up to cover seasonal changes adequately. The survey shall establish background levels of radioactive and toxic pollutants; characterize pertinent environmental and ecological parameters; and identify potential pathways for human exposure or environmental impact as a basis for determining the nature and extent of the subsequent routine operational effluent and environmental monitoring program.
2. MONITORING EXISTING SITES. An environmental radioactivity monitoring program shall be maintained at existing sites and, as determined on a case-by-case basis by the Director, Operational and Environmental Safety Division, at certain former sites to determine:
  - a. Whether containment and control of releases of radioactivity from site operations are functioning as planned.
  - b. Whether and to what extent environmental levels of radioactivity and other pollutants, as appropriate, released from Department of Energy sites comply with applicable standards.
  - c. The overall impact of Department of Energy operations on the environment.
3. QUALITY ASSURANCE. Quality assurance with respect to sampling and analytical procedures, data processing, and reporting shall be an integral part of the program. Judgment regarding the extent of environmental monitoring must be exercised by the Department of Energy field organizations and contractor management based on hazard potential, quantities and concentrations of materials released, specific local public interest or concern, and extent and type of utilization of affected offsite air, land, and water. Environmental monitoring for nonradioactive pollutants is necessary if it is not possible to determine compliance with Federal, state, or local environmental quality standards on the basis of effluent monitoring data. Before a new facility becomes operational at an existing site, the environmental monitoring program should be modified to establish background information with respect to those radionuclides or other pollutants likely to be released and those environmental parameters likely to be affected by operation of that facility.

4. SCOPE AND CONTENT OF ENVIRONMENTAL MONITORING PROGRAM, REPORTS, AND SUMMARIES.

- a. Environmental Monitoring. Programs for monitoring the environment shall be conducted at Department of Energy sites to determine:
- (1) Compliance with the requirements of Order DOE 5480.1, Chapters I, XI, and XII.
  - (2) The background levels and site contribution of radioactivity; and, as appropriate, other pollutants, in the site environs.
  - (3) Compliance with applicable environmental quality and public exposure limits and other environmental commitments (e.g., those published in environmental impact statements or other official documents).
- b. Environmental Monitoring Report.
- (1) An environmental monitoring report shall be prepared annually to summarize and interpret the levels of radioactivity and, as appropriate, nonradioactive pollutants in the environs of Department of Energy sites attributable to site operations. Levels of pollutants should be placed in perspective by comparing them to applicable standards and to relevant parameters, such as background and natural radioactivity. Copies of this report shall be distributed as indicated in Chapter IV, paragraph 4c(2), of this Order.
  - (2) The environmental monitoring report shall summarize the results of monitoring to determine compliance with applicable effluent standards and permit conditions and should incorporate any other effluent and environmental data and information derived from routine sampling or special studies or measurements that would indicate adherence to or deviations from public safety and property protection commitments published by the Department of Energy in environmental impact statements or other official Department of Energy documents. Any results of offsite radiation surveys made with the Aerial Measurement System should be summarized and included in the report as they become available. The results of pertinent environmental surveys conducted by other Federal, state, or local environmental protection agencies (as available) should be characterized in the report and referenced.
  - (3) In general, onsite monitoring data need not be included in the environmental monitoring report unless the data are necessary to demonstrate compliance with applicable standards or may be helpful in interpreting offsite data. Effluent monitoring data for pollutants shall be included in the report (a) if needed to demonstrate

whether or not such effluents are in compliance with applicable effluent, emission, or environmental standards; or (b) if used to calculate offsite impacts. With regard to effluent monitoring data for radioactivity, the total number of curies in airborne and liquid effluents released to the offsite environment, and the nuclides of particular local interest, shall be included in the portions of the report dealing with air and water monitoring, respectively. In instances where liquid effluents released to different receiving streams results in separate routes of potential environmental exposure, the radioactivity discharged to each receiving stream should be identified.

- (4) Detailed effluent data, such as that submitted annually on Form DOE F 5821.1, should not be included in the Environmental Monitoring Report. Onsite discharge data should also be excluded from this report.

c. Environmental Summary. An environmental summary shall be prepared annually for all sites exempted from preparing an Environmental Monitoring Report.

- (1) To summarize and interpret the levels of radioactive and non-radioactive pollutants in the environs of Department of Energy sites resulting from facility operations in relation to applicable standards.
- (2) To be less detailed and of lesser magnitude than the environmental monitoring report. It should be inclusive enough to determine the environmental impact of facility operations. The summary shall include the following topics:

(a) Facility Description.

- 1 Location.
- 2 Work performed.
- 3 Environmental setting.

(b) Pollutants Released in Effluents.

- 1 Air.
- 2 Liquid (including those released to sanitary sewers).

(c) Comparison of Effluents with Respect to Applicable Standards.

d. Reporting Units and Format.(1) Units.(a) Radiological.1 Air.  $\mu\text{Ci/ml}$  (for uranium and thorium also include  $\mu\text{g/m}^3$ ).2 Water.  $\mu\text{Ci/ml}$  (for uranium and thorium also include  $\text{mg/l}$ ).3 Soil.a  $\mu\text{Ci/m}^2$  or  $\text{pCi/m}^2$ . (Specify depth or profile depth. For tritium the concentration may be expressed in  $\mu\text{Ci/ml}$  of soil moisture.)b  $\mu\text{Ci/g}$  or  $\text{pCi/g}$  dry weight. (Specify depth and method of obtaining dry weight. )4 Sediment.  $\mu\text{Ci/g}$  or  $\text{pCi/g}$  dry weight. (Specify depth and method of obtaining dry weight. For uranium and thorium also include  $\sim/\text{g}$  dry or wet weight, where feasible. For tritium the concentration may be expressed in  $\text{mCi/ml}$  of moisture content in unit volume of wet samples.)5 Food and Vegetation.  $\mu\text{Ci/g}$  or  $\text{pCi/g}$  dry weight. (Specify percent moisture and method of obtaining dry weight. For tritium the concentration may be expressed in  $\text{mCi/ml}$  of moisture content in unit volume of wet samples.)6 Milk.  $\mu\text{Ci/ml}$ .7 Penetrating.  $\text{mrem/year}$ .(b) Nonradioactive Pollutants. The reporting units should be the same as those prescribed by the applicable effluent and environmental quality standards. In reporting other measurements the commonly used and accepted units for the pollutant in question should be used. When the metric equivalent is specified in the standard, it will be the unit of preference.(c) Metric Units. Metric units may be used throughout the report with English equivalents included parenthetically except as in (b) above.

(2) Format.

- (a) The Environmental Monitoring Report shall include for each sampling station the number of samples taken with an indication of the central tendency and spread of the data. Where appropriate, this should include concentration (C) maximum and C minimum, the mean concentration per report period (C mean) and two standard deviations, and the percent of the relevant effluent or environmental quality standard for each parameter. The relevant standard also should be shown and the source referenced. The minimum detection levels should be indicated. Data below the minimum detection level may be expressed as being less than (<) the minimum detection value. Background levels should be subtracted from the sampling results included in the report.
- (b) In computing averages, the preferred method is the method outlined in ERDA-77-24, "A Guide for Environmental Radiological Surveillance at ERDA Installations." However, as an alternate method, it is acceptable that sample results below the detection level be assigned the detection level value, and the average expressed as less than (<) the computed value. In either case, the methods used to calculate these numbers should be outlined in the report.
- (c) The prescribed format for a typical Environmental Monitoring Report is indicated in Attachment 5 of this Order. The prescribed format for a typical Environmental Summary is indicated in Attachment 6 of this Order.
- (d) Assessment and Reporting of Potential Dose to the Public. The environmental monitoring report shall contain an assessment of the potential radiation exposure to the public which could have resulted from site operations during the calendar year. The assessment should be as accurate and realistic as is practical and shall incorporate the dose reference Points in 2 below. As the potential exposure to an individual or population group increases with respect to the relevant Order DOE 5480.1, Chapter XI, dose standards, the dose assessment should be increasingly more detailed.

1 Basic approach and methodology. Average or typical effluent and environmental data and exposure conditions (after subtracting background contributions) shall be used in making the assessment rather than atypical data and assumptions which exaggerate the estimates. Generally the most accurate dose estimates can be calculated using actual measurements of radioactivity in the pathways of exposure as close to man as possible, e.g., measurements in drinking water after treatment rather

than in liquid effluents or surface water. Under certain circumstances, such as the discharge of noble gases and tritium in stack effluents, calculations of potential dose using average annual-effluent and meteorological data, and applicable dispersion equations may provide an acceptable estimate. In the latter case, the related environmental monitoring data that are available should be evaluated and interpreted to verify, or qualify, the calculated dose estimate. Simple modeling and calculational methods are acceptable, e.g., use of the ratio of the observed average concentration to the applicable Radioactivity Concentration Guide (RCG), as the basis for estimating the dose to the critical organ. Specific isotope data are preferred for dose calculations. However, gross activity measurements may be used if supporting data relating gross activity to specific radionuclide values can be referenced. All significant potential pathways of exposure should be evaluated, including, particularly, those wherein reconcentration is likely to occur.

- 2 Dose Reference Points. Generally, the assessment should provide realistic estimates of:
  - a The "fence-post" dose rate at the location on the site boundary where the maximum exposure rates exist.
  - b Maximum organ (whole body included) doses to any individual exposed in an offsite location.
  - c Average dose to the critical organs (whole body included) of a suitable sample of the exposed population.
  - d The man-rem (whole body) dose to the population within 80 km (50 miles). The 80-kilometer distance shall be measured from a point located centrally with respect to major facilities or Department of Energy program activities.
- 3 Reporting of Dose Assessments. All assessments developed pursuant to this section shall be summarized and incorporated in the annual environmental monitoring report. The modeling and calculational methodology should be included or referenced. A comparison of results with applicable standards and relevant parameters, e.g., natural and artificial sources of exposure shall also be included.

5. EFFLUENT MONITORING. Monitoring shall be conducted for pollutants as follows:
  - a. Effluent Monitoring. Effluents shall be monitored:
    - (1) To determine compliance with the requirements of Order DOE 5480.1, Chapters I, XI, and XII.
    - (2) To evaluate the effectiveness of effluent treatment and control.
    - (3) For radioactivity inventory purposes.
    - (4) To determine compliance with all Department of Energy, Environmental Protection Agency, state agencies, etc., imposed effluent limits and other environmental commitments, e.g., those published in environmental impact statements, or other official documents.
  - b. Onsite Discharge Monitoring. Radioactivity released to onsite waste treatment or disposal systems shall be monitored to assess the efficacy of treatment and control, and to provide a quantitative and qualitative annual summary of the radioactivity released onsite.
  - c. Monitoring Guidelines.
    - (1) General.
      - (a) As a general rule, monitoring should be conducted in a manner that provides accurate measurements of the quantity and concentration of liquid and airborne pollutants in effluents as a basis for:
        - 1 Determining compliance with applicable discharge and effluent control limits, including self-imposed administrative limits designed to assure compliance with in-plant operating limits, effluent standards or guides, and with environmental standards or guides.
        - 2 Evaluating the adequacy and effectiveness of containment and waste treatment and control as well as of efforts toward achieving levels of radioactivity which are as low as reasonably achievable considering technical and economical constraints.
        - 3 Compiling an annual inventory of the radioactivity released in effluents and onsite discharges.

- (b) Technical specifications on sample collection and analysis are not included here since they do not lend themselves to development of broad guidance but must be tailored to the monitoring requirements in each specific situation. However, standard sampling and analytical techniques should be used to the extent practical (see references).
- (2) Monitoring Locations. Measurements of volume, rate of discharge, content, etc., should be made, insofar as is practical, at the point at which the data most closely represent what is being released. This implies that measurements should be made at the point of discharge, though there are exceptions. Effluents should be monitored at the point at which the applicable standards apply. In the case of onsite discharges, the monitoring location may be the waste treatment or disposal system; and in case of effluents, the monitoring location may be the point of release to the offsite environment after all treatment and control, including retention and decay, have been effected. In many instances, the monitoring location is specified in a discharge or operating permit.
- (3) Type and Frequency of Sampling.
- (a) Sampling frequency and type should be determined by considering the purpose for which the data are being obtained, e.g. , evaluation of the effectiveness of waste treatment and control, compliance with operating limits of applicable effluent or performance standards, compilation of release data, etc. Continuous sampling is desirable and may be necessary where there is wide variation in the concentration or mixture of potential pollutants in the effluent stream. However, periodic sampling may suffice when the concentrations and mixtures are reasonably constant and there is little likelihood of unusual variations. Similarly, proportional sampling may be necessary when effluent flow rates fluctuate, whereas a representative grab-sample may suffice for batch discharges. The method of sampling may be specified in the applicable regulation or permit.
- (b) For purposes of reporting radiological data, gross radioactivity measurements are generally inadequate. They are appropriate only:
- 1 When gross radioactivity releases are a small fraction of the offsite Radioactivity Concentration Guides (RCG's) for "unidentified mixtures" and are of no health or environmental significance;

- 2 When the relative concentrations of specific radio-nuclides are so well known by other means that gross radioactivity measurements are truly indicative of the activity being released; or
  - 3 When the activity of waste streams is so low as to preclude specific nuclide measurements.
- d. Monitoring Data Recordkeeping. Radioactive effluents and onsite charge monitoring and reporting shall be adequate to provide an annual average concentration and an annual summary of the quantities of radioactivity released. The summary should be complete to the extent that all significant releases are reported. It is necessary, therefore, that the annual average flow and the specific concentration in each waste stream be known. For the purpose of determining compliance with standards, the data should be collected and recorded in the units in which relevant standards are expressed. The onsite discharge and effluent data reports will be used to compile a Department of Energy-wide summary of radioactivity which has been released onsite and to the offsite environment from its facilities.



CHAPTER IV

ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION REPORTS

1. GENERAL.

- a. Requirements for reports resulting from Type A and B investigations are provided in Chapter 11 to this Order.
- b. Approval of the Operational and Environmental Safety Division is necessary prior to substitution of contractor forms for those required in this Chapter.
- c. Department of Labor, Occupational Safety and Health Administration (OSHA) rules and definitions shall govern the recording and measuring of work injury experience. Chapter V of this Order shall govern the determination of Department of Energy property valuation for property damage experience. "American National Standards Institute Method of Recording and Measuring Motor Vehicle Fleet Accident Experience," D15.1 (latest edition) shall govern the recording and measuring of motor vehicle accident experience. Revision of annual reports for each of the 2 calendar years immediately preceding shall be transmitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., before February 28 of each year. Doubtful cases of occupational injury or illness classification shall be forwarded to the Operational and Environmental Safety Division for final determination.

2. TYPE C INVESTIGATION REPORTS.

- a. A quarterly report of Radiation Exposures defined in paragraph e(4) of Chapter II of this Order, which occurred during the calendar quarter shall be prepared by field organizations and submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of the month following the end of the quarter in which the exposure occurred; negative reports are not required. The report shall include the following information:
  - (1) A brief description of how the exposure occurred.
  - (2) Personal information:
    - (a) Name.
    - (b) Date of birth.
    - (c) Place of birth.
    - (d) Sex.
    - (e) Social security number.

- (3) Radiation exposure information:
- (a) Approximate dates for period during which the exposure was accumulated.
  - (b) Types of radiation involved.
  - (c) Total estimated radiation dose in rem.
- b. Form 5484.3, Supplementary Record of Occupational Injuries and Illnesses, Attachment 1, shall be prepared by each Department of Energy office and Department of Energy contractor organizational unit, for all "recordable occupational injuries and illnesses," as defined on the Form OSHA No. 200, Log of Occupational Injuries and Illnesses, Attachment 7. The Office of Workers' Compensation Programs Forms CA 1 and 2, which shall include additional information (items 1 through 5 on page 3 of "Recordkeeping and Reporting Guidelines for Federal Agencies"), may be completed in lieu of Form 5484.3 for Federal Employees. One copy of each of these forms shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of April, July, October, and January.
- c. Form 5484.5, Report of Property Damage or Loss, Attachment 4, shall be prepared for "each accident or loss in the categories listed on the form. This form is to be prepared by the Department of Energy or Department of Energy contractor employee designated to investigate such an accident at the time of the accident. One copy shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., with Form 5484.4. Form 5484.5 is to be used in reporting Department of Energy property damage or loss from all accidental causes, exclusive of that resulting from use and occupancy considerations, from motor vehicle accidents, or from aircraft accidents. In general, loss estimates should be predicated on the net cost for replacing or restoring damaged facilities to the condition existing prior to the accident. Due allowance should be made for salvage values but no allowance made for prior depreciation. The appropriate method for filling in Form 5484.5 is self evident, with the exception of Sections 4 and 5.
- (1) Section 4.
- (a) All damage to, or loss of Department of Energy-owned cargo, or damage caused by such cargo, which occurs during transportation should be classed as Type 4e irrespective of the cause.

- (b) All damage to, or loss of, or damage caused by, nuclear reactors or vital appendages thereto ( e.g., cooling system components, control equipment), should be classed as Type 4g3 "Vital appendages" include all equipment and materials directly associated with or necessary to the sustaining of reactor operation.
  - (c) All damage or loss sustained as a consequence of (and following the outbreak of) fire should be classed as Type 4a except fire losses involving cargo during transportation (see (a), above). Contamination damage caused by fire should be included in the loss reportable under Type 4a accidents.
  - (d) Except for cases covered by (a), (b), or (c), above, all losses suffered as a consequence of explosion (including any losses from contamination spread during the explosion) are classed as Type 4b.
  - (e) All contamination-caused losses, exclusive of those cases covered by (a), (b), (c), or (d), above, or those which result from nonreactor criticality accidents, should be classed as Type 4g1.
  - (f) Section 4d (Electrical Fault or Failure with Loss over \$1000) should not be used for reporting losses resulting from other" than accidental (i.e., reasonably unforeseeable) causes.
- (2) Section 5. If a given loss involves more than one accident type (see section 4 of Form 5484.5), list each such accident type contributing to the loss in the "Accident Type No." column and "opposite each enter appropriate data.
- d. SF-91A, Investigation Report of Motor Vehicle Accident, Attachment 3, shall be prepared for each incident resulting in injury or property damage of \$250 or more. One copy shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., with Form 5484.4. The description of the occurrence, item number 26, shall include the following information:
- (1) Whether or not the vehicle was equipped with seat belts.
  - (2) Whether or not the seat belts were in use at the time of the accident.
  - (3) The dollar loss incurred.

3. QUARTERLY SUMMARIES AND OTHER REPORTS.

- a. Form EV-102A. Form EV-102A, Summary of Department of Energy and Department of Energy Contractor Occupational Injuries and Illnesses, Attachment 8, shall be prepared by each Department of Energy office and Department of Energy contractor organizational unit. Form EV-102A data may be obtained from the Form OSHA No. 200, or its equivalent, maintained at the individual establishments. One copy from each field organization, area office, and contractor organizational unit, plus a consolidated Form EV-102A for each field organization shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of April, July, October, and January. Revisions of annual reports are due February 28 for each of the two preceding calendar years. The revisions should reflect the new (corrected) totals rather than the additions or deletions which should be applied to the previous report.
- b. Form 5484.4. Form 5484.4, Tabulation of Property Damage Experience, Attachment 2, shall be prepared by each Department of Energy office and Department of Energy contractor organization unit. One copy from each field organization, area office, and contractor organizational unit, plus a consolidated Form 5484.4 for each field organization shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of April, July, October, and January. Revisions of annual reports are due February 28 for each of the two preceding calendar years.
- c. Forms OSHA-200 and OSHA-100F. Form OSHA-200, Log of Occupational Injuries and Illnesses, Attachment 7, shall be completed for Department of Energy contractor employees, and Form OSHA-100F, Log of Federal Occupational Injuries and Illnesses, Attachment 9, shall be completed for Federal employees and maintained on file for a period of at least 5 years.
- d. Reports of Occupational Exposure to Radiation for Department of Energy and Department of Energy Contractor Personnel Upon Termination of Employment. Upon termination of employment, report on Form 5484 8 Termination occupational Exposure Report, Attachment 10, all external and internal radiation exposures recorded for the terminated individual during his period of employment or work assignment at a Department of Energy or Department of Energy contractor facility. These reports are to be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within 30 days from the individual's date of termination or within 30 days after his exposure has been determined, whichever is later. Upon written and signed request, a copy of the report shall be provided to the individual terminating employment or work assignment.

- e. Report of Radiation Exposures to Headquarters Employees. Report all recorded external and internal radiation exposures that occur during a visit by Department of Energy Headquarters employees to a Department of Energy field organization or contractor facility. Complete the appropriate portions of Form 5484.8 and submit it to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within 30 days after the individual's date of visit or within 30 days after his exposure has been determined, whichever is later.
- f. Report of Radiation Exposures to Visitors.
  - (1) Report all positive external and internal radiation exposures recorded for visitors during the period of their visit to a Department of Energy or Department of Energy contractor facility. Complete the appropriate portions of Form 5484.8 and submit copies of these reports to the visitor's employer (or to the visitor if he has no employer) and to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within a period of 30 days after the date of the visit or within 30 days after the visitor's exposure has been determined, whichever is later. For visitors who are employees of the Department of Energy or Department of Energy contractors, a report should be submitted only to the visitor's employer.
  - (2) Any radiation exposure in excess of the radiation dose equivalent standards established by Order DOE 5480.1, Chapter XI, shall be reported within 24 hours after the exposure or within 24 hours after the exposure has been determined, whichever is later, to the visitor and his employer by telephone or teletype message. If the initial report is made by telephone, a written report shall follow within 30 days.
- g. Preoperational Environmental Survey Reports shall be prepared as specified in Chapter III, paragraph 1, which summarize preoperational survey data and information. Five copies shall be submitted to the Operational and Environmental Safety Division and one copy to appropriate program offices before the new site becomes operational.
- h. Aircraft Accident/Incident Reports. Form 5484.1, Aircraft Accident/Incident Preliminary Report, Attachment 11, and Form 5484.2, Aircraft Accident/Incident Record, Attachment 12, shall be prepared for all aircraft accidents and incidents. One copy of each form as soon as completed shall be forwarded to the Operational and Environmental Safety Division, Safety Analysis Branch, EV-134, and one copy to the appropriate Headquarters program office. Copies of both completed forms will also be included in the regular report of an Aircraft Accident/Incident Investigation Board.

4. ANNUAL REPORTS.

d. Annual Radiation Exposure Reports. Field organization managers shall submit the following reports (Forms 5484.6, 5484.7 only) to the System Safety Development Center (SSDC), EG&G Idaho, Inc., by March 31 for the preceding calendar year for monitored Department of Energy and Department of Energy contractor employees and for visitors to Department of Energy or Department of Energy contractor facilities.

(1) Whole Body Exposures. Form 5484.6, Annual Summary of Whole Body Exposures to Ionizing Radiation, Attachment 13.

(2) Internal Exposures.

(a) Form 5484.7, Summary of Exposures Resulting in the Internal Body Depositions of Radioactive Materials for CY\_\_\_\_\_, Attachment 14. The report shall include:

1 Any uptake of radioactive material occurring during the reporting year that independently, or when added to a current burden, is estimated to result in a dose commitment to the critical organ in excess of 50 percent of the pertinent annual dose equivalent standards set forth in Order DOE 5480.1, Chapter XI.

2 Any previously unreported uptake of radioactive material that is determined to have been reportable according to the above criteria by reason of more recent dose estimates.

(b) Any dose commitment to a critical organ resulting from an uptake of radioactive material should be added to the dose received by that organ from external sources when determining uptakes that are reportable according to the above criteria. In those cases where the whole body is considered to be the critical organ and the dose commitment from each internal uptake is combined with the dose contributed by external sources for the purpose of reporting cumulative whole body exposures on Form 5484.6, it is not necessary to report those internal exposures on Form 5484.7.

b. Annual Industrial Summary of Fire and Other Property Damage Experience (Suggested Format). The report summarizes the CY experience and activities of this office relative to the control of Department of Energy property damage and loss from fire and other accident causes. An aggregate loss of \$\_\_\_\_\_ was suffered during 19 CY as a consequence of property damage accidents on Department of Energy-owned property for which this office has responsibility. About \_\_\_\_\_ percent of this loss resulted from the accidents listed below. A description of each accident involving a loss of \$5,000 or more is attached.

Major 19 CY Department of Energy Property Damage Accidents

<u>Loss</u>	<u>Date</u>	<u>Location</u>	<u>Type of Accident</u>
\$15,000	7/24	Power Plant, Fernald	Spontaneous ignition of coal in boiler feed bin.

- (1) Loss Experience Analysis. The monetary damage or loss suffered from the following categories of accidents should be presented:
- (a) Fire.
  - (b) Explosion.
  - (c) Nature.
  - (d) Mechanical.
  - (e) Electrical.
  - (f) Radiation/Contamination.
  - (g) Other.
- (2) Recurring Loss Prevention Costs. The major available recurring costs of control or property damage or loss from the subject causes are primarily incurred as a consequence of paid fire department, volunteer brigade, and fire protection engineering expenses. A comparison of such costs with that of previous years should be set forth in charts (or tables). Data should be given for 19 CY' and at least 2 previous years. If too voluminous, data should be given in an attached exhibit or reduced to chart form. Minimum data should include:
- (a) Dollar cost in 19 CY and 1 previous year for contractor and field organization fire department, fire brigade, and fire protection engineering expenses.
  - (b) As above, but expressed in terms of dollar cost per \$1,000,000 of Department of Energy-owned property.
  - (c) Department of Energy field organization fire protection engineering expense during 19 CY expressed in \$/\$1,000,000 of Department of Energy-owned property. The (higher) (lower) recurring costs of 19 CY as compared with the previous 19 CY, are attributed to: (Give reasons.)

- (3) Property Damage Vulnerability of Department of Energy Projects. While property damage risks have been reduced to proportions warranting little concern by management at most locations, it should be noted that, under existing conditions, high property damage loss and/or serious interruption of Department of Energy operations are considered as being reasonably possible at the locations given below:
- (a) Locations. Limit to locations where losses of \$1,000,000 or serious interruption of important operations may reasonably be anticipated. If lengthy, summarize in this section and furnish details in an exhibit.
  - (b) Remarks. (Be brief.)
- (4) Department of Energy Fire Engineering Risk Appraisal. The responsibilities of this office for Department of Energy appraisals of fire risks detailed in this Chapter were discharged by conduct of the Department of Energy fire protection engineering appraisals of the installations detailed in Exhibit. This exhibit also includes for each facility brief comments as to the overall status of fire protection, the estimated replacement value of Department of Energy property, the number of inspections made during 19 CY, and notations as to their relative importance to the Department of Energy program.
- (5) Major Fire Protection Accomplishments During 19 CY. Summarize the categories of fire protection in which major improvements have been made. For example, mention should be made of automatic protection systems installed, increased inspection activities, organizational improvement, cost reductions, and promotional activities (e.g., National Fire Prevention Week, etc.).
- (6) Major Fire Protection Objectives for Next Year. Briefly summarize in this section areas in which major expenditures of effort or funds are anticipated.
- (7) Observations, Conclusions, and Recommendations. While no suggested format is given for the content of this section, in individual cases it may be appropriate to suggest basic changes in Department of Energy regulations or to point out especially important risks (e.g., arson, sabotage, explosions risk to the public, radiation hazards from fires, etc.). In general, any items of interest to other field organizations should be included. The material in this section should very briefly summarize conclusions resulting from 19 CY experience.

- (8) Cover Memorandum. The covering memorandum should call particular attention to any section of the report considered to be of outstanding importance or interest. Brief comments on the highlights of the report are also appropriate.

c. Effluent and Environmental Monitoring Reports.

(1) Reports of Effluent Monitoring Data.

- (a) Effluent monitoring data for nonradioactive pollutants should be reported in the site environmental monitoring report or summary as described in Chapter III of this Order.
- (b) Radioactive Effluent and Onsite Discharge Data Reports covering the previous calendar year shall be submitted to the Information Systems Branch, EG&G Idaho, Inc., by April 1, with a copy of the cover letter (enclose maps only) to the Operational and Environmental Safety Division. The reports, including the data forms, cover sheet, maps, and, if necessary, explanatory information shall be submitted in accordance with instructions provided in Section 11 of the Effluent Information System and Onsite Discharge Information System User's Manuals. Maps should be included only when they reflect modifications (terminations or startups, etc.) from previous years. The Monitoring Data Report shall consist of:
- 1 A cover sheet listing the site, facility, report period, contractor(s), and address.
  - 2 A summary providing pertinent descriptive and interpretative information which would serve to explain any facets of the data which are not adequately described on the forms. (Classified effluent data should be submitted on separate forms.)
  - 3 Maps, 8-1/2 x 11 inch, showing the locations of effluent streams and onsite discharge points.
  - 4 Completed Radioactive Effluents/Onsite Discharges/Unplanned Releases Form, Form DOE F 5821.1, Attachment 1b, unless submitted via the Secure Automatic Communications Network (SACNET) or directly to the computer operations.
- (c) Unplanned releases of radioactivity in effluents, or that go offsite by spills, leaks, etc., which are reported according to Chapter I of this Order, and unplanned releases of radioactivity in onsite spills, leaks, etc., shall be reported to the Information System Branch, EG&G Idaho, Inc., on a separate Form DOE F 5821.1.

- (d) Field organizations should assure that any data errors on the Radioactive Effluent/Onsite Discharge Data Form are reported promptly to the Information Systems Branch, EG&G Idaho, Inc., using amended forms.
- (2) Environmental Monitoring Reports covering the previous calendar year shall be prepared annually and distributed by May 1 to the Operational and Environmental Safety Division (10 copies), appropriate program offices, the Department of Energy Technical Information Center, and to other agencies and organizations, as appropriate. Attachment 5 of this Order provides the suggested format for this report.
- (3) Environmental Summaries for the previous calendar year shall be submitted annually to the Operational and Environmental Safety Division (10 copies) by May 1 for all sites which are exempted from (2) above, in accordance with the provisions of Chapter III of this Order. Attachment 6 of this Order provides the suggested format for this report.
- (4) Environmental Reports to Regulatory Agencies shall be submitted in accordance with schedules established by the applicable permits or regulations.

## 5. UNUSUAL OCCURRENCE REPORTING.

- a. General. Heads of field organizations shall establish a system for the notification, investigation, and reporting of unusual occurrences that are not otherwise required by this Order. The objective of this system is to identify the full significance and the potential impact of these occurrences so that needed improvements in Department of Energy and Department of Energy contractor operations are not overlooked and to keep Department of Energy and Department of Energy contractor management advised of deficiencies in their operations so that informed decisions can be made on corrective actions needed to keep the level of risk acceptably low.
- b. Guidelines and Examples. The following guidelines and examples are included to illustrate the general type of occurrences to be considered when implementing this system. These have been identified in general terms, as identification of all potential circumstances is not feasible. Heads of field organizations shall provide specifics since operational areas vary widely among field organizations and contractors.
- (1) Any substantial loss of capability by a protective system to perform its intended safety function, e.g.:
- (a) Loss or partial loss of the thermal shield on Type B packages.

- (b) Failure of the shipping cask external cooling system.
  - (c) Failure of effluent monitors, high radiation alarms, and evacuation signals.
  - (d) Failure of a safety channel to cause a reactor to scram (for any reason) when conditions are more severe than those expected to produce a scram.
  - (e) Discovery of a shut valve controlling a sprinkler system when the reason for the closure is unknown (the insurance survey reports included at least 20 such instances).
  - (f) Failure of a building or site alarm system where an emergency power supply was not adequate to supply backup power for the duration of the outage.
  - (g) Failure of a primary supply system (water tank, reservoir water supply mains) due to freezing, mechanical damage, shut valves, earthquake, drought, leakage, or other unplanned cause.
  - (h) Failure of instrument systems designed to warn of airborne hazards, criticality, stack releases, etc.
- (2) Any violation of a Department of Energy prescribed or approved safety limit, e.g. ,:
- (a) Violation of critical mass limits.
  - (b) Violation of pressure or temperature limits specified for safety purposes.
  - (c) A reactivity transient which momentarily exceeds the established safety limit for reactor power (or neutron flux).
  - (d) An increased fire loss potential beyond Department of Energy limits where the increase is due to a failure of administrative controls to limit the values at risk.
- (3) Any violation of a limiting safety system setting (for those nuclear operations conducted under technical specifications), e.g.:
- (a) Operation of equipment above specified speed.
  - (b) Failure to ascertain that neutron poison systems meet specifications.

- (c) An instrument found set to provide a scram signal at a level less conservative than the limiting safety system setting.
- (4) Any substantial degradation of a barrier designed to contain radiation or other toxic materials or any substantial unplanned release of radioactive or toxic material past this barrier, e.g.:
- (a) Leaks from broken pipelines, tanks, or drums which could create onsite, offsite, or public concerns.
  - (b) Holding pond failure or overflow.
  - (c) Failure of stack emission controls.
  - (d) Failure or deterioration of radiation shields.
  - (e) Any glove breach in a glovebox operation
  - (f) The release of toxic materials which results or could result in significant or substantial exposures to personnel.
  - (g) A visible crack detected in a reactor primary system pipe, or a reactor primary system leak.
  - (h) Failure of ventilation system, or fire doors and dampers in radioactive cell.
  - (i) "Channeling" in charcoal filters.
- (5) Any substantial unplanned or unexpected change in a process condition or variable (temperature, pressure, pH, reactivity flow, concentration, etc.) of importance to safety, whether abrupt or long term, e.g.:
- (a) Excessive increased or decreased temperatures in a gaseous diffusion stage.
  - (b) pH changes that result in precipitation of fissile materials in equipment designed to be safe for dilute solution processes.
  - (c) (Abrupt) - On restarting the reactor, the critical rod positions indicate a core reactivity well outside the expected error of the predicted reactivity value.
  - (d) (Long term) - A fuel channel  $\Delta T$  has increased over the past week of operation until it is now only 5° Celsius below the maximum acceptable, instead of the normal 20° Celsius.

- (6) Any fire, explosion, or electrical or mechanical malfunction, or other operating problem which substantially affects or directly threatens safe operation, e.g.:
  - (a) A glovebox fire, a roof fire, a lube oil fire, a transformer fire, a shield material fire, any fire involving fissionable or other radioactive materials, fires in shipping or storage containers.
  - (b) Explosions as applicable to any of the above.
  - (c) Any explosion in process or storage equipment.
  - (d) Components of an experiment in the reactor vessel are found to be missing when the experiment is removed.
  - (e) Any fire in a reactor or process control room, including fires limited to within control panels.
  - (f) Any fire in electronic equipment such as tape drives and process control electronics.
  - (g) Any fire in electrical power supply or switchgear supplying or controlling critical process or safety equipment.
  - (h) Any detonation or fire occurring in chemical explosives intended for use in nuclear weapons or devices.
  - (i) Fires and explosions in containment areas (hoods, gloveboxes, cells) that result in releases of hazardous materials.
  
- (7) Substantial failure of a process controlling device of importance to safety to function as intended during operation, including periodic in-service testing, e.g.:
  - (a) Failure of pressure or temperature controls in a gaseous diffusion plant.
  - (b) Failure of pH control in a dissolving or precipitating operation.
  - (c) Failure of gas release detectors and alarms.
  - (d) Failure of control valves.
  - (e) Failure of a safety rod in a reactor to scram on demand during a prestartup check.

- (f) Failure of oven, boiler, or furnace controls; especially flame-failure devices, fuel shutoff valves, and temperature limit switches.
  - (g) Failure of relief devices on pressure vessels.
  - (h) Failure of circuits that signal unsafe/safe conditions when radiation producing machinery (X-ray, accelerators, etc.) is activated/deactivated.
- (8) Any design deficiency or construction error found during construction, modification, or operation which, had it remained undetected, could have had a Substantial adverse effect on the safety of the operation at some point during its design lifetime, e.g.:
- (a) Improper location of temperature sensing devices, high radiation detectors.
  - (b) Insufficient fire protection devices.
  - (c) Inadequate shielding for the projected operation.
  - (d) Cracking of a reactor component is detected. Breakage could potentially result in interference with safety devices or coolant flow.
  - (e) Failure to install fire dampers or automatic door and damper releases of improper installation of such devices preventing proper operation.
  - (f) Omission of vents, drains, curbs, or other devices intended to limit flammable vapor or liquid accumulations.
  - (9) personnel barriers or guards missing or not installed correctly.
  - (h) Nonuniform density of cell wall shielding.
  - (i) Inadequate or improperly located air sampling devices.
- (9) Any condition resulting from natural events or man-made activities which substantially affects or threatens safe operation, e.g.:
- (a) Wind damage, disruption of water supply.
  - (b) Sabotage, personnel operations errors, strikes, and work stoppage.

- (c) Nearby construction activity that results in an unplanned loss of all water to the complex containing a reactor using water for cooling purposes.
  - (d) Construction or modification penetrations of fire-radiation barriers that have not been corrected or are made while operations are continued that require the integrity of the barrier.
  - (e) Flood, rainstorms, or windstorm occurrences that damage stacks, ducts, filter banks, or power sources or cause soil stability problems threatening important buildings or facilities.
  - (f) Soil stability problems affecting important Utility lines or threatening the structural integrity of vital buildings.
  - (g) Natural or man-made barriers that limit emergency access to, or egress from, important facilities.
- (10) Any unplanned substantial accumulation of fissionable material in a process system, e.g.:
- (a) Unplanned condensation in a gaseous diffusion plant.
  - (b) Precipitation in equipment designed for dilute solution.
  - (c) Residue buildup in any process equipment.
  - (d) Malfunctioning of d bypass cleanup system of a homogeneous reactor that leads to discovery that fuel has crystallized (solidified) in the process vessel.
- (11) Any gross deviation from approved procedures.
- (a) Operation of a condenser at temperatures and pressures above those specified.
  - (b) Operation of barrier unplugging process above prescribed rates.
  - (c) Failure of workers to use protective equipment.
  - (d) Conversion of equipment to unapproved use.
  - (e) Without obtaining the required approvals, bypassing a safety channel in an effort to avoid a reactor scram.

- (12) Any foreign object discovered in a process system which affects or could threaten the safety of the operation, e.g.:
- (a) Water in a system to be operated in the absence of moisture.
  - (b) Unplanned or unexpected isotopes present; e.g., tritium in scrap reprocessing, americium such as occurred in processing Zero Pulse Power Reactor (ZPPR) fuel plates.
  - (c) Recovery of a fabric object from the plenum of a heat exchanger during other maintenance to that unit.
  - (d) Contaminated material in a nonradioactive waste disposal system.
- (13) Any structure, system, or component failure which directly affects or threatens safe operation.
- (a) Failure of structural timbers, girders, beams, I-beams, pre-stressed concrete, and similar items.
  - (b) Failure of building ventilation systems to perform according to specification.
  - (c) Failure of fire fighting equipment.
  - (d) Vibration resulting in a component in the reactor vessel being free of its normal constraints.
  - (e) Failures that allow personnel to enter areas thought to be free from hazards. (Work spaces with high residual ozone, CO, CO<sub>2</sub>, airborne radioactivity, high gamma levels, etc.)
- (14) Any series of related events which individually do not warrant reporting, but which collectively reach a level of substantial concern, e.g.:
- (a) Minor occurrences of the type items listed which taken collectively indicate a general deterioration of provisions for safety.
  - (D) Failure of a redundant circuit, e.g., a diode in a reactor scram circuit found shorted during a routine maintenance check. The scram function is not impaired because of a second good diode. Checks of other identical circuits reveal a number of similar failures.

- (c) Failures or impairments of individual fire detectors or sprinklers which do not prevent the overall system from functioning but which are occurring in increasing numbers or with increasing frequency.
  - (d) Frequent tripping of circuit breakers, ground fault circuit interrupters, and similar protective devices of a common type or serving a common area.
  - (e) Numerous or increasingly frequent failures of one make or type of safety device, such as tire nose, extinguisher cylinders, or breathing air cylinders, during periodic pressure testing programs.
- (15) Any evacuation of personnel from a facility housing nuclear operations, except a false alarm or a preplanned practice evacuation.
- (16) Cases of illness of obscure cause where the occupational medical director determines that an occupational relationship is suspected but not demonstrable.



CHAPTER V

CRITERIA FOR DETERMINING DEPARTMENT OF ENERGY PROPERTY VALUATION  
AND DEPARTMENT OF ENERGY LOSSES

1. DEPARTMENT OF ENERGY PROPERTY VALUATION.

a. Include (for fire, property damage, and contamination accidents).

(1) Approximate replacement value of all Department of Energy-owned buildings and equipment. The replacement value shall be calculated by applying to the original cost (or most recent appraised value) an appropriate cost index ratio (cost index data published by "Engineering News Record" shall be used.)

(2) Cost of all Department of Energy-owned supplies.

(3) Average inventory of all source and special nuclear materials.

b. Exclude (for fire, property damage, and contamination accidents).

(1) Land and land improvements, such as sidewalks, roads, etc.

(2) Below-ground facilities not susceptible to damage by fire or explosion, such as major water mains, water ponds, etc., which are carried as separate capital accounts.

2. GUIDELINES GOVERNING LOSS ESTIMATION.

a. Include.

(1) All estimated or actual costs to restore Department of Energy property to preoccurrence conditions irrespective of whether this is done in fact. Where the occurrence involves property that has been lost, completely destroyed, or contaminated to a degree precluding economically justifiable recovery, estimates should be based on cost for actual replacement and installation of identical building equipment, devices, or materials (including nuclear materials). In the case of unused, obsolete, or excess buildings, equipment, or materials, the estimated market value at time of occurrence should be used.

(2) Estimated cost for restoring to preoccurrence condition, without improvement, all partially lost or damaged Department of Energy property. Include cost for decontamination where required.

(3) Estimated costs for reprocessing and reclaiming partially destroyed and damaged materials. Include damage resulting from firefighting, such as that caused by water and smoke.

(4) All post-occurrence cleanup expenses, e.g., cleanup of radioactive contamination resulting from accidents, explosions, fires, or other occurrences.

b. Exclude.

(1) Expenses directly resulting solely from loss of the use or occupancy of facilities affected by the occurrence.

(2) All post-occurrence expenses paid for by non-Department of Energy sources, e.g., expenses covered by private insurance.

c. Miscellaneous Guidelines.

(1) Credit should be allowed for the estimated salvaged value of items recovered.

(2) The damage and loss of privately-owned property is not reportable, under the requirements of this appendix, except to the extent that the Department of Energy is liable for damage and loss consequences resulting from the occurrence.

(3) Burnout of electric motors and other electrical equipment through overheating from electrical causes will be considered a "fire loss" only if self-sustained combustion exists after power is shut off.

(4) Expenses due to normal wear are not considered as reportable loss providing that all of the loss is reasonably foreseeable and pre-accepted. However, unanticipated loss accompanying such occurrences is reportable. For example, the cost for repairing or replacing a tank, which developed a leak due to corrosion, may not be an accidental loss; but the cost for recovery and/or replacement of released material, including accompanying costs for product recovery, or replacement and costs for cleanup and decontamination, should be considered as an accidental loss.

Supplementary Record of Occupational Injuries and Illness

DOE F 5484.3  
9-80  
DOE 5484.1

U.S. DEPARTMENT OF ENERGY

Case or File No. 2601

Supplementary Record of Occupational Injuries and Illnesses

EMPLOYER

1. Name: Columbia Construction  
2. Mail address: P. O. Box 3652 Hudson, New York  
(No. and street) (City or town) (State)  
3. Location, if different from mail address \_\_\_\_\_

INJURED OR ILL EMPLOYEE

4. Name: Ralph C. Lewis Social Security No. 039-61-4179  
(First name) (Middle name) (Last name)  
5. Home address: 16 Remsem Road Bingham, New York  
(No. and street) (City or town) (State)  
6. Age: 29 7. Sex: Male X Female \_\_\_\_\_ (Check one)  
8. Occupation: Machine Repair  
(Enter regular job title, not the specific activity he was performing at time of injury)  
9. Department: Crafts Services  
(Enter name of department or division in which the injured person is regularly employed, even though he may have been temporarily working in another department at the time of injury.)

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure: Same as (2)  
(No. and street) (City or town) (State)

If accident or exposure occurred outside employer's premises, give address of plant or establishment in which it occurred. Do not indicate department or division. If accident occurred outside employer's premises at an identifiable address, give that address. If it occurred on a public highway or at any other place which cannot be identified by number and street, please provide place references locating the place of injury as accurately as possible.

**EXAMPLE**

11. Was place of accident or exposure on employer's premises? Yes (Yes or No)  
12. What was the employee doing when injured? Dismantling a Power Saw  
(Be specific. If he was using tools or equipment or handling material  
Using a socket wrench to remove a bolt  
name them and tell what he was doing with them.)

13. How did the accident occur? The wrench slipped and right thumb struck sharp edge of saw.  
(Describe fully the events which resulted in the injury or occupational illness. Tell what happened and how it happened. Name any object or substances involved and tell how they were involved. Give

full details on all factors which led or contributed to the accident. Use separate sheet for additional space.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

14. Describe the injury or illness in detail and indicate the part of body affected. Laceration of right thumb - 6 sutures required  
(e.g.: amputation of right index finger at second joint; fracture of ribs; lead poisoning; dermatitis of left hand, etc.)

15. Name the object or substance which directly injured the employee. (For example, the machine or thing he struck against or which struck him; the vapor or poison he inhaled or swallowed; the chemical or radiation which irritated his skin; or in cases of strains, hernias, etc., the thing he was lifting, pulling, etc.)  
Edge of saw

16. Date of injury or initial diagnosis of occupational illness: 6/1/79 (Date)

17. Did employee die? No (Yes or No)

OTHER

18. Name and address of physician: Dr. Rooney, Site Physician  
19. If hospitalized, name and address of hospital: Outpatient, Bingham Hospital Emergency Room  
Date of report: 7/6/79 Prepared by: Y. McCamy  
Official position: Safety Auditor

(Complete reverse for lost workday cases.)

The following additional information (items 20-25) must be provided for lost workday cases:

**LOST WORKDAY CASES**

- 20. Days away from work: 0 Enter the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness. The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even if he had been able to work. NOTE: For employees not having a regularly scheduled shift, i.e., certain truck drivers, construction workers, farm labor, casual labor, part-time employees, etc., it may be necessary to estimate the number of lost workdays. Estimates of days away from work shall be based on prior work history of the employee AND days worked by employees, not ill or injured, working in the department and/or occupation of the ill or injured employee.
- 21. Days of restricted work activity: \_\_\_\_\_ Enter the number of workdays (consecutive or not) on which because of injury or illness: 1) the employee was assigned to another job on a temporary basis, or 2) the employee worked at a permanent job less than full time, or 3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it. The number of days of restricted work activity should not include the day of injury or onset of illness or any days on which the employee would not have worked even if he had been able to work.

**CORRECTIVE ACTION**

- 22. What actually has been done to correct conditions causing the injury or illness? \_\_\_\_\_  
\_\_\_\_\_
- 23. What remains to be done to correct such conditions and why? \_\_\_\_\_  
\_\_\_\_\_
- 24. Comments on adequacy or corrective action taken, or planned, including progress on pending actions: \_\_\_\_\_  
\_\_\_\_\_
- 25. Signature of reviewing official: Y. McCamy Date: 7/6/79  
Title: Safety Auditor

**EXAMPLE**

GUIDELINES CONCERNING THE  
SUPPLEMENTARY RECORD OF  
OCCUPATIONAL INJURIES  
AND ILLNESSES

To supplement the Log of Occupational Injuries and Illnesses (OSHA No. 100), each establishment must retain a record of each recordable occupational injury or illness. Workmen's compensation, insurance, or other reports are acceptable as records if they contain all facts listed below or are supplemented to do so. If no suitable report is made for other purposes, this form may be used or the necessary facts can be listed on a separate plain sheet of paper. These records must also be available in the establishment without delay and at reasonable times for examination by representatives of the Department of Labor and the Department of Health, Education and Welfare. The records must be maintained for a period of not less than five years following the end of the calendar year to which they relate.

Such records must contain at least the following facts:

- 1) About the employer - name, mail address, and location if different from mail address.
- 2) About the injured or ill employee - name, social security number, home address, age, sex, occupation, and department.
- 3) About the accident or exposure to occupational illness - place of accident or exposure, whether it was on employer's premises, what the employee was doing when injured, and how the accident occurred.
- 4) About the occupational injury or illness - description of the injury or illness, including part of body affected, name of the object or substance which directly injured the employee, and date of injury or diagnosis of illness.
- 5) Other - name and address of physician, if hospitalized, name and address of hospital, date of report, name and position of person preparing the report, and case number corresponding to the log.

For lost workday cases:

- 6) About lost workdays - the number of days away from work and/or the number of days of restricted work activity.
  - 7) About causative factors - a statement of what has been done and what remains to be done to correct conditions causing the accident: signed comments by a reviewing official on the adequacy of the corrective actions.
- Note: If an occurrence results in recordable injury or illness as well as property damage of \$1,000 or more, DOE F 5484.5 must be completed also and submitted as required. If property damage results without injury, then only the DOE F 5484.5 should be submitted. If a motor vehicle accident results in recordable injury, DOE F 5484.3 must be completed in addition to any required motor vehicle accident report forms.

U.S. DEPARTMENT OF ENERGY  
TABULATION OF PROPERTY DAMAGE EXPERIENCE

REPORTING PERIOD From January 1, 1980 To March 31, 1980 NAME OF REPORTING UNIT: Simpson Engineering

**SECTION I - TRANSPORTATION AND MOBILE EQUIPMENT OCCURRENCES**

CATEGORY	NUMBER OF CONVEYANCES in reporting period only (1)	NUMBER OF OCCURRENCES		USAGE		RATE (6)	ESTIMATED LOSS (in dollars)			TOTAL COST PER 1,000 MILES (10)
		With Injury (2)	Total (3)	Miles of Travel (4)	Hours Operated (5)		Government (7)	Reimbursed and other (8)	Total (9)	
a. Contractor Operated Motor Vehicle	896	0	10	857,388		11.66	30/0	150	3220	\$3.76
b. Aircraft	1	0	0		223	0	0	0	0	
c. Marine	3	0	0		90	0	0	0	0	
d. Railroad	0	0	0	0		0	0	0	0	
<b>OPERATED BY FEDERAL EMPLOYEES</b>										
e. Government Motor Vehicle										
f. Private Motor Vehicle										
g. Materials Handling Equipment										

EXAMPLE

**SECTION II - OTHER PROPERTY DAMAGE OCCURRENCES**

CATEGORY	NUMBER OF OCCURRENCES (11)	ESTIMATED LOSS (in dollars)		
		Government (12)	Reimbursed and Other (13)	Total (14)
h. Electrical	0	0	0	0
i. Fire	1	750	0	750
j. Mechanical	0	0	0	0
k. Radiation/Nuclear	0	0	0	0
l. Explosion	0	0	0	0
m. Natural Causes	0	0	0	0
n. Miscellaneous	1	3,016	0	3,016

(15) Total amount of tort claims (under Federal Tort Claims Act)	\$0.00
(16) Total amount of Government property damage (columns 7 and 12)	\$3,766
(17) Government Property Evaluation (most recent estimate based on DOE 5484.1)	\$397,900,000

SUBMITTED BY:  
Eugene B. Dunn

DATE:  
4/4/80



INVESTIGATION REPORT OF MOTOR VEHICLE ACCIDENT		Please read the Privacy Act Statement at the bottom		1 DEPARTMENT OR AGENCY		2 REPORTING UNIT (Name and location)	
				Department of Energy		Ledderly Services Seconic River Plant	
3 GENERAL LOCATION OF ACCIDENT (If accident was in the city, complete item 3a. If outside city limits, complete a, b, c and d.)						4 EXACT TIME OF ACCIDENT	
a CITY OR TOWN, COUNTY AND STATE				b MILES	c DIRECTION	d FROM CITY/TOWN (shown in a)	e DATE (Day, Mo., Yr.)
Seconic River Plant Miles County, North Carolina						<input type="checkbox"/> LIMITS <input type="checkbox"/> CENTER	f DAY OF THE WEEK
						8/19/80 Wednesday 4:00 a.m. p.m.	
5 EXACT LOCATION OF ACCIDENT		a ACCIDENT OCCURRED ON (Street name) (Highway)				Mark 5b or c and complete appropriate information. Other identity could be nearest intersecting street, house number, power or telephone pole (give number), highway curve bridge, railroad crossing, filling station, alley, driveway, culvert, guardrail, milepost, underpass, or other identifying landmark.	
		Road 5					
		b AT INTERSECTION (Street name, alley or highway identification) (Highway)					
		Road 5 and Burlington RR Crossing					
		c NOT AT INTERSECTION		EXACT DISTANCE DIREC. OF TION (Street or other identity)		AND EXACT DISTANCE DIREC. OF TION (Street or other identity)	
6 FEDERAL VEHICLE (Fed.)		a YEAR	b MAKE	c BODY TYPE	d NO. OF PASSENGERS	e KIND OF CARGO	f EXTENT OF CARGO DAMAGE (if none, so state)
		1974	Ford	Pick-up	1	None	None
7 INCLUDES PRIVATELY OWNED VEHICLES OPERATED BY:		3 REGISTRATION NUMBER			h PARTS OF VEHICLE DAMAGED AND NATURE OF DAMAGE		
		NME2-118			Hood, right fender, grill, windshield, bumper, radiator, and supports on front end. Damage \$2065		
		i OPERATOR'S PERMIT (State and number)		(Federal No.)			
		N.C. 5142B06		85019			
		j LIMITATION OF PERMIT		k TRAVELING DIRECTION		l STREET/HIGHWAY ON WHICH VEHICLE WAS TRAVELING	
		None		North		Road 5	
		m TYPE PERMIT	n YEARS DRIVING EXPERIENCE	o NUMBER OF HOURS ON DUTY BEFORE ACCIDENT OCCURRED	p DISTANCE DANGER WAS NOTICED	q ESTIMATED SPEED THEN	r ESTIMATED SPEED AT IMPACT
		<input checked="" type="checkbox"/> OPERATOR	TOTAL		20	40 m.p.h.	45 m.p.h.
		<input type="checkbox"/> TRUCK DRIVER	19	3		40 m.p.h.	45 m.p.h.
		<input type="checkbox"/> CHAUFFEUR	19	3		40 m.p.h.	45 m.p.h.
		s DRIVER (Name)		SEX	t DRIVER'S ADDRESS		
		Donald Weaver		M	State Road 31 P. O. Box 39-F Marshalltown, N. C.		
				AGE	42		
7 OTHER VEHICLE (2)		a YEAR	b MAKE	c BODY TYPE	d NO. OF PASSENGERS	e KIND OF CARGO	f EXTENT OF CARGO DAMAGE (if none, so state)
		1978	Dodge	Pickup	1	None	None
		g REGISTRATION NUMBER			h PARTS OF VEHICLE DAMAGED AND NATURE OF DAMAGE		
		NME 39-25			None		
		i OPERATOR'S PERMIT (State and number)		(Federal No.)			
		N.C. 4287CZ4		34658			
		j LIMITATION OF PERMIT		k TRAVELING DIRECTION		l STREET/HIGHWAY ON WHICH VEHICLE WAS TRAVELING	
		None		North		Road 5	
		m TYPE PERMIT	n YEARS DRIVING EXPERIENCE	o NUMBER OF HOURS ON DUTY BEFORE ACCIDENT OCCURRED	p DISTANCE DANGER WAS NOTICED	q ESTIMATED SPEED THEN	r ESTIMATED SPEED AT IMPACT
		<input checked="" type="checkbox"/> OPERATOR	TOTAL		0	30 m.p.h.	45 m.p.h.
		<input type="checkbox"/> TRUCK DRIVER	11	7 1/2		30 m.p.h.	45 m.p.h.
		<input type="checkbox"/> CHAUFFEUR	11	7 1/2		30 m.p.h.	45 m.p.h.
		s DRIVER (Name)		SEX	t DRIVER'S ADDRESS		
		Lawrence Chambers		M	General Delivery Scholesville, N. C.		
				AGE	31		
8 WITNESSES (Name)		ADDRESS		TELEPHONE NO.		LOCATION AT TIME OF ACCIDENT	
A		None					
B							

EXAMPLE

In compliance with the Privacy Act of 1974, the following information is provided:  
Solicitation of the information requested on this form is authorized by Title 40 U.S.C. Section 491. Disclosure of the information by a Federal employee is mandatory as it is the first step in the Government's investigation of a motor vehicle accident. The principal purposes for which the information is intended to be used are to provide necessary data for use by legal counsel in legal actions resulting from the accident and to provide accident information/statistics for use in analyzing accident causes and developing methods of reducing accidents. Routine use of the information may be by Federal, State or local governments, or agencies, when relevant to civil, criminal, or regulatory investigations or prosecutions. An employee of a Federal agency who fails to report accurately a motor vehicle accident involving a Federal vehicle or who refuses to cooperate in the investigation of an accident may be subject to administrative sanctions.

KILLED OR INJURED

1 NAME <b>None</b>		SEX	b ADDRESS	
		AGE		
A 1. Mark <input type="checkbox"/> in the two appropriate boxes		d IN WHICH VEHICLE	e LOCATION IN VEHICLE	f FIRST AID GIVEN BY
<input type="checkbox"/> KILLED <input type="checkbox"/> DRIVER <input type="checkbox"/> PASSENGER <input type="checkbox"/> INJURED <input type="checkbox"/> HELPER <input type="checkbox"/> PEDESTRIAN		<input type="checkbox"/> FED <input type="checkbox"/> OTHER (2)		
j TAKEN BY		h TAKEN TO		i REGISTRATION NUMBER

2 NAME		SEX	b ADDRESS	
		AGE		
B 1. Mark <input type="checkbox"/> in the two appropriate boxes		d IN WHICH VEHICLE	e LOCATION IN VEHICLE	f FIRST AID GIVEN BY
<input type="checkbox"/> KILLED <input type="checkbox"/> DRIVER <input type="checkbox"/> PASSENGER <input type="checkbox"/> INJURED <input type="checkbox"/> HELPER <input type="checkbox"/> PEDESTRIAN		<input type="checkbox"/> FED <input type="checkbox"/> OTHER (2)		
j TAKEN BY		h TAKEN TO		i REGISTRATION NUMBER

10 PEDESTRIAN	a DIRECTION PEDESTRIAN WAS GOING	b <input type="checkbox"/> ON <input type="checkbox"/> ACROSS Street name or highway	c WHERE WAS PEDESTRIAN GOING: SW corner to NE corner E side to W side etc. FROM TO	
11 DESCRIBE WHAT PEDESTRIAN WAS DOING AT THE TIME OF THE ACCIDENT (Crossing intersection with signal against signal diagonally in roadway working playing walking hitching on veh. etc.)				

11 DAMAGE TO PROPERTY OTHER THAN MOTOR VEHICLES OR CARGO (Name objects show ownership state nature of damage)

None

# EXAMPLE

12 KIND OF LOCALITY (Mark one)	
<input type="checkbox"/> Manufacturing industrial	
<input type="checkbox"/> Shopping business	
<input type="checkbox"/> Residential	
<input type="checkbox"/> Amusement recreation	
<input checked="" type="checkbox"/> Open country	
<input type="checkbox"/> Industrial premises	
<input type="checkbox"/> Home street premises	
<input type="checkbox"/> Other specify	
13 LIGHT (Mark one)	
<input checked="" type="checkbox"/> Daylight	1 Darkness with
<input type="checkbox"/> None	1) Artificial light
<input type="checkbox"/> Dawn	2) No artificial light
14 WEATHER (Mark one)	
<input checked="" type="checkbox"/> Clear	3 Fog
<input type="checkbox"/> Hailing	4 Other specify
15 CONDITION OF TIRES AND PEDESTRIAN	
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 All tires inflated properly
<input type="checkbox"/>	2 Had been checked (Mark (1), (2) or (3) below)
<input type="checkbox"/>	1) Anyly impaired
<input type="checkbox"/>	2) Anyly impaired
<input type="checkbox"/>	3) Not known whether impaired
<input type="checkbox"/>	Mark (1) or more for each person
<input type="checkbox"/>	c Physical defect
<input type="checkbox"/>	1) Worn handcaps carrying bundles umbrellas etc
<input type="checkbox"/>	e Sleepy fatigued etc
<input type="checkbox"/>	f Apparently asleep
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	g Apparently normal

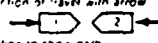




15 CONDITION OF VEHICLES		
FED 2	Mark one or more for each vehicle	
<input type="checkbox"/>	a Defective brakes	
<input type="checkbox"/>	b Headlights out <input type="checkbox"/> One <input type="checkbox"/> Both	
<input type="checkbox"/>	c Tail light out or obscured	
<input type="checkbox"/>	d Dim cover or lens or lights only	
<input checked="" type="checkbox"/>	e Signal lights defective <b>Brake</b>	
<input type="checkbox"/>	f Other lights/reflectors defective	
<input type="checkbox"/>	g Tire blew out	
<input type="checkbox"/>	h Defective steering mechanism	
<input checked="" type="checkbox"/>	i No apparent defects	
<input type="checkbox"/>	j Other defects Specify	
17 VISION OBSCURED BY		
FED 2	Mark where applicable	
<input type="checkbox"/>	a Rain snow etc on windshield	
<input type="checkbox"/>	b Cracked windshield	
<input type="checkbox"/>	1 Dirty windshield wipers	
<input type="checkbox"/>	2 Windshield not fastened in place	
<input type="checkbox"/>	a) Broken wiper etc	
<input type="checkbox"/>	1 Building	
<input type="checkbox"/>	g Embankment	
<input type="checkbox"/>	h Signboards	
<input type="checkbox"/>	i Parked vehicle	
<input type="checkbox"/>	j Moving vehicle	
<input type="checkbox"/>	k Other Specify	
18 ROAD CONDITIONS (Mark one)		
<input checked="" type="checkbox"/>	a Dry	d Snowy
<input type="checkbox"/>	b Wet	e Icy
<input type="checkbox"/>	c Muddy	Continued next column

ROAD CONDITIONS (Cont'd - Mark one or more)		
<input type="checkbox"/>	f Loose material on surface	
<input type="checkbox"/>	g Holes deep ruts	
<input type="checkbox"/>	h Defective shoulders	
<input checked="" type="checkbox"/>	i No defects	
<input type="checkbox"/>	j Other defects Specify	
<input type="checkbox"/>	k Road under construction or repair <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
19 TRAFFIC CONTROLS		
FUNCTIONING	NOT FUNCTIONING	Mark appropriate column for each control present
<input checked="" type="checkbox"/>	<input type="checkbox"/>	a Railroad crossing gates
<input checked="" type="checkbox"/>	<input type="checkbox"/>	b Railroad automatic signal
<input type="checkbox"/>	<input type="checkbox"/>	c Officer or watchman
<input type="checkbox"/>	<input type="checkbox"/>	d Stop and go light
<input type="checkbox"/>	<input type="checkbox"/>	e Stop sign
<input type="checkbox"/>	<input type="checkbox"/>	f Advance stop sign
<input type="checkbox"/>	<input type="checkbox"/>	g Stop as needed
<input type="checkbox"/>	<input type="checkbox"/>	h Advance stop sign
20 ROAD DESCRIPTION		
a WIDTH OF ROAD OR PAVEMENT <b>25</b>		
b NUMBER OF LANES <b>2</b>	c LANES MARKED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
d LANES SEPARATED <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES if yes describe separation		

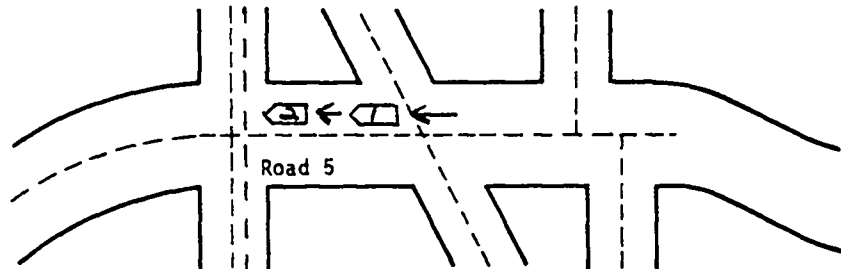
<b>21. DRIVER ACTIONS</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>FED 2</td><td>Mark one for each driver</td></tr> <tr><td></td><td>a. Making right turn</td></tr> <tr><td></td><td>b. Making left turn</td></tr> <tr><td></td><td>c. Making U turn</td></tr> <tr><td>X</td><td>d. Going straight ahead</td></tr> <tr><td>X</td><td>e. Slowing down/stopping</td></tr> <tr><td></td><td>f. Overtaking/passing</td></tr> <tr><td></td><td>g. Forward from parking space</td></tr> <tr><td></td><td>h. Backward from parking space</td></tr> <tr><td></td><td>i. Other backing</td></tr> <tr><td></td><td>j. Stopped in traffic lane</td></tr> <tr><td></td><td>k. Other (Specify)</td></tr> </table>	FED 2	Mark one for each driver		a. Making right turn		b. Making left turn		c. Making U turn	X	d. Going straight ahead	X	e. Slowing down/stopping		f. Overtaking/passing		g. Forward from parking space		h. Backward from parking space		i. Other backing		j. Stopped in traffic lane		k. Other (Specify)	<b>DRIVER'S ACTIONS Continued</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>FED 2</td><td>Mark if applicable</td></tr> <tr><td></td><td>f. Skidding</td></tr> <tr><td></td><td>m. Avoiding vehicle, object or pedestrian</td></tr> <tr><td></td><td>n. Emerging from alley or driveway</td></tr> <tr><td></td><td>o. Disabled vehicle parked</td></tr> <tr><td></td><td>p. Gave warning (horn, signal, indicator)</td></tr> <tr><td colspan="2"><b>22. VIOLATIONS</b></td></tr> <tr><td>FED 2</td><td>Mark one or more</td></tr> <tr><td></td><td>a. Exceeding lawful speed</td></tr> <tr><td>X</td><td>b. Following too closely</td></tr> <tr><td></td><td>c. Disregarded stop sign</td></tr> <tr><td></td><td>d. Disregarded stop-go signal</td></tr> <tr><td></td><td>e. Disregarded police officer</td></tr> </table>	FED 2	Mark if applicable		f. Skidding		m. Avoiding vehicle, object or pedestrian		n. Emerging from alley or driveway		o. Disabled vehicle parked		p. Gave warning (horn, signal, indicator)	<b>22. VIOLATIONS</b>		FED 2	Mark one or more		a. Exceeding lawful speed	X	b. Following too closely		c. Disregarded stop sign		d. Disregarded stop-go signal		e. Disregarded police officer	<b>1. OTHER IMPROPER ACTION (Specify)</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>FED</td><td></td></tr> <tr><td>2</td><td></td></tr> <tr><td colspan="2"><b>23. POLICE ACTION (if any)</b></td></tr> <tr><td colspan="2">a. CHARGE Federal vehicle warning for following too close</td></tr> <tr><td colspan="2">b. NAME OF PERSON CHARGED Don Weaver</td></tr> <tr><td>c. POLICE OFFICER'S NAME S. Noone</td><td>d. BADGE NO 6217</td></tr> <tr><td colspan="2">e. POLICE OFFICER'S DEPARTMENT SHP-Patrol</td></tr> </table>	FED		2		<b>23. POLICE ACTION (if any)</b>		a. CHARGE Federal vehicle warning for following too close		b. NAME OF PERSON CHARGED Don Weaver		c. POLICE OFFICER'S NAME S. Noone	d. BADGE NO 6217	e. POLICE OFFICER'S DEPARTMENT SHP-Patrol	
FED 2	Mark one for each driver																																																																	
	a. Making right turn																																																																	
	b. Making left turn																																																																	
	c. Making U turn																																																																	
X	d. Going straight ahead																																																																	
X	e. Slowing down/stopping																																																																	
	f. Overtaking/passing																																																																	
	g. Forward from parking space																																																																	
	h. Backward from parking space																																																																	
	i. Other backing																																																																	
	j. Stopped in traffic lane																																																																	
	k. Other (Specify)																																																																	
FED 2	Mark if applicable																																																																	
	f. Skidding																																																																	
	m. Avoiding vehicle, object or pedestrian																																																																	
	n. Emerging from alley or driveway																																																																	
	o. Disabled vehicle parked																																																																	
	p. Gave warning (horn, signal, indicator)																																																																	
<b>22. VIOLATIONS</b>																																																																		
FED 2	Mark one or more																																																																	
	a. Exceeding lawful speed																																																																	
X	b. Following too closely																																																																	
	c. Disregarded stop sign																																																																	
	d. Disregarded stop-go signal																																																																	
	e. Disregarded police officer																																																																	
FED																																																																		
2																																																																		
<b>23. POLICE ACTION (if any)</b>																																																																		
a. CHARGE Federal vehicle warning for following too close																																																																		
b. NAME OF PERSON CHARGED Don Weaver																																																																		
c. POLICE OFFICER'S NAME S. Noone	d. BADGE NO 6217																																																																	
e. POLICE OFFICER'S DEPARTMENT SHP-Patrol																																																																		

**24. INDICATE ON THIS DIAGRAM HOW THE ACCIDENT HAPPENED**

Use one of these outlines to sketch the scene. Write in street or highway names or numbers.

- a. Number Federal vehicle as 1, other vehicle as 2, additional vehicles as 3 and show direction of travel with arrow.  
Example: 
- b. Use solid line to show path before accident and broken line to show the accident.  

- c. Show pedestrian by 
- d. Show railroad by 
- e. Place arrow in this circle to indicate NORTH 

Burlington RR Crossing



**EXAMPLE**

<b>25. POINT OF IMPACT</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>FED 2</td><td>Mark one for each vehicle</td></tr> <tr><td>X</td><td>a. Front</td></tr> <tr><td></td><td>b. Right front</td></tr> <tr><td></td><td>c. Left front</td></tr> <tr><td></td><td>d. Rear</td></tr> <tr><td>X</td><td>e. Right rear</td></tr> <tr><td></td><td>f. Left rear</td></tr> <tr><td></td><td>g. Right side</td></tr> <tr><td></td><td>h. Left side</td></tr> </table>	FED 2	Mark one for each vehicle	X	a. Front		b. Right front		c. Left front		d. Rear	X	e. Right rear		f. Left rear		g. Right side		h. Left side	<b>26. DESCRIBE WHAT HAPPENED (Refer to vehicles as Fed. and 2.)</b> <p>As vehicle #2 slowed down for railroad crossing, Federal vehicle ran into rear of vehicle #2.</p>
FED 2	Mark one for each vehicle																		
X	a. Front																		
	b. Right front																		
	c. Left front																		
	d. Rear																		
X	e. Right rear																		
	f. Left rear																		
	g. Right side																		
	h. Left side																		

**28. REVIEWING OFFICIAL'S STATEMENT** (The back of this form may be used for additional space to continue any item.)

<b>a. SHOW CONSEQUENCES OF ACCIDENT AFFECTING AGENCY PERSONNEL SHOWN IN ITEM 9 BY COMPLETING ITEMS BELOW</b> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">TYPE OF PERSONNEL</td> <td style="width:70%;">PROBABLE DISABILITY</td> </tr> <tr> <td>A. DATE STOPPED WORK</td> <td rowspan="2">NATURE OF INJURY AND PART OF BODY</td> </tr> <tr> <td>DATE RESUMED WORK</td> </tr> <tr> <td>B. TYPE OF PERSONNEL</td> <td>PROBABLE DISABILITY</td> </tr> <tr> <td>DATE STOPPED WORK</td> <td rowspan="2">NATURE OF INJURY AND PART OF BODY</td> </tr> <tr> <td>DATE RESUMED WORK</td> </tr> </table>	TYPE OF PERSONNEL	PROBABLE DISABILITY	A. DATE STOPPED WORK	NATURE OF INJURY AND PART OF BODY	DATE RESUMED WORK	B. TYPE OF PERSONNEL	PROBABLE DISABILITY	DATE STOPPED WORK	NATURE OF INJURY AND PART OF BODY	DATE RESUMED WORK	<b>b. REMARKS (if any)</b>  
TYPE OF PERSONNEL	PROBABLE DISABILITY										
A. DATE STOPPED WORK	NATURE OF INJURY AND PART OF BODY										
DATE RESUMED WORK											
B. TYPE OF PERSONNEL	PROBABLE DISABILITY										
DATE STOPPED WORK	NATURE OF INJURY AND PART OF BODY										
DATE RESUMED WORK											
REVIEWING OFFICIAL Warren T. Scully	SIGNATURE  	TITLE (Military or Civilian) Safety Superintendent	DATE 8/21/80								



DOE F 5484.1  
8 801  
DOE 5484.1

U.S. DEPARTMENT OF ENERGY

**REPORT OF PROPERTY DAMAGE OR LOSS**

Use form to report any accident causing loss (use and occupancy excepted) or damage to DOE-owned property in excess of amounts shown in section 4 below

1. GENERAL							
a. FIELD ORGANIZATION Department of Energy Ashville, Kentucky			b. CONTRACTOR ACCOUNTABLE FOR PROPERTY (If subcontractor, also state contractor) Martin Brothers				
c. LOCATION OF ACCIDENT L-463B South Warehouse			d. DATE OF ACCIDENT 7-23-80	e. TIME OF ACCIDENT 1908			
2. TYPE OF ACTIVITY			3. PERSONNEL EFFECTS				
<input type="checkbox"/> GOVERNMENT <input type="checkbox"/> COST PLUS CONSTRUCTION <input checked="" type="checkbox"/> PRODUCTION <input type="checkbox"/> LUMP SUM CONSTRUCTION <input type="checkbox"/> RESEARCH <input type="checkbox"/> ARCHITECT/ENGINEER <input type="checkbox"/> SERVICES			a. FATALITY		DOE	Other	
					0	0	
			b. OCCUPATIONAL INJURY		0	0	
			c. OCCUPATIONAL ILLNESS		0	0	
4. ACCIDENT TYPE							
a. FIRE (Reactors excluded) INVOLVING LOSS OVER \$1,000:			e. TRANSPORTATION LOSS OVER \$1,000 (Cargo only, all causes) <input type="checkbox"/>				
1. Building and Contents <input type="checkbox"/>			f. MECHANICALLY CAUSED DAMAGE LOSS OVER \$1,000 <input type="checkbox"/>				
2. Brush and Forest <input type="checkbox"/>			g. RADIATION AND NUCLEAR ACCIDENTS LOSS OVER \$1,000:				
3. Other (Specify) <input type="checkbox"/>			1. Contamination (Spills, leaks, releases, etc) <input type="checkbox"/>				
b. EXPLOSION (Reactors excluded) INVOLVING LOSS OVER \$1,000			2. Criticality (Reactors excluded) <input type="checkbox"/>				
1. Air-flammable vapor (or gas) <input type="checkbox"/>			Nuclear reactor <input type="checkbox"/>				
2. Chemical reaction <input type="checkbox"/>			3. Damage from inadequate cooling <input type="checkbox"/>				
3. Compressed fluids <input type="checkbox"/>			b. Excursion (Damage from uncontrolled fission) <input type="checkbox"/>				
4. High explosives <input type="checkbox"/>			c. Radioactive material spill or leak <input type="checkbox"/>				
5. Dust <input type="checkbox"/>			d. Nonradioactive material spill or leak <input type="checkbox"/>				
c. NATURAL CAUSES INVOLVING LOSS OVER \$1,000:			e. Fire <input type="checkbox"/>				
1. Wind, rain, flood or waves <input type="checkbox"/>			f. Other (Specify) <input type="checkbox"/>				
2. Lightning <input type="checkbox"/>			h. OTHER (Specify)				
3. Earthquake <input type="checkbox"/>			Furnace liner melted				
d. ELECTRICAL FAULT OR FAILURE LOSS OVER \$1,000 <input type="checkbox"/>							
5. MONETARY DAMAGE OR LOSS BY ACCIDENT TYPE							
ACCIDENT TYPE	TO DOE OWNED PROPERTY					TO OTHER PUBLIC OR PRIVATE PROPERTY TOTAL	
	From Contamination		From Fire	From Explosion	From Other		DOE Total
	In Building	Outside					
liner burnout					\$34,642	\$34,642	
TOTALS							
6. DESCRIPTION OF DAMAGE OR LOSS							
1. Molten metal burned through refractory liner and electrical coils of induction furnace.							
2. Damage to some instrumentation and power cables.							
7. EFFECT ON PRODUCTION OR OPERATION CAPABILITY							

DOE F 5484 S Continued

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8 . CAUSE AND CONTROL

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a. CAUSE

Metal being melted and liner materials were incompatible, and at elevated temperature the liner quickly deteriorated.

---

b FACTORS CONTRIBUTING TO EXTENT OF LOSS

1. Lack of liner deterioration monitoring.
2. Contamination of material being processed.

---

PREVENTIVE ACTION TAKEN OR CONTEMPLATED TO MINIMIZE RISK OF SIMILAR LOSSES

See Accident Investigation Report KY-4-F.

# EXAMPLE

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9. STORY AND RECOMMENDATIONS

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The "C" shift emergency squad responded to fire alarm box 347 at 1911 hours. There were many small fires inside the building and a grass fire to the east of the building. six 15-pound CO<sub>2</sub> and one 150-pound CO<sub>2</sub> extinguishers were used to extinguish the fires. All support systems for the furnace were tagged out and the furnace was left to cool by itself. The all clear was given at 1952 hours and the extinguishers were replaced.

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10 WHAT NEW WORK PRACTICE, GUIDE, CODE OR STANDARD, ETC., IS SUGGESTED TO HELP OTHERS AVOID SIMILAR LOSSES?

--

L. S. Dauer

Fire Protection Engineer

7/25/80

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Reported by:

Title:

Date:

QUALITY AND FORMAT FOR A TYPICAL ENVIRONMENTAL MONITORING REPORT

1. Quality of Report. The report shall be of the high quality typical of DOE and contractor technical and public reports (e.g., appropriate cover, printed text, quality 8-1/2 x 11" figures and maps, and professional editing).
2. Title Page. Include the name of site, facility, report period, address, and operating contractor.
3. Introduction. Provide a brief description of the site, the nature of its primary operations or activities, and a general discussion of environmental features and land and water use, including pertinent demographic information, that could be affected by site operations.
4. Summary. Provide a concise evaluation and interpretation of the monitoring data contained in the report in relation to applicable standards and requirements with explanation, as appropriate, of unusual incidents or releases. This section should include discussion of any abnormal occurrences, such as flooding, forest fires, fish kills, altered land use, etc., which could have resulted from or have some impact upon either the program activity or the site, and should be written in a manner understandable by the informed layman, summarization of population dose estimates should be included.

5. Monitoring Data Collection, Analysis, and Evaluation.
  - a. Include a brief description of the type and frequency of sampling, methods of analysis, and accompanying tables and graphs which clearly and accurately present the monitoring results. Quality assurance programs should also be discussed for sampling and analysis. A map showing the location of monitoring stations and sampling points also shall be included.
  - b. As a general rule, data should only be presented for radioactivity and pollutants in media for which there are applicable standards or other meaningful bases for interpreting the results (e.g., background levels, upstream versus downstream concentration). Interpretations shall be made, as appropriate, of how the environmental levels resulting from site operations compare to relevant parameters such as background, natural radioactivity, and applicable effluent and/or environmental quality standards.
6. References. List and explain, as appropriate, the effluent, air and water quality, and other standards or documents cited in the body of the report.
7. Distribution. A standard distribution list which includes all persons and/or organizations to whom the environmental monitoring report is regularly distributed should be included as an integral part of the report.

QUALITY AND FORMAT OF A TYPICAL ENVIRONMENTAL SUMMARY

1. Quality of Report. The report shall be of high quality typical of DOE and contractor technical and public reports, and be suitable for publication by the Operational and Environmental Safety Division.
2. Title Page. Include the name of the site, facility, report period, address, and operating contractor.
3. Summary. Provide a concise evaluation and interpretation of the data included in the body of the Summary in relation to applicable standards and requirements.
4. Body of the Summary. Include a discussion of those topics listed in Chapter III of this Order as well as any other topics of relevant interest.
5. References. List and explain as appropriate the applicable standards cited in the body of the report.
6. Distribution. Include a listing of those persons or organizations receiving copies of the environmental summary.





Instructions for OSHA No. 200

I. Log and Summary of Occupational Injuries and Illnesses

Each employer who is subject to the recordkeeping requirements of the Occupational Safety and Health Act of 1970 must maintain for each establishment a log of all recordable occupational injuries and illnesses. This form (OSHA No. 200) may be used for that purpose. A substitute for the OSHA No. 200 is acceptable if it is designed clearly readable and under standards as the OSHA No. 200.

Enter each recordable case on the log within six (6) workdays after learning of its occurrence. Although other records must be maintained at the establishment to which they refer, it is possible to prepare and maintain the log at another location using data processing equipment if desired. If the log is prepared elsewhere, a copy dated to within 45 calendar days must be present at all times at the establishment.

Logs must be maintained and retained for five (5) years following the end of the calendar year to which they relate. Logs must be available (normally at the establishment) for inspection and copying by representatives of the Department of Labor, or the Department of Health, Education and Welfare, or State accident jurisdiction under the Act.

II. Changes in Extent of or Outcome of Injury or Illness

If during the 5-year period the log must be retained, there is a change in an extent and outcome of an injury or illness which affects entries in columns 7, 8, 9, or 12, the first entry should be lined out and a new entry made. For example, if an injured employee at first required only medical attention but later lost workdays away from work, the check in column 8 should be lined out, and checks entered in columns 2 and 3 and the number of lost workdays entered in column 4.

In another example, if an employee with an occupational illness lost workdays, returned to work, and then died of the illness, the entries in columns 9 and 10 should be lined out and the date of death entered in column 8.

The cause inquiry for an injury or illness should be lined out if later found to be nonrecordable. For example, an injury or illness which is later determined not to be work related, or which was initially thought to involve medical treatment but later was determined to have involved only first aid.

III. Posting Requirements

A copy of the totals and information following the fold line of the last page for the year must be posted at each establishment in the place or places where notices to employees are customarily posted. This copy must be posted no later than February 1 and must remain in place until March 1.

Even though there were no injuries or illnesses during the year, records must be entered on the totals line, and the form posted.

The person responsible for the annual summary totals shall certify that the totals are true and complete by signing at the bottom of the form.

IV. Instructions for Completing Log and Summary of Occupational Injuries and Illnesses

Column A - CASE OR FILE NUMBER Self-explanatory

Column B DATE OF INJURY OR ONSET OF ILLNESS For occupational injuries enter the date of the event. For occupational illnesses enter the date of initial diagnosis of illness or of absence from work if carried before diagnosis, enter the first day of the absence if diagnosis is the illness which has later been diagnosed and recognized.

Column C - INJURY OR ILLNESS-RELATED DEATHS Self-explanatory

Column D - INJURIES OR ILLNESSES WITH LOST WORKDAYS Self-explanatory

Any injury which involves days away from work, or days of restricted work activity, or both must be recorded since it always involves one or more of the criteria for recordability.

Column E - INJURIES OR ILLNESSES INVOLVING DAYS AWAY FROM WORK Self-explanatory

Column F - LOST WORKDAYS - DAYS AWAY FROM WORK Enter the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness. The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work.

NOTE For employees not having a regularly scheduled shift, such as certain truck drivers, construction workers, farm labor, casual labor, part time employees, etc., it may be necessary to estimate the number of lost workdays. Estimates of lost workdays shall be based on prior work history of the employee AND days worked by employees, not ill or injured, working in the department and/or occupation of the ill or injured employee.

Column G - LOST WORKDAYS - DAYS OF RESTRICTED WORK ACTIVITY

- Enter the number of workdays (consecutive or not) on which because of injury or illness: (1) the employee was assigned to another job on a temporary basis or (2) the employee worked at a permanent job less than full time or (3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work.

Column G and H - INJURIES OR ILLNESSES WITHOUT LOST WORKDAYS Self-explanatory

Column I - TYPE OF ILLNESS Enter a check in only one column for each illness.

TERMINATION OR PERMANENT TRANSFER - Place an asterisk to the right of the entry in columns 7a through 7c of illness which represented a termination of employment or permanent transfer.

V. Totals Add number of entries in columns 1 and 8. Add number of checks in columns 2, 3, 6, 7, 9, 10 and 13. Add number of days in columns 4, 5, 11 and 12.

Totals are to be generated for each column at the end of each page and at the end of each year. Only the yearly totals are required to be posted.

If an employee's loss of workdays is continuing at the time the totals are calculated, estimate the number of future workdays the employee will lose and add that estimate to the workdays already lost and include this figure in the annual totals. No further entries are to be made with respect to such cases in the next year's log.

VI. Definitions OCCUPATIONAL INJURY is any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from an exposure involving a single incident in the work environment.

NOTE Conditions resulting from animal bites such as insect or snake bites or from one-time exposure to chemicals, are considered to be injuries.

OCCUPATIONAL ILLNESS of an employee is any abnormal condition or disorder, other than one resulting from an occupational injury caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion, or direct contact.

The following listing gives the categories of occupational illnesses and the orders that will be used for the purpose of classifying recordable illnesses. For purposes of information, examples of each category are given. These are typical examples, however, and are not to be considered the complete listing of the types of illnesses and disorders that are to be counted under each category.

- 7a. Occupational Skin Diseases or Disorders Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants, of some chronic ulcers, chemical burns or intertrigo, etc. 7b. Dust Diseases of the Lungs (Pneumoconiosis) Examples: Silicosis, asbestosis, coal worker's pneumoconiosis, byssinosis, anthracosis and other pneumoconiosis. 7c. Respiratory Conditions Due to Toxic Agents Examples: Pneumonitis, other pneumonitis, emphysema or acute bronchitis due to toxic dusts, gases, or fumes, formaldehyde, etc.

7d. Poisoning (Systemic Effect of Toxic Materials) Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals (including by lead in automobile battery acid); by other gases, vapors, or fumes; by organic solvents such as carbon tetrachloride, trichloroethylene, by inorganic solvents such as cyanide, cyanogen chloride, by other chemicals such as formaldehyde, pesticides, and herbicides.

7e. Disorders Due to Physical Agents (Other than Toxic Materials) Examples: Heatstroke, heat exhaustion, heat cramps, effects of environmental heat, lightning, lightning and other electrical effects, low frequency electric current effects, ultraviolet radiation (sunburn, skin cancer), effects of ionizing radiation (including high frequency rays, microwaves, ultrasound).

7f. Disorders Associated With Repetitive Trauma Examples: Non-infectious hand problems (tenosynovitis, carpal tunnel syndrome) and other repetitive strain injuries due to repetitive motion or vibration of products.

7g. All Other Occupational Illnesses Examples: Anemia, dermatitis, infectious hepatitis, malaria, and brucellosis, food poisoning, histoplasmosis, etc.

MEDICAL TREATMENT includes treatment other than first aid administered by a physician or by registered professional personnel in the standing orders of a physician. Medical treatment does NOT include and treatment long-term treatment and substantial observation of minor scratches, cuts, burns, splinters and so forth, which do not ordinarily require medical care (even though provided by a physician or registered professional personnel).

ESTABLISHMENT - A single physical location where business is conducted or where services or industrial operations are performed (for example, a factory, mill, store, hotel, restaurant, movie theater, farm, etc.) where separate activities are performed at a single physical location. If construction activities operated from the same physical location in a year, each activity shall be treated as a separate establishment.

For firms engaged in activities which may be physically dispersed such as agriculture, construction, transportation, communications, etc., records and summary reports must be maintained at a place where employees report each day.

Records for personnel who do not primarily report or work at a single establishment, such as traveling salesmen, technicians, employees, etc., may be maintained at the location in which they are sent or the base from which personnel operate to carry out their activities.

WORK ENVIRONMENT is comprised of the physical factors, equipment, materials, processes used, and the kinds of physical activities engaged in the course of an employee's work, whether or not all the employees are present.

DOE Form EV-102A (11-77) U.S. DEPARTMENT OF ENERGY  
SUMMARY OF DOE AND DOE CONTRACTOR OCCUPATIONAL INJURIES AND ILLNESSES  
REPORT PERIOD: FROM January 1, 1980 TO March 31, 1980

1. ORGANIZATIONAL UNIT: Department of Energy Northern California Operations Office  
2. ADDRESS OF REPORTING UNIT: Simpson Engineering Company P. O. Box 919 Livermore, CA 94550  
3. CONTRACTOR: Simpson Engineering Company  
4. CONTRACT NO.: 56477 ENG 60

5. TYPE OF OPERATION:  
 Government  Research  Cost-Plus Construction  Architect-Engineering  
 Production  Services  Lump-Sum Construction

6. TYPE OF REPORT:  
 Single Reporting Unit  Combined, all Contractor Units (same type of operation) with 25 or Fewer Employees  
 Combined, all Government and Contractor Units

INJURY AND ILLNESS CATEGORY	TOTAL CASES	DEATHS	LOST WORKDAY CASES				NONFATAL CASES WITHOUT LOST WORKDAYS	TERMINATIONS OR PERMANENT TRANSFERS			
			Total Lost Workday Cases	Cases Involving Days Away From Work	Days Away From Work	Days of Restricted Work Activity					
CATEGORY	CODE	Number of entries in col. 7 of the log (1)	Number of entries in col. 8 of the log (2)	Number of checks in col. 9 of the log (3)	Number of entries in col. 9A of the log (4)	Sum of entries in col. 9A of the log (5)	Sum of entries in col. 9B of the log (6)	Number of checks in col. 10 of the log (7)	Number of checks in col. 11 of the log (8)		
OCCUPATIONAL INJURIES	10	53	0	27	20	73	154	26	0		
Occupational Skin Diseases or Disorders	21	2	0	0	0	0	0	2	0		
Dust Diseases of the Lungs	22	<b>EXAMPLE</b>									
Respiratory Conditions Due to Toxic Agents	23										
Poisoning (Systemic Effects of Toxic Materials)	24										
Disorders Due To Physical Agents	25										
Disorders Associated with Repeated Trauma	26										
All Other Occupational Illnesses	29										
TOTAL - OCCUPATIONAL ILLNESSES (Sum of codes 21 through 29)	30	2	0	0	0	0	0	2	0--		
TOTAL	Year of Code 10 & Code 10)	PERIOD	31	55	0	27	20	73	154	28	0
	OCCUPATIONAL INJURIES AND ILLNESSES	YEAR-TO-DATE	32	55	0	27	20	73	154	28	0

( For this reporting period only )

AVERAGE NUMBER OF EMPLOYEES FOR THIS REPORTING PERIOD: 6,810  
TOTAL MAN-HOURS WORKED FOR THIS REPORTING PERIOD: 2,890,362  
CUMULATIVE MAN-HOURS WORKED (Year to Date): 2,890,362

I certify that the Summary of DOE and DOE Contractor Occupational Injuries and Illnesses is true and complete to the best of my knowledge.  
(Signature) Eugene B. Dunn  
(Title & Date) Safety Engineer 4/4/80

**SUMMARY OF OCCUPATIONAL INJURIES AND ILLNESSES**  
DOE Form EV-102 A

**APPLICATION** This form is to be completed as required by all organizational units (DOE Federal Government facilities) and by all DOE contractors. For contractors with 25 or fewer employees, the organizational unit may designate whether to submit separate forms for each or a single combined form for all such contractors. If a combined form is submitted, all of the combined contractors must have the same type of operation and the number of contractors involved should be stated in the space where the contractor's name is usually placed. The contract number is not filled in for a combined report.

**ATTACHMENTS** Copies of all DOE EV-101 forms for the current reporting period must be attached to the DOE Form EV-102 A when it is submitted.

**CORRECTIONS** Explanations of corrections to previous submittals of this form should be made on a separate sheet of plain paper and included with the DOE form which reflects those changes in the year-to-date totals line (code 32).

**REPORTING PERIOD** Fill in the dates of the reporting period for which all data on the form applies (except the code 32 line and the cumulative man hours, which are assumed to start from January 1).

**TYPE OF OPERATION** Check the appropriate box if the submission is for a single reporting unit. This section may be left blank for a combined report of Government and Contractor Units.

**TYPE OF REPORT** Check the box for a single reporting unit only if the form is for a single contractor or a single DOE Federal Government facility. The combined box for all government and contractor units should be checked if the form is for an organizational unit and its contractors. The last box may be used if the form is for a combined report of all contractors with 25 or fewer employees.

**DEFINITIONS** For definitions of terms used in this form's injury/illness section, see the back of form OSHA No. 100.

**POSTING REQUIREMENTS** A copy or copies of the calendar year summary must be posted at each establishment (organizational unit or contractor) in the place or places where notices to employees are customarily posted. This summary must be posted no later than February 1 and must remain in place until March 1.

**INSTRUCTIONS** for completing this form. All entries must be summarized from the log (OSHA No. 100) or its equivalent. Before preparing this summary, review the log to be sure that entries are correct and each case is included in only one of the following classes: deaths (date in column 8), lost workday cases (check in column 9), or nonfatal cases without lost workdays (check in column 10). If an employee's loss of workdays is continuing at the time the summary is being made, estimate the number of future workdays he will lose and add that estimate to the workdays he has already lost and include this total in the summary. No further entries are to be made with respect to such cases in the next year's summary.

Occupational injuries and the seven categories of occupational illnesses are to be summarized separately. Identify each case by the code in column 7 of the log of occupational injuries and illnesses. The summary from the log is made as follows.

**BE SURE TO COUNT ONLY THOSE CASES FROM THE LOG WHICH ARE FOR THE CURRENT REPORTING PERIOD**

A. For occupational injuries identified by a code 10 in column 7 of the log form, make entries on the line for code 10 of this form.

Column 1—Total Cases. Count the number of entries which have a code 10 in column 7 of the log. Enter this total in column 1 of this form. This is the total of occupational injuries for the year.

Column 2—Deaths. Count the number of entries (date of death) for occupational injuries in column 8 of the log.

Column 3—Total Lost Workday Cases. Count the number of checks for occupational injuries in column 9 of the log.

Column 4—Cases Involving Days Away From Work. Count the number of entries for occupational injuries in column 9A of the log.

Column 5—Days Away From Work. Add the entries (total days away) for occupational injuries in column 9A of the log.

Column 6—Days of Restricted Work Activity. Add the entries (total of such days) for occupational injuries in column 9B of the log.

Column 7—Nonfatal Cases Without Lost Workdays. Count the number of checks for occupational injuries in column 10 of the log.

Column 8—Terminations or Permanent Transfers. Count the number of checks for occupational injuries in column 11 of the log.

**CHECK:** If the totals for code 10 have been entered correctly, the sum of columns 2, 3, and 7 of this form will equal the number entered in column 1 of this form.

B. Follow the same procedure for each illness code, entering the totals on the appropriate line of this form.

C. Add the entries of codes 21 through 29 in each column for occupational illnesses and enter totals on the line for code 30.

D. Add the entries for codes 10 and 30 in each column and enter totals on the line for code 31.

E. Add together code 31 line entries from this summary and the previous reporting period summary (unless this is the first summary for the year) and enter the totals on the line for code 32.

**CHECK:** If the summary has been made correctly, the entry in column 1 of the year-to-date total line (code 32) of this form will equal the total number of cases on the log for all reporting periods this year.

F. For combined reports of more than one unit, add together the individual DOE EV-102 A forms submitted by each unit to obtain the figures for the combined form.

**ON THE LINES PROVIDED,** enter the average number of employees and the total man-hours worked for this reporting period as well as the cumulative man-hours worked for the year.

The person responsible for the preparation of the summary shall certify that it is true and complete by signing the statement on the form.

**RECORDABLE CASES** You are required to record information about every occupational death, every nonfatal occupational illness and three nonfatal occupational injuries which involve one or more of the following: loss of consciousness, loss of consciousness, restriction of work or motion, transfer to another job, or medical treatment (other than first aid).  
More complete definitions appear on the other side of this form.

**LOG OF FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES**

Use this form for Civilian Personnel (X) Military (Non-combat Personnel) ( )

CASE OR FILE NUMBER	DATE OF INJURY OR ONSET OF ILLNESS	EMPLOYEE'S NAME (First name or initial, middle initial, last name)	OCCUPATION (Enter regular job title, not activity unless not performing when injured or onset of illness.)	DEPARTMENT (Enter department in which the employee is regularly employed.)	Nature of Injury or Illness and Part(s) of Body Affected (Typical codes for this column might be: Amputation of 1st joint right forefinger; Scald of lower back; Contact dermatitis on both hands [Electroshock-body].)	Injury or Illness Code (See codes on bottom of page)	DEATHS (Enter date of death.)	LOST WORKDAY CASES			NONFATAL CASES WITHOUT LOST WORKDAYS (Enter a check if the entry was made on columns 8 or 9 but the case is not reportable as defined above.)	TERMINATIONS OR PERMANENT TRANSFERS (Enter a check if the entry in columns 8 or 9 represented a termination or permanent transfer.)
								Enter a check if case involved lost workdays	Enter number of days AWAY FROM WORK due to injury or illness	Enter number of days of RESTRICTED WORK ACTIVITY due to injury or illness.		
F-1	1/10/80	E. L. Bagley	Bus Driver	Transportation	Right lumb, sacral strain	10	-	✓	9	0	-	-
F-2	1/12/80	A. S. LaGrange	Nurse	Medical	Abrasion left knee, swollen right knee, tender with movement	10	-	✓	1	0	-	-
F-3	1/14/80	C. W. Fowler	Laborer	enac	umbro						✓	
F-4	1/17/80	B. R. Collier	Bus Driver	Transportation	Bruised right shin and knee, Pain in back and hip	10	-					✓
F-5	1/21/80	J. M. Thomas	Cook	Service	1st - 2nd degree burns	10	-					✓
F-6	2/1/80	C. B. Tilden	Service Station Attendant	Transportation	Pain in right shoulder	10	-	✓	0	2	-	-
F-7	2/3/80	F. H. Palmateer	Cook	Service	Deep laceration, left arm	10	-					✓
F-8	2/22/80	T. L. Carson	Painter	Maintenance	Lower lumbar pain	10	-	✓	3	2	-	-
F-9	3/10/80	B. A. Turner	Equipment Operator	Production	Muscle spasm, right shoulder	10	-	✓	0	1	-	-
F-10	3/17/80	R. S. Story	Bus Driver	Transportation	Sprained right ankle	10	-	✓	4	0	-	-
F-11	4/26/80	C. L. Knowles	Mechanic	Maintenance	1 1/4" laceration, third finger, left hand	10	-					✓
F-12	6/23/80	S. L. Conway	Bus Driver	Transportation	Pain in down left leg							

**EXAMPLE**

- |   |                          |  |
|---|--------------------------|--|
| Department of Energy                          | Injury Code              | Illness Code   |
| (Special Agency and Federal Institution Code) | 10 Occupational Injuries | 21 Occupational skin diseases of all kinds                       |
| (Public Utility & Federal Institution Code)   |                          | 22 Dust diseases of the lungs (pneumoconiosis)                   |
|   |                          | 23 Respiratory conditions due to toxic agents                    |
|   |                          | 24 Poisoning (Systemic effects of toxic materials)               |
|   |                          | 25 Disorders due to physical agents (other than toxic materials) |
|   |                          | 26 Disorders due to repeated trauma                              |
|   |                          | 29 All other occupational illnesses                              |

## DEFINITIONS OF TERMS FOR USE IN RECORDING FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES

**OCCUPATIONAL INJURY** is any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from exposure to the work environment.

**OCCUPATIONAL ILLNESS** is any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with his employment. It includes acute and chronic illnesses or diseases which may be caused by inhalation, absorption, ingestion or direct contact and which can be included in the categories listed below.

The following listing gives the categories of occupational illnesses and disorders that will be utilized for the purpose of classifying recordable illnesses. The identifying codes are those to be used in Column 7 of the log. For purposes of information, examples of each category are given. These are typical examples, however, and are not to be considered to be the complete listing of the types of illnesses and disorders that are to be counted under each category.

- (21) Occupational Skin Diseases or Disorders  
Examples: Contact dermatitis, eczema, or rash caused by primary irritants and sensitizers or poisonous plants, ulcers, chronic ulcers; chemical burns or inflammations, etc.
- (22) Dose Diseases of the Lungs (Pneumoconiosis)  
Examples: Silicosis, asbestosis, coal worker's pneumoconiosis, byssinosis, and other pneumoconioses.
- (23) Respiratory Conditions Due to Toxic Agents  
Examples: Pneumonitis, pharyngitis, rhinitis or acute conjunctivitis due to chemicals, dusts, gases, or fumes; farmer's lung, etc.
- (24) Poisoning (Systemic Effects of Toxic Materials)  
Examples: Poisoning by lead, mercury, cadmium, arsenic, or other metals; poisoning by carbon monoxide, hydrogen sulfide or other gases; poisoning by benzol, carbon tetrachloride, or other organic solvents; poisoning by insecticide sprays such as parathion, lead arsenate; poisoning by other chemicals such as formaldehyde, plastics and resins, etc.
- (25) Disorders Due to Physical Agents (Other Than Toxic Materials)  
Examples: Heatstroke, heatstroke, heat exhaustion and other effects of environmental heat, freezing, frostbite and

effects of exposure to low temperatures, carbon disease, effects of ionizing radiation (x-rays, gamma rays), effects of nonionizing radiation (including flash, ultraviolet rays, microwaves, infrared), etc.

- Disorders Due to Repeated Trauma  
Examples: Noise-induced hearing loss, synovitis, tenosynovitis, and bursitis, Raynaud's phenomenon, and other conditions due to repeated motion, vibration or pressure.

- All Other Occupational Illnesses  
Examples: Anthrax, brucellosis, infectious hepatitis, malignant and benign tumors, food poisoning, histoplasmosis, toxocariasis, etc.

**RECORDABLE OCCUPATIONAL INJURIES AND ILLNESSES** are any occupational injuries or illnesses which result

in FATALITIES, regardless of the time between the injury and death, or the length of the illness; or

2. LOST WORKDAY CASES; other than fatalities that result in lost workdays; or

3. NONFATAL CASES WITHOUT LOST WORKDAYS, which result in transfer to another job or termination of employment, or require medical treatment (as defined below), or involve loss of consciousness or restriction of work or motion. This category also includes any drug related occupational illnesses which are reported to the Agency but are not classified as fatalities or lost workday cases.

**MEDICAL TREATMENT** includes treatment administered by a physician or by registered professional personnel under the written orders of a physician. Medical treatment does NOT include first aid treatment (one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care) even though provided by a physician or registered professional personnel.

**ESTABLISHMENT** A single physical location where business is conducted or where services or industrial operations are performed (for example: warehouse, or central administrative office). Where distinctly separate activities are performed at a single physical location (such as contract construction activities performed from the same physical location as a lumber yard), each activity shall be treated as a separate establishment. Agencies engaged in activities such as agriculture, construction, transportation, communications, and electric, gas and water services, which may be physically dispersed, records may be maintained at a place to which employees report each day. Records for personnel who do not primarily report to work at a single establishment, such as traveling technicians, engineers, etc., shall be maintained at the location from which they are paid or the base from which personnel operate to carry out their business.

**WORK ENVIRONMENT** is comprised of the physical location, equipment, materials processed or used, and the kinds of operations performed by an employee in the performance of his work, whether on or off the Agency's premises.

## INSTRUCTIONS FOR COMPLETING LOG OF FEDERAL OCCUPATIONAL INJURIES AND ILLNESSES (OSHA FORM NO. 100F)

**Column 1—CASE OR FILE NUMBER**  
Any number may be entered which will facilitate comparison with supplementary records.

**Column 2—DATE OF INJURY OR ILLNESS**  
For occupational injuries enter the date of the work accident which resulted in injury. For occupational illnesses enter the date of initial diagnosis of illness, or, if absence occurred before diagnosis, the first day of the absence in connection with which the case was diagnosed.

**Column 3—EMPLOYEE'S NAME**  
**Column 4—OCCUPATION**  
Enter the occupational title of the job to which the employee was assigned at the time of injury or illness. In the absence of a formal occupational title, enter a brief description of the duties of the employee.

**Column 5—DEPARTMENT**  
Enter the name of the department in which employee was assigned at the time of injury or illness, whether or not employee was actually working in that department at the time. In the absence of formal department titles, enter a brief description of normal workplace to which employee is assigned.

**Column 6—NATURE OF INJURY OR ILLNESS AND PART(S) OF BODY AFFECTED**  
Enter a brief description of the injury or illness and indicate the part or parts of body affected. Where entire body is affected, the entry "body" can be used.

**Column 7—INJURY OR ILLNESS CODE**  
Enter the one code which most accurately describes the nature of injury or illness. A list of codes appears at the bottom of the log. A more complete description of occupational injuries and illnesses appears below in "DEFINITIONS."

**Column 8—FATALITIES**  
If the occupational injury or illness resulted in death, enter date of death.

**Column 9—LOST WORKDAY CASES**  
Enter a check for each case which involves days away from work, or days of restricted work activity, or both. Each lost workday case also requires an entry in column 9A or column 9B, or both.

**Column 9A—LOST WORKDAYS—DAYS AWAY FROM WORK**  
Enter the number of workdays (consecutive or not) on which the employee would have worked but could not because of occupational injury or illness. The number of lost workdays

should not include the day of injury or onset of illness, nor any days on which the employee would not have worked (e.g., through able to work).

**NOTE:** For employees not having a regularly scheduled schedule (e.g., certain truck drivers, construction workers, part-time employees, etc.) it may be necessary to estimate the number of lost workdays. Estimates of lost workdays shall be based on prior work history of the employee and days worked by employees not ill or injured, working in the department and/or occupation of the ill or injured employee.

**Column 9B—LOST WORKDAYS—DAYS OF RESTRICTED WORK ACTIVITY**

Enter the number of workdays (consecutive or not) on which because of injury or illness:

- 1) the employee was assigned to another job on a temporary basis;
- 2) the employee worked at a permanent job less than full time, or
- 3) the employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The number of lost workdays should not include the day of injury or onset of illness or any days on which the employee would not have worked even though able to work.

**Column 10—NONFATAL CASES WITHOUT LOST WORKDAYS**

Enter a check in Column 10 for all cases of occupational injury or illness, which did not involve fatalities or lost workdays but did result in:

- Transfer to another job or termination of employment; or
- Medical treatment, other than first aid, or
- Diagnosis of occupational illness, or
- Loss of consciousness, or
- Restriction of work or motion.

**Column 11—TRANSFER TO ANOTHER JOB OR TERMINATION OF EMPLOYMENT WITHOUT LOST WORKDAYS**

If the check in Column 10 represented a transfer to another job or termination of employment with no lost workdays, enter another check in Column 11.

**INITIALING REQUIREMENT**

Each line entry regarding an occupational injury or illness must be initialed in the right hand margin by the person responsible for the accuracy of the entry. Changes to an entry also must be initialed in the affected column.

**CHANGES IN EXTENT OF OR OUTCOME OF INJURY OR ILLNESS**

If there is a change in an occupational injury or illness case which affects entries in Columns 9, 10, or 11, the first entry should be lined out and a new entry made. For example, if an injured employee at first required only medical treatment but later lost workdays, the check in Column 10 should be lined out and the number of lost workdays entered in Column 9.

In another example, if an employee with an occupational illness lost workdays, returned to work, and then died of the illness, the workdays noted in Column 9 should be lined out and the date of death entered in Column 8.

An entry may be lined out if later found to be a nonoccupational injury or illness.

U.S. DEPARTMENT OF ENERGY  
**TERMINATION OCCUPATIONAL EXPOSURE  
 REPORT**

Fusion Research Laboratory R. Carrington  
 P. O. Box 1605 2/4/80 319-255-3131  
 Cupertino, California 94553

KEYPUNCH  
 COLS. 13 & 06-78  
 IN ALL CARDS

1 SOCIAL SECURITY NO								
1	6	2	1	0	3	4	7	7
2								

6 CONTRACTOR CODE													
0	1	-	0	0	-	4	3	7	2	-	1	0	C
78	79												

**EXAMPLE**

7 HIRE				3 NAME										4 BIRTH		5 TERM							
M	M	D	Y	FIRST					LAST					M	M	D	Y	M	M	D	Y		
0	9	0	7	C	L	A	R	E	N	C	E	F	W	I	L	L	I	A	M	S			
10				21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

8 BEGIN				9 END				11	11 EXTERNAL EXPOSURE				12 13												
M	M	D	Y	M	M	D	Y	AREA EXP.					TYPE	TYPE											
0	9	1	5	7	4	1	2	0	9	7	9	W	B												
18				19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

14 BEGIN				15 END				8	17 INTERNAL EXPOSURE				18 19 20 21				22 23												
M	M	D	Y	M	M	D	Y	ORGAN CODE					METH	DOSE	ORGAN	CODE	LINE	NUCLIDES	ILLJ	TYPE	TYPE								
0	9	1	5	7	4	1	2	0	9	7	9	1	8	0	0	0	I	V	E	A	M	2	4	1					
10				11					31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	

INSTRUCTIONS FOR COMPLETING DOE F 5484.1  
Termination Occupational Exposure Report

1. GENERAL INSTRUCTIONS

- a. Pursuant to DOE F 5484.1, a Termination Exposure Report summarizing whole body exposures recorded during the period of employment by DOI and DOE contractor shall be prepared upon termination.
- b. Please print all information. The letter 'O' should be printed '0' to differentiate it from the number zero. Similarly, the letter 'Z' should be printed '2' to differentiate it from the number '2'. Several of the data items require data to be right justified (R.J.), written from the right hand side of the field, while others require data to be left justified (L.J.), written from the left hand side of the field. All months and days should be represented by two-digit numbers (e.g., September 1, 1941, should be written, 09-03-41).
- c. Only one character per indicated space is allowed. Do not use more than the allotted spaces on the form.
- d. PREPARED BY, DATE, ORGANIZATION, AND ADDRESS—This information is for reference, should future verification be required from the individual who originally encoded the summary information. If cards or tapes are submitted, this portion of DOE F 5484.1 should be completed and submitted with them.
- e. For each individual reported, there must be identification data ('1' in column 80) and either external exposure data ('2' in column 80) or internal exposure data ('3' in column 80). The '2' or '3' cards, as many as necessary, should be grouped and follow the '1' card when transmitted to assure that all exposure data for an individual is reported.

2. SPECIFIC INSTRUCTIONS

- a. SOCIAL SECURITY NUMBER Enter social security number of individual being reported. Use the word "none" for individuals without a social security number and "unknown" for those who refuse to reveal it. In either case, the entry should be left justified.
- b. HIRE Enter date the individual was hired. For visitors, hire dates are not required.
- c. NAME Enter the last name of the individual starting in column 22, the middle initial in column 37, and the last name starting in column 38. If there is no middle initial, leave that box blank.
- d. BIRTH Enter birthdate of individual.
- e. TERMINATION Enter the date the individual was terminated. For visitors, the end exposure date will be the same as the termination date.
- f. CONTRACT CODE A unique identifier assigned to each contractor and DOI office reporting to the Radiation Exposure System. The code should be left justified in the field with hyphens included and spaces trailing. This section and item 7, Type, must always be completed and consistent for all cards (1 through 3).
- g. TYPE Enter alphabetic character to indicate type of organization:
  - (1) 'C' - DOE Contractor
  - (2) 'O' - DOI Office
- h. BEGIN Enter beginning monitoring date of exposure for external exposure reports.

- i. END: Enter ending monitoring date of exposure for external exposure reports.
- j. AREA EXP Enter 2-character code to indicate the area of exposure:
 

(1) 'WB' = Whole Body	(5) 'EX' = Extremity
(2) 'SK' = Skin	(6) 'EY' = Eye
(3) 'HN' = Hands	(7) 'HD' = Head
(4) 'FA' = Forearms	(8) 'GN' = Glands
- k. EXTERNAL EXPOSURE Indicate the total dose in RIMS that was recorded for the specified part of body during the indicated period of exposure, use seven digits, three decimal positions. If the total dose was recorded as being minimal (i.e., less than measurable by the monitoring system employed), place an 'M'. Right justify data and omit the decimal point, e.g., code 1.252 as 1252.
- l. TYPREC Always equal 'T' for terminated employees. Always equal 'V' for report of visitor exposure.
- m. TYPEXP Always equal 'E' for external.
- n. BEGIN Enter beginning date of exposure for internal exposure reports.
- o. END: Enter ending date of exposure for internal exposure reports.
- p. ORGAN CODE Enter 2-digit code to indicate organ affected:
 

(1) Lung	28	(8) Liver	56
(2) Bone	11	(9) Testes	78
(3) Digestive System	50	(10) Prostate	77
(4) Whole Body	00	(11) Thyroid	96
(5) Kidney	71	(12) Ovary	87
(6) Spleen	07	(13) Muscle	13
(7) Pancreas	59	(14) Adrenal Gland	93
- q. INTERNAL EXPOSURE Enter estimate of internal disposition: seven digits, three decimal positions (right justify numbers omit the decimal point, e.g., code 45.252 as 45252). If the total dose was recorded as being minimal (i.e., less than measurable by the monitoring system employed), place an 'M'.
- r. METH. DOSE Method of determining dose:
  - (1) B - Bioassay
  - (2) IV - In-vivo count
- s. ORGAN CODE Second organ code (see number 16, if required)
- t. UNITS Unit of measure codes:
 

(1) Microcuries	'C'	(4) ' of Lung Burden	'G'
(2) Micrograms	'D'	(5) ' of Thyroid Burden	'H'
(3) ' of Body Burden	'F'	(6) ' of Kidney Burden	'L'
- u. NUCLIDE Enter the deposited nuclide(s), left justified. Use the proper isotope notation as listed in the Table, order DOE F 5480.1 Chapter XI, omitting hyphens and spacing. If the dose resulted from a mixture of nuclides, list the major contributors consecutively (i.e., Cesium 137 and Cobalt 60 would be coded CS137CB60).
- v. TYPREC Always equal 'T' terminated employees. Always equal 'V' for report to visitor exposure.
- w. TYPEXP Always equal 'I' for internal.

DOE F 5484.1  
2-801

U.S. DEPARTMENT OF ENERGY  
AIRCRAFT ACCIDENT/INCIDENT PRELIMINARY REPORT

INSTRUCTIONS: (1) To be completed as soon as possible by the assigned DOE or DOE contractor accident investigator  
(2) Forward one copy to the head of the field organization safety division or office and one copy to the Director, Office of Operational and Environmental Safety, DOE Headquarters.

A. ACCIDENT/INCIDENT DATA

1. FROM (office of origin)	2. TO	3. DATE	4. TIME (local)
Rocky Mountain Operations Office	DOE Headquarters EV-134	April 20, 1980	Unknown

5. INFORMATION FROM

6. REGISTRATION NUMBER N 3624	7. MAKE AND MODEL Cessna C 100	8. OPERATOR OF AIRCRAFT Atlas Aviation
9. TYPE OF ACTIVITY (air taxi, instruction, pleasure, business, executive, cargo) IF KNOWN Business		

10. BRIEF DESCRIPTION OF CIRCUMSTANCES SURROUNDING THE OCCURRENCE

Aircraft departed Markel Airport at 0916 20 April, 1980; did not arrive at destination, declared overdue and missing 1141 20 April. Subsequent search discovered wreckage and bodies approximately 100 feet below peak of Mt. Mason.

**EXAMPLE**

11. WEATHER DATA:

Scattered clouds 10,000 feet

12. AIRCRAFT DAMAGE:  Demolished  Substantial  Minor  Fire  None

13. NUMBER OF INJURIES OF OCCUPANTS AND NON-OCCUPANTS	NONE	MINOR	SERIOUS	FATAL
				2

14. NAME AND ADDRESS OF PILOT Colin Ferguson	15. NAMES OF CREW None	16. NUMBER OF PASSENGERS 1
---	---------------------------	-------------------------------

17. LOCATION OF OCCURRENCE (Nearest city, town and state) (Give route if overdue or missing)

Copinsburg, Colorado

18. DATE AND TIME OF OCCURRENCE

20 April, 1980 Time unknown

19. INFORMATION ON COVERAGE OF OCCURRENCE BY FAA, NTSB, OTHERS

B. FAA AIR TRAFFIC SERVICES SUMMARY OF FLIGHT HANDLING

1. LAST DEPARTURE POINT Markel Airport	2. DATE AND TIME 20 April 1980	3. INTENDED DESTINATION Buford Airport, Colorado
---	-----------------------------------	---

4. LAST RADIO CONTACT (POSITION AND/OR RADAR POSITION)  
1037

5. LAST ATC CONTROL CLEARANCE  
1030

6. FLIGHT PLAN  IFR  VFR  None  Unknown

7. PILOT BRIEFING  Yes  No  Unknown

8. OTHER

REGISTRATION OR IDENTIFICATION NUMBER N-3624		MAKE AND MODEL Conair C 1000		DATE OF ACCIDENT/INCIDENT 20 April, 1980	
<b>C. PRIORITY PROCEDURES</b>					
1. <input type="checkbox"/> Human Safety		2. <input checked="" type="checkbox"/> Contractor and DOE Notified		3. <input checked="" type="checkbox"/> NTSB/FAA Notified	
4. <input type="checkbox"/> Passengers (arrange for accommodations or continued transportation as necessary)					
5. <input checked="" type="checkbox"/> Wreckage (arrange for protection and for removal after NTSB clearance)					
6. <input type="checkbox"/> Secure Hazardous or Classified Cargo					
<b>D. CONTRACTOR AND DOE, NTSB/FAA INITIAL NOTIFICATION</b>					
1. AIRCRAFT TYPE Conair C 1000		2. N NUMBER 3624		3. AIRCRAFT NATIONALITY USA	
				4. AIRCRAFT OPERATOR Atlas Aviation	
5. AIRCRAFT OWNER Department of Energy		6. PILOT IN COMMAND Colin Ferguson		7. ACCIDENT/INCIDENT TIME Unknown	
		8. LAST DEPARTURE POINT Market Airport New Mexico		9. NEXT EXTENDED LANDING POINT Buford Airport Colorado	
10. AIRCRAFT WRECKAGE POSITION Mt. Moran, Colorado		11. NUMBER PERSONS ABOARD Crew 1 Passengers 1		12. NUMBER OF Injuries 0	
		13. WEATHER Fatalities 2 VFR X IFR    Vis.    Wind    Cell.			
14. EXTENT OF DAMAGE Demolished		15. DANGEROUS ARTICLES ABOARD None		16. TYPE OF FLIGHT (check one) <input type="checkbox"/> Cargo <input type="checkbox"/> Trng. <input checked="" type="checkbox"/> Pass.	
17.a. NAME OF NTSB, FAA AGENT, CONTRACTOR/DOE OFFICIAL NOTIFIED T. C. Charles				17.b. DATE AND TIME OF NOTIFICATION 1340 20 April, 1980	
<b>E. CONTRACTOR NOTIFICATION CHECKLIST (Business and home telephone numbers)</b>					
1. <input checked="" type="checkbox"/> Chief Pilot (Business) 216-343-6817 (Home) 216-410-5115		2. <input type="checkbox"/> Chairman of Board (Business) _____ (Home) _____			
3. <input type="checkbox"/> President (Business) _____ (Home) _____		4. <input type="checkbox"/> Chief of Maintenance (Business) _____ (Home) _____			
5. <input type="checkbox"/> P R Department (Business) _____ (Home) _____		6. <input type="checkbox"/> Contractor Attorney (Business) _____ (Home) _____			
7. <input type="checkbox"/> Contractor Insurance (Business) _____ (Home) _____		8. <input type="checkbox"/> Contractor Answering Service Briefed			
9. <input type="checkbox"/> Other Key Personnel (Title) E. F. Moses, Manager (Business) 216-410-6744 (Home) 216-342-1035 (Title) _____ (Business) _____ (Home) _____					
1. RECEIVED AT Center Emergency Information		2. DELIVERED TO Aviation Safety Division		3. DATE 20 April 1980	
4. RECEIVED BY (Signature and Title) L. T. Farley Emergency Information Coordination		6. DATE 20 April 1980		7. TIME 1635	
8. RECEIVED VIA <input type="checkbox"/> In Person <input type="checkbox"/> Radio <input checked="" type="checkbox"/> Telephone					

DOE F 5484.2  
② 807  
DOE F 5484.1

U.S. DEPARTMENT OF ENERGY

**AIRCRAFT ACCIDENT/INCIDENT RECORD**

**A - GENERAL IDENTIFICATION (WHAT, WHERE, WHEN)**

1. CATEGORY - 135 Aircraft <input type="checkbox"/> Large Aircraft		2. AGENCY AIRCRAFT <input type="checkbox"/> Owned <input type="checkbox"/> Rented		3. TYPE OCCURRENCE <input type="checkbox"/> Accident <input type="checkbox"/> Incident	
4. AIRCRAFT MAKE AND MODEL Conair C 1000		5. REGISTRATION MARK N-3624		6. LOCATION OF ACCIDENT (City, County, State) Copinsburg, Colorado	
7. NAME OF OPERATOR Atlas Aviation		a ADDRESS OF OPERATOR Three Mile Road Brunswick, New Mexico		9. DATE April 20, 1980	10. TIME (local) Unknown

**- B - NARRATIVE (Explanations- Remarks)**

Aircraft departed Markel Airport at 091620 April, 1980. Did not arrive at destination, declared overdue and missing 1141 20 April. Subsequent search discovered wreckage and bodies approximately 100 feet below peak of Mt. Moran.

**EXAMPLE**

(Continue on additional sheet when necessary)

C - PERSONS INVOLVED						D - DAMAGE			
		1. Passenger	2. Flt. Crew	3. Cabin Crew	4. Grnd. Crew	5. Public	6. Total		
ABOARD		1	1				2	1. Minor	YES/NO
INJURED		/	/	/	/	/	/	2. Substantial	
DECEASED		1	1				2	3. Demolished	✓
								4. Fire after impact	
								5. Property damage	
								6.	

F - AIRCRAFT OPERATION									
1. TYPE OF OPERATION	2. FLT. NO.	3. OPERATION CONDUCTED UNDER FAR		4. PHASE OF FLIGHT	GROUND TAXI	TAKEOFF CLIMB	LEVEL OFF	DESCENT	APPROACH LANDING

F - AIRPORT				
1. NAME OF AIRPORT	2. RUNWAY NUMBER	3. RUNWAY LENGTH	4. ELEVATION	5. RUNWAY TEMP.

5. REMARKS (Condition of runway - ice, snow, lighting, etc.)  
Not Used

G - WEATHER							
1. STATION	2. TIME	3. SKY CONDITION	4. VIS.	5. RESTRICTIONS TO VIS.	6. TEMP.	7. D.P.	8. WIND
Markel Airport	1000	10,000 Scattered	6 mi.	None	46	210	4 kts

9. REMARKS (SIGMETs, advisories, prepac, turbulence, trends, etc.)

H - AIR TRAFFIC CONTROL										
1. CONTROL/COMMUNICATION FACILITY				2. CLEAR/FLT. PLAN			3. TYPE OF APPROACH			
TOWER	CENTER	FSS	IFR	NONE	ILS FRONT	VOR	VOR/DME	PAR		
OTHER (explain)				UNICOM	NONE X	ILS BACK	ADF	ASR	VISUAL	
4. RADAR		5. DEPARTED		DESTINATION						
IN AREA OF COVERAGE		Markel Airport 0916		FOR Buford Airport AT Z						
UNDER CONTROL		6. LAST COMMUNICATION (Position, time, altitude)		Markel Airport Time 0916 Altitude 000 feet						

I - CREW HISTORY (Who)

1. Pilot in Control <input checked="" type="checkbox"/> PIC <input type="checkbox"/> SIC		2. Seat Occupied <input checked="" type="checkbox"/> Left <input type="checkbox"/> Right		3. Name of VIP or Newsworthy Aboard None	
A. Name of Pilot in Command Colin Ferguson		B. Date of Birth 6/17/36		5.A. Name of Second in Command None	
5. Domicile (city and state) Hyattstown, Colorado		C. Domicile (city and state)			
D. Certificate - Grade, Number and Rating Airline, Multi-engine land 6033498			D. Certificate - Grade, Number and Rating		
E. Total Time 3277 hrs.	F. Time in Equip. 241 hrs.	G. Medical - Class, Date 1st 12/31/79	E. Total Time	F. Time in Equip.	G. Medical - Class, Date
4. Profic. Check - Date 6/24/79	I. Line Check - Date 9/3/79	J. Duty Time - 24 Hrs. None	H. Profic. Check - Date	I. Line Check - Date	J. Duty Time - 24 hrs.

J - FACTORS INVOLVED

(Check applicable box)	YES	NO	(Check applicable box)	YES	NO	(Check applicable box)	YES	NO
<b>TAKEOFF/LANDING</b>			<b>COLLISION</b>			<b>CONTROL AFFECTED</b>		
1. Unscheduled landing			18. Near midair			32. Inflight (incl. takeoff & landing)		
2. Forced emergency landing			19. Midair between aircraft			33. Ground		
3. Landed short of runway - 500 feet or LESS			20. Midair with obstruction			34. Off taxiway/ramp while taxing		
4. Landed short of runway - 500 feet or MORE			21. Ground - Aircraft, other object, person		X	35. Unable/unsafe to taxi (install pins, tow, etc.)		
5. Landed on wrong airport			22. Bird(s)			<b>MISCELLANEOUS</b>		
6. Landed on wrong runway			<b>PRESSURE VESSEL</b>			38. Structural failure		
7. Overran departure end of runway			23. Explosive decompression			37. Loss/separation of part(s)		
8. Off side of runway			24. Cabin pressure/temperature			38. Cargo containment/restraint		
9. Rejected takeoff			26. Passenger oxygen masks extended			39. Lightning strike		
10. Mercy landing (incl. passeng. crew)			27. Ruptured/pierced (prop. turbine, etc.)			40. Turbulence		
<b>EMERGENCIES</b>			<b>FIRE</b>			41. Powerplant shutdown		
11. Declared			28. Inflight			42. Non-routine pass. off loading		
12. Descent			29. Ground (refueling, APU, etc.)			43. Crew member incapacitation		
13. Collision avoidance maneuver			30. Smoke/fumes in cockpit or cabin			44. Runway blocked		
14. Evacuation			31. Fire warning			45. Air security (hijack, bomb threat, sabotage, etc.)		
15. Fire and rescue alert						46. Public protection		
16. Fire and rescue action						47. Passenger disturbance (unruly passenger, etc.)		
17. Other emergency/alternate/Abnormal action (specify)						48. Public complaint (noise, low flying, etc.)		
						49. Parachute incident		

EXAMPLE

K - MALFUNCTIONS/FAILURES

(Check applicable box)	YES	NO	(Check applicable box)	YES	NO
1. Flight controls			8. Communication		
2. Lift/drag devices			9. Propulsion (engine, props, fuel, reversers, etc.)		
3. Flight instruments (alt., air speed, gyro, etc.)			10. Hydraulic system		
4. Other instruments/gages (press., temp., qty., etc.)			11. Landing gear (wheels, brakes, tires, doors, etc.)		
5. Other indicators (gear, doors, horns, lights, etc.)			12. Electrical system		
6. Emergency equip. (seats, slides, oxygen, exting., etc.)			13. Pressurization system		
7. Navigation systems			14. Other (specify)		
15. Components involved (engine make and model, part name and numbers)					

L - INVESTIGATION

1. NTSB/FAA NOTIFIED <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	2. RECORDER REVIEW A. FLIGHT <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO B. VOICE <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	3. EXTENT OF INVESTIGATION <input type="checkbox"/> OFFICE <input checked="" type="checkbox"/> SCENE	4. SOURCE OF INFORMATION <input checked="" type="checkbox"/> ATC <input type="checkbox"/> OPERATOR <input type="checkbox"/> SURVEILLANCE <input type="checkbox"/> OTHER (specify)
5. RELATED REPORTS <input type="checkbox"/> MRR <input type="checkbox"/> M or D <input checked="" type="checkbox"/> NONE	6. NTSB/FAA INVESTIGATOR R. Weissching	7. DOE COORD. INVESTIGATOR L. T. Farley	

M - DISPOSITION

1. REPORT SUBMITTED BY (Signature) L. T. Farley	2. OFFICE ASD	3. DATE 4/20	4. RECEIVED Field Safety Div. Date: 4/20/Int. 4/20	OESD HQ Date: 4/20/Int. 4/20	DIST. OF REPORT List
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U.S. DEPARTMENT OF ENERGY

ANNUAL SUMMARY OF WHOLE BODY EXPOSURES TO IONIZING RADIATION

PUNCH COLS.  
1-16 IN ALL  
THREE CARDS  
(A, B, AND C)

1	EMPLOYEE											(L J)		
TYPE	CONTRACT CODE											FACIL. CODE		
1	0	1	0	0	0	1	2	1	0	0	2	14	15	16

ORGANIZATION	PREPARED BY		
Fusion Research Laboratory	R. Carrington		
ADDRESS	DATE	AREA CODE	PHONE
P. O. Box 1605	2/4/80	319-265-	3131
Cupertino, California 94553			

EXAMPLE

CARD	2 YR	3 TOTAL	4. NUMBER OF INDIVIDUALS WITH DOSE IN EACH RANGE - REM																(R J)
	CY	NUMBER	None	0-100	100-200	200-400	400-700	700-900	1,000-1,999	2,000-2,999	3,000-3,999	4,000-4,999	5,000-5,999	6,000-6,999	7,000-7,999	8,000-8,999	9,000-9,999	10,000-10,999	
A	79	491	450	5	10	3	1	1											
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	

B	4 (CONTINUED)																(R J)	5. ACTUAL VALUES OF EXPOSURES - 12 00			
																		VALUE 1	VALUE 2	VALUE 3	VALUE 4
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			

C	6. OTHER FACILITY TYPE																(L J)	
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

- FACILITY TYPES
- 02 REACTOR
  - 04 FUEL FABRICATION
  - 08 URANIUM ENRICH
  - 10 WEAPONS FAB. & TEST
  - 14 GENERAL RESEARCH
  - 16 ACCELERATOR
  - 40 OTHER\*
  - 88 VISITORS
  - 99 DOE OFFICES

ANNUAL SUMMARY OF WHOLE BODY EXPOSURES TO IONIZING RADIATION

1. GENERAL INSTRUCTIONS

- a. Pursuant to DOE 5484.1, an annual report summarizing internal body exposures recorded during the previous calendar year for DOE and DOE contractor employees in the course of DOE activities and for visitors to DOE or DOE operations shall be prepared each year.
- b. Please print all information. The letter 'O' should be printed '0' to differentiate it from the number zero. Similarly, the letter 'Z' should be printed '2' to differentiate it from the number '2'. Several of the data items require data to be right justified (R. J.), written from the right hand side of the field, while others require data to be left justified (L. J.), written from the left hand side of the field.
- c. Only one character per indicated space is allowed. Do not use more than the allotted spaces on the form.
- d. Prepared By, Date, Organization, and Address—This information is for reference, should future verification be required from the individual who originally encoded the summary information. If cards or tapes are submitted, this portion of DOE F 5484.6 should be completed and submitted with them.
- e. A separate DOE F 5484.6 must be completed for each facility type where monitored personnel are employed. For example, if a contractor operates several facilities and also monitors visitors, a separate DOE F 5484.6 should be prepared for each facility and for the total number of visitors.

2. SPECIFIC INSTRUCTIONS

- a. **EMPLOYER:** This section must always be completed and consistent for all cards (A through C). It is composed of codes in three parts as follows:
  - (1) **Type**—A one-character alpha code to indicate the type of organization. 'C' = DOE contractor. 'G' = DOE office.

(2) **Contractor Code**—A unique identifier assigned to each contractor and DOE office reporting to the Radiation Exposure Information Reporting System. The code should be left justified in the field with hyphens included and spaces trailing.

(3) **Facility Code**—A two-character numeric code identifying the facility type for which the summary is being reported. If the facility type does not correspond to one of those listed on the front of DOE F 5484.6, indicate code '40' here and specify the facility type in item number 6 of card C.

- b. **YR:** Indicate the calendar year for which the summary is being submitted.
- c. **TOTAL:** The total number of individuals in all of the dose ranges. (The number should be right justified with leading blanks.)
- d. **NUMBER OF INDIVIDUALS WITH DOSES IN EACH RANGE (REM):** A series of 18, 5-digit fields which represent the number of individuals who received doses during the calendar year for the 18 ranges specified. (The numbers must be right justified with leading blanks.)
- e. **ACTUAL VALUES:** All exposures over 12,000 rems must be reported individually by actual value. (The value is right justified in the field with leading spaces. Omit the decimal point, e.g., code 13.428 as 13428. Three decimal places are assumed for these values.)
- f. **'OTHER' FACILITY TYPE:** If the facility type for which a contractor wishes to submit a report is not listed on the front of DOE F 5484.6, indicate code '40' in item 1-c and enter the name of the new facility type here, left justified, abbreviating when necessary.



Instructions for Completing DOE F 5484.7

**ANNUAL SUMMARY OF EXPOSURES  
RESULTING IN INTERNAL BODY DEPOSITIONS OF RADIOACTIVE MATERIALS**

**1. GENERAL INSTRUCTIONS**

- a. Pursuant to DOE 5484.1, an annual report summarizing internal body exposures recorded during the previous calendar year for DOE and DOE contractor employees in the course of DOE activities and for visitors to DOE or DOE operations shall be prepared each year.
- b. Please print all information. The letter 'O' should be printed '0' to differentiate it from the number zero. Similarly, the letter 'Z' should be printed '2' to differentiate it from the number '2'. Several of the data items require data to be right justified (R. J.), written from the right hand side of the field, while others require data to be left justified (L. J.), written from the left hand side of the field.
- c. Only one character per indicated space is allowed. Do not use more than the allotted spaces on the form.
- d. Prepared By, Date, Organization, and Address—This information is for reference, should future verification be required from the individual who originally encoded the summary information. If cards or tapes are submitted, this portion of DOE F 5484.7 should be completed and submitted with them.
- e. **EXPOSURE DATE.** Enter beginning date of exposure.
- f. **BIRTH:** Enter birthdate of individual(s) being reported.
- g. **NAME** Enter the first initial of the individual in column 36, the middle initial in column 37, and the last name starting in column 38.
- h. **NUCLIDES:** Enter the deposited nuclide(s), left justified. Use the proper isotope notation as listed in the Table, Order DOE 5480.1, Chapter 11, A—Standards for Radiation Protection, omitting hyphens and spacing. If the dose resulted from a mixture of nuclides, list the major contributors consecutively (i.e., Cesium 137 and Cobalt 60 would be coded CS137C060).
- i. **ORGAN CODE 1:** Enter 2-digit code to indicate each organ for which a dose is specified. Select from the codes listed:

(1) Lung	28	(8) Liver	56
(2) Bone	11	(9) Testes	78
(3) Digestive System	50	(10) Prostate	77
(4) Whole Body	00	(11) Thyroid	96
(5) Kidney	71	(12) Ovary	87
(6) Spleen	07	(13) Muscle	13
(7) Pancreas	59	(14) Adrenal Gland	93

**2. SPECIFIC INSTRUCTIONS**

- a. **EMPLOYER** (required item on all cards): This section must always be completed and consistent for all cards.
- (1) **Contractor Code**—A unique identifier assigned to each contractor and DOE office reporting to the Radiation Exposure Information Reporting System. The code should be left justified in the field with hyphens included and spaces trailing.
- (2) **Type**—A one-character alpha code to indicate the type of organization. 'C' = DOE contractor. 'G' = DOE office.
- b. **SOCIAL SECURITY NUMBER:** Enter social security number(s) of individual(s) being reported.
- h. **ORGAN CODE 2:** Second organ code (if required).
- i. **ORGAN CODE 3:** Third organ code (if required).
- j. **DOSE EQUIVALENT:** Enter the dose commitment (rems) received by the specified organ(s) during the calendar year; seven digits including three decimal positions. (Right justify numbers, omit the decimal point, e.g., code 45.252 as 45252.)
- k. **METH. DOSE:** Enter method of determining dose. Select 2-digit code from following list:

(1) — Bioassay (2) — In-vivo count

GPO 477 353



**INSTRUCTIONS**

**GENERAL INSTRUCTIONS.** All organizations releasing liquid and airborne radioactive wastes are required to complete this form for all effluent release points, onsite radioactive waste discharge points and unvented releases.

**SYNOPSIS INSTRUCTIONS.**

- A. A separate form must be completed for each effluent release point and for each onsite radioactive waste discharge point.
- B. Limit the number of characters in each item as indicated.
- C. Data entered on the form must be legible and must be printed. The letter "O" shall be printed. Do not differentiate it from the number zero.
- D. Do not use more than the allotted space indicated on the Form.
- E. The forms shall be submitted to Waste Programs Division, E.O.S. Mail, P.O. Box 1055, Idaho Falls, Idaho 83415, no later than three months following the annual period for which it is prepared.

**AMENDED DATA INSTRUCTIONS.**

- A. To amend Section 1 data only, the identification codes in column 2 of Section O must be equal to the codes in the corresponding columns of the record to be amended.
- B. To amend Section 1 and 2 data or to amend Section 2 data only, the identification codes in columns 2 of Section O must be equal to the codes in the corresponding columns of the record to be amended.
- C. Select the proper amended data code. See Section 6, item 26, and enter in column 26.
- D. Section 1 Narrative Summary under Section 2 Nucleide Data may be amended.

**SECTION 0**

**GENERAL INSTRUCTIONS.** This section must always be completed. The alphabetical designation for the contractor, plant and facility required in Columns 4, 5 and 6 shall be established by the operations office. Each office shall ensure that there are no duplications of designations within a jurisdiction.

**COLLARS**

- 2. Alphabetical designation for the Operations Office. Use office designations as shown below:
 

Albuquerque Operations Office	A
Ten Francisco Operations Office	B
Chicago Operations Office	C
Idaho Operations Office	D
Grand Junction Operations Office	E
Idaho Falls Operations Office	F
Clack Rapids Operations Office	G
Pittsburgh Area Reactors Office	H
Portland Operations Office	I
Salt Lake River Operations Office	J
Energy Research Center	K
Salt Lake City Area Reactors Office	L

- 3. Alphabetical designation for the Area Office. Use office designations as shown below:
 

Albuquerque	A	Baltimore	J	Washington	S
Burlington	B	Kansas City	K	Pittsburgh	T
Chattanooga	C	Los Alamos	L	Pacific Area	U
Dallas	D	Portland	M	Support	V
Idaho Falls	E	Portland	N	Chromat	W
Idaho Falls	F	Portland	O	Whisper	X
Idaho Falls	G	Portland	P	Santa	Y
Idaho Falls	H	Portland	Q	Portland	Z
Idaho Falls	I	Portland	R	New Brunswick	

(Leave blank if not applicable)

- 4. The alphabetical designation of the contractors, laboratories, universities and other Government organizations which have issued onsite airborne radioactive effluents, this designation shall be comparable with the standard Operations Office/Area Office Contractor (C/C) name list provided to I and O offices.

- 5. The alphabetical designation of the main plant, such as Chemical Processing Plant, 200 Area, etc.

- 6. The alphanumeric designation of the facility within the main plant, i.e., Cobaltation Facility, Fast Flux Test Facility, waste discharge or release point and airborne radioactive wastes or effluents.

- 7. Identifying number which refers to a map showing the site and facility and the point of discharge or release. Provide a number for each column. For example, the number 0 would be 000 00 would be 000.

- 10-12. Identifying number of each significant liquid and airborne radioactive release point or onsite waste discharge point. Follow the instructions for numbering as noted for columns 7-9.

- 13. Identify if the onsite radioactive waste discharge point or effluent release point is an air or liquid stream:
  - A. Airborne Effluent
  - L. Liquid Effluent
  - B. Airborne Onsite Waste Discharge
  - M. Liquid Onsite Waste Discharge

- 14-18. Report Period: The latter part of this section should be used for the normal annual reporting of effluents and onsite waste discharges. For example, the annual annual report for the period January 1972 through December 1972 would be 72010171231.

The waste stream should be used for reporting unvented releases. This is to be printed in 24 Hour Mean Time. The designation for the various items appear in Columns 27-30.

- E. Eastern
- C. Central
- M. Mountain
- P. Pacific
- A. Atlantic
- Z. Other use GMT

For example, for an accidental radioactive release occurring at 8:30 PM on February 14, 1972, in the Eastern States, the report period would be 720114 2030E. NOTE: An entry must always be made in Columns 14 through 23.

- 26. Alphabetical designation for use of amended data and/or security classification:
 

None UNCL Data	A-Amended UNCL
C-Classified	M-Amended Confidential
S-Secret	V-Amended Secret

**SECTION 1**

**GENERAL INSTRUCTIONS.** This section must be filled out only when a new effluent release point or an onsite waste discharge point is being reported or its when section 1 is being amended when amending section 1 data, section 2 may be left blank, if desired. Unless otherwise noted, entries in this section must begin in column 23.

**CARD LINE COLUMN**

- 1. 23-68 Plant Title: A brief descriptive title of the main plant.

- 1. 23-69 Facility Title: A brief descriptive title of the facility within the main plant, e.g., Cobaltation Facility, Fast Flux Test Facility, which releases or discharges radioactive liquid and airborne wastes.
- 2. 12-69 Effluent Release Point or Onsite Waste Discharge Point: A descriptive title identifying the onsite waste discharge point or effluent release point e.g., 646, 200, Steam A, 200 B discharge to CRB 11, etc.
- 2. 23-70 Operation Generating Pollutants: A description of the operation which generates the pollutants, e.g., hot cells, plutonium radiochemistry lab, uranium isotope enrichment P reactor core cooling basin, etc.
- 2. 23-71 Waste Treatment System: A descriptive title, e.g., 200 H pressure vessel filter, 646, 11 high efficiency cyclones, etc. used for treatment of the onsite waste discharge or effluent prior to release or disposal.
- 2. 44-23-68 Monitoring System: A brief description of the type of monitoring equipment including the manufacturer and model number of the equipment, the type of probe and channel length of sampling line, efficiency, etc. as appropriate to provide a concise abstract of the monitoring system.
- 2. 6-23-30 Number of Samples: Approximate number of samples taken during the reporting period. Entry must be an integer and right adjusted. Minor year-to-year variations do not necessitate an amended section 1 form.
- 2. 6-23-60 Sample Information: Entry must begin in column 26. Describe as prescribed, continuous, etc.
- 2. 7-23-70 Receiving Media Or Contained Storage/Disposal/Discharge Facility: Receiving Discharge: A descriptive title of the media receiving the effluents e.g., Main River, atmosphere ground water, etc. or of the storage/disposal facility receiving the onsite waste discharge listed in 2. 23-69 above.
- 2. 7-77-70 Storage/Disposal Facility Name Code: A field office designated three digit code to identify all storage or disposal facilities receiving onsite waste discharges as defined in ERDA 9513.
- 2. 7-80 Storage/Disposal Facility Classification Code: A one digit code:
 

T. Hot Plant	E. Sewage Basin
D. Dry Basin Vessel	C. CRB
R. Receptor Basin	L. Pond or Lagoon
S. Settling Basin	W. Wastewater Treatment Plant
G. Solid to Ground	A. Tankage
- 2. 6-10-23-69 Other Information: Any pertinent information not submitted with other data, this part provides the opportunity to elaborate on points or problems which are not covered in the narrative and nucleide data provided on this form. NOTE: If an amended section 1 is submitted, one must repeat previous comments in order to preserve them in the record.

**SECTION 2**

**GENERAL INSTRUCTIONS.** This section must always be filled out except when the 52311 form is being used to submit amended Section 0 or 1 data. When amending Section 2 data, Section 1 may be left blank, if desired. Only 26 nucleides may be input for any reporting period.

**1 CARD COLUMN**

- 26-30 If this form is reporting an Onsite Waste Discharge, specify the startup date if the form is reporting an Effluent Release Point. (see column 26)
  - 34-48 If the Onsite Waste Discharge Facility is active and Active in these columns, if facility is retired specify the termination date as prescribed. No entry is required if reporting an Effluent Release Point.
  - 41-48 Gross volume flow of liquid or air for the effluent stream reported as follows:
    - Column 41 Sign plus is preferred
    - Column 42 Units
    - Column 43 Tons
    - Column 44 Thousands
    - Column 45 Thousands
    - Column 46 1000
    - Column 47 Plus or minus sign of exponent
    - Column 48-49 Value of exponent
- Examples of this method of notation: 1000 1000 reported 5 150E 03. 5 15 reported 5 150E + 03. 5 150E - 03. 5 150E reported 5 150E - 03.
- NOTE: If volume is unknown print "UNKN" in column 42-48. Otherwise an entry must always be made in Columns 42 through 48.
- 50 Units used to report the gross volume in Column 42-48 according to the notation on the form.
  - 51-78 List the section 8 report element added for any Effluent Release Point or Onsite Waste Discharge Point which discharge radioactivity FROM the storage/disposal facility listed in section 1. If no storage/disposal facilities are reported in section 1 e.g., columns 77-80 of Card 87 are blank in section 1. These columns should be left blank. The nucleides 9-19 in each of the reported discharges into a given or named facility, and be correct for all radionuclides discharged FROM the facility in order to arrive at a correct total inventory of the waste remaining in the disposal facility.

**11 CARD COLUMN**

- 27-48 Identify the individual pollutants discharged for each onsite waste discharge or effluent stream. Use normal accepted notations. Column 69 to reported CD-68. Uranium 235 to U-235. Self-generating abbreviations are acceptable, such as MAP (Mixed Actinide Products), WPP (Waste Product), UN (U-235) etc. The designations must be compatible with the Standard Nucleide Identification list provided to Field Offices.
- 49-68 Indicate either the annual amount or the annual average concentration per both of the nucleide reported in columns 27-48 using the same notations as in Section 2, Card 3, Columns 42-48. The value in columns 43-48 must be equal to 688F which allows columns 47-48 to be left blank.
- 50 Indicate according to the notations on the form the units used to report the amount or concentration in columns 42-48. Column 50 may be blank if the Amount or Concentration value in column 42-48 is equal to 688F.
- 51 Indicate according to notations for solubility on the Form.
- 52 Any pertinent information related to nucleide amount or concentration.

**3 CARD COLUMN**

- 27-48 CRIPER FACTOR prescribed. Note: This factor is applicable only to 68 air borne releases.
- 41-48 Enter value of 0 (operator factor) to be reported for release point described in Section 6. Entry must equal 0 000E + 00. Unless a value is entered, this factor will always default to 1 000E + 00.

# U.S. Department of Energy

Washington, D.C.

# PAGE CHANGE

DOE 5484.1 Chg 1  
6-9-81

**SUBJECT:** ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION  
REPORTING REQUIREMENTS

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1. PURPOSE. This Page Change transmits the revised page of DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS , OF 2-24-81.
2. EXPLANATION OF CHANGE. The \$500 value contained on page II-3, paragraph 1e(3), line 3, is incorrect. The correct value is \$1,000. The instructions on the back of Attachment 2 were omitted when DOE 5484.1 was printed. These instructions are now included.
3. FILING INSTRUCTIONS.

a.	<u>Remove Page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
	II-3	2-24-81	II-3	6-9-81
	II-4	2-24-81	II-4	2-24-81
	Atch 2, page 1	2-24-81	Atch 2, page 1	2-24-81
			Atch 2, page 2	6-9-81

- b. After filing the attached pages, this transmittal may be discarded.



William S. Heffelfinger  
Assistant Secretary  
Management and Administration

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**DISTRIBUTION:**  
All Departmental Elements  
Federal Energy Regulatory Commission

**INITIATED BY:**  
Operational and Environmental  
Safety Division



e. Submission of Type C Investigation Reports.

- (1) All occupational injuries and illnesses shall be investigated to determine corrective action appropriate to minimize or preclude similar injuries and illnesses. A report shall be made on Form 5484.3, Supplementary Record of Occupational Injuries and Illnesses, Attachment 1, for occupational illnesses as defined by the Occupational Safety and Health Administration, and for lost work day cases and nonfatal cases without lost work days as defined in 29 CFR 1904.
- (2) All accidents involving Government-owned, -rented, or -leased vehicles (including Interagency Motor Pool vehicles) or privately owned vehicles while operated on official business shall be investigated and the number of such occurrences reported on Form 5484.4, Tabulation of Property Damage Experience, Attachment 2. The investigation for each accident causing \$250 or more damage and/or injury shall be recorded on SF-91A, Investigation Report of Motor Vehicle Accident, Attachment 3, and copies submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of the month following the end of the quarter in which the accident occurred.
- (3) All accidents resulting in Department of Energy or other property damage or loss shall be investigated. The investigation for each loss exceeding \$1000 shall be recorded on Form 5484.5, Report of Property Damage or Loss, Attachment 4, and copies submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of the month following the end of the quarter in which the accident occurred.
- (4) All radiation exposures of individuals which in one calendar quarter exceed the following shall be reported by memo to the Operational and Environmental Safety Division:
  - (a) 3 rem to whole body.
  - (b) 5 rem to skin of whole body or thyroid.
  - (c) 10 rem to forearms.
  - (d) 25 rem to hands or feet.

2. STANDARDS FOR INVESTIGATION.

a. Appointing the Board.

- (1) A board of investigation shall consist of three to five members, one of whom is appointed as chairman.

Vertical line denotes change

- (2) All members of Type A investigation boards shall be Department of Energy employees. Type B investigation boards may consist of Department of Energy employees, Department of Energy contractor employees, or both, at the discretion of the head of the field organization. Department of Energy employees appointed to a Type A investigation board, and Department of Energy and Department of Energy contractor employees appointed to a Type B investigation board shall work for, and report to, the appointing official during the investigation.
  - (3) At least one of the members of the board shall be a trained accident investigator.
  - (4) All competencies should be considered in appointing each board, including managerial, scientific, professional, and investigative.
  - (5) The use of necessary consultants or advisors who are experts in certain areas or who are familiar with the operations or management of the program involved in the occurrence is encouraged. These persons may be contractor personnel.
  - (6) A superior and his subordinate shall not serve on the same board.
  - (7) Employees directly related to the operation or activity involved in the occurrence shall not serve on a board.
- b. Investigation Report. The purpose of the investigation report is to convey in clear and concise language the results of the investigation (the facts surrounding the occurrence, the analysis of these facts, and the conclusions). The investigation report constitutes a record of the occurrence by which the investigation is measured as to thoroughness, accuracy, and objectivity, and to which reference may be made at a later date. In addition, any corrective actions directed by the appointing or the reviewing official will be based largely on the contents of the report.
- (1) General. The investigation report shall consist of, but is not limited to, four sections: summary, facts, analysis, and conclusions.
    - (a) The summary is a brief account of the essential facts of the occurrence and the investigators' conclusions. The facts section consists of a recitation of the factual information determined in the course of the investigation. It should relate the "who, what, when, where, why, and how," of the occurrence. The analysis section of the report is based on the factual information developed and consists of the reasoning of the investigators which support the conclusion. The conclusions section consists of the findings, the probable causes of and contributing factors to the occurrence, and the judgments of needs.

DOE 5484 4  
MIB  
DOE 5484 1

U.S. DEPARTMENT OF ENERGY  
TABULATION OF PROPERTY DAMAGE EXPERIENCE

REPORTING PERIOD: From January 1, 1980 To March 31, 1980 NAME OF REPORTING UNIT Simpson Engineering

SECTION I - TRANSPORTATION AND MOBILE EQUIPMENT OCCURRENCES

CATEGORY	NUMBER OF CONVEYANCES (this reporting period only) (1)	NUMBER OF OCCURRENCES		USAGE		RATE (6)	ESTIMATED LOSS (in dollars)			TOTAL COST PER 1,000 MILES (10)
		With Injury (2)	Total (3)	Miles of Travel (4)	Hours Operated (5)		Government (7)	Reimbursed and other (8)	Total (9)	
a. Contractor Operated Motor Vehicle	896	0	10	857,388		11.66	3070	150	3220	\$3.76
b. Aircraft	1	0	0		223	0	0	0	0	
c. Marine	3	0	0		90	0	0	0	0	
d. Railroad	0	0	0	0		0	0	0	0	
OPERATED BY FEDERAL EMPLOYEES										
e. Government Motor Vehicle										
f. Private Motor Vehicle										
g. Material Handling Equipment										

SECTION II - OTHER PROPERTY DAMAGE OCCURRENCES

CATEGORY	NUMBER OF OCCURRENCES (11)	ESTIMATED LOSS (in dollars)		
		Government (12)	Reimbursed and Other (13)	Total (14)
n. Electrical	0	0	0	0
l. Fire	1	750	0	750
j. Mechanical	0	0	0	0
k. Radiation/Nuclear	0	0	0	0
i. Explosion	0	0	0	0
m. Natural Causes	0	0	0	0
n. Miscellaneous	1	3,016	0	3,016

(15) Total amount of tort claims (under Federal Tort Claims Act)	\$0.00
(16) Total amount of Government property damage (columns 7 and 12)	\$6,836
(17) Government Property Evaluation (most recent estimate based on DOE 5484.1)	\$397,900,000

SUBMITTED BY:

Eugene B. Dunn

DATE:

4/4/80

INSTRUCTIONS FOR COMPLETION OF DOE F 5484.4

**APPLICATION**—This form is to be completed as required for all DOE offices and contractor organizational units. The data provided shall be for the same reporting unit(s) as designated on side "A" of the form. All data is cumulative except column 1 (current reporting period only).

**DEFINITIONS**

**Motor Vehicle**—any car, truck, bus, or motorcycle licensed for over-the-road use.  
**Occurrence**—any deviation from the planned or expected behavior or course of events in connection with any DOE or DOE contractor operation if the deviation has safety, health, or environmental significance.

**SECTION I**

**General**—List all occurrences in which one of the conveyances or pieces of equipment listed in categories a through g is being operated on official DOE Federal Government business, and which results in death, recordable injury, or property damage of two hundred fifty dollars (\$250) or more, regardless of who was injured (if anyone) or what property was damaged. Occurrences which are of a transportation or mobile equipment nature but do not fit one of the categories listed in this section should be listed under the miscellaneous category of Section II.

**Categories**

- a. Contractor-operated motor vehicles—include all Federal Government-owned, leased, or rented vehicles, or privately-owned vehicles which are operated by a DOE contractor employee.
  - b. Aircraft—means any air-borne craft, whether powered, towed, or free-flying, which is being operated by a DOE or DOE contractor employee. This includes privately-owned as well as Federal Government-owned, leased, or rented aircraft.
  - c. Marine—means any water-borne craft, motorized, non-motorized, steam, sail, towed, etc., which is operated by a DOE or DOE contractor employee. This includes privately-owned as well as Federal Government-owned, leased, or rented marine craft.
  - d. Railroad—means any unit of equipment (or combinations) listed below, which is operated by a DOE or DOE contractor employee.
    - (1) Locomotive self-propelled unit of equipment designed solely for moving other equipment.
    - (2) Light locomotive self-propelled unit of equipment uncoupled to any other equipment.
    - (3) Motor car self-propelled unit of equipment designed to carry freight or passengers (not a locomotive).
    - (4) Car, examples include freight, passenger, dining equipment, caboose, chemical, gondola, mining, ATMX, courier.
- For categories e, f, and g, below, list only those occurrences in which the motor vehicle or piece of equipment was being operated by a DOE Federal Government employee.
- e. Government Motor Vehicle—includes any Federal Government-owned, leased, or rented motor vehicle.
  - f. Private Motor Vehicle—includes any privately-owned motor vehicle.
  - g. Materials Handling Equipment—means operations of lifting and handling during construction, warehousing, storage, dock loading, and dock unloading using cranes, powered industrial trucks, and yard vehicles.

**Columns**

- (1) Number of Conveyances—includes all conveyances owned, leased, or rented by DOE during the reporting period and all privately-owned conveyances used for official DOE Federal Government business during the current reporting period. For railroads, count each separate unit or car as a single conveyance.
- (2) Number of Occurrences with Injury—include all occurrences which result in death or recordable injury.
- (3) Total Number of Occurrences—include all occurrences which result in death, recordable injury, or property damage of two hundred fifty (\$250) or more (Column 3 includes column 2 plus the property damage occurrences which did not involve death or recordable injury.)
- (4) Miles of Travel—Record the number of miles travelled on official DOE Federal Government business. For railroads, count only the miles travelled by the power unit.
- (5) Hours Operated—Record the number of hours operated on official DOE Federal Government business. If aircraft or marine units are towed or otherwise moved by a power unit, count only the hours of operation of the power unit.
- (6) Rate—The rate for motor vehicles and railroads equals the total number of occurrences (column 3) multiplied by

1,000,000 and divided by miles of travel (column 4). The rate for aircraft and marine equals the total number of occurrences (column 3) multiplied by 1.000 and divided by hours operated (column 5).

- (7) Government Estimated Loss—If DOE bears all or part of the cost of the occurrence as of the end of the reporting period, regardless of who may be responsible, record in dollars the estimated Federal Government loss borne by DOE in column 7.
- (8) Reimbursed and Other Estimated Loss—If by the end of the reporting period another party reimburses DOE or bears an amount of the loss for an occurrence, record in dollars the amount reimbursed or borne by such parties in column 8.
- (9) Total Estimated Loss—The sum of columns 7 and 8 is recorded in column 9.
- (10) Total Cost per 1,000 Miles—Multiply the appropriate motor vehicle total estimated loss (column 9) by 1,000 and divide by miles of travel (column 4). Record the result in column 10.

**SECTION II**

**General**—Record all property damage occurrences of \$1000 or more not recorded in Section I above. Include occurrences which result in damage to DOE Federal Government property or involve DOE Federal Government or DOE contractor operations.

**Categories**

- h. Electrical—Property damage resulting from electrical fault or failure.
- i. Fire—Property damage resulting from fire. Except that for motor vehicle accidents which result in fire, the loss should be listed in Section I rather than Section II. However, if a fire damages a motor vehicle and it is not the result of that vehicle being involved in an accident, then the loss should be listed in Section II.
- j. Mechanical—Property damage resulting from mechanical failure or breakdown, not including normal wear unless the failure of a worn component incurs damage of \$1000 or more on other components. However, if wear resulting from lack of maintenance or improper maintenance causes a loss of \$1000 or more, then this occurrence should be recorded as a mechanical failure of the worn component.
- k. Radiation/Nuclear—include losses from contamination (leaks, spills, releases), unplanned criticality, nuclear reactor (meltdown, excursion, material spill or leak, fire), and other related occurrences.
- l. Explosion—Property damage suffered as a consequence of explosion (including any losses from contamination spread by the explosion).
- m. Natural Causes—Property damage suffered as a consequence of wind, rain, flood, waves, lightning, earthquake etc.
- n. Miscellaneous—include all property damage occurrences which are recordable but did not fit one of the categories a-m in Sections I or II.

**Columns**

- (11) Number of Occurrences—Record the number of occurrences for each of the categories h-n.
- (12) Government Estimated Loss—If DOE bears all or part of the cost of the occurrence as of the end of the reporting period, regardless of who may be responsible, record in dollars the estimated Federal Government loss borne by DOE in column 12.
- (13) Reimbursed and Other Estimated Loss—If by the end of the reporting period another party reimburses DOE or bears an amount of the loss for an occurrence, record in dollars the amount reimbursed or borne by such parties in column 13.
- (14) Total Estimated Loss—The sum of columns 12 and 13 is recorded in column 14.

**ITEM 15**—include only tort claims against DOE resulting from an occupational occurrence other than a breach of contract for which the Federal Tort Claims Act allows recovery. Record in item 15 the total dollar amount paid by DOE from the start of the calendar year through the end of this reporting period.

**ITEM 16**—The total amount of Government property damage is the sum of all entries in columns 7 and 12.

**ITEM 17**—The most recent estimate of DOE Federal Government property valuation (based on DOE 5484.1) should be recorded in item 17.

line denotes change.

# U.S. Department of Energy

Washington, D. C.

## PAGE CHANGE

DOE 5484.1 Chg 2  
8-13-81

**SUBJECT:** ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION  
INFORMATION REPORTING REQUIREMENTS

---

1. PURPOSE. This Page Change revises Chapter IV of DOE 5484.1.
2. EXPLANATION OF CHANGE.
  - a. Paragraphs 3a and 3b of Chapter IV have been changed to delete the requirement for the preparation of a consolidated Form EV-102A and a consolidated DOE F 5484.4 by each field organization.
  - b. Paragraph 5 of Chapter IV has been deleted because it has been replaced by DOE 5484.2, UNUSUAL OCCURRENCE REPORTING SYSTEM.
3. FILING INSTRUCTIONS.
  - a. 

<u>Remove</u>	<u>Dated</u>	<u>Insert</u>	<u>Dated</u>
Pages IV-3	2-24-81	Pages IV-3	2-24-81
IV-4	2-24-81	IV-4	8-13-81
IV-9 thru IV-17 (and IV-18)	2-24-81	IV-9 IV-10	2-24-81 8-13-81
  - b. After filing the attached, this transmittal may be discarded.



William S. Heffelfinger  
Assistant Secretary  
Management and Administration

**DISTRIBUTION:**  
All Departmental Elements  
Federal Energy Regulatory Commission

**INITIATED BY:**  
Assistant Secretary, Environmental  
Protection, Safety, and Emergency  
Preparedness



- (b) All damage to, or loss of, or damage caused by, nuclear reactors or vital appendages thereto (e.g., cooling system components, control equipment), should be classed as type 4g3. "Vital appendages" include all equipment materials directly associated with or necessary to the sustaining of reactor operation.
  - (c) All damage or loss sustained as a consequence of (and following the outbreak of) fire should be classed as Type 4a except fire losses involving cargo during transportation (see (a). above). Contamination damage caused by fire should be included in the loss reportable under Type 4a accidents.
  - (d) Except for cases covered by (a), (b), or (c), above, all losses suffered as a consequence of explosion (including any losses from contamination spread during the explosion) are classed as Type 4b.
  - (e) All contamination-caused losses, exclusive of those cases covered by (a), (b), (c), or (d), above, or those which result from nonreactor criticality accidents, should be Classed as Type 4g1.
  - (f) Section 4d (Electrical Fault or Failure with Loss over \$1000) should not be used for reporting losses resulting from other than accidental (i.e., reasonably unforeseeable) causes.
- (2) Section 5. If a given loss involves more than one accident type (see Section 4 of Form 5484.5), list each such accident type contributing to the loss in the "Accident Type Mc." column and opposite each enter appropriate data.
- d. SF-91A, Investigation Report of Motor Vehicle Accident, Attachment 3, shall be prepared for each incident resulting in injury or property damage of \$250 or more. One copy shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., with Form 5484.4. The description of the occurrence, item number 26, shall include the following information:
- (1) Whether or not the vehicle was equipped with seat belts.
  - (2) Whether or not the seat belts were in use at the time of the accident.
  - (3) the dollar loss incurred.

3. QUARTERLY SUMMARIES AND OTHER REPORTS.

- a. Form EV-102A. Form EV-102A, Summary of Department of Energy and Department of Energy contractor Occupational Injuries and Illnesses, Attachment 8, shall be prepared by each Department of Energy office and Department of Energy contractor organizational unit. Form EV-102A data may be obtained from the Forms OSHA-200 and/or OSHA-100F, or their equivalents, maintained at the individual establishments. One copy from each field organization, area office, and contractor organizational unit shall be submitted to the System Safety Development Center (SSOC), Eg&G Idaho, Inc., on or before the 25th of April, July, October, and January. Revisions of reports for each of the two preceding calendar years are due February 28. The revisions should reflect the new (corrected) totals rather than the additions or deletions which should be applied to the previous report.
- b. DOE F 5484.4. DOE F 5484.4, "Tabulation of Property Damage Experience," Attachment 2 shall be prepared by each Department of Energy office and Department of Energy contractor organization unit. One copy from each field organization, area office, and contractor organizational unit shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., on or before the 25th of April, July, October, and January. Revisions of reports for each of the two preceding calendar years are due February 28.
- c. Forms OSHA-200 and OSHA-100F. Form OSHA-200, "Log of Occupational Injuries and Illnesses," Attachment 7, shall be completed for Department of Energy contractor employees, and Form OSHA-100F, "Log of Federal Occupational Injuries and Illnesses," Attachment 9, shall be completed for Federal employees and maintained on file for a period of at least 5 years.
- d. Reports of Occupational Exposure to Radiation for Department of Energy and Department of Energy Contractor Personnel Upon Termination of Employment. Upon termination of employment, report on Form 5484.8, Termination Occupational Exposure Report, Attachment 10, all external and internal radiation exposures recorded for the terminated individual during his period of employment or work assignment at a Department of Energy or Department of Energy contractor facility. These reports are to be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within 30 days from the individual's date of termination or within 30 days after his exposure has been determined, whichever is later. Upon written and signed request, a copy of the report shall be provided to the individual terminating employment or work assignment.

Vertical line denotes change.

- (8) Cover Memorandum. The covering memorandum should call particular attention to any section of the report considered to be of outstanding importance or interest. Brief comments on the highlights of the report are also appropriate.

c. Effluent and Environmental Monitoring Reports.

(1) Report of Effluent Monitoring Data.

(a) Effluent monitoring data for nonradioactive pollutants should be reported in the site environmental monitoring report or summary as described in Chapter III of this Order.

(b) Radioactive Effluent and Onsite Discharge Data Reports covering the previous calendar year shall be submitted to the Information Systems Branch, EG&G Idaho, Inc., by April 1, . with a copy of the cover letter (enclose maps only) to the Operational and Environmental Safety Division. The report, including the data forms, cover sheet, maps, and, if necessary, explanatory information shall be submitted in accordance with instructions provided in Section II of the Effluent Information System and Onsite Discharge Information System User's Manuals. Maps should be included only when they reflect modifications (terminations or startups, etc.) from previous years. The Monitoring Data Report shall consist of:

- 1 A cover sheet listing the site, facility, report period, constructor(s), and address.
- 2 A summary providing pertinent descriptive and interpretative information which would serve to explain any facets of the data which are not adequately described on the forms. (Classified effluent data should be submitted on separate forms.)
- 3 Maps, 8-1/2 x 11 inch, showing the locations of effluent streams and onsite discharge points.
- 4 Completed Radioactive Effluents/Onsite Discharges/Unplanned Releases Form, Form DOE F 5821.1, Attachment 15, unless submitted via the Secure Automatic Communications Network (SACNET) or directly to the computer operations.

(c) Unplanned releases of radioactivity in effluents, or that go offsite by spills, leaks, etc., which are reported according to chapter 1 of this Order, and unplanned releases of radioactivity in waste spills, leaks, etc., shall be reported to the Information System Branch, EG&G Idaho, Inc., on a separate Form, DOE F 5821.1.

- (d) Field organizations should assure that any data errors on the Radioactive Effluent/Onsite Discharge Data Form are reported promptly to the Information Systems Branch, EG&G Idaho, Inc., using amended forms.
- (2) Environmental Monitoring Reports covering the previous calendar year shall be prepared annually and distributed by May 1 to the Operational and Environmental Safety Division (10 copies), appropriate program offices, the Department of Energy Technical Information Center; and to other agencies and organizations, as appropriate. Attachment 5 of this Order provides the suggested format for this report.
- (3) Environmental summaries for the previous calendar year shall be submitted annually to the Operational and Environmental Safety Division (10 copies) by May 1 for all sites which are exempted from (2) above, in accordance with the provisions of Chapter III of this Order. Attachment 6 of this Order provides the suggested format for this report.
- (4) Environmental Reports to Regulatory Agencies shall be submitted in accordance with schedules established by the applicable permits or regulations.



Vertical line denotes change.

## E R R A T A S H E E T

The Table of Contents was inadvertently omitted from DOE 5484.1 Chg 2, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 8-13-81. The Table of Contents should be replaced with the attached pages.



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

PAGE CHANGE

DOE 5484.1 Chg 3

11-6-87

SUBJECT: PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION  
REPORTING SYSTEM

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1. PURPOSE. To transmit revised pages to DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING SYSTEM, of 2-24-81.
2. EXPLANATION OF CHANGE. Revisions have been made to the Radiation Exposure Information Records System which is used to report occupational radiation exposures to Department of Energy (DOE) and DOE contractor employees and radiation exposure to visitors. A suggested reporting format formerly included in paragraph 4b of Chapter IV has been reformatted as Attachment 13 and several attachments have been deleted. As a result, changes have been made in pagination and in attachment numbers.
3. FILING INSTRUCTIONS.

8. <u>Remove Page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
3 thru 12	2-24-81	3 thru 12	11-6-87
	2-24-81		2-24-81
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		iii,(and iv)	11-6-87
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Attachment 14	2-24-81	-	
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b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



LAURENCE F. DAVENPORT  
Assistant Secretary  
Management and Administration

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**DISTRIBUTION:**  
All Departmental Elements

**INITIATED BY:**  
Assistant Secretary for Environment  
Safety, and Health



- b. Trained Investigator. An individual who has completed the Department of Energy Accident Investigation Workshop.
- c. Substantial. Clearly outside normally accepted or experienced bounds.
- d. Department of Energy Contractor. Includes prime contractor or Subcontractor subject to the contractual provisions of 48 CFR 923.70, 48 cfr 970.23, or other contractual provisions where DOE has elected to enforce environment, safety, and health requirements by specific negotiated contract provisions.
- e. Notification. The actions taken to notify cognizant Department of Energy Officials of an occurrence, and the subsequent actions taken at successive levels within the Department of Energy to notify the Secretary of an occurrence.
- f. Investigation. A detailed, systematic search to uncover the "who, what, when, where, why, and how" occurrences and to determine what corrective actions are needed in order to prevent recurrence.
- g. Investigation Report. A clear and concise written account of the results of the investigation.
- h. Contracting Officer. An official designated to enter into or administer contracts and make related determination and findings.
- i. Terminated Employee. For the purpose of this Order, an individual employee by DOE or a DOE contractor who terminates his or her employment, an individual who transfers to another DOE or contractor facility or office, an Individual who begins a leave of absence which results in the termination of radiation monitoring of greater than 12 months duration, or all employees of a contractor whose contracts with DOE terminated.
- j. Monitored Visitor. Any nonemployee, including subcontractors, not classified as a "nonemployee radiation worker" (page 5, paragraph 4x.) visiting a facility that is operated by DOE or a DOE contractor under circumstances requiring that he or she be monitored for radiation exposure.
- k. Recorded Dose and Dose Equivalent. That number (corrected for background), zero (minimal or negligible) and above, which is recorded as representing an individual's dose from external radiation sources or internally deposited radioactive materials determined in accordance with DOE 5480.1B, Chapter XI, requirements.
- l. Positive Exposure. Any recorded exposure, corrected for background, greater than the established minimum detection limit of the monitoring device or the measuring technique employed.

Vertical line denotes change.

11-6-87

- m. Dose Commitment. Dose commitment is the dose equivalent (rems) received by specified organs during a period of 1 calendar year that was the result of an uptake of a radionuclide by a person occupationally exposed.
- n. Radiation Records Repository The DOE centralized data base located at the System Safety Development Center EG&G Idaho, Inc. which contains statistical summaries of occupational radiation exposure information for activities associated with DOE operations. Individual occupational exposure records are maintained by DOE sites. The Radiation Records Repository also contains summary data submitted for the DOE predecessor agencies, the Atomic Energy Commission and the Energy Research and Development Administration activities.
- o. Effluent. Airborne and liquid wastes deliberately discharged from a Department of Energy site or facility following such engineered waste treatment and all effluent controls, including onsite retention and decay, as may be provided. This term does not include mild wastes, wastes for shipment offsite, wastes that are contained (e.g., underground nuclear test debris) or stored (e.g., in tanks) or wastes that are to remain onsite through treatment or disposal.
- p. Effluent Monitoring. Sample collection and analysis of samples and other measurements for the purpose of establishing the type and Concentration of radioactive and nonradioactive pollutants in liquids and a airborne discharges from Department of Energy facilities.
- q. Environmental Monitoring. Sample Collection and analysis of environmental media, i.e., air, water, soil, foodstuff and biota from the environs of Department of Energy sites for the purpose of assessing effects of Department of Energy operations at that site on the local environment. Generally, environmental monitoring is required to determine compliance with applicable environmental radiation standards.
- r. Onsite Discharge. Airborne and liquid wastes discharge to onsite treatment or disposal system, e.g., sewage lagoons, retention ponds, and e cribs, for retention, settling, decay, or storage onsite.
- s. Department of Energy Site. Either a tract owned by DOE or a tract otherwise made available to the Federal Government under terms that afford to the Department of Energy rights of access and control substantially equal to those that the Department of Energy would possess if it were the holder of the fee (or pertinent interest therein) as agent of and on behalf of the Government. One or more DOE operations/ program activities are carried out within the boundaries of the described tract.

Vertical line denotes change.

- t. Department of Energy Operations. Those activities funded by DOE for which DOE has authority to enforce for environmental protection, safety, and health protection requirements.
  - u. Field Element. A general term for any officially established Departmental component (excluding individual duty stations) located outside the Washington, D.C. metropolitan area.
  - v. Monitored Worker. Any employee of the reporting organization who works with, or is in the proximity of, ionizing radiation or radioactive material and who is monitored in accordance with DOE 5480.1B, Chapter XI.
  - w. Monitored Personnel Locator File. A DOE centralized file maintained at the System Safety Development Center, EG&G Idaho, that contains all monitored DOE and DOE contractor personnel employed, and visitors who have positive exposures. The file consists of identification information only, e.g., name, social security number, birth year, and employer organization (or organization visited). The file is used to identify personnel work locations so that inquiries can be made to the reporting organization for official dose records.
  - x. Nonemployee Radiation Worker. An individual who is either a subcontractor to a DOE contractor or who visits a DOE site to perform work for or in conjunction with DOE or utilizes DOE facilities and who is monitored for occupational exposure as required in DOE 5480.1B, Chapter XI.
- b. POLICY AND OBJECTIVES.
- a. It is the policy of the Department of Energy that timely notification of occurrences involving Department of Energy and Department of Energy contractor operations be made to responsible authority; that all occurrences be investigated; that reports be submitted to responsible Department of Energy officials; that management take responsive action; and that there be consistency in the treatment of such occurrences.
  - b. The objectives of the information reporting system are:
    - (1) To investigate and evaluate occurrences to determine their causes and the appropriate measures to prevent recurrences and improve the safety of the Department of Energy and Department of Energy contractor operations.
    - (2) To obtain early, complete, and factual information on occurrences as a basis for: (a) reports to the Secretary, Congress, and other Federal agencies; and (b) where appropriate, informing the public.
    - (3) To assure the gathering of adequate information on which to base management action.

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- (4) To provide a basis for the improvement of guides, sales, and standards used in the Department of Energy and Department of Energy contractor operations.
- (5) to establish a procedure for the development and reporting of occupational radiation exposure information to the Radiation Records Repository that will be of assistance to the Department of Energy in determining that radiation doses to individuals are maintained at the lowest levels technically and economically practicable.
- (6) To monitor, evaluate, and report onsite discharges, liquid and airborne effluents and environmental Conditions in the vicinity of Department of Energy sites to access the levels of radioactive and nonradioactive pollutants and their impact on the public and the environment.

6. RESPONSIBILITIES AND AUTHORITIES.

- a. Assistant Secretary for Environment, Safety, and Health (EH-1).
  - (1) Appoints Headquarters investigation boards and establishes the scope of Headquarters investigations;
  - (2) Accepts Headquarters investigation boards' reports; and
  - (3) Directs corrective actions based on Headquarters investigation boards' recommendations.
- b. Director of Operational Safety (EH-34).
  - (1) Develops policies, procedures, standards, and guidelines for notification, investigation, and reporting of occurrences in the Department of Energy and Department of Energy contractor operations.
  - (2) Establishes requirements and prescribes procedures for the collection and compilation of data and reports related to occurrences and other information of environmental protection, safety, and health protection significance.
  - (3) Recommends Headquarters or field investigations (when not otherwise required by this order) for occurrences that an overall impact on Department of Energy programs.
  - (4) Recommends Headquarters or field investigation boards to the Assistant Secretary for Environment, Safety and Health.
  - (5) Reviews the reports of Headquarters and field investigation boards to:

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- (a) Determine whether the investigations and the reports meet Department of Energy standards for thoroughness, objectivity, and independence.
  - (b) Assure prompt identification and correction of injury and property damage causes.
  - (c) Assure appropriate distribution of the reports in those instances where the lessons learned are potentially applicable to other Department of Energy and Department of Energy contractor sites.
- (6) Recommends to the Assistant Secretary for Environment Safety, and Health the acceptance of the reports of Headquarters investigation boards and the necessary corrective actions based on the boards' reports and other appropriate considerations.
  - (7) Assure that the corrective actions that are directed by the Assistant Secretary for Environment, Safety, and Health are satisfactorily completed.
  - (8) Accepts field investigation reports one, if appropriate. recommends to Heads of Field Elements additional corrective actions.
  - (9) Informs the Secretary and the Assistant Secretary for Environment, safety, and Health the appropriate congressional committees, other federal agencies, the Inspector General, and other appropriate Headquarters elements of significant occurrences in the Department of Energy and Department of Energy contractor operations.
- (10) Maintains, consolidates, and summarizes information regarding occurrences in the Department of Energy and Department of Energy contractor operations in order to:
    - (8) Provide basic safety statistics used in evaluating safety program performance.
    - (0) Provide safety information to the Secretary, the Congress, Department of Energy offices, Department of Energy contractors, other Federal agencies, and the public.
    - (C) Provide a basis for identifying needed improvements to safety codes, standards, and regulations.
    - (d) Identify areas where research or development work is needed for safety evaluation or control purposes.

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- (11) Develops and maintains a cadre of Department of Energy trained accident investigators who are available to participate as members of Headquarters and field investigation boards.
- (12) Circulates investigation reports for review by appropriate Headquarters elements when the recommendations for corrective actions involve or may affect activities under their jurisdiction.
- (13) Conducts and coordinates all activities associated with operation and maintenance of the DOE Radiation Records Repository assuring that:
  - (a) Radiation exposure data are submitted to the repository.
  - (b) Monitored personnel locator file information is submitted to the repository.
  - (c) Requests for information from the repository are processed.
  - (d) Information that identifies the individual will be disclosed only in accordance with the Privacy Act of 1974 and the Freedom of Information Act, as amended. The release of summary statistical information reported in accordance with this Order is governed by DOE 1340.1A, MANAGEMENT OF PUBLIC COMMUNICATIONS, PUBLICATIONS, AND SCIENTIFIC, TECHNICAL, AND ENGINEERING PUBLICATIONS.
- (14) Establishes and interprets Department of Energy environmental and effluent monitoring and reporting requirements.
- (15) Reviews and approves field element recommendations as to which sites need not perform routine effluent or environmental and reporting. This approval authority does not extend to monitoring and reporting required by Federal, State, and local laws, regulations, and permits.
- (16) May waive specific Department of Energy effluent and environmental monitoring and reporting requirements for existing sites if not otherwise required by law or permit conditions.

c. Inspector General (IG-1).

- (1) Reviews and recommends policies and standards for notification investigation, and reporting of occurrence in the Department of Energy and Department of Energy contractor operations.

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- (2) Reviews Department of Energy notification, investigation, and reporting of occurrences for adequacy and consistency with the requirements of Order and, as appropriate, reports results of such reviews to the Secretary.
- (3) Conducts investigations as required by the Secretary.
- (4) Concurs in the membership of all Headquarters investigation boards recommended by the Director of Operational Safety.

d. Heads of Departmental Elements.

- (1) Review reports of occurrences for operations for which they are cognizant in order to determine if any instructions or procedures for which they are responsible need revision. Those responsible Headquarters officials having contractor organizations directly under their jurisdiction will assume the same responsibilities as Heads of Field Elements in paragraph 6f, below. The Deputy Assistant Secretary for Naval Reactors shall assume, for Naval Reactor's activities, the same responsibilities as Heads of Field elements.
- (2) Notify, within 24 hours after receipt of exposure information, any Department of Energy employee in their organization of any radiation exposure received that exceeds the dose equivalent standards specified in DOE 5480.1A, Chapter XI; notify the Director of Safeguards and Security if the incident would appear to have interface with nuclear material control/accountability and/or security interests.
- (3) Assure that employees in their organization obtain a personnel monitoring device prior to visiting facilities not operated by the Department of Energy or Department of energy contractors where exposure to radiation is possible. Instruct Department of Energy employees who might unexpectedly visit a contractor or licensed facility without a monitoring device to use the personnel monitoring device provided by the facility and to request that any resultant exposure information along with the individual's name, social security number, and date of birth be sent to the Department of Energy Headquarters, Attention: Director of Operational Safety, EH-34.

e. Heads of Field Elements and Other Contracting Officers.

- (1) Establish procedures to assure proper notification (internally and to Federal, State, regional, and local agencies), investigation, and reporting of occurrences as required in this Order.

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- (2) Identify occurrences that are to be investigated by field element boards. Appoint field investigation boards and establish the scope of their investigations including limitations, if any. Heads of Field Elements may desire to use Department of Energy personnel from other offices. Arrangements for use of such personnel may be made by contacting the Director of Operational Safety, or communicating directly with another field element. If arrangements are made with another field element, the Office of Operational Safety should be advised.
- (3) Review reports of field investigation boards and order additional investigation, if necessary.
- (4) Transmit reports of field investigation boards to the Office of Operational Safety (EN-34) with copies to the Inspector General (IG-1) and other appropriate Headquarters officials. Transmit with each report a field element evaluation of the report including a statement of the corrective actions that have been taken or are planned by the field element.
- (5) Assure that corrective actions are satisfactorily completed and so advise the Office of Operational Safety with copies to the appropriate Headquarters program organization.
- (6) Assure that, except for necessary emergency actions, the scene of any occurrence requiring or possibly requiring a Headquarters or field element board investigation is not disturbed until the investigation board concurs that recovery or normal operations may be resumed.
- (7) Assure that Headquarters and field investigation boards receive the necessary logistic and administrative support.
- (8) Direct the preparation and release of public statements on occurrences, where deemed appropriate.
- (9) Assure that all individuals under their Jurisdiction are:
  - (a) Notified within 24 hours after receipt of exposure information of any radiation exposures that exceed the dose equivalent standards specified in DOE 5480.1A, Chapter XI.
  - (b) Provided, upon written and signed request, with a summary of their reported occupational radiation exposures. Such reports shall be furnished within 30 days from the time the request is made, or within 30 days after the exposure has been determined, whichever is later.

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- (10) Prepare an Annual Summary of Fire and Other Property Damage Experience Report and submit it to the Director of Operational Safety (EH-34) on or before 3-15 of each year.
- (11) Determine when preoperational and environmental surveys are required to obtain background and baseline data in advance of start up of any new site or a new facility or process at an existing site; review and approve the preoperational survey program prior to its implementation; and review and approve the report of the survey results prior to start up of the new facility or site operation.
- (12) Assure the Department of Energy facilities and sites under their purview conduct the effluent and environmental monitoring and reporting programs in accordance with the requirements of this Order and as necessary to determine compliance with all applicable Federal, State, and local effluent standards and permit conditions; and report to the local, state, and regional environmental protection agencies, the public and Department of Energy Headquarters on the status of such compliance.
- (13) Recommend to the Director of Operational Safety, with the concurrence of the director(s) of the responsible program office(s), when routine environmental monitoring and reporting is not required (programs to be waived) or is to be terminated at Department of Energy sites. Requests for approval to terminate any environmental monitoring and reporting activities should include an explanation, with supporting data, as to why the site is not expected to have significant releases or a significant effect on the the environment. For any site holding an exemption from environmental reporting requirements, the respective field element head or contract administrator shall assure that an annual environmental summary is prepared as required by page III-3, paragraph 4c, of this Order, and copies forwarded to the Director of Operational Safety (EH-34).
- (14) May grant an explanation from monitoring and reporting for those effluents that meet all of the following criteria:
  - (a) Do not routinely contain and are not a potential source of accidental releases of significant quantities or concentrations of radioactivity or nonradioactive pollutants in relation to applicable standards.
  - (b) Are of no health and safety or environmental significance.
  - (c) Are not required to be maintained by other Federal, State, or local pollution control agencies or regulations. (The Office

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of Operational Safety will assist in the interpretation of "significant" as used above, and elsewhere in this Order, on a case-by-case basis as requested.)

f. Members of Headquarters and Field Elements Boards of Investigation.

- (1) Report directly to the Department of Energy appointing official during the investigation.
- (2) Understand the scope of the investigation including the limitations, if any, prior to initiating the investigation. If necessary, the board should discuss the scope of the investigation with the appointing official or his or her designee.
- (3) Conduct an investigation and prepare an investigation report that satisfies the requirements in this Order.
- (4) Transmit the report with a cover memorandum that includes the board's recommendation to the appointing official within a specified period of time.

g. Requestors of Radiation Exposure Information. All requests for information from the Department of Energy Records Repository should be directed to the Director of Operational Safety. Information that identifies the individual will be disclosed only upon written authorization of the individual or his or her duly authorized representative pursuant to the Privacy Act of 1974 and the Freedom of Information Act.

BY ORDER OF THE SECRETARY OF ENERGY:



LAURENCE F. DAVENPORT  
Assistant Secretary  
Management and Administration

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- Attachment 12- DOE F 5821.1, "Radioactive Effluent/Onsite Discharges/Unplanned Releases"
- Attachment 13- Annual Industrial Summary of Fire and Other Property Damage Experience (Suggested Format)

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3. QUARTERLY SUMMARIES AND OTHER REPORTS.

- a. DOE F 5484.4. DOE F 5484.4 "Tabulation of Property Damage Experience," Attachment 2, shall be prepared by each Departmental Element and contractor organization unit. One copy from each field element, area office, and contractor organizational unit shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho Inc., on or before the 25th of January, April, July, and October. Revisions of reports for each of the 2 preceding calendar years are due 2-28.
- b. Forms OSHA-200 AND OSHA-100F. Form OSHA-200, "Bureau of Labor Statistics Log and Summary of Occupational Injuries and Illnesses," Attachment 7 shall be completed for Department of Energy contractor employees, and Form OSHA-100 F, "Log of Federal Occupational Injuries and Illnesses," Attachment 9, shall be completed for Federal employees and maintained on file for a period of at least 5 years.
- c. Report of Radiation Exposures to Headquarters Employees. Report all recorded external and internal radiation exposures that occur during a visit by Department of Energy Headquarters employees to a field element or contractor facility. Complete the appropriate portions of DOE F 5484.8, and submit it to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within 30 days after the individual's date of visit or within 30 days after his or her exposure has been determined, whichever is later.
- d. Report of Radiation Exposures to Visitors.
- (1) Report all positive external and internal radiation exposures recorded for visitors during the period of their visit to a Department of Energy or contractor facility. Complete the appropriate portions of DOE F 5484.8 and submit copies of these reports to the visitor's employer (or to the visitor if he or she has no employer) within a period of 30 days after the date of the visit or 30 days after the visitor's exposure has been determined, whichever is later. For visitors who are employees of the Department of Energy or Department of Energy contractors, a report should be submitted only to the visitor's employer.
  - (2) Any radiation exposure in excess of the radiation dose equivalent standards established by DOE 5480.1B, Chapter XI, shall be reported within 24 hours after the exposure or within 24 hours after the exposure has been determined, whichever is later, to the visitor and his employer by telephone or teletype message. If the initial report is made by telephone, a written report shall follow within 30 days.

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- e. Preoperational Environmental Survey Reports shall be prepared as specified on page III-1, which summarized preoperational survey data and information. Five copies shall be submitted to the Office of Environment, Safety, and Health and one copy to appropriate program offices before the new site becomes operational.

4. ANNUAL REPORTS.

- a. Annual Radiation Exposure Reports. Heads of Field Elements shall submit the following reports ("Annual Radiation Dose Summary," and DOE F 5484.7, "Summary of Exposures Resulting in Internal Body Depositions of Radioactive Materials for CY 19\_\_.") to the System Safety Development Center (SSDC), EG&G Idaho, Inc., by 3-31 for the preceding calendar year for monitored Department of Energy and Department of Energy contractor employees and for visitors to Department of Energy or Department of Energy contractor facilities.

- (1) Summary of Worker and visitor Radiation Exposure and Locator File Input. field elements shall submit an "Annual Radiation Dose Summary," Attachment 8, for all monitored workers, including DOE and DOE contractor employees, nonemployee radiation workers, and visitors with positive exposures, to the System Safety Development Center at EG&G Idaho no later than 3-31 for the preceding calendar year. Exposures received by employees of DOE contractors while on trips to other DOE contractor sites are included in the annual summary of the individual. The transmittal should include the total number of monitored visitors. Submittal should be via the Secure Automatic Communications Network. Alternatively, hard copies of the report may be used (Attachment 8). Whatever form of transmittal is selected, it should be safeguarded to avoid unwarranted public release or privacy act protection information.

(2) Internal Exposures.

- (a) DOE F 5484.7, Attachment 11. The report shall include:

- 1 Any uptake of radioactive material occurring during the reporting year that independently, or when added to a current burden, it estimated to result in a dose commitment to the critical organ in excess of 50 percent of the *pertinent annual dose equivalent standatrds set for in* DOE 5480.1A, Chapter XI.

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- 2 Any previously unreported uptake of radioactive material that is determined to have been reportable according to the above criteria by reason of more recent dose estimates.
- (b) Any dose commitment to a critical organ resulting from an uptake of radioactive material should be added to the dose received by that organ from external sources when determining uptakes that are reportable according to the above criteria. In those cases where the whole body is considered to be the critical organ and the dose commitment from each internal uptake is combined with the dose contributed by external sources for the purpose of reporting cumulative whole body exposures in the Annual Radiation Dose Summary, it is not necessary to report those internal exposures on DOE F 5484.7.
- b. Annual Industrial Summary of Fire and Other Property Damage Experience (Suggested Format). The report summarizes the ~~calendar~~-year experience and activities of this organization relative to the control of Department of Energy property damage and loss from fire and other accident causes. A suggested reporting format is provided as Attachment 13.
- c. Effluent and Environmental Monitoring Reports.
- (1) Reports of Effluent Monitoring Data.
- (a) Effluent monitoring data for nonradioactive pollutants should be reported in the site environmental monitoring report or summary as described in Chapter III of this Order.
- (b) Radioactive Effluent and Onsite Discharge Data Reports covering the previous calendar year shall be submitted to the Information Systems Branch, EG&G Idaho, Inc., by April 1, with a copy of the cover letter (enclose maps only) to the Office of Operational Safety. The reports, including the data forms, cover sheet, maps, and, if necessary, explanatory information shall be submitted in accordance with Instructions provided in Section II of the Effluent Information System and Onsite Discharge Information System User's Manuals. Maps should be included only when they reflect modifications (terminations or startups, etc.) from previous years. The Monitoring Data Report shall consist of:
- 1 A cover sheet listing the site, facility, report period, contractor(s), and address.

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- 2 A summary providing pertinent descriptive and interpretative information which would serve to explain any facets of the data which are not adequately described on the forms. (Classified effluent data should be submitted on separate forms.)
  - 3 Maps, 8-1/2 x 11 inch, showing the locations of effluent streams and onsite discharge points.
  - 4 Completed Radioactive Effluents/Onsite Discharges/Unplanned Releases, DOE F 48212.1., Attachment 12, unless submitted via the Secure Automatic Communications Network (SACNET) or directly to the computer operations.
- (c) Unplanned releases of radioactivity in effluents, or that go offsite by spills, leaks, etc., which are reported according to Chapter I of this Order, and unplanned releases of radioactivity in onsite spills, leaks, etc. shall be reported to the Information System Branch, EG&G Idaho, Inc., on a separate DOE F 5821.1.
- (d) Field elements should assure that any data errors on the Radioactive Effluent/Onsite Discharge Data Form are reported promptly to the Information Systems Branch, EG&G Idaho, Inc., using amended forms.
- (2) ~~Environmental Monitoring Reports covering the previous calendar year shall be prepared annually and distributed by May 1 to the Office of Operational Safety (10 copies), appropriate program offices, the Department of Energy Technical Information Center, and to other agencies and organizations, as appropriate. Attachment 5 of this Order provides the suggested format for this report.~~
  - (3) Environmental Summaries for the previous calendar year shall be submitted annually to the Office of Operational Safety (10 copies) by May 1 for all sites which are exempted from (2) above, in accordance with the provisions of Chapter III of this Order. Attachment 6 of this Order provides the suggested format for this report.
  - (4) Environmental Reports to Regulatory Agencies shall be submitted in accordance with schedules established by the applicable permits or regulations.

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REVISED RADIATION EXPOSURE INFORMATION REPORTING SYSTEM  
U.S. DEPARTMENT OF ENERGY

ANNUAL RADIATION DOSE SUMMARY

for  
Monitored Workers and for Visitors with a Positive Exposure

(Example)

Item	<u>Example Code or Data</u>	<u>Field Size (Characters)</u>	<u>Column Range</u>
1. Calendar year of reported data	1986	4	1-4
2. Social security number	123456789	9	9-13
3. Name of monitored individual (left justify)			
a. First name or initial	JOHN	15	14-28
b. Middle name or initial	Q	12	29-40
c. Last name	DOE	15	41-55
4. Birth year	1942	4	56-59
5. Sex (F or M)	M	1	60-60
6. Beginning of monitoring date (MMDDYY)	010182	6	61-66
7. End of monitoring date, end of visit date, or termination date		6	67-72
8. Employment status	A	1	73-73
A= Monitored worker	(see TABLE 1)		
T= Terminated employee			
V= Monitored Visitor			
N= Nonemployee radiation worker			
9. Organization code	0567002	7	74-80
10. Facility type code	(see TABLE 2)	2	81-82
11. Occupation code	(see TABLE 3)	3	83-85

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Item	<u>Example Code or Data</u>	<u>Field Size (Characters)</u>	Column Range
12. Annual whole body dose			
a. Total effective dose equivalent*	(dose equivalent**)	7	86-92
b. External penetrating (including neutron)	(dose equivalent**)	7	93-99
- Neutron	(dose equivalent**)	7	100-106
c. Internal*			
Year of uptake	1981	4	107-110
Radionuclide(s) (left justified)	PU239PU240AM241	15	111-125
Effective dose equivalent	(effective dose equivalent**)	7	126-132
Year of uptake	1986	4	133-136
Radionuclide(s) (left justified)	N3	15	137-151
Effective dose equivalent	(effective dose equivalent**)	7	152-158
Uptakes continued elsewhere (Y/N)	N	1	159-159
13. Annual shallow dose	(dose equivalent**)	7	160-166
14. Annual extremity dose*			
a. Forearms and hands	(dose equivalent**)	7	167-173
b. Lower legs and feet	(dose equivalent**)	7	174-180

Assumes computerized data base input. Hard copy forms will be made available for visitors with a positive exposure complete items 1-3, 6-9, and 12-14. Items 1-9 will be copied to the Monitored Personnel Locator File with items 2 and 3 being deleted from the annual dose file within 60 days of the transmittal to the System Safety Development Center, EG&G Idaho, Inc.

\* These reporting requirements will replace DOE F 5484.7. However, at this time, reporting deferred pending revision of DOE 5480.1B, Chapter XI.  
\*\*Dose equivalent in units of mrem, right justified.

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### Instructions for Preparing Annual Radiation Dose Summary

this report is required for all employees and for those visitors having a positive exposure who were monitored for radiation exposure in accordance with DOE 5480.1A, Chapter XI. Reporting units shall submit report to the System Safety Development Center, EG&G Idaho, Inc., by 3-31 following the year of monitoring. The transmittal should include the total number of visitors monitored. The report summarized the individual's annual exposure data in the following manner:

1. CALENDAR YEAR - Enter the calendar year for which data are being submitted. A site dosimetry record year may differ slightly from the actual calendar year because of dosimeter processing scheduling. Minor variances (up to 2 weekds) are permissible as long as the period of reporting is consistent from year to year.
2. SOCIAL SECURITY NUMBER - if less than 9 digits, left justify.
3. NAME - FIRST name or initial, in upper case and left justified.  
- MIDDLE name or initial, in upper case and left justified.  
- LAST name, in upper case and left justified.
4. BIRTH YEAR - Enter full year of birth (example = 1942). This is optional for visitors.
5. SEX - Female "F" or Male "M". This is optional for visitors.
6. BEGINNING OF MONITORING DATE - Enter the beginning monitoring date for calendar year.
7. TERMINATION OR END OF MONITORING DATE - For terminated employees, enter the date of latest termination. For visitors, enter the ending date of the visit during which positive exposure is received. A separate report is required for each successive visit where a positive exposure is experienced. If a monitoring period of a visitor bridges 2 calendar years (see Item 1, above) and the visitor is provided a single dosimeter for the duration of his visit, any positive exposure recorded should be reported in the year the dosimeter is processed. However, if a visitor is provided a separate dosimeter in each calendar year, a separate report is required for each year.
8. EMPLOYMENT STATUS - Definitions are provided in Table 1.
  - MONITORED WORKER, enter "A" for those persons employed as of the close of the calendar year (see Item 1, above).
  - TERMINATED EMPLOYEE, enter "T" for those persons who have terminated employment during the calendar year and are not rehired as of the end of the calendar year (see Item 1, above).
  - MONITORED VISITOR, enter "V" for individuals visiting during the calendar year.
  - NON-EMPLOYEE RADIATION WORKER, enter "N" for visitors who are considered radiation workers during the calendar year.

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9. ORGANIZATION CODE - Enter the organization code (obtained from the System Safety Development Center (SSDC), EG&G, Idaho, FTS: 583-0141) of the employer. For visitors, enter the organization code of the host.
10. FACILITY CODE - Enter the code from Table 2 for the facility contributing the predominant portion of the individual's effective dose equivalent. Otherwise, indicate the facility wherein the greater portion of work service is recorded.
11. OCCUPATION CODE - Enter the code from Table 3 for the generic occupation that best fits the individual's occupation title.
12. ANNUAL WHOLE BODY DOSE - Enter the dose equivalent or effective dose equivalent in units of millirem, right justified.
  - a. TOTAL EFFECTIVE DOSE EQUIVALENT - Enter the sum of the external whole body penetrating dose equivalent and the weighted internal dose equivalents in units of millirem.
  - b. EXTERNAL PENETRATING - Enter the total annual penetrating dose equivalent at 1.0 cm from external radiation sources, including neutron exposure in units of millirem.  
NEUTRON - Enter the dose equivalent in units of millirem from neutron exposure only.
  - c. INTERNAL - Enter the actual or suspected year of uptake, the major radionuclide(s) involved, and the resulting annual effective dose equivalent associated with any internally deposited radio-nuclides contributing to the total annual internal effective dose equivalent in units of millirem. Where more than one uptake of the same radionuclide occurs during the year, these should be combined. Provision is given for reporting the annual effective dose equivalent due to deposition of other radionuclides. Indicate "Yes" (Y) or "No" (N), whether a separate form is submitted for continuation of uptakes.
13. ANNUAL SHALLOW DOSE - Total dose equivalent at 0.007 cm in units of millirem, right justified (excluding neutron dose).
14. ANNUAL EXTREMITY DOSE - Enter the dose equivalent in units of millirem right justified for all monitored workers. When only a whole body dosimeter is worn, enter the dose equivalent from the whole body dosimeter. When both an extremity and a whole body dosimeter are used during a monitoring period, do not include the contribution from the whole body dosimeter to the extremity entry. When both the left and right extremity are monitored, record the higher of the right or left exposure.

Vertical line denotes change.

- a. FOREARMS AND HANDS- Enter the total dose for the arm below the elbow.
- b. LOWER LEGS AND FEET - Enter the total dose for the leg below the knee.

(Note: Leaving a dose amount blank indicates specific monitoring was not conducted. A zero dose represents a "less than measureable" exposure.)

\*Reporting outterred pending revision of DOE 5480.1B, Chatpter XI.

Vertical line denotes change.

Table 1  
Definitions for Employment Status

Monitored worker. Any active employee of the reporting organization who works with, or is in the proximity of, ionizing radiation or radioactive material and who is monitored in accordance with the DOE 5480.1B, Chapter XI.

Terminated Employee. For the purposes of this Order, an individual employed by DOE or DOE contractor who terminates his or her employment, an individual who transfers to another DOE or contractor facility or office that results in termination of radiation monitoring, an individual who begins a leave of absence of greater than 12 months duration, or all employees of a contractor whose contracts with DOE are terminated.

Monitored Visitor. Any nonemployee visiting a facility that is operated by Department of Energy (DOE) or DOE contractor under circumstances other than as a nonemployee radiation worker, requiring that he or she be monitored for radiation exposure.

Nonemployee Radiation Worker. An individual who is either a subcontractor to a DOE contractor or who visits a DOE site to perform work for or in conjunction with DOE or utilizes DOE facilities and who is monitored for occupational exposure as required in DOE 5480.1B, Chapter XI.

Vertical line denotes change.

DOE 5484.1 Chg 3  
11-6-87

Table 2

Facility Type

CODE	<u>FACILITY TYPE OR OPERATION</u> <sup>1 /</sup>
10	ACCELERATOR
21	FUEL/URANIUM ENRICHMENT
22	FUEL FABRICATION
23	FUEL PROCESSING
40	MAINTENANCE AND SUPPORT (SITE-WIDE)
50	REACTOR
61	RESEARCH, GENERAL
62	RESEARCH, FUSION
70	WASTE PROCESSING/MANAGEMENT
80	WEAPONS FABRICATION AND TESTING
99	OTHER

<sup>1 /</sup> Workers should be assigned to one facility type where the predominant amount of the individual's work takes place.

Vertical line denotes change.

Table 3  
Occupational Codes<sup>1/</sup>

<u>CODE</u>	<u>OCCUPATIONAL CODES OCCUPATIONAL CATEGORIES</u>	<u>SOC REFERENCE</u> <sup>1/</sup>
110	MANAGERS AND ADMINISTRATORS	11-14
-	PROFESSIONAL	15-39
160	Engineers	16
170	Scientists	17-19
134	Health Physicists	1843
200	Misc. Professionals	20-25, 32-34
260	Doctors and Nurses	26-30
350	Technicians	35-39
360	Health Technicians	36
370	Engineering Technicians	37
380	Science Technicians	38
383	Radiation Monitors/Techs.	383
390	Misc. Technicians	39
400	SALES	40-44
450	ADMIN, SUPPORT AND CLERICAL	45-47
-	SERVICE	50-52
512	Firefighters	512
513	Security Guards	513/4
521	Food Service Employees	521
524	Janitors	524
525	Misc. Service	523, 525/6
-	AGRICULTURE	55-58
562	Groundskeepers	562
570	Forest workers	57
580	Misc. Agriculture	55, 561, 58
-	REPAIR/CONSTRUCTION	60-65
610	Mechanics/Repairers	60-61
641	Masons	641
642	Carpenters	642
643	Electricians	643
644	Painters	644
645	Pipe Fitter	645
650	Miners/Drillers	65
660	Misc. Repair/Construction	62,640
-	PRECISION/PRODUCTION	67-78
661	Machinists	681
662	Sheet Metal Workers	682
690	Operators, Plant/System/Utility	69
710	Machine Setup/Operators	71-76
771	Welders and Solderers	771
730	Misc. Precision/Production	67, 683-688, 772-78

Vertical line denotes change.

-	TRANSPORT	81-83
820	Truck Drivers	8212-8214
821	Bus Drivers	8215
825	Pilots	825
830	Equipment Operators	83
840	Misc. Transport	81, 8216-824, 826
850	HANDLERS/LABORERS/HELPERS	85-87
910	MILITARY	91
990	MISCELLANEOUS	99

1 /

The occupational classifications provided have been standardized to the codes in the Department of Commerce's Standard Occupational Classification (SOC) Manual (1980). If a differing classification system exists onsite, arrangements should be made with EG&G Idaho to have them develop a conversion program if retention of the existing classification system is desired.

Vertical line denotes change.



SUMMARY OF EXPOSURES RESULTING IN INTERNAL BODY DEPOSITIONS  
OF RADIOACTIVE MATERIALS FOR CV 19

REPORTING ORGANIZATION		PERFORMED BY	
Fusion Research Laboratory R. Carrington			
ADDRESS	DATE	MOB. NO.	PHONE
P.O. Box 1005	2/4/88	319-268-3131	
Cupertino, California 94563			

REPORTING AND USE ONLY

REPORTING ORG. NO. OR NUMBER	REPORTING ORG. NO. OR NUMBER
------------------------------------	------------------------------------

SUMMARY OF EXPOSURE RECEIVED IN INTERNAL BODY DEPOSITIONS  
OF RADIOACTIVE MATERIALS FOR CV 19  
CONTINUE FROM THE PREVIOUS PAGE CONTAINER

1. DATE, TIME AND PLACE	2. EXPOSURE	3. ISOTOPE	4. TYPE	5. SOURCE	6. A.1	7. B.1	8. C.1	9. D.1	10. E.1	11. F.1
<div style="border: 2px solid black; padding: 10px; transform: rotate(-45deg); display: inline-block;">           EXHAUSTED         </div>										

Vertical line denotes change.

**Instructions for Completing DOE FORM 17**  
**ANNUAL SUMMARY OF EXPOSURES**  
**RESULTING IN INTERNAL BODY DEPOSITION OF RADIOACTIVE MATERIALS**

**1. GENERAL INSTRUCTIONS**

- a. Pursuant to DOE 5484.1, an annual report summarizing internal body exposures recorded during the previous calendar year for DOE and DOE contractor employees in the course of DOE activities and for visitors to DOE or DOE operations shall be prepared each year.
- b. Please print all information. The letter 'O' should be printed '0' to differentiate it from the number zero. Similarly, the letter 'I' should be printed '1' to differentiate it from the number '7'. Several of the data items require data to be right justified (R. J.), written from the right hand side of the field, while others require data to be left justified (L. J.), written from the left hand side of the field.
- c. Only one character per indicated space is allowed. Do not use more than the allowed space on the form.
- d. **Printed By, Date, Organization, and Address**—This information is for reference. Should future verification be required from the individual who originally created the summary information, 8 cards or more are submitted. The portion of DOE FORM 17 should be completed and submitted with them.

**2. SPECIFIC INSTRUCTIONS**

- a. **EMPLOYER (reported item on all cards):** This section must always be completed and consistent for all cards.
  - (1) **Character Code**—A unique identifier assigned to each contractor and DOE office reporting to the Radiation Exposure Information Reporting System. The code should be left justified in the field with hyphens included and spaces omitted.
  - (2) **Type**—A one-character alpha code to indicate the type of organization. 'C' = DOE contractor. 'D' = DOE office.
- b. **SOCIAL SECURITY NUMBER:** Enter social security number(s) of individual(s) being reported.

c. **EXPOSURE DATE:** Enter beginning date of exposure.

d. **BIRTH:** Enter birthdate of individual(s) being reported.

e. **NAME:** Enter the first initial of the individual in column 26, the middle initial in column 27, and the last name starting in column 28.

f. **ORGANOID:** Enter the chemical symbol(s), left justified. Use the proper language notation as listed in the Table, Order DOE 5484.1, Chapter 11, A—Standards for Radiation Protection, counting systems and units. If the data resulted from a mixture of organoids, list the major component(s) sequentially (i.e., Caesium 137 and Cobalt 60 would be coded 001370000).

g. **ORGAN CODE 1:** Enter 3-digit code to indicate each organ for which a dose is specified. Select from the table below.

(1) Lung	00	(8) Liver	06
(2) Bone	11	(9) Testes	30
(3) Digestive System	03	(10) Pancreas	77
(4) Whole Body	05	(11) Thyroid	08
(5) Kidney	71	(12) Spleen	07
(6) Spleen	07	(13) Muscle	13
(7) Fat/adipose	08	(14) Adrenal Gland	03

h. **ORGAN CODE 2:** Second organ code (if reported)

i. **ORGAN CODE 3:** Third organ code (if reported)

j. **DOSE EQUIVALENT:** Enter the dose commitment (rem) received by the specified organ(s) during the calendar year; even days including three decimal places (Right justify numbers, omit the decimal point, e.g., code 00.353 or 00353.)

k. **MEYK DOSE:** Enter method of determining dose. Select 3-digit code from following list.

(1) - Bioassay	(2) - Urinary assay
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DOE FORM 17

Vertical line denotes change.

RADIOACTIVE EFFLUENT/ONSITE DISCHARGES/UNPLANNED RELEASES

U.S. DEPARTMENT OF ENERGY  
RADIOACTIVE EFFLUENTS/ONSITE DISCHARGES/UNPLANNED RELEASES

Form 1  
1-78

Plant Name: Pacific Refractory  
Unit: GRC-1 High Temperature Unit  
Description: Liquid Waste (Leakage) (Leakage Stack)  
Process: Evaporation of Liquid Waste Materials  
Emission: Condensation  
Control: Continuous Air Sampler 15 Foot Sample Line  
Monitoring: Continuous  
Type of Monitoring: Continuous  
Monitoring Station: 15 Foot Sample Line

Author: J. G. Hartley  
Date: 6/6/80  
Checked: R. E. Rogers  
Date: 6/7/80

1 66 610

Time	Activity	Unit	Concentration
10:15 AM	7.45	(2) Stack Concentration	
10:15 AM	6.54	(2) Stack Concentration	
11:00 AM	6.07	(2) Stack Concentration	
11:15 AM	6.06	(2) Stack Concentration	
11:30 AM	6.06	(2) Stack Concentration	
11:45 AM	6.06	(2) Stack Concentration	
12:00 PM	6.06	(2) Stack Concentration	
12:15 PM	6.06	(2) Stack Concentration	
12:30 PM	6.06	(2) Stack Concentration	
12:45 PM	6.06	(2) Stack Concentration	
1:00 PM	6.06	(2) Stack Concentration	
1:15 PM	6.06	(2) Stack Concentration	
1:30 PM	6.06	(2) Stack Concentration	
1:45 PM	6.06	(2) Stack Concentration	
2:00 PM	6.06	(2) Stack Concentration	
2:15 PM	6.06	(2) Stack Concentration	
2:30 PM	6.06	(2) Stack Concentration	
2:45 PM	6.06	(2) Stack Concentration	
3:00 PM	6.06	(2) Stack Concentration	
3:15 PM	6.06	(2) Stack Concentration	
3:30 PM	6.06	(2) Stack Concentration	
3:45 PM	6.06	(2) Stack Concentration	
4:00 PM	6.06	(2) Stack Concentration	
4:15 PM	6.06	(2) Stack Concentration	
4:30 PM	6.06	(2) Stack Concentration	
4:45 PM	6.06	(2) Stack Concentration	
5:00 PM	6.06	(2) Stack Concentration	
5:15 PM	6.06	(2) Stack Concentration	
5:30 PM	6.06	(2) Stack Concentration	
5:45 PM	6.06	(2) Stack Concentration	
6:00 PM	6.06	(2) Stack Concentration	
6:15 PM	6.06	(2) Stack Concentration	
6:30 PM	6.06	(2) Stack Concentration	
6:45 PM	6.06	(2) Stack Concentration	
7:00 PM	6.06	(2) Stack Concentration	
7:15 PM	6.06	(2) Stack Concentration	
7:30 PM	6.06	(2) Stack Concentration	
7:45 PM	6.06	(2) Stack Concentration	
8:00 PM	6.06	(2) Stack Concentration	
8:15 PM	6.06	(2) Stack Concentration	
8:30 PM	6.06	(2) Stack Concentration	
8:45 PM	6.06	(2) Stack Concentration	
9:00 PM	6.06	(2) Stack Concentration	
9:15 PM	6.06	(2) Stack Concentration	
9:30 PM	6.06	(2) Stack Concentration	
9:45 PM	6.06	(2) Stack Concentration	
10:00 PM	6.06	(2) Stack Concentration	
10:15 PM	6.06	(2) Stack Concentration	
10:30 PM	6.06	(2) Stack Concentration	
10:45 PM	6.06	(2) Stack Concentration	
11:00 PM	6.06	(2) Stack Concentration	
11:15 PM	6.06	(2) Stack Concentration	
11:30 PM	6.06	(2) Stack Concentration	
11:45 PM	6.06	(2) Stack Concentration	
12:00 AM	6.06	(2) Stack Concentration	

Vertical line denotes change.

Vertical line denotes change.

SECTION 1  
The following information is required for the preparation of the report...

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

SECTION 2

The following information is required for the preparation of the report...

SECTION 3

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

SECTION 4

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

SECTION 5

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

SECTION 6

- 1. The name of the organization...
2. The name of the individual...
3. The name of the project...
4. The name of the sponsor...

SECTION 7

The following information is required for the preparation of the report...

SECTION 8

SECTION 9

SECTION 10

SECTION 11

SECTION 12

SECTION 13

SECTION 14

SECTION 15

SECTION 16

SECTION 17

SECTION 18

SECTION 19

The following information is required for the preparation of the report...

SECTION 20

SECTION 21

SECTION 22

SECTION 23

SECTION 24

SECTION 25

SECTION 26

SECTION 27

SECTION 28

SECTION 29

SECTION 30

SECTION 31

SECTION 32

SECTION 33

SECTION 34

SECTION 35

ANNUAL INDUSTRIAL SUMMARY OF FIRE AND OTHER PROPERTY DAMAGE EXPERIENCE  
(Suggested Format)

an aggregate loss of \$\_\_ was suffered during 19 CV as a consequence of property damage accidents on Department of Energy-owned property for which this office has responsibility. About \_\_ percent of this loss resulted from the accidents listed below. A description of each accident involving a loss of \$5,000 or more is attached.

Major 19 CV Department of Energy Property Damage Accidents

<u>Loss</u>	<u>Date</u>	<u>Location</u>	<u>Type of Accident</u>
\$15,000	7/24	Powerplant, Fernald	Spontaneous ignition of coal in boiler feed bin.

- (1) Loss Experience Analysis. The monetary damage or loss suffered from the following categories of accidents should be presented:
  - (a) Fire.
  - (b) Explosion.
  - (c) Nature.
  - (d) Mechanical.
  - (e) Electrical.
  - (f) Radiation/Contamination.
  - (g) Other.
- (2) Recurring Loss Prevention Costs. The major available recurring costs of control or property damage or loss from the subject causes are primarily incurred as a consequence of paid fire department, volunteer brigade, and fire protection engineering expenses. A comparison of such costs with that of previous years should be set forth in charts (or tables). Data should be given for 19 CV and at least 2 previous years. If too voluminous, data should be given in an attached exhibit or reduced to chart form. Minimum data should include:
  - (a) Dollar cost in 19 CV and 1 previous year for contractor and field element fire department, fire brigade, and fire protection engineering expenses.

Vertical line denotes change.

- (b) As above, but expressed in terms of dollar cost per \$1,000,000 of Department of Energy-owned property.
  - (c) Department of Energy field element fire protection engineering expense during 19 CV expressed in \$/\$1,000,000 of Department of Energy-owned property. The (higher) (lower) recurring costs of 19 CV as compared with the previous 19 CV, are attributed to: (Give reasons.)
- (3) Property Damage Vulnerability of Department of Energy Projects. While property damage risks have been reduced to proportions warranting little concern by management at most locations, it should be noted that, under existing conditions, high property damage loss and/or serious interruption of Department of Energy operations are considered as being reasonably possible at the locations given below:
- (A) Locations. Limit to locations where losses of \$1,000,000 or serious interruption of important operations may reasonably be anticipated. If lengthy, summarize in this section and furnish details in an exhibit.
  - (b) Remarks. (Be brief.)
- (4) Department of Energy Fire Engineering Risk Appraisal. The responsibilities of this office for Department of Energy appraisals of fire risks detailed in this chapter were discharged by conduct of the Department of Energy fire protection engineering appraisals of the installations detailed in Exhibit\_\_. This exhibit also includes for each facility brief comments as to the overall status of fire protection, the estimated replacement value of Department of Energy property, the number of inspections made during 19 CV, and notations as to their relative importance to the Department of Energy program.
- (5) Major Fire Protection Accomplishments During 19 CV. Summarize the categories of fire protection in which major improvements have been made. For example, mention should be made of automatic protection Systems installed, increased inspection activities, organizational improvement, cost reductions, and promotional activities (e.g., National Fire Prevention Week).
- (6) Major Fire Protection Objectives for Next Year. Briefly summarize in this section areas in which major expenditures of effort or funds are anticipated.

Vertical line denotes change.

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- (7) Observations, Conclusions, and Recommendations. While no suggested format is given for the content of this section, in individual cases it may be appropriate to suggest basic changes in Department of Energy regulations or to point out especially important risks (e.g., arson, sabotage, explosion, risk to the public, radiation hazards from fires). In general, any items of interest to other field elements should be included. The material in this section should very briefly summarize conclusions resulting from 19 CY experience.



E R R A T A   S H E E T

Page IV-3 was inadvertently omitted from DOE 5484.1 Chg 3, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING SYSTEM, of 11-6-87; and pages Iii and IV-4 were inadvertently printed back-to-back. The attached pages should be replaced with those previously distributed.



- Attachment 9 - Form OSHA-100F, "Log of Federal Occupational Injuries and Illnesses"
- Attachment 10 - DOE F 5484.8, "Termination Occupational Exposure Report"
- Attachment 11 - DOE F 5484.7, "Summary of Exposures Resulting in Internal Body Depositions of Radioactive Materials for CY 19\_\_"
- Attachment 12 - DOE F 5821.1, "Radioactive Effluent/Onsite Discharges/Unplanned Releases"
- Attachment 13 - Annual Industrial Summary of Fire and Other Property Damage Experience (Suggested Format)

Vertical line denotes change.



QUARTERLY SUMMARIES AND OTHER REPORTS.

- a. DOE F 5484.1. DOE F 5484.4 "Tabulation of Property Damage Experience," Attachment 2, shall be prepared by each Departmental Element and contractor organization unit. One copy from each field element, area office, and contractor organizational unit shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho Inc., on or before the 25th of January, April, July, and October. Revisions of reports for each of the 2 preceding calendar years are due 2-28.
- b. Forms OSHA-200 and OSHA-100F. Form OSHA-200, "Bureau of Labor Statistics Log and Summary of Occupational Injuries and Illnesses," Attachment 7, shall be completed for Department of Energy contractor employees, and Form OSHA-100F, "Log of Federal Occupational Injuries and Illnesses," Attachment 9, shall be completed for Federal employees and maintained on file for a period of at least 5 years.
- c. Report of Radiation Exposures to Headquarters Employees. Report all recorded external and internal radiation exposures that occur during a visit by Department of Energy Headquarters employees to a field element or contractor facility. Complete the appropriate portions of DOE F 5484.8, and submit it to the System Safety Development Center (SSDC), EG&G Idaho, Inc., within 30 days after the individuals's date of visit or within 30 days after his or her exposure has been determined, whichever is later.
- d. Report of Radiation Exposures to Visitors.
  - (1) Report all positive external and internal radiation exposures recorded for visitors during the period of their visit to a Department of Energy or contractor facility. Complete the appropriate portions of DOE F 5484.8 and submit copies of these reports to the visitor's employer (or to the visitor if he or she has no employer) within a period of 30 days after the date of the visit or within 30 days after the visitor's exposure has been determined, whichever is later. For visitors who are employees of the Department of Energy or Department of Energy contractors, a report should be submitted only to the visitor's employer.
  - (2) Any radiation exposure in excess of the radiation dose equivalent standards established by DOE 5480.1B, Chapter XI, shall be reported within 24 hours after the exposure or within 24 hours after the exposure has been determined, whichever is later, to the visitor and his employer by telephone or teletype message. If the initial report is made by telephone, a written report shall follow within 30 days.

Vertical line denotes change.

- (b) All damage to, or loss of, or damage caused by, nuclear reactors or vital appendages thereto (e.g., cooling system components, control equipment), should be classed as Type "Vital appendages" include all equipment and materials directly associated with or necessary to the sustaining of reactor operation.
  - (c) All damage or loss sustained as a consequence of (and following the outbreak of) fire should be classed as Type 4a except fire losses involving cargo during transportation (see (a), above). Contamination damage caused by fire should be included in the loss reportable under Type 4a accidents.
  - (d) Except for cases covered by (a), (b), or (c), above, all losses suffered as a consequence of explosion (including any losses from contamination spread during the explosion) are classed as Type 4b.
  - (e) All contamination-caused losses, exclusive of those cases covered by (a), (b), (c), or (d), above, or those which result from nonreactor criticality accidents, should be classed as Type 4g1.
  - (f) Section 4d (Electrical Fault or Failure with Loss over \$1000) should not be used for reporting losses resulting from other than accidental (i.e., reasonably unforeseeable) causes.
- (2) Section 5. If a given loss involves more than one accident type (see Section 4 of Form 5484.5), list each such accident type contributing to the loss in the "Accident Type No." column and opposite each enter appropriate data.
- d. SF-91A, Investigation Report of Motor Vehicle Accident, Attachment 3, shall be prepared for each incident resulting in injury or property damage of \$250 or more. One copy shall be submitted to the System Safety Development Center (SSDC), EG&G Idaho, Inc., with Form 5484.4. The description of the occurrence, item number 26, shall include the following information:
- (1) Whether or not the vehicle was equipped with seat belts.
  - (2) Whether or not the seat belts were in use at the time of the accident.
  - (3) The dollar loss incurred.

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

PAGE CHANGE

DOE 5484.1 Chg 4

10-17-89

SUBJECT: ENVIRONMENTAL PROTECTION, SAFETY AND HEALTH PROTECTION  
INFORMATION REPORTING REQUIREMENTS

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1. PURPOSE. To incorporate provisions of DOE N 5480.4, PRELIMINARY NOTIFICATION OF ENVIRONMENT, SAFETY AND HEALTH CONCERNS, of 6-21-88.
2. EXPLANATION OF CHANGE. Adds immediate notification to DOE Emergency Operations Center for certain significant safety issues or concerns.
3. FILING INSTRUCTIONS.

a. <u>Remove page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
5	11-6-87	5	10-17-89
6	11-6-87	6	11-6-87
7	11-6-87	7	10-17-89
8	11-6-87	8	11-6-87
9	11-6-87	9	11-6-87
10 thru 12	11-6-87	10 thru 14	10-17-89
i	2-24-81	i	10-17-89
ii	11-6-87	ii	11-6-87
I-3 thru I-5 (and I-6)	2-24-81	I-3 thru I-6 I-7 (and I-8)	10-17-89 2-24-81

- b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



DONNA R. FITZPATRICK  
Assistant Secretary  
Management and Administration

---

DISTRIBUTION.  
All Departmental Elements

INITIATED BY:  
Assistant Secretary for Environment,  
Safety, and Health

- t. Department of Energy Operations. Those activities funded by DOE for which has authority to enforce for environmental protection, safety, and health protection requirements.
  - u. Field Element. A general term for any officially established Departmental component (excluding individual duty stations) located outside the Washington, DC, metropolitan area.
  - v. Monitored Worker. Any employee of the reporting organization who works with, or is in the proximity of, ionizing radiation or radioactive material and who is monitored in accordance with DOE 5480.11.
  - w. Monitored Personnel Locator File. A DOE centralized file maintained at the System Safety Development Center, EG&G Idaho, that contains all monitored DOE and DOE contractor personnel employed, and visitors who have positive exposures. The file consists of identification information only, e.g., name, social security number, birth year, and employer organization or organization visited). The file is used to identify personnel work locations so that inquiries can be made to the reporting organization for official dose records.
  - x. Nonemployee Radiation Worker. An individual who is either a subcontract to a DOE contractor or who visits a DOE site to perform work for or In conjunction with DOE or utilizes DOE facilities and who is monitored for occupational exposure as required in DOE 5480.11.
  - y. Engineered Safety Features. Components or equipment designed to: (a) provide the capability to shutdown the facility and maintain it in a safe shutdown condition; (b) ensure the integrity of the process system which provides a boundary against release of radioactive material (e.g., the integrity of the coolant pressure boundary in a reactor or a glove box in a process facility); (c) prevent or mitigate the consequences of events or accidents that could result in potentially measurable offsite exposures.
5. POLICY AND OBJECTIVES.
- a. It is the policy of the Department of Energy that timely notification of occurrences involving Department of Energy and Department of Energy contractor operations be made to responsible authority; that all occurrences be investigated; that reports be submitted to responsible Department of Energy officials; that management take responsive action; and that there be consistency In the treatment of such occurrences.

Vertical line denotes change.

¶ b. Director of Quality Programs (EH-32)

- (1) Develops policies, procedures, standards and guidelines for notification, investigation, and reporting of occurrences in the Department of Energy and Department of Energy contractor operations.
- (2) Establishes requirements and prescribes procedures for the collection and compilation of data and reports related to occurrences and other information of environmental protection, safety, and health protection significance.
- (3) Recommends Headquarters or field Investigations (when not otherwise required by this order) for occurrences that have an overall impact on Department of Energy programs.
- (4) Recommends members for Headquarters investigation boards to the Assistant Secretary for Environment, Safety and Health.
- (5) Reviews the reports of Headquarters and field investigation boards to:
  - (a) Determine whether the investigations and the reports meet Department of Energy standards for thoroughness, objectivity, and independence.
  - (b) Assure prompt identification and correction of injury and property damage causes.
  - (c) Assure appropriate distribution of the reports in those instances where the lessons learned are potentially applicable to other Department of Energy and Department of Energy contractor sites.
- (6) Recommends to the Assistant Secretary for Environment, Safety and Health the acceptance of the reports of Headquarters investigation boards and the necessary corrective actions based on the boards' reports and other appropriate considerations.
- (7) Assures that the corrective actions that are directed by the Assistant Secretary for Environment, Safety and Health are satisfactorily completed.

Vertical line denotes change.

- (b) Monitored personnel locator file information is submitted to the repository.
  - (c) Requests for information from the repository are processed.
  - (d) Information that identifies the Individual will be disclosed only in accordance with the Privacy Act of 1974 and the Freedom of Information Act, as amended. The release of summary statistical information reported in accordance with this Order is governed by DOE 1340.1A, MANAGEMENT OF PUBLIC COMMUNICATIONS, PUBLICATIONS, AND SCIENTIFIC, TECHNICAL, AND ENGINEERING PUBLICATIONS.
- (14) Establishes and interprets Department of Energy environmental and effluent monitoring and reporting requirements.
  - (15) Reviews and approves field element recommendations for sites that need not perform routine effluent or environmental monitoring and reporting. This approval authority does not extend to monitoring and reporting required by Federal, State, and local laws, regulations, and permits.
  - (16) May waive specific Department of Energy effluent and environmental monitoring and reporting requirements for existing Sites if not otherwise required by law or permit conditions.
- c. Inspector General (IG-1).
- (1) Reviews and recommends policies and standards for notification, investigation, and reporting of occurrences in the Department of Energy and Department of Energy contractor operations.
  - (2) Reviews Department of Energy notification, investigation, and reporting of occurrences for adequacy and consistency with the requirements of Order and, as appropriate, reports results of such reviews to the Secretary.
  - (3) Conducts investigations as required by the Secretary.
  - (4) Concurs in the membership of all Headquarters investigation boards recommended by the Office of Assistant Inspector General for Investigations.

- (2) Identify occurrences that are to be Investigated by field element boards. Appoint field investigation boards and establish the scope of their investigations including limitations if any. Heads of Field Elements may desire to use Department of Energy personnel from other offices. Arrangements for use of such personnel maybe made by contacting the Director of Quality Programs, or communicating directly with another field element. If arrangements are made with another field element, the Office of Quality Programs should be advised.
- (3) Review reports of field investigation boards and order additional investigation, if necessary.
- (4) Transmit reports of field investigation boards to the Office of Quality Programs with copies to the Inspector General (IG-1) and other appropriate Headquarters officials. Transmit with each report a field element evaluation of the report including a statement of the corrective actions that have been taken or are planned by the field element.
- (5) Assure that corrective actions are satisfactorily completed and so advise the Office of Quality Programs with copies to the appropriate Headquarters program organization.
- (6) Assure that, except for necessary emergency actions, the scene of any occurrence requiring or possibly requiring a Headquarters or field element board investigation Is not disturbed until the investigation board concurs that recovery or normal operations may be resumed.
- (7) Assure that Headquarters and field investigation boards receive the necessary logistic and administrative support.
- (8) Direct the preparation and release of public statements on occurrences, where deemed appropriate.

Vertical line denotes change.

respective field element head or contract administrator shall assure that an annual environmental summary is prepared as required by page III-3, paragraph 4c, of this Order, and copies forwarded to the Director of Quality Programs (EH-32).

- (14) May grant an exemption from monitoring and reporting for those effluents that meet all of the following criteria:
- (a) Do not routinely contain and are not a potential source of accidental releases of significant quantities or concentrations of radioactivity or nonradioactive pollutants in relation to applicable standards.
  - (b) Are of no health and safety or environmental significance.
  - (c) Are not required to be maintained by other Federal, State, or local pollution control agencies or regulations. (The Office of Quality Programs will assist in the interpretation of "significant" as used above, and elsewhere in this Order, on a case-by-case basis as requested.)
- (15) Shall assure that operating contractors notify them of concerns with ES&H significance. Operations Offices shall immediately submit "preliminary notification" to the Headquarters Emergency Operation Center (EOC).

f. Members of Headquarters and Field Elements Boards of Investigation.

- (1) Report directly to the Department of Energy appointing official during the investigation.
- (2) Understand the scope of the investigation including the limitations, if any, prior to initiating the investigation. If necessary, the board should discuss the scope of the investigation with the appointing official or his or her designee.
- (3) Conduct an investigation and prepare an investigation report that satisfies the requirements in this Order.
- (4) Transmit the report with a cover memorandum that includes the board's recommendations to the appointing official within a specified period of time.

Vertical line denotes change.

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Vertical line denotes change.

- r. Any aviation related occurrence Involving: a fatality or fatalities; lost workday Injuries to crew members, ground crew, or other personnel assigned to aviation operations; Injuries to passengers or members of the general public; downtime for aircraft; an explosion or fire involving an aircraft; substantial damage to property, and classified, radioactive, high explosive or other hazardous cargo. (Level of investigation for these occurrences not already requiring Type A or B investigation shall be determined by the head of the field organization.) Investigations shall comply with all applicable Federal Aviation Administration, Department of Transportation, and National Transportation Safety Board regulations, and with state accident reporting requirements.
- s. The EOC shall immediately inform the appropriate Headquarters program office and the Assistant Secretary for Environment, Safety and Health (EH-1). The timeframe for notification to the EOC shall be no more than 4 hours upon issue identification. Oral or abbreviated reports to the EOC shall be followed by a written report within 48 hours, consistent with that prescribed for Unusual Occurrence Reports in DOE 5000.3, detailing the safety issue or concern, how it was identified and addressed, and any resultant actions taken or to be taken. Preliminary notifications shall be made upon:
- (1) Any event, condition, analysis, or research finding that results in the safety status of (or analytical basis for) the facility, including engineered safety features, being seriously degraded or in question;
  - (2) Inspection or appraisal findings indicating that major safety-related equipment required to be operational by technical specifications or Operational Safety Requirements is not operating within approved limitations;
  - (3) The initiation of any unplanned nuclear facility shutdown or significantly curtailed operations either required by the plant's technical specifications or Operational Safety Requirements, or taken as an independent initiative by the contractor or the Department;
  - (4) Any significant ES&H event, issue, or condition that requires, or by practice entails, nonroutine notification or reporting to State or Federal regulatory authorities;

Vertical line denotes change.

- e. Any radiation exposure to an Individual which in 1 calendar quarter exceeds the following (Type 3 investigation):
  - (1) 5 rem to the whole body.
  - (2) 15 rem to skin of whole body or thyroid.
  - (3) 30 rem to the forearms.
  - (4) 75 rem to the hands or feet.
- f. Any internal uptake of radioactive material which on the basis of a small number of early assay data could result in a dose or dose commitment in excess of the pertinent annual standard set forth in the Order DOE 5480.11. For whole-body dose, 5 rem is the pertinent annual standard. (Type B investigation. )
- g. Any unplanned nuclear excursion in a reactor, whether or not terminated by protective actions, which is clearly outside the routinely accepted and experienced bounds for that reactor. (Type B investigation. )
- h. Any vehicle transporting radioactive material that is known by the shipper or receiver to have been found on arrival at a Department of Energy or Department of Energy contractor facility to be contaminated in either the interior or exterior above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization. )
- 1. Any shipment of radioactive material that arrives at a Department of Energy contractor facility damaged to the extent that there is substantial reduction in the effectiveness of the package; from which radioactive contents are leaking or may have leaked; or contaminated above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization. )

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- (3) Location of occurrence.
- (4) Driver's account or report of the occurrence.
- (5) Identification of the packaging by model, special permit, specification, or certificate number.
- (6) Type and quantity of material in each package, and total quantity in the shipment(s).
- (7) Nature of package and vehicle contamination, if any.
- (8) Radiation levels detected (direct) and amount of removable contaminants (microcuries per 100 square centimeters). .
- (9) Personnel explosive and contamination, how determined, and action taken.
- (10) Extent of contamination and estimated cost of cleanup.
- (11) Nature of packaging failure, if any.
- (12) Source of contamination if the package is undamaged.
- (13) Nature of any defects or deterioration of the packaging.
- (14) Evidence of improper package handling.

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

**PAGE CHANGE**

DOE 5484.1 Chg 5

3-15-90

SUBJECT: ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION  
INFORMATION REPORTING REQUIREMENTS

1. This Page Change transmits revised pages to DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 2-24-81.
2. EXPLANATION OF CHANGE. Provides language to clarify the applicability of notification requirements to the Naval Nuclear Propulsion Program facilities and activities.
3. FILING INSTRUCTIONS.

<u>Remove page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
I-3	10-17-89	I-3	10-17-89
I-4	10-17-89	I-4	3-15-90

- a.
- b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



JIM E. TARRO  
Acting Director of Administration and  
Human Resource Management

DISTRIBUTION.

All Departmental Elements

INITIATED BY.

Assistant Secretary for  
Environment, Safety and Health



- r. Any aviation related occurrence involving: a fatality or fatalities; lost workday injuries to crew members, ground crew, or other personnel assigned to aviation operations; injuries to passengers or members of the general public; downtime for aircraft; an explosion or fire involving an aircraft; substantial damage to property, and classified, radioactive, high explosive or other hazardous cargo. (Level of investigation for these occurrences not already requiring Type A or B investigation shall be determined by the head of the field organization.) Investigations shall comply with all applicable Federal Aviation Administration, Department of Transportation, and National Transportation Safety Board regulations, and with state accident reporting requirements.
  
- s. The EOC shall immediately inform the appropriate Headquarters program office and the Assistant Secretary for Environment, Safety and Health (EH-1). The timeframe for notification to the EOC shall be no more than 4 hours upon issue identification. Oral or abbreviated reports to the EOC shall be followed by a written report within 48 hours, consistent with that prescribed for Unusual Occurrence Reports in DOE 5000.3, detailing the safety issue or concern, how it was identified and addressed, and any resultant actions taken or to be taken. Preliminary notifications shall be made upon:
  - (1) Any event, condition, analysis, or research finding that results in the safety status of (or analytical basis for) the facility, including engineered safety features, being seriously degraded or in question;
  - (2) Inspection or appraisal findings indicating that major safety-related equipment required to be operational by technical specifications or Operational Safety Requirements is not operating within approved limitations;
  - (3) The initiation of any unplanned nuclear facility shutdown or significantly curtailed operations either required by the plant's technical specifications or Operational Safety Requirements, or taken as an independent initiative by the contractor or the Department;
  - (4) Any significant ES&H event, issue, or condition that requires, or by practice entails, nonroutine notification or reporting to State or Federal regulatory authorities;

- (5) Any significant issue or condition that results in manual or automatic actuation or any engineered safety feature in the plant, except under controlled test conditions;
- (6) Any further degradation or increased uncertainties in the level of safety of a plant or other worsening plant conditions, as a follow-up to an initial notification under this guidance; or
- (7) Identification of potential safety concerns or issues, e.g., those stemming from worker statements or contractor incident reports, which, notwithstanding existing DOE reporting requirements, are deemed to be of immediate safety significance, consistent with this Order.

t. Headquarters notification by facilities and activities of the Naval Nuclear Propulsion Program, conducted pursuant to Executive Order 12344 (42 U.S.C. 7158, note), shall be in accordance with the policies and practices established by the Director, Naval Nuclear Propulsion (who is Deputy Assistant Secretary for Naval Reactors within the Department), in lieu of paragraph 1.s above.

2. NOTIFICATION WITHIN 72 HOURS. Notification to Headquarters of the following occurrences shall be made within 72 hours of the occurrence.
- a. Estimated loss or damage to Department of Energy or other property amounting to between \$50,000 and \$100,000 or estimated costs within these limits required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property. (Type B investigation is required for loss or damage between \$50,000 and \$250,000. See Chapter V of this Order, "Criteria for Determining DOE Property Valuation and DOE Losses.")
  - b. Any occupational illness which results in inpatient hospitalization. (Type B investigation.)
  - c. Any series of occupational illnesses with the same or similar causes involving five or more persons of which at least one is a lost workday case. (Type B investigation.) If the occurrence results in five or more lost workday cases, then a Type A investigation must be performed. See paragraph 16 of this Chapter.
  - d. Any occupational illness which is a lost workday case involving more than 5 days away from work. (Type B investigation.)

Vertical line denotes change.

# U.S. Department of Energy

Washington, D.C.

# PAGE CHANGE

DOE 5484.1 Chg 6

6-29-90

**SUBJECT: ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION  
INFORMATION REPORTING REQUIREMENTS**

---

1. PURPOSE. This Page "Change transmits the revised pages of DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 2-24-81.
2. EXPLANATION OF CHANGE. This Order. has been changed to reflect changes to two other DOE Orders. DOE 5000.3A. OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION; has been revised to incorporate, for the line organizations, all notification and reporting requirements for operations information, and for the use of operations information to improve operations. In addition, DOE 5400.1 Includes the effluent and environmental monitoring program requirements for DOE operations, which were previously covered in this Order.

As a result, the basic Order has been changed to reflect changes in DOE 5000.3A and DOE 5400.1, by deleting those aspects of DOE 5484.1 that are now covered by these Orders. In addition, Chapter I has been changed to delete all notification requirements now contained in DOE 5000.3A, it is now a listing of occurrences for which DOE Type A, 8, or C investigations are required. The contents of Chapter III, "Effluent and Environmental Monitoring Program Requirements," have been deleted and replaced with a statement that the Effluent and Environmental Monitoring Program requirements are provided in DOE 5400.1, GENERAL ENVIRONMENTAL PROTECTION PROGRAM. Paragraphs 3g, "Preoperational Environmental Survey Reports," and 4c, "Effluent and Environmental Monitoring Reports," of Chapter IV have been deleted, since they are now covered by DOE 5400.1

3. FILING INSTRUCTIONS.

<u>Remove Page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
1 and 2	2-24-81	1 thru 2a	6-29-90
5	10-17-89		
6	11-6-87	5 thru 13 (and 14)	6-29-90
7	10-17-89		
8 and 9	11-6-89		
10 thru 14	10-17-89		
i	10-17-89	i	6-29-90
ii	11-6-87	ii	6-29-90
I-1 and I-2	2-24-81	I-1 and I-2	6-29-90
I-3 and I-4	10-11-89	I-3 and I-4	6-29-90

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INITIATED BY:  
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<u>Remove page</u>	<u>Dated</u>	<u>Insert Page</u>	<u>Dated</u>
I-5 and I-6	10-17-89		
I-7 (and I-8)	2-24-81		
III-1 thru III-9	2-24-81	II-6a	6-29-90
IV-5 and IV-6	11-6-87	IV-5 and IV-6	6-29-90
IV-7 (and IV-8)	11-6-87		
Atch 5, page 1 and 2	2-24-81		
Atch 6, page 1	2-24-81		

b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



JIM E. TARRO  
Director of Administration and  
Human Resource Management

# U.S. Department of Energy

Washington, D.C.

# ORDER

DOE 5484.1

2-24-81

Change 6: 6-29-90

**SUBJECT: ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION  
INFORMATION REPORTING RETIREMENTS**

---

1. PURPOSE. This Order establishes the requirements and procedures for the investigation of occurrences having environmental protection, safety, or health protection significance, and for efficient and environmental monitoring of Department of Energy Operations.
2. SCOPE. This Order applies to all Department of Energy contractor operations where, under the contractual arrangements for the work to be performed, the Department of Energy has established control over environmental protection, safety, and health protection program content. The provisions of this Order also apply to Federal operations but not to the Federal employee occupational safety and health program (as defined in DOE 3790.1A). This Order will serve as guidance for the Federal employees occupational safety and health program until it is specifically amended to apply directly to that program. This Order does not apply to the reporting and analysis of operational occurrences by the line organizations for the purpose of minimizing recurrence and improving operations, which is addressed in DOE 5000.3A, OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION.
3. REFERENCES.
  - a. DOE Procurement Regulation 9-50.704.2, which provides environmental protection, safety, and health protection contract clauses.
  - b. Accident/Incident Investigation Manual, DOE ISSDC 76-45/27, which provides guidance for conducting Department of Energy accident investigations.
  - c. ERDA Guide to the Classification of Occupational Injuries and Illnesses, ERDA-76/45-7, which provides guidance for recording and reporting occupational injuries and illnesses.
  - d. 29 CFR 1904, Recording and Reporting Occupational Injuries and Illnesses, provides the Occupational Safety and Health Administration (OSHA) standards for recording and reporting of occupational injuries and illnesses.
  - e. 29 CFR 1960, 10-21-80, Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters, Subpart 1, Recordkeeping and Reporting Requirements, which provides Occupational Safety and Health Standards for recording and reporting Federal employee occupational injuries and illnesses.

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- f. DOE 5480.1B, ENVIRONMENT, SAFETY, AND HEALTH PROTECTION PROGRAM FOR DOE " OPERATIONS, of 9-23-86, which establishes the environmental protection, safety, and health protection program for the Department.
- g. 49 CFR 173, General Requirements for Shipments and Packaging.
- h. DOE 5400.1, GENERAL ENVIRONMENTAL PROTECTION PROGRAM, of 11-9-88, which establishes environmental program requirements.
- i. Privacy Act, PL 93-579.
- j. Freedom of Information Act, PL 90-23.
- k. A Guide for Environmental Radiological Surveillance at Energy Research and Development Administration Installations, ERDA-77-24, March 1977.
- l. Effluent Information System (EIS) and Onsite Discharge Information System (ODIS) User's Manual, October 1977.
- m. Quality Criteria for Mater, 1976, Environmental Protection Agency.
- n. Guidance for Air Quality Monitoring Network Design and Instrument Siting, January 1974, Environmental Protection Agency.
- o. Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), May 1978, Environmental "Protection Agency.
- p. Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities, American National Standards Institute, N13.1.
- q. Standard Methods for the Examination of Water and Wastewaters, 14th Edition, 1976, American Public Health Association.
- r. American-Society of Testing Materials (ASTH) Standards, Parts 23 and 31, Water and Atmospheric Analysis, 1970.
- s. Manual of Methods for Chemical Analysis of Water and Wastes," 1974, Office of Technology Transfer, Environmental Protection Agency.
- t. 40 CFR 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants.
- u. 40 CFR 141, Interim Primary Drinking Water Regulations: Radioactivity, June 28, 1976.
- v. DOE 5632.2, PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIALS, of 2-16-79 which establishes minimum protection standards for special nuclear materials.

w. 40 CFR 125, Policies and Procedures for the National Pollutant Discharge Elimination System.

x. DOE 3790.1A, FEDERAL EMPLOYEE OCCUPATIONAL SAFETY AND HEALTH PROGRAM, of 10-24-84.

4. DEFINITIONS.

a. Occurrence. Any deviation from the planned or expected behavior or course of events in connection with any Department of Energy or Department of Energy-controlled operation if the deviation has environmental protection, safety, or health protection significance.

Vertical line denotes change.



- t. Department of Energy Operations. Those activities funded by DOE for which DOE has authority to enforce for environmental protection, safety, and health protection requirements.
- u. Field Element. A general term for any officially established Departmental component (excluding individual duty stations) located outside the Washington, DC, metropolitan area.
- v. Monitored Worker. Any employee of the reporting organization who works with, or is in the proximity of, Ionizing radiation or radioactive material and who is monitored in accordance with DOE 5480.11.
- w. Monitored Personnel Locator File A DOE centralized file maintained at the System Safety Development Center, EG&G Idaho, that contains all monitored DOE and DOE contractor personnel employed, and visitors who have positive exposures. The file consists of identification information only, e.g., name, social security number, birth year, and employer organization (or organization visited). The file is used to "identify personnel work locations so that inquiries can be made to the reporting organization for official dose records.
- x. Nonemployee Radiation Worker. An individual who is either a subcontractor to a DOE contractor or who visits a DOE site to perform work for or in conjunction with DOE or utilizes DOE facilities and who is monitored for occupational exposure as required in DOE 5480.11.
- y. Engineered Safety Features Components or equipment designed to: (a) provide the capability to shutdown the facility and maintain it in a safe shutdown condition; (b) ensure the integrity of the process . system which provides a boundary against release of radioactive material (e.g., the integrity of the coolant pressure boundary *in* a reactor or a glove box in a process facility); (c) prevent or mitigate the consequences of events or accidents that could result in potentially measurable offsite exposures.

## 5. POLICY AND OBJECTIVES.

It is the policy of the Department of Energy that:

- (a) Occurrences Involving Department of Energy and Department of Energy contractor operations be investigated by Investigation boards chaired by an individual from an organization other than the line organization responsible for facility operations.

Vertical line denotes change,

- (b) Procedures are established for the development and reporting of occupational radiation exposure information to the Radiation Records Repository that will be of assistance to the Department of Energy in determining that radiation doses to individuals are maintained at the lowest levels technically and economically practicable.

## 6. RESPONSIBILITIES AND AUTHORITIES

### a. Assistant Secretary for Environment, Safety and Health (EH-1)

- (1) May appoint Headquarters investigation boards and establishes the scope of Headquarters investigations for occurrences involving environmental, radiation protection, non-nuclear worker and public health and safety as specified in Chapter I.
- (2) Accepts Headquarters investigation boards' reports for areas under their cognizance.
- (3) Directs corrective actions based on Headquarters investigation boards' recommendations.
- (4) Develops policies, procedures, standards, and guidelines for investigation, of occurrences in the Department of Energy and Department of Energy contractor operations under their cognizance.
- (5) Recommends Headquarters or field investigations (when not otherwise required by this Order) for occurrences within his or her cognizance which have an overall Impact on Department of Energy programs.
- (6) Reviews the reports of Headquarters and field investigation boards for occurrences within his or her cognizance to:
  - (a) Determine whether the investigations and the reports meet Department of Energy standards for thoroughness, objectivity, and independence.
  - (b) Assure prompt identification and correction of injury and property damage causes.
  - (c) Assure appropriate distribution of the reports In those instances where the lessons learned are potentially applicable to other Department of Energy and Department of Energy contractor sites.

- (7) Accepts field investigation reports for occurrences under his or her cognizance and, if appropriate, recommends to heads of field organizations additional corrective actions.
- (8) Informs the Secretary and the appropriate Congressional Committees, other Federal agencies, the Inspector General and other appropriate Headquarters offices and divisions of significant occurrences in the Department of Energy and Department of Energy contractor operations.
- (9) Develops and maintains a cadre of Department of Energy trained accident investigators who are available to participate as members of Headquarters and field investigation boards for areas under his or her cognizance.
- (10) Circulates investigation reports for review by appropriate Headquarters divisions and offices when the recommendations for corrective actions involve or may affect activities under their jurisdiction.
- (11) Conducts and coordinates all activities associated with operation and maintenance of the Department of Energy Radiation Records Repository, including:
  - (a) Submission of radiation exposure data to the Repository.
  - (b) Submission of monitored personnel locator file information to the Repository;
  - (c) Processing of Requests for information from the Repository;
  - (d) Disclosing information that identifies the individual only in accordance with the Privacy Act of 1974 and the Freedom of Information Act, as amended. The release of summary statistical information reported in accordance with this Order is governed by DOE 1340.1A, MANAGEMENT OF PUBLIC COMMUNICATIONS, PUBLICATIONS, AND SCIENTIFIC, TECHNICAL, AND ENGINEERING PUBLICATIONS.
- (12) Establishes and interprets department of Energy environmental and effluent monitoring and reporting requirements.

Vertical line denotes change.

- (13) Reviews and approves field element recommendations as to which sites need not perform routine effluent or environmental monitoring and reporting. This approval authority does not extend to monitoring and reporting required by Federal, State, and local laws, regulations, and permits.
- (14) May waive specific Department of Energy effluent and environmental monitoring and reporting requirements for existing sites if not otherwise required by law or permit conditions.

b. Director, Office of Nuclear Safety (NS-1).

- (1) May appoint Headquarters Investigation boards and establishes the scope of Headquarters investigation for occurrences involving nuclear safety as specified in Chapter I.
- (2) Accepts Headquarters investigation boards' reports for areas under his or her cognizance.
- (3) Directs corrective actions based on Headquarters Investigation boards' recommendations.
- (4) Develops policies, procedures, standards, and guidelines for investigation, of occurrences in the Department of Energy and Department of Energy contractor operations under his or her cognizance.
- (5) Recommends Headquarters or field investigations (when not otherwise required by this Order) for occurrences within his or her cognizance which have an overall impact on Department of Energy programs.
- (6) Reviews -the reports of Headquarters and field investigation boards for occurrences within his or her cognizance to:
  - (a) Determine whether the Investigations and the reports meet Department of Energy standards for thoroughness, objectivity, and independence.
  - (b) Assure prompt identification and correction of injury and property damage causes.
  - (c) Assure appropriate distribution of the reports in those instances where the lessons learned are potentially applicable to other Department of Energy and Department of Energy contractor sites.

- (7) Accepts field investigation reports for occurrences under his or her cognizance, and, if appropriate, recommends to heads of field organizations additional corrective actions.
  - (8) Inform the Secretary and the appropriate Congressional Committees, other Federal agencies, the Inspector General and other appropriate Headquarters offices and divisions of significant occurrences in the Department of Energy and Department of Energy contractor operations.
  - (9) Develops and maintains a cadre of Department of Energy trained accident Investigators who are available to participate as members of Headquarters and field investigation boards for areas within his or her cognizance.
  - (10) Circulates investigation reports for review by appropriate Headquarters divisions and offices when the recommendations for corrective actions involve or may affect activities under their jurisdiction.
- c. Office of Energy Research through the Director, Office of Health and Environmental Research.
- (1) Provides, upon request, personnel monitoring devices for Department of Energy Headquarters employees who are planning to visit facilities not operated by the Department of Energy or Department of Energy contractors where they might encounter radiation exposure.
  - (2) Furnishes copies of the results of monitoring to EH, NS, and to the head of the appropriate office or division, Headquarters.
- d. Inspector General.
- (1) Reviews and recommends policies and standards for independent investigation of occurrences, in the Department of Energy and Department of Energy contractor operations.
  - (2) Reviews Department of Energy investigation of occurrences for adequacy and consistency with the requirements of this chapter and, as appropriate, reports results of such reviews to the Secretary.
  - (3) Conducts Investigations as required by the Secretary.
  - (4) Concurs in the membership of all Headquarters investigation boards recommended by the Assistant Secretary for Environment Safety and Health or the Director, Office of Nuclear Safety as appropriate.

## e. Heads of Headquarters Elements.

- (1) Assure that employees in their organization obtain a personnel monitoring device prior to visiting facilities not operated by the Department of Energy or Department of Energy contractors where exposure to radiation is possible, and instruct Department of Energy employees who might unexpectedly visit a contractor or licensed facility without a monitoring device to use the personnel monitoring device provided by the facility and to request that any resultant exposure information along with the individual's name, social security number, and date of birth be sent to the Department of Energy Headquarters, Attention: Director, Operational and Environmental Safety Division.
- (2) Assign a staff member to act as liaison for the purpose of notifying the Office of Health and Environmental Research of their anticipated needs for personnel dosimeters and to facilitate the movement of dosimeters to and from the Office of Health and Environmental Research.

f. Heads of Field Organizations and Other Contracting Officers.

- (1) Establish procedures to assure proper investigation, of occurrences; preparation, review, and approval of investigation board reports; and submittal of routine reports as required in this Order.
- (2) Identify occurrences that are to be investigated by field organization boards. Appoint field investigation boards and establish the scope of their investigations including limitations, if any. Heads of field organizations may desire to use Department of Energy personnel from other offices; "Arrangements for use of such personnel may be made by contacting the Assistant Secretary for Environment Safety and Health or the Director, Office of Nuclear Safety as appropriate, or communicating directly with another field organization. If arrangements are made with another field organization, the Assistant Secretary for Environment Safety and Health or the Director, Office of Nuclear Safety should be advised as appropriate.
- (3) Review reports of field investigation boards and order additional investigation, if necessary.

- (4) Transmit reports of field investigation boards to the Assistant Secretary for Environment Safety and Health, cognizant DOE program office, the Director, Office of Nuclear Safety, the Inspector General, and other appropriate Headquarters officials. Transmit with each report a field organization evaluation of the report including a statement of the corrective actions which have been taken or are planned by the field organization.
- (5) Assure that corrective actions are satisfactorily completed and so advise the cognizant program office, Assistant Secretary for Environment Safety and Health, the Director, Office of Nuclear Safety, and other appropriate Headquarters program organizations.
- (6) Assure that, except for necessary emergency actions, the scene of any occurrence requiring or possibly requiring a Headquarters or field organization board Investigation is not disturbed until the investigation board concurs that recovery or normal operations may be resumed.
- (7) Assure that Headquarters and field investigation boards receive the necessary logistic and administrative support.
- (8) Direct the preparation and release of public statements on the investigation of occurrences, where deemed appropriate.
- (9) Prepare an Annual Summary of Fire and Other Property Damage Experience Report and submit it to EH-1 on or before March 15 of each year.
- (10) Determine when preoperational and environmental surveys are required to obtain background and baseline data in advance of start up of any new site or a new facility or process at an existing site; review and approve the preoperational survey program prior to its implementation; and review and approve the report of the survey results prior to start up of the new facility or site operation.
- (11) Assure the Department of Energy facilities and sites under their purview conduct the effluent and environmental monitoring and reporting programs in accordance with the requirements of this Order and as necessary to determine compliance with all applicable Federal, State, and local effluent standards and permit conditions; and report to the local, State, and regional environmental protection agencies, the public and Department of Energy Headquarters on the status of such compliance.

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- (12) Recommend to the Office of Environment Safety and Health with the concurrence of the director(s) of the responsible program office(s). when routine environmental monitoring and reporting is not required (programs to be waived) or is to be terminated at Department of Energy sites. Requests for approval to terminate any environmental monitoring and reporting activities should include an explanation, with supporting data, as to why the site is not expected to have significant releases or a significant effect on the @environment. For any site holding an exemption from environmental reporting requirements, the respective field element head or contract administrator shall assure that an annual environmental summary is prepared as required by DOE 5400.1 and copies forwarded to the Office of Environment, Safety, and Health.
- (13) May grant an exemption from monitoring and reperking for those effluents that meet all of the following criteria.
- (a) Do not routinely contain and are not a potential source of accidental releases of significant quantities or concentrations of radioactivity or nonradioactive pollutants in relation to applicable standards.
- (b) Are of no health and safety or environmental significance.
- (c) Are not required to be maintained by other Federal, State, or local pollution control agencies or regulations. (The Office of Environment, Safety and Health will assist in the interpretation of "significant" as used above, and elsewhere in this Order, on a case-by-case basis as requested.)

f. Members of Headquarters and Field Elements Boards of Investigation.

- (1) Report directly to the Department of Energy appointing official during the investigation.
- (2) Understand the scope of the investigation including the limitations, if any, prior to initiating the investigation. If necessary, the board should discuss the scope of the investigation with the appointing official or his or her designee.
- (3) Conduct an investigation and prepare an investigation report that satisfies the requirements in this Order.
- (4) Transmit the report with a cover memorandum that includes the board's recommendations to the appointing official within a specified period of time.

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- g. Requestors of Radiation Exposure Information. All requests for informant on from the Department of Energy Records Repository should be directed to the Office of Environment, Safety, and Health. Information that identifies the individual will be disclosed only upon written authorization of the Individual or his or her duly authorized representative pursuant to the Privacy Act of 1974 and the Freedom of Information Act.

BY ORDER OF THE SECRETARY OF ENERGY:



JIM E. TARRO  
Director of Administration and  
Human Resource Management

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CHAPTER I

OCCURRENCES REQUIRING INVESTIGATION

The Investigation level (Type A, B or C) for occurrences covered by this Order shall be as specified below:

1. Any fatal or imminently fatal injury or illness involving a Department of Energy or Department of Energy contractor employee or a member of the public due to an occurrence associated with a Department of Energy or Department of Energy contractor operation. (Type A investigation.)
2. Any one occurrence (involving either occupational injuries or illness) in a Department of Energy or Department of Energy contractor operation which results in *five* or more lost workday cases. Type A investigation. )
3. Estimated loss or damage to Department of Energy or other property amounting to \$100,000, or more, or estimated costs of \$100,000 or more required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property. (Type A investigation, if the costs exceed \$250,000. See Chapter V of this Order 'Criteria for Determining DOE Property Valuation and DOE losses. ")
4. Any occurrence involving a nuclear explosive under Department of Energy jurisdiction which results in an explosion, fire, the spread of radioactive material, personal injury or death, or damage to private property. (Type A investigation. )
5. Any "accidental releases of pollutants which result or could result in significant effect on the public or on the offsite environment, e.g., need to relocate people, substantial fish kill, requirements for corrective action in the environment, requests that downstream water supply intakes be shut down, etc. (Type A investigation. )
6. Any accidental releases of pollutants designated by the Environmental Protection Agency as "hazardous" and requiring activation by the Environmental Protection Agency or the U.S. Coast Guard of the National Oil and Hazardous Substances Pollution Contingency Plan to effect removal or corrective measures. (Type A investigation. )
7. Any apparent loss or theft of radioactive or nonradioactive material in such quantities and under such circumstances that it could constitute a hazard to the health and safety of individuals. Where this involves the possible theft of Government property, the

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Federal. Bureau of Investigation shall be notified by the Office of Safeguards and Security for a decision as to acceptance of investigation jurisdiction. For apparent losses of source-material, special nuclear material, and such other material included in the category "Special Nuclear Materials," see Order DOE 5632.2A. (Type A investigation.)

8. A single or annual "accumulated. whole-body exposure of an individual to 25 rem or more of radiation, a single exposure of the skin of the whole body of an individual to 75 rem or more of radiation, a single exposure of the forearms of an individual to 150 rem or more of radiation, or a single exposure of the hands or feet of any individual to 375 rem or more of radiation. (Type A investigation.)
9. Any internal uptake of radioactive material which on the basis of a small number of early assay data could result in a dose or dose commitment in excess of 5 times the pertinent annual standard set forth in the chapter. For whole body dose, 5 rem is the pertinent annual standard. (Type A Investigation.)
10. Any nuclear criticality achieved in a system not intended to reach criticality. (Type A investigation.)
11. Any release of radioactive material to controlled or uncontrolled areas in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the respective concentration guides specified for such materials in DOE 5480.11, RADIATION PROTECTION FOR OCCUPATIONAL WORKERS. (Type B investigation.)
12. Any release of radioactive material offsite that could reasonably be expected to result in an annual dose or dose commitment to any member of the general population greater than the annual standards set forth in Order DOE 5480.1, Chapter XI, "Standards for Radiation Protection." (Type B investigation. )
13. Any occurrence which likely to give rise to an inquiry by members of the public or press, if the field organization head involved considers the inquiry to be of sufficient importance to notify Headquarters. (Level of. investigation shall be determined by the head of the field organization. )
14. Any occurrence where a press release is made or where information is provided to the news media, other Federal agencies, or state or local authority, either by the field organization or a Department of Energy contractor. (Level of investigation shall be determined by the head of the field organization. )

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15. Any radiological assistance occurrence. (Level of investigation shall be determined by the head of the field organization.)
16. Any request to an offsite authority for emergency assistance involving a nuclear operation. (Level of investigation shall be determined by the head of the field organization. )
17. Any discovery of significant radioactive or nonradioactive contamination in the onsite or offsite environment attributable to current or past Department of Energy operations. (Level of investigation shall be determined by the head of the field organization.)
18. Any aviation related occurrence Involving: a fatality or fatalities; lost workday injuries to crew members, ground crew, or other personnel assigned to aviation operations; injuries to passengers or members of the general public; downtime for aircraft; an explosion or fire involving an aircraft; substantial damage to property, and classified, radioactive, high explosive or other hazardous cargo. (Level of investigation for these occurrences not already requiring Type A or B investigation shall be determined by the head of the field organization. ) Investigations shall comply with all applicable Federal Aviation Administration, Department of Transportation, and National Transportation Safety Board regulations, and with state accident reporting requirements.
19. Estimated loss or damage to Department of Energy or other property amounting to between \$50,000 and \$100,000 or estimated costs within 'these limits required for cleaning (including decontamination), renovating, replacing, or rehabilitating structures, equipment, or property. (Type B investigation is required for loss or damage between \$50,000 and \$250,000. See Chapter V of this Order, "Criteria for Determining DOE Property Valuation and DOE losses.')
20. Any occupational illness which results in inpatient hospitalization. (Type B investigation. )
21. Any series of occupational illnesses with the same or similar causes involving five or more persons of which at least one is a lost workday case. (Type B investigation. ) If the occurrence results in five or more lost workday cases then a Type A investigation must be performed.

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22. Any occupational illness which is a lost workday case involving more than 5 days away from work. (Type B investigation. )
23. Any radiation exposure to an individual which in 1 calendar quarter exceeds the following (Type B investigation):
  - (1) 5 rem to the whole body.
  - (2) 15 rem to skin of whole body or thyroid.
  - (3) 30 rem to the forearms.
  - (4) 75 rem to the hands or feet.
24. Any internal uptake of radioactive material which on the basis of a small number of early assay data could result in a dose or dose commitment in excess of the pertinent annual standard set forth in DOE 5480.11, RADIATION PROTECTION FOR OCCUPATIONAL WORKERS. For -whole-body dose, 5 rem is the pertinent annual standard. (Type B investigation.)
25. Any unplanned nuclear excursion in a reactor, whether or not terminated by protective actions, which is clearly outside the routinely accepted and experienced bounds for that reactor. (Type B investigation.)
26. Any vehicle transporting radioactive material that is known by the shipper or the receiver to have been found on arrival at a Department of Energy or Department of Energy contractor facility to be contaminated in either the interior or exterior above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization.)
27. My-shipment of radioactive material that arrives at a Department of Energy contractor facility damaged to the extent that there is substantial reduction in the effectiveness of the package; from which radioactive contents are leaking or may have leaked; or contaminated above the limits specified in Section 173.397, "Contamination Control," Department of Transportation Regulations, 49 CFR 173. (Level of investigation shall be determined by the head of the field organization.)

CHAPTER III

EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM  
REQUIREMENTS

| The contents of this chapter have been deleted. The Effluent and Environmental Monitoring Program Requirements are provided in DOE 540001, GENERAL ENVIRONMENTAL PROTECTION PROGRAM.

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- 8 The following information shall be obtained and included in the Investigation of occurrences which take place during the transportation of radioactive materials:
- a Identification of the shipper and receiver.
  - b Identification of service used for shipment, I.e., public vehicle or common carrier and mode of shipment (truck, rail, air, or waterway). Include the name of the carrier and the specific vehicle or car number.
  - c Location of occurrence.
  - d Driver's account or report of the occurrence.
  - e Identification of the packaging by model, special permit, specification, or certificate number.
  - f Type and quantity of material in each package, and total quantity in the shipment(s).
  - g Nature of package and vehicle contamination, if any.
  - h Radiation levels detected (direct) and amount of removable contaminants (microcuries per 100 square centimeters).
  - i Personnel exposure and contamination, how determined, and action taken.
  - j Extent of contamination and estimated cost of cleanup.
  - k Nature of packaging failure, if any.
  - l Source of contamination If the package is undamaged.
  - m Nature of any defects or deterioration of the packaging.
  - n Evidence of improper package handling.

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- e. Preoperational Environmental Survey Reports shall be prepared in accordance with DOE 5400.1, GENERAL ENVIRONMENTAL PROTECTION PROGRAM.

#### 4. ANNUAL REPORTS.

- a. Annual Radiation Exposure Reports. Heads of Field Elements shall submit the following reports ("Annual Radiation Dose Summary," and DOE F 5484.7, "Summary of Exposures Resulting in Internal Body Depositions of Radioactive Materials for CY 19\_\_\_\_,") to the System Safety Development Center (SSDC), EG&G Idaho, Inc, by 3-31 for the preceding calendar year for monitored Department of Energy and Department of Energy contractor employees and for visitors to Department of Energy or Department of Energy contractor facilities.

- (1) Summary of Worker and Visitor Radiation Exposure and Locator File Input. Field elements shall submit an "Annual Radiation Dose Summary," Attachment 8, for all monitored workers, including DOE and DOE contractor employees, nonemployee radiation workers, and visitors with positive exposures, to the System Safety Development Center at EG&G Idaho no later than 3-31 for the preceding calendar year. Exposures received by employees of DOE contractors while on trips to other DOE contractor sites are included in the annual summary of the individual. The transmittal should include the total number of monitored visitors. Submittal should be via the Secure Automatic Communications Network. Alternatively, hard copies of the report may be used (Attachment 8). Whatever form of transmittal is selected, it should be safeguarded to avoid unwarranted public release of privacy act protection information.

#### (2) Internal Exposures.

- (a) DOE F 5484.7, Attachment 11. The report shall include:

- 1 Any uptake of radioactive material occurring during the reporting year that independently, or when added to a current burden, is estimated to result in a dose commitment to the critical organ in excess of 50 percent of the pertinent annual dose equivalent standards set forth in DOE 5480.11, RADIATION PROTECTION FOR OCCUPATIONAL WORKERS.

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2 Any previously unreported uptake of radioactive material that is determined to have been reportable according to the above criteria by reason of more recent dose estimates.

(b) Any dose commitment to a critical organ resulting from an uptake of radioactive material should be added to the dose received by that organ from external sources when determining uptakes that are reportable according to the above criteria. In those cases where the whole body is considered to be the critical organ and the dose commitment from each internal uptake is combined with the dose contributed by external sources for the purpose of reporting cumulative whole body exposures in the Annual Radiation Dose Summary, it is not necessary to report those internal exposures on DOE F 5484.7.

- b. ~~Annual Industrial Summary of Fire and Other Property Damage Experience~~ (Suggested Format). The report summarized the calendar year experience and activities of this organization relative to the control of Department of Energy property damage and loss from fire and other accident causes. A suggested reporting format is provided as Attachment 13.

# U.S. Department of Energy

Washington, D.C.

## PAGE CHANGE

DOE 5484.1 Chg 7

10-17-90

**SUBJECT:** ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS

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1. PURPOSE. To transmit revised pages to DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 2-24-81.
2. EXPLANATION OF CHANGE. To:
  - a. Reflect the responsibilities and authority of the Director, Naval Nuclear Propulsion Program, for matters within the subject area of the Order.
3. FILING INSTRUCTIONS.
  - a. 

<u>Remove Page</u>	Dated	<u>Insert Page</u>	Dated
13 (and 14)	6-29-90	13 (and 14)	10-17-90
  - b. After filing the attached pages, this transmittal may be discarded.

BY ORDER OF THE SECRETARY OF ENERGY:



JIM E. TARRO  
Director of Administration and  
Human Resource Management

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**DISTRIBUTION:**  
All Departmental Elements

**INITIATED BY:**  
Assistant Secretary for Environment  
Safety, and Health



DOE 5484.1 Chg 7  
10-17-90

g. Requestors of Radiation Exposure Information. All requests for information from the Department of Energy Records Repository should be directed to the Office of Environment, Safety, and Health. Information that identifies the individual will be disclosed only upon written authorization of the individual or his or her duly authorized representative pursuant to the Privacy Act of 1974 and the Freedom of Information Act.

h. Director, Naval Nuclear Propulsion Program: Executive Order 12344, statutorily prescribed by P.L. 98-525 (42 U.S.C. 7158, note), establishes the responsibilities and authorities of the Director, Naval Nuclear Propulsion Program (who is also the Deputy Assistant Secretary for Naval Reactors within the Department) over all facilities and activities which comprise the Program, a joint Navy-DOE organization. The policy principle promoted by these executive and legislative actions is cited in the Executive Order as "...preserving the basic structure, policies, and practices developed for this Program in the past..." Accordingly, based on the Executive Order and this policy principle, the Naval Nuclear Propulsion Program is exempt from the provisions of this Order. The Director shall establish the reporting requirements and methods implemented within the Program, including that necessary to meet the external reporting needs of the Department.

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