

**DOE M 231.1-2**

Approved: 08-19-03

# **OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS INFORMATION**

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**U.S. DEPARTMENT OF ENERGY**  
**Office of Environment, Safety and Health**

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**DISTRIBUTION:**  
All Departmental Elements

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

**SUBJECT: OCCURRENCE REPORTING AND PROCESSING OF OPERATIONS  
INFORMATION**

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1. PURPOSE. This Manual provides detailed requirements to supplement DOE O 231.1A, *Environment, Safety, and Health Reporting*, dated 08-19-03. This Manual is approved for use by all DOE Elements and their contractors.
2. REFERENCE. DOE O 231.1A, *Environment, Safety, and Health Reporting*, dated 08-19-03.
3. CANCELLATION. DOE M 232.1-1A, *Occurrence Reporting and Processing of Operations Information*, dated 7-21-97. Cancellation of a Manual does not, by itself, modify or otherwise affect any contractual obligation to comply with the Manual. Cancelled Manuals that are incorporated by reference in a contract remain in effect until the contract is modified to delete the references to the requirements in the cancelled Manuals.
4. CONTACT. Beneficial comments and any pertinent data that may improve this document should be sent to the Office of Environment, Safety and Health (Office of Corporate Performance Analysis) at 301-903-3393.

BY ORDER OF THE SECRETARY OF ENERGY:



KYLE E. McSLARROW  
Deputy Secretary

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## **SECTION 1. SCOPE.**

This Manual and DOE Order 231.1A, *Environment, Safety, and Health Reporting*, dated 08-19-03, set forth the minimum set of occurrence reporting requirements for Department of Energy (DOE) Departmental Elements, including the National Nuclear Security Administration (NNSA), and contractors responsible for the management and operation of DOE-owned and DOE-leased facilities, including NNSA facilities. These requirements include categorizing occurrences related to safety, environment, health, or operations (“Reportable Occurrences”); notifying DOE of these occurrences; and developing and submitting documented follow-up reports. These occurrence reporting directives further require that the notifications be timely in accordance with the significance of the occurrence, and that the written reports contain appropriate information describing the occurrence, significance, causal factors, and corrective actions. No exemption to this minimum set of occurrence reporting requirements is permitted.

## **SECTION 2. PURPOSE.**

This Manual provides detailed information for reporting occurrences and managing associated activities at DOE facilities, including NNSA facilities. It complements DOE O 231.1A, *Environment, Safety, and Health Reporting* and its use is required by that Order. Information gathered in response to the requirements in this Order and Manual is used for analysis of the Department’s performance in environmental protection and the safety and health of its workers and the public. This information is also used to develop lessons learned and document events that impact DOE operations.

## **SECTION 3. APPLICABILITY.**

- a. DOE Elements. Except for the exclusions in paragraph c of this section, this Manual applies to all DOE Elements, including NNSA, as listed in Attachment 1.

Where a responsibility or authority is assigned to an organization that is restructured, the responsibility or authority will be reassigned to the appropriate successor organization as explicitly determined by the appropriate Lead Program Secretarial Officer.

- b. Site/Facility Management Contractors.

- (1) The Contractor Requirements Document (CRD), Attachment 2, sets forth requirements of this Manual that will apply to site/facility management contractors whose contracts include the CRD.

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- (2) Except for the exclusions in paragraph c of this section, this CRD must be included in all site/facility management contracts.
  - (3) This Manual does not apply to other than site/facility management contractors. Any application of any requirements of this Manual to other than site/facility management contractors will be communicated separately from this Manual.
  - (4) The office identified in the Responsibilities section is responsible for telling contracting officers which site/facility management contractors are affected. Once notified, contracting officers are responsible for incorporating the CRD into the contracts of affected site/facility management contractors via the laws, regulations, and DOE directives clause of the contracts.
  - (5) As the laws, regulations, and DOE directives clause of site/facility management contracts state, regardless of the performer of the work, the site/facility management contractor with the CRD incorporated into its contract is responsible for compliance with the requirements of the CRD. An affected site/facility management contractor is responsible for flowing down the requirements of this CRD to subcontracts at any tier to the extent necessary to ensure the site/facility management contractor's compliance with the requirements. In doing so, the contractor must not unnecessarily or imprudently flow down requirements to subcontracts. That is, the contractor will both ensure that it and its subcontractors comply with the requirements of this CRD and only incur costs that would be incurred by a prudent person in the conduct of competitive business.

c. Exclusions.

- (1) Power Marketing Administration reporting of major electrical power outages, disturbances, and fuel shortages subject to the emergency power system reporting requirements prescribed in 10 CFR 205, and 350-354, *Report Of Major Electric Utility Systems Emergencies*.
- (2) Activities under the authority of the Director, Naval Nuclear Propulsion, pursuant to Executive Order 12344, as set forth in Public Laws 98-525 and 106-65.

#### **SECTION 4. RESPONSIBILITIES.**

The following provides primary responsibilities for implementation of the Occurrence Reporting Program. Other specific responsibilities are provided elsewhere in the Manual.

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4.1 Assistant Secretary for Environment, Safety and Health.

- a. Develops, promulgates, and maintains policies to implement and sustain an effective Occurrence Reporting Program, including the computerized Occurrence Reporting and Processing System.
- b. Provides formal Departmental interpretation of the requirements of this Manual, in coordination with the Secretarial Offices and the National Nuclear Security Administration (NNSA) for NNSA facilities.
- c. Develops, promulgates, and maintains guidance materials, and conducts workshops, as necessary, for implementing the requirements of this Manual.
- d. Monitors reports relative to reporting activities at DOE facilities to assess implementation of this Manual and to identify needed improvements.
- e. Monitors and audits implementation of this Manual related to the Office of Environment, Safety and Health functional areas of responsibility.
- f. Periodically analyzes occurrence reporting data to identify significant issues and trends across the Department.
- g. In conjunction with the Chief Information Officer, operates, maintains, and further develops the supporting computer data system, the Occurrence Reporting and Processing System (ORPS).

4.2 Secretarial Officers/Deputy Administrators (NNSA).

- a. Delegate responsibilities and authority for implementing this Manual, including designating Program Managers.
- b. Establish agreements with Heads of Field Elements to ensure support for the Facility Representative and Program Manager in accordance with this Manual.
- c. Review occurrence reporting data and identify circumstances that are indicative of deteriorating or poor program performance in their respective areas of authority.
- d. Provide the Headquarters Operations Center (HQ OC) with a prioritized list of emergency management duty officers and their contact numbers to permit notification on a 24 hour-a-day, 7 day-a-week basis.

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- e. Ensure training programs are established for both DOE and contractor personnel.
  - f. Ensure the requirements in the CRD for DOE M 231.1-2 are applied to applicable contracts within 3 months after approval of this Order.
  - g. Ensure initiators of procurement requests identify in procurement requests whether the requirements in the CRD for DOE M 231.1-2 are to be applied to the award or sub awards resulting from the procurement request and any special instructions for the application of the CRD.

#### 4.3 Director, Office of Security

- a. Formulates Department-wide policy regarding the protection and control of both classified matter and unclassified controlled information, which includes Official Use Only and Unclassified Controlled Nuclear Information (UCNI) policy.
- b. Resolves any security issues with respect to occurrence reporting.
- c. Director, Office of Operations Support.
  - 1. Maintains a 24-hour-a-day/7-day-a-week capability at the DOE HQ OC to receive and log Operational Emergency notifications per DOE O 151.1A, *Comprehensive Emergency Management System*, to process Prompt Notifications of Significance Category 1 Reportable Occurrences, and to process Prompt Notifications of other occurrences requiring immediate notification to DOE HQ from Departmental Operations/Field/Site Offices and facilities per this Manual.
    - a) Receives Prompt Notifications of Operational Emergencies orally.
    - b) Receives by e-mail the Prompt Notifications of Significance Category 1 Reportable Occurrences and other occurrences requiring immediate notification to DOE HQ.
    - c) When called as follow-up to an e-mail notification, confirms the receipt of the e-mail transmitting the Prompt Notification of Significance Category 1 Reportable Occurrences and other occurrences requiring immediate notification to DOE HQ.
  - 2. Logs receipt of all Prompt Notifications and immediately conducts oral notifications to the emergency management duty officer of the Secretarial



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Officers/Deputy Administrators (NNSA) with responsibility for the facility, site, or activity involved in the operational emergency or occurrence.

- a) The DOE HQ OC will immediately call the appropriate emergency management duty officer and provide information from the Prompt Notification. Notifications by the DOE HQ OC will be made for all Operational Emergencies, Significance Category 1 Reportable Occurrences, and other occurrences requiring immediate notification to DOE HQ regardless of the time or day of the week.
- b) The DOE HQ OC will forward an e-mail copy of Prompt Notifications of Significance Category 1 Reportable Occurrences, and other occurrences requiring immediate notification of DOE HQ to the emergency management duty officer who was called.

4.4 Director, Office of Emergency Operations, NNSA

- a. Develops, promulgates, and maintains policies related to reporting criteria, classifications, definitions, and prompt notification requirements for Operational Emergencies.
- b. Provides formal Departmental interpretation of the requirements for classifying Operational Emergencies.
- c. Develops, promulgates, and maintains guidance materials, and conducts workshops, as necessary, on identification and classification of Operational Emergencies.
- d. Monitors reports relative to reporting activities at DOE facilities to assess implementation of the Operational Emergency portion of the Occurrence Reporting Program and to identify needed improvements.

4.5 Heads of Field Elements.<sup>1</sup>

- a. Ensure that agreements are established with responsible Secretarial Officers or Deputy Administrators (NNSA) on the working relationship between the Secretarial Officer or Deputy Administrator and the Field Element for the purpose of carrying out the requirements of this Manual.

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<sup>1</sup>Whenever the term Heads of Field Elements is used in this Manual, it includes Operations Offices, Field Offices, Site Offices, Service Centers, Project Offices and Area Offices.

- b. Assess capability and performance of the facility personnel in carrying out the requirements of this Manual, in accordance with established agreements with the responsible Secretarial Officers or Deputy Administrators (NNSA).
  - c. Provide technical support as necessary to Facility Representatives and line management staff in responding to any reportable occurrence, in accordance with established agreements with the responsible Secretarial Officers or Deputy Administrators (NNSA).
  - d. Designate and direct Facility Representatives and Designees to fulfill the responsibilities required by this Manual.
  - e. Ensure the requirements in the CRD for DOE M 231.1-2 are applied to applicable contracts within 3 months after approval of this Order.
  - f. Ensure initiators of procurement requests identify in procurement requests whether the requirements in the CRD for DOE M 231.1-2 are to be applied to the award or sub awards resulting from the procurement request and any special instructions for the application of the CRD.
- 4.6 Program Managers. In addition to other requirements prescribed by this Manual, Program Managers are responsible for the following:
- a. Reviewing activities related to reportable occurrences, including reporting and the development of programs and procedures.
  - b. Ensuring that a system for Prompt Notification and categorization of reportable occurrences has been established for their DOE programs and for facilities under their cognizance.
  - c. Ensuring that the Headquarters Operations Center (HQ OC) is informed of how the Headquarters Program Manager or Designees can be reached at all times.
  - d. Ensuring that lessons learned and generic or programmatic implications are identified and elevated to the Secretarial Officer or Deputy Administrator (NNSA) for appropriate action.
  - e. Ensuring that actions are taken to prevent recurrence of significant events.
  - f. Reviewing and assessing reportable occurrence information from facilities under their cognizance to assess the Facility Manager's and Facility

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Representative's evaluation of significance, causes, generic implications, and corrective actions implementation and closeout, and to ensure that DOE and contractor staff involved in these operations perform the related functions.

- g. Ensuring that Occurrence Reports and operations information from other organizations are disseminated to appropriate DOE and contractor activities within their cognizance, are reviewed for generic implications, and are used to improve operations.
  - h. Ensuring that Occurrence Reports are prepared and transmitted in accordance with DOE information security requirements (see Section 7).
  - i. Notifying the cognizant Secretarial Officer or Deputy Administrator (NNSA) of all Significance Category 1 Occurrences.
  - j. Interacting with the Facility Representative and HQ oversight organizations as necessary, and inform and advising their respective management of their findings.
  - k. Elevating any unresolved issues regarding actions or determinations on a reportable occurrence to the Secretarial Officer or Deputy Administrator (NNSA) and, if necessary, the Secretary for resolution and direction.
- 4.7 Facility Representatives.<sup>2</sup> In addition to other requirements prescribed in this Manual, Facility Representatives or designee, or selected line management staff if a Facility Representative is not assigned, are responsible for the following:
- a. Evaluating facility implementation of the notification and reporting process to ensure it is compatible with and meets the requirements of this Manual.
  - b. Maintaining day-to-day operational oversight of contractor activities, as described in DOE-STD-1063-2000, *Facility Representatives*.
  - c. Ensuring that occurrences that may have generic or programmatic implications are identified and elevated to the Head of the Field Element for appropriate action.
  - d. Ensuring that facility personnel act to minimize and prevent recurrence of significant events.

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<sup>2</sup>Whenever the term Facility Representative is used in this Manual, it includes Facility Representatives or designee, or selected line management staff if a Facility Representative is not assigned.

- e. Reviewing and assessing reportable occurrence information from facilities under their cognizance to determine the acceptability of the Facility Manager's evaluation of the significance, causes, generic implications, and corrective action implementation and closeout, and to ensure that facility personnel involved in these operations perform the related functions.
  - f. Ensuring that Occurrence Reports are prepared and transmitted in accordance with DOE information security requirements (see Section 7).
  - g. Interacting with facility personnel and Field Element oversight organizations as necessary and informing and advising their respective managements of their findings.
  - h. Elevating any unresolved issues regarding actions or determinations on a reportable occurrence to the Program Manager for resolution and direction.
  - i. Being available at all times to satisfy the requirements of this Manual.
- 4.8 Facility Managers. In addition to other requirements prescribed in this Manual, Facility Managers are responsible for the following:
- a. Ensuring procedures are implemented for notification and reporting that meet the requirements of this Manual.
  - b. Actively monitoring day-to-day operations and performance of facilities/activities under their cognizance.
  - c. Identifying and sharing with others lessons learned and generic or programmatic implications from occurrences and taking actions to minimize or prevent recurrence.
  - d. Determining causes and generic implications, and implementing corrective actions and closeout activities for reportable occurrences.
  - e. Reviewing and assessing reportable occurrence information for their facility(ies) to assess generic implications and corrective action(s) implementation, closeout, and effectiveness, as required; to identify and report recurring events, and to ensure that facility personnel involved in these operations perform the related functions.
  - f. Ensuring that Occurrence Reports and operations information from other organizations are disseminated to appropriate facility personnel within their

cognizance, are reviewed for generic implications, and are used to improve operations.

- g. Preparing and transmitting Occurrence Reports in accordance with DOE information security requirements (see Section 7).
- h. Being available at all times to satisfy the requirements of this Manual.

## **SECTION 5. OCCURRENCE REPORTING.**

To implement the occurrence categorization, notification, reporting, and processing system, the key responsible personnel must be identified and procedures developed, approved, and implemented to ensure that all of the occurrence reporting requirements, as delineated in DOE O 231.1A and this Manual, are met. The Facility Manager must be available at all times to carry out the responsibilities for the categorization, notification, and reporting requirements. Facility operators are required to ensure that occurrences resulting from activities performed by subcontractors in support of facility operation are reported in accordance with the provisions of this Manual.

For reportable occurrences, facility personnel are required to categorize the occurrences, notify DOE as required, and prepare and submit Occurrence Reports. This Section addresses the process for meeting these requirements, including roles and actions for key facility personnel and the steps to be taken to ensure performance. In Section 11, the Occurrence Reporting Model summarizes the various time limits, levels of investigation and analysis, corrective action development and tracking, approvals, and lessons learned development by Significance Category.

The documentation and distribution requirements will be satisfied by utilization of a centralized unclassified DOE operational database, the computerized Occurrence Reporting and Processing System (ORPS). However, under no circumstances will Occurrence Reports containing classified information or Unclassified Controlled Nuclear Information (UCNI) be entered into the ORPS database. Requirements regarding security classification are provided in Section 7.

Occurrences involving foreign personnel, governments, organizations, entities or influence must be reported by the Facility Manager to the Office of Counterintelligence or the Office of Defense Nuclear Counterintelligence, as appropriate. Such reporting is not intended to interfere with or delay any actions directed toward protection of personnel or property.

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5.1 Event or Condition Identification.

- a. Occurrences may be identified by direct observation of equipment or process malfunctions, log or record reviews, operator recognition of their own or others' errors, or other means.
- b. Operations personnel must take appropriate immediate action to stabilize and/or place the facility/operation in a safe condition and ensure that any potential environmental effects are stabilized and workers are treated for injuries sustained. Also, actions should be taken to preserve conditions for continued investigation; however, these actions are not to interfere with establishing a safe condition.
- c. The facility staff and operators must, upon identification of an abnormal or suspected abnormal event or condition, promptly notify the appropriate line management and the Facility Manager of the event status and record and/or archive all pertinent information, including details concerning the discovery of the occurrence and actions taken to stabilize or place the facility/operation in a safe condition.

5.2 Event or Condition Categorization. The Facility Manager must categorize all occurrences, except Operational Emergencies, within 2 hours of discovery by the cognizant facility staff following the site/facility-specific procedures developed in accordance with Section 9 of this Manual. The significance categories, as outlined in the Occurrence Reporting Model (Section 11), are for those occurrences of interest for complex-wide occurrence reporting and are described very generally below. More definitively, Section 6, Reporting Criteria, provides very specific reporting criteria and assigns the appropriate significance category to each criterion. Local implementing procedures may increase the reporting requirements but may not decrease the requirements below.

- a. Operational Emergencies (OE). Operational Emergencies are defined in DOE O 151.1A, *Comprehensive Emergency Management System*. Operational Emergency Occurrences are the most serious occurrences and require an increased alert status for onsite personnel and, in specified cases, for offsite authorities. The prompt notification requirements, definitions, criteria, and classifications of operational emergencies and appropriate responses are provided in DOE O 151.1A. Written Occurrence Reports must be completed in accordance with this Manual.
- b. Significance Category 1. Occurrences in this category are those that are not Operational Emergencies and that have a *significant impact* on safe facility

operations, worker or public safety and health, regulatory compliance, or public/business interests.

- c. Significance Category R. Occurrences in this category are those identified as recurring, as determined from the periodic performance analysis of occurrences across a site.
- d. Significance Category 2. Occurrences in this category are those that are not Operational Emergencies and that have a *moderate impact* on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests.
- e. Significance Category 3. Occurrences in this category are those that are not Operational Emergencies and that have a *minor impact* on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests
- f. Significance Category 4. Occurrences in this category are those that are not Operational Emergencies and that have *some impact* on safe facility operations, worker or public safety and health, public/business interests.

If the consequences are not fully determined or the event exceeds the threshold of more than one criterion (see Section 6), then the event must be categorized at the higher criteria level being considered. The occurrence criterion must be continuously reevaluated and changed, as needed, when new information becomes available.

### 5.3 DOE HQ Operations Center Prompt Notifications.

5.3.1 Operational Emergencies. The requirements for the prompt and follow-up notifications to DOE (including NNSA) and other agencies and the appropriate emergency responses to be taken are provided in DOE O 151.1A, *Comprehensive Emergency Management System*. The specific procedures on how these events are categorized and how and when DOE is notified are included in the site/facility-specific emergency response plans or procedures. If an event has been declared an Operational Emergency, the Facility Manager will be responsible for the written Notification Report and for the completion of all other occurrence reporting requirements, as described below.

#### 5.3.2 Prompt Notifications for Significance Category 1, 2, 3, and 4 Reportable Occurrences.

- a. The Facility Manager must notify the DOE Facility Representative (in a manner determined locally) and the DOE Headquarters Operations Center

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(DOE HQ OC), as required, of the following reportable occurrences as soon as practical (i.e., promptly), but no later than 2 hours after categorization:

- 1) All Significance Category 1 occurrences require a Prompt Notification to the Facility Representative and DOE HQ OC.
  - 2) All Significance Category 2 occurrences require a Prompt Notification to the Facility Representative and, if directed by the Facility Representative, to the DOE HQ OC.
  - 3) All Significance Category 3 occurrences require a prompt notification to the Facility Representative.
  - 4) Additionally, specific Significance Category 2, 3, and 4 occurrences (identified as requiring prompt notification with an asterisk in the reporting criteria listed in Section 6) require prompt notification to the Facility Representative and DOE HQ OC.
- b. The DOE HQ OC will relay notifications to the appropriate HQ-level Program Manager and make any further notifications, as required.
- c. The Facility Manager may use the local Field/Site Emergency Operations Center to expedite establishing the communication link required and to record and archive conversations. The prompt notification process is as follows:
- 1) The Facility Manager must e-mail the prompt notification of the reportable occurrence to the DOE HQ OC, and follow up with a phone call to the DOE HQ OC to ensure receipt of the e-mail.
  - 2) The Prompt Notification must clearly state/select the Significance Category (1, R, 2, 3, or 4) and identify the specific reporting criteria associated with the occurrence.
  - 3) Prompt Notification to the DOE HQ OC must include information on the following items:
    - a) Occurrence Significance Category
    - b) Location and description of the event
    - c) Date and time of discovery
    - d) Damage and casualties
    - e) Impact of event on other activities and operations



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- f) Protective actions taken or recommended
  - g) Weather conditions at the scene
  - h) Level of media interest at scene/facility/site.
  - i) Other notifications made
- 4) All information should be clear and succinct. Avoid jargon. Uncommon or site/facility-specific abbreviations and acronyms should be fully described.
  - 5) The Facility Manager must follow the appropriate security procedures if the notification to DOE may contain classified or sensitive information.
  - 6) If the occurrence is recategorized, then the occurrence must be reconsidered for prompt notification. If appropriate, the Facility Manager must notify the Facility Representative and the DOE HQ OC as soon as practical, but within the prompt notification time requirements of the new Significance Category for the recategorized occurrence and provide the Occurrence Report number. The DOE HQ OC will make any required internal DOE HQ notifications.
  - 7) Follow-up notifications must be made to DOE for any further degradation in the level of safety or impact on the environment, health, or operations of the facility or other worsening conditions subsequent to the previous notification. If a degradation results in upgrading the event to an Operational Emergency, the DOE HQ OC must be notified in accordance with DOE O 151.1A, *Comprehensive Emergency Management System*.
- 5.4 Written Notification Report. The Facility Manager must prepare the written Notification Report (including all required fields and all other fields for which information is known) as discussed in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, and distribute it per Section 5.6.e. Direct entry into the computerized Occurrence Reporting and Processing System (ORPS) satisfies this requirement. Any changes in the reporting criteria of the occurrence, which result in a change, either lower or higher, to the Significance Category, must be documented in an Update Report and submitted within the timeframe required for the Notification Report under the new Significance Category. A discussion on the change in categorization must be included in the Description of Occurrence field in the Update Report.

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- 5.4.1 Occurrence Report Preparation. In preparing the Notification Report, and subsequently the Final Report, the following writing instructions must be followed:
- a. The report should enable the general reader to understand the basic “what, who, when, where, how” of the event, the safety issues involved, and the actions taken.
  - b. The Subject/Title and the first paragraph of the Occurrence Description should relay the essential nature of the event (i.e., a summary of the occurrence in newspaper style).
  - c. All information should be clear and succinct. Avoid redundant and unnecessary text, and lengthy “log book” accounts, unless a discussion of the event in chronological order is considered essential to understanding the event.
  - d. Complex and more significant occurrences should warrant a greater level of detail. Significance Category 4 occurrences would likely need only a short paragraph under Occurrence Description. However, all reports should present enough information so that the general reader understands why the event needs to be reported and what the effect is.
  - e. Avoid jargon and uncommon or site/facility-specific abbreviations and acronyms. If used, acronyms should be initially spelled out.
  - f. Unless necessary to record and explain the event (e.g., suspect/counterfeit items or material), use general descriptions of equipment, procedures, etc., rather than presenting lengthy detailed titles and the numbers and letters assigned to those items.
  - g. Quantify the level of contamination, dose, release, and damage (e.g., estimate the acres of wild land burned) when possible, instead of merely stating a reportable limit was exceeded.
  - h. Use active rather than passive voice whenever possible. For example, write, “*the electrician* severed the conduit” rather than “the conduit was severed.”
  - i. When appropriate for clarification, photos, sketches, and drawings must be maintained with the occurrence report record. In addition, sites are encouraged but not required to make photos, sketches, and drawings

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available via a Web page, with the Web page address included as a hyperlink in the ORPS report.

5.4.2 Notification Report Submittal Schedule. The written Notification Report must be submitted according to the following schedule:

- a. Reports for Operational Emergencies and Significance Category 1 Occurrences. Before the close of the next business day from the time of categorization (not to exceed 80 hours).
- b. Reports for Significance Categories R and 2 Occurrences. Before the close of the next business day from the time of categorization.
- c. Reports for Significance Category 3 Occurrences. No later than close of business on the second business day from the time of categorization.
- d. Reports for Significance Category 4 Occurrences. Only a Short Form Report is required by close of business the second business day from the time of categorization.

5.5 Occurrence Investigation and Analysis. The following steps describe an acceptable process for submitting Update Reports and conducting the investigation and analysis of a specific occurrence. DOE 5480.19, *Conduct Of Operations Requirements For DOE Facilities*, and DOE-STD-1045-93, *Guide to Good Practices for Notifications and Investigation of Abnormal Events*, should be considered when establishing a program for investigation of occurrences. In cases of conflict between DOE 5480.19 or DOE-STD-1045-93 and this Manual, the requirements of this Manual must be followed.

In general, the investigative process is used to gain an understanding of the occurrence, its causes, and the corrective actions necessary to prevent recurrence or only remedy the problem, based on the significance of the occurrence. If DOE is doing a Type A or B investigation, the Facility Manager is not required to perform an identical investigation. However, the Facility Manager is still required to do the preliminary assembly of information to turn over to the DOE Accident Investigation Board, in accordance with DOE O 225.1A, *Accident Investigation*.

- a. The Facility Manager should use the graded approach described in the Occurrence Reporting Model (Section 11) when determining the level of effort required for the investigation into the causes of the occurrence. The graded approach is based on the significance, severity, or risk associated with the event or condition.

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For Operational Emergencies, in general, the investigation, problem analysis, and corrective action process should parallel the process for Significance Category 1 occurrences. However, the Facility Manager should consider a graded approach when determining the level of effort for the investigation into the cause of the Operational Emergency. The graded approach is based on whether the Operational Emergency was directly caused by DOE operations or resulted from non-DOE operations or natural phenomena. For example, investigations of an Operational Emergency involving the release of hazardous materials might require an accident investigation or the assembly of a team of investigators and subject matter experts. Investigation of an Operational Emergency resulting from a DOE facility being required to implement protective actions because a non-DOE activity offsite released hazardous materials or an Operational Emergency resulting from an earthquake may not require root cause determination because the initiating event was clearly beyond DOE's control.

- b. All causes must be identified as required in the Occurrence Reporting Model (Section 11) and included in the occurrence report. The cause codes to be used for reporting are provided in the Causal Analysis Tree (Section 11). Guidance on selecting the appropriate cause code is provided in DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*. The Cause Description field should include a brief discussion to clearly link the event to the cause code(s). For those occurrences that require a formal root cause analysis, any of the site approved root cause analysis methodologies are permitted. The methodology used must be included in the Cause Description field of the occurrence report. In addition to determining the causes of the occurrence, any weaknesses in the facility's implementation of the ISM program must be identified and entered in the ISM field, as discussed in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*.
- c. In addition to submitting an Update Report when the Significance Category of the occurrence has been changed (as stated in Section 5.4), the Facility Manager must submit and distribute an Update Report for all occurrences, with the exception of Significance Category 4 occurrences, if there is any significant and new information about the occurrence. The status of the investigation, recurring consequences, and the identification of additional component defects are activities associated with the occurrence and must be included in Update Reports.
- d. Using a graded approach as described in the Occurrence Reporting Model (see Section 11), the Facility Manager should consult in a timely manner with the Facility Representative and the Program Manager, as appropriate, for their assessment, if any, of the occurrence.

- 5.6 Occurrence Report Closure. The following steps describe an acceptable process for closing out the Final Report for all occurrences except those categorized as Significance Category 4:
- a. The Final Report must be prepared by the Facility Manager and submitted as soon as practical but within 45 calendar days after initial categorization of the occurrence. The Final Report must be prepared using the writing instructions listed in Section 5.4.1 and must document the following:
    - (1) The significance, nature, and extent of the event or condition;
    - (2) The causes of the event or condition (including the root cause, as required) using the codes provided in the Causal Analysis Tree (Section 11);
    - (3) The immediate actions taken and the corrective action(s) to be taken (see Section 5.6.f), as required by the Occurrence Reporting Model (Section 11); and
    - (4) The lessons learned.
  - b. If the required analysis cannot be completed within 45 calendar days after initial categorization, an Update Report must be submitted within the 45 days. The Update Report must provide a detailed explanation of the delay and provide an estimated date for submittal of the Final Report. This information must be reported in the “Evaluation” block of the Occurrence Report. It is expected that the analysis of most occurrences will be completed and the Final Report submitted within the 45 calendar days. However, for certain occurrences, such as those requiring an accident investigation, it is understood that the information required for the Final Report may not be available within this time. For occurrences resulting in an accident investigation, all causes (direct, contributing, and root) identified in the accident investigation report, as well as the corrective actions developed in response to the judgments of need, must be included in the Final Report.
  - c. For Operational Emergencies and Significance Category 1, R, and 2 Final Reports, the Facility Representative must review, approve, and add any comments, as necessary, within 14 calendar days after receipt of the report. For Operational Emergencies and Significance Category 1 Final Reports, after the Facility Representative has approved the occurrence report, the Program Manager must review, approve, and add any comments to the Final Report within 14 calendar days. If the ORPS database is being used, the Facility Representative and Program Manager’s comments should be provided through

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ORPS. Facility Representative and Program Manager comments are not required for their approval of the report.

- d. If the Final Report is not approved by the Facility Representative or the Program Manager, the Facility Representative or Program Manager who is rejecting the report must provide the reason for disapproval in the comment section of the report at the time the action is taken. The revised Final Report must be resubmitted within 21 calendar days of the disapproval. If it cannot be resubmitted within this time, an Update Report must be submitted within the 21 calendar days explaining the delay and providing an estimated date for resubmittal of the Final Report. This information must be reported in the "Evaluation" block of the Occurrence Report.
- e. All Occurrence Reports must be distributed as soon as practical to the following:
  - Facility Representative
  - Program Manager
  - Heads of all Field organizations (including NNSA)
  - Office of Environment, Safety and Health (Office of Performance Assessment and Analysis) and Administrator (NNSA) and
  - DOE Management and Operations or Integrating contractors

If the Occurrence Reports are entered into the ORPS database, the distribution requirement is automatically satisfied.

- f. As prescribed on the Occurrence Reporting Model (Section 11) and depending on the Significance Category, the Facility Manager must track all corrective actions to closure, including independent verification or sampling at the facility level and also evaluate the effectiveness of the corrective actions to prevent recurrence (if applicable). Site/contractor corrective action programs must include management of Significance Category 4 occurrences, whose corrective actions are not managed through ORPS.
- g. The cognizant Facility Manager may use the ORPS database to track the status of Final Report corrective actions. For those facilities that do not choose to use ORPS to track the status of their corrective actions, the specific corrective action tracking number from the local corrective action tracking system must be entered into ORPS. Any changes made to the corrective actions tracked in the local corrective action system must follow the site's approved change process and should be updated in ORPS. For Significance Category 2 and higher reports, any text change to a corrective action previously entered in ORPS must be updated in ORPS with Facility Representative approval. A status report of

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all incomplete Occurrence Reports (not Final) and incomplete corrective actions (for those sites who choose to track the status of their corrective actions using ORPS) will be available at any time from the ORPS database. Retain all supporting information pertaining to each occurrence or report (e.g., graphs, analyses, and formal investigation reports) in accordance with Departmental Records Disposition Schedules, as required by 36 CFR Chapter 12, Subchapter B, RECORDS MANAGEMENT.

- 5.7 Short Form Reports. A Short Form Report, as described in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*, must be prepared and submitted for all Significance Category 4 occurrences no later than 2 business days after categorization of the occurrence. This report will satisfy all of the written reporting requirements for these occurrences.
- 5.8 Performance Analysis and Identification of Recurring Occurrences. Each contractor at a site and managers at DOE owned and operated sites must perform ongoing, but as a minimum quarterly, analyses of events during a 12-month period to look for trends. This periodic performance analysis must evaluate occurrences of all significance categories plus contractor-/operator-determined non-reportable events in order to prevent serious events from occurring. Quarterly performance analysis results must be reported to contractor and DOE line management in order to achieve improvements.

Occurrences identified as recurring require a new occurrence report to be submitted for notification of the recurring issue, with investigation, root cause analysis, and corrective actions subsequently required. Previous individual Occurrence Report Numbers associated with the recurring issue must be provided in the Similar Occurrence Report Numbers field. The reporting organization should select the appropriate reporting criteria associated with the recurring issue. If no specific reporting criteria can be identified, the Reporting Criteria should be listed as Group 10, Criteria #2.

Recurring occurrences must be categorized and reported collectively as a Significance Category R occurrence, even if each individual occurrence had been originally categorized at a higher or lower significance level (e.g., as Significance Category 1 or 4 or even as non-reportable occurrences). See the Occurrence Reporting Model (Section 11) to learn the requirements for a Significance Category “R” occurrence. More information on the performance analysis process for all occurrence reports and specifics on recurring occurrences are provided in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*.

DOE Headquarters’ Office of Environment, Safety and Health must perform a semiannual analysis of all reportable occurrences during a 12-month period to look

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for trends. In those cases where recurring events are discovered, these events must promptly and formally be brought to the attention of the Program Office(s) for identification of appropriate corrective actions.

- 5.9 Training. Specific training programs for the requirements of this Manual must be established for both DOE (including NNSA) and contractor personnel for facilities under their cognizance. These training programs must include the following:
- a. Indoctrination in the objectives and process of occurrence reporting as defined in the occurrence reporting requirements documents.
  - b. Identification of reportable occurrences and their categorization, notification, and associated reporting requirements; analysis, determination, and coding of causes; identification of generic implications; and management of corrective actions.
  - c. Utilization of ORPS, including input of occurrence reports and obtaining information from the database.
  - d. Utilization of the Causal Analysis Tree.
  - e. Where applicable, the preparation of occurrence reports that may include classified information or unclassified controlled information (e.g., OOU or UCNI), including the sanitization of the report for entry into ORPS.

## **SECTION 6. REPORTING CRITERIA.**

The following are the reporting criteria, categorized into 10 major groups and appropriate subgroups related to DOE operations. This list provides a minimum set of requirements necessary to develop local procedures and report occurrences applicable to local operations. Categorization of occurrences must be done at the criterion level.

Site/contractor corrective action programs will manage actions for important events that do not meet the ORPS reporting herein (as well as Significance Category 4 occurrences, whose corrective actions are not managed through ORPS).

The reporting of safeguards and security events is addressed by DOE N 471.3, *Reporting of Events of Security Concern*. Such events are no longer reported in ORPS unless they involve other consequences that met the ORPS reporting criteria presented herein.

This Manual does not absolve the cognizant parties from making required reports to other agencies.



6.1 Major Criteria Groups. The 10 major groups of categorized occurrences are as follows.

Group 1 - Operational Emergencies

Group 2 - Personnel Safety

Group 3 - Nuclear Safety Basis

Group 4 - Facility Status

Group 5 - Environmental

Group 6 - Contamination/Radiation Control

Group 7 - Nuclear Explosive Safety

Group 8 - Transportation

Group 9 - Noncompliance Notifications

Group 10 - Management Concerns/Issues

6.2 Categorizing Instructions

1. An event can meet multiple reporting criteria that establish it as an occurrence. **All of the specific reporting criteria applicable for an occurrence must be identified.** Some criteria are “secondary” in that they complement other reporting criteria that require occurrence reporting. In these cases, all of the applicable criteria must be recorded. Each criterion is denoted by its Group, Subgroup (if applicable), and sequence number (#). Thus, for example, the violation of a safety limit is denoted as Group 3, Subgroup A, Sequence (1) or “3A(1).”
2. The reporting criteria presented below list a specific Significance Category (SC) for each criterion, between the sequence number (#) and the criterion text. Significance Categories are designated as “OE” for Operational Emergencies, “R” for recurring occurrences, or 1, 2, 3, or 4. Thus, for example, the Significance Category for a Stop Work Order issued by a DOE office, criterion 4B(1), is SC 2.
3. Operational Emergencies, Significance Category 1, and some other occurrences in lesser significance categories require prompt notification to the DOE HQ OC. **Asterisks (\*) next to the significance categories below denote those occurrences requiring prompt notification to the DOE HQ OC.** Section 5.3.2 of this Manual defines the prompt notification requirements.

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4. DOE O 151.1A describes initiating events that are considered Operational Emergencies. DOE O 225.1A defines when Type A or B accident investigations should be initiated. While some Operational Emergencies and some other ORPS occurrences involve conditions that would be sufficient to initiate accident investigations, criterion 10(1) herein will report the actual initiation of Type A or B accident investigations.

### 6.3 Occurrence Reporting Criteria

#### **Group 1 - Operational Emergencies**

<u>#</u>	<u>SC</u>	<u>Criterion</u>
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- |     |     |  |
|-----|-----|--|
| (1) | *OE | An Operational Emergency not needing further classification, as defined in DOE 151.1A, Chapter 5, Paragraph 2. |
| (2) | *OE | An Alert, as defined in DOE 151.1A, Chapter 5, Paragraph 3a.   |
| (3) | *OE | A Site Area Emergency, as defined in DOE 151.1A, Chapter 5, Paragraph 3b.                                      |
| (4) | *OE | A General Emergency, as defined in DOE 151.1A, Chapter 5, Paragraph 3c.  |

#### **Group 2 - Personnel Safety and Health**

##### Subgroup A Occupational Illnesses/Injuries

<u>#</u>	<u>SC</u>	<u>Criterion</u>
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- |     |    |   |
|-----|----|---|
| (1) | *1 | Any occurrence due to DOE operations resulting in a fatality or terminal injury/illness. For fatalities caused by overexposures, the intent of this criterion is to report those caused by acute rather than chronic effects. |
| (2) | *1 | Any single occurrence requiring in-patient hospitalization of three or more personnel.  |
| (3) | 2  | Any single occurrence resulting in three or more personnel having Days Away, Restricted or Transferred (DART) cases per 29 CFR Part 1904.7.   |

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- (4) \*2 Personnel exposure to chemical, biological or physical hazards above limits established by the Occupational Safety and Health Administration (refer to 29 CFR Part 1910) or American Conference of Governmental Industrial Hygienists, whichever is lower, and that requires the administration of medical treatment beyond simple first aid on the same day as the exposure. [29 CFR 1904.7(b)(5)(i) and (ii) define “medical treatment” and “first aid.”]
  
  - (5) 3 Personnel exposure to chemical, biological or physical hazards above limits established by the Occupational Safety and Health Administration (refer to 29 CFR Part 1910) or American Conference of Governmental Industrial Hygienists.
  
  - (6) 3 Any single occurrence resulting in a serious occupational injury. A serious occupational injury is an occupational injury that:
    - (a) Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;
    - (b) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose, or a minor chipped tooth);
    - (c) Causes severe hemorrhages or severe damage to nerves, muscles, or tendons;
    - (d) Damages any internal organ; or
    - (e) Causes second- or third-degree burns, affecting more than five percent of the body surface.

Subgroup B Fires/Explosions

# SC Criterion

- (1) \*1 Any unplanned fire or explosion within primary confinement/containment boundaries for nuclear or hazardous material within a facility.

[Note: Facility specific documents need to define what constitutes the primary confinement/containment boundary.]

- (2) \*2 Any unplanned fire or explosion in a nuclear facility that activates a fire suppression system (e.g., halon discharge, sprinkler heads activating), is extinguished by a fire department, or disrupts normal facility operations.

[Note: The activation or degradation of Safety Class and Safety Significant fire suppression systems are addressed by Group 4 Criteria.]

- (3) \*3 Any unplanned fire or explosion in a non-nuclear facility that
- a) Activates a fire suppression system,
  - b) Takes longer than 10 minutes to extinguish following the arrival of fire protection personnel, or
  - c) Disrupts normal operations in a high hazard facility.
- (4) \*4 Any wild land fire (e.g., forest fire, grassland fire) or other fire outside of a DOE facility that has the potential to threaten the facility.

Subgroup C    Hazardous Energy Control

#    SC    Criterion

- (1)    2    Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.
- (2)    3    Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

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**Group 3 - Nuclear Safety Basis**

Subgroup A Technical Safety Requirement Violations

# SC Criterion

- (1) \*1 Any violation of a Hazard Category 1, 2, or 3 nuclear facility's Technical Safety Requirement (or Operational Safety Requirement) Safety Limit.

[Note: Safety Limits are high-level Technical Safety Requirement controls, used infrequently across the DOE Complex. As defined in 10 CFR 830.3, a Safety Limit is a limit on process variables associated with those safety class physical barriers, generally passive, that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials.]

- (2) 2 Any violation or noncompliance of a Hazard Category 1, 2, or 3 nuclear facility's Technical Safety Requirement (or Operational Safety Requirement) Limiting Control Setting, Limiting Condition for Operation, Administrative Control, or Surveillance Requirement.

Exception: An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function. (See separate criterion for late surveillance tests below.)

- (3) 3 Any violation or noncompliance of a hazard control specified in a Hazard Category 1, 2, or 3 nuclear facility's DOE approved Documented Safety Analysis [issued pursuant to 10 CFR 830.204 and including Basis for Interim Operation (BIO), etc.], or DOE issued Safety Evaluation Report that are not addressed by Criteria 3A(1) and 3A(2).

Exceptions:

- (a) An event consisting solely of a violation of a safety management program (e.g., quality assurance, personnel training) cited in the Documented Safety Analysis.

(b) An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function. (See separate criterion for late surveillance tests below.)

(4) 4 An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function.

Subgroup B Documented Safety Analysis Inadequacies

# SC Criterion

(1) 2 Determination of a positive Unreviewed Safety Question (USQ) that reveals a currently existing inadequacy in the documented safety analysis [e.g., Safety Analysis Report (SAR) or Basis for Interim Operation (BIO)].

(2) 3 Declaration of a potential inadequacy of the documented safety analysis (a potential positive USQ), per 10 CFR 830.203(g).

Subgroup C Nuclear Criticality Safety

# SC Criterion

(1) \*1 A loss of multiple nuclear criticality process-condition controls, where processes include operation, transport, and storage of fissionable materials, such that no valid controls are available to prevent a criticality accident.

(2) 2 A loss of one or more nuclear criticality process-condition controls such that an accidental criticality is possible from the loss of an additional process-condition control, where processes include operation, transport, and storage of fissionable materials.

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#### Group 4 - Facility Status

[Note: The criteria below apply to both nuclear and non-nuclear facilities, where applicable.]

##### Subgroup A Safety Structure/System/Component Degradation

# SC Criterion

- (1) 3 Performance degradation of any Safety Class or Safety Significant Structure, System, or Component (SSC) that prevents satisfactory performance of its design function when it is required to be operable.
- (2) 4 Performance degradation of any Safety Class SSC when not required to be operable.

##### Subgroup B Operations

# SC Criterion

- (1) \*2 A Stop Work Order issued by a DOE office.
- (2) 2 Actuation of a Safety Class Structure, System, or Component (SSC), or its alarms, resulting from an actual unsafe condition. Spurious alarms (e.g., due to electronic noise, radon/thoron decay) should not be reported.
- (3) 3 Actuation of a Safety Significant Structure, System, or Component (SSC), or its alarms, resulting from an actual unsafe condition. Spurious alarms (e.g., due to electronic noise, radon/thoron decay) should not be reported.
- (4) 3 Any facility evacuation, not including a precautionary evacuation, in response to an actual event. If the event fell under another reporting criterion, then evacuation should be reported as well by noting multiple reporting criteria for the single occurrence.
- (5) 4 A facility operational event caused by deviating from a written procedure or using an inadequate procedure resulting in an adverse effect on safety, such as: an inadvertent facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes), facility or operations shutdown due to alarm

response procedures, inadvertent process liquid transfer, or inadvertent release of hazardous material from its engineered containment.

(6) \*4 A facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes) directed by management for safety reasons.

(7) 4 A facility or site stand-down resulting from safety reasons reportable as an occurrence or occurrences.

[Note: This is a secondary reporting criterion and does not require a separate occurrence report.]

(8) 4 Any event or condition that would prevent immediate facility or offsite emergency response capabilities.

Subgroup C Suspect/Counterfeit and Defective Items or Material

# SC Criterion

(1) 3 Discovery of any suspect/counterfeit item or material found in a Safety Class or Safety Significant Structure, System, or Component (SSC).

A suspect item or material is one whose documentation, appearance, performance, material, or other characteristics may have been misrepresented by the vendor, supplier, distributor, or manufacturer. A counterfeit item or material is one for which sufficient evidence exists that deliberate misrepresentation has occurred.

(2) 4 Discovery of any suspect/counterfeit item or material other than office supplies, office equipment, or household products.

(3) 4 Discovery of any defective item or material, other than a suspect/counterfeit item or material, in any application whose failure could result in a loss of safety function, or present a hazard to public or worker health and safety.

A defective item or material is any item or material that does not meet the commercial standard or procurement requirements as defined by catalogues, proposals, procurement specifications,



design specifications, testing requirements, contracts, or the like. It does not include parts or services that fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level.

### **Group 5 - Environmental**

#### Subgroup A Releases

<u>#</u>	<u>SC</u>	<u>Criterion</u>
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- |     |    |  |
|-----|----|--|
| (1) | *2 | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility, that is above permitted levels and exceeds the reportable quantities specified in 40 CFR 302 or 40 CFR 355.  |
| (2) | 2  | Any discharge that exceeds 100 gallons of oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. For operations involving oil field crude or condensate, any discharge of 100 barrels or more is reportable under this criterion. |
| (3) | 4  | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility that is above permitted levels and exceeds 50 percent of the reportable quantities specified in 40 CFR 302 or 40 CFR 355.   |
| (4) | 4  | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility that must be reported to outside agencies in a format other than routine periodic reports. (However, oil spills of less than 10 gallons and with negligible environmental impact need not be reported in ORPS.)         |

#### Subgroup B Ecological and Cultural Resources

<u>#</u>	<u>SC</u>	<u>Criterion</u>
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- |     |   |  |
|-----|---|--|
| (1) | 2 | Any occurrence causing significant impact to any ecological resource for which DOE is a trustee (e.g., destruction of a critical habitat, damage to an historic/archeological site, damage to wetlands). |
|-----|---|--|

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**Group 6 - Contamination/Radiation Control**
Subgroup A    Loss of Control of Radioactive Materials

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>   |
|----------|-----------|--|
| (1)      | 2         | Identification of radioactive material offsite due to DOE operations/activities that exceeds applicable DOE-approved authorized limits (pursuant to DOE O 5400.5). This applies to items/areas consisting of radioactive material. This does not apply to items with surface radioactive contamination. See Criterion 6B(1) below for criteria for identification of items with surface radioactive contamination. |
| (2)      | 2         | Loss of radioactive material that exceeds 100 times the quantities specified in 10 CFR Part 835, Appendix E (excluding consumer products such as smoke detectors), or loss of accountability of such material for more than 24 hours. The 24-hour time period begins when the loss of accountability is discovered.  |
| (3)      | 3         | Loss of radioactive material which exceeds 1 times and no greater than 100 times the quantities specified in 10 CFR Part 835, Appendix E (excluding consumer products such as smoke detectors) or loss of accountability of such material for more than 24 hours. The 24-hour time period begins when the loss of accountability is discovered.  |

Subgroup B    Spread of Radioactive Contamination

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>   |
|----------|-----------|--|
| (1)      | 2         | Identification of radioactive contamination offsite due to DOE operations/activities that exceeds applicable DOE-approved authorized limits (pursuant to DOE 5400.5) or, if there are none, the values found in 10 CFR Part 835, Appendix D. |

[Note: All releases of property containing or potentially containing residual radioactivity are subject to requirements in DOE 5400.5. Compliance with 10 CFR Part 835, Appendix D values does not necessarily satisfy the requirements in DOE 5400.5.]

- 
- (2) 2 Identification of onsite radioactive contamination greater than 100 times the total contamination values in 10 CFR 835 Appendix D and that is found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and areas controlled in accordance with 10 CFR 835.1102(c). For tritium, the reporting threshold is 100 times the removable contamination values in 10 CFR Part 835, Appendix D.

[Notes:

- (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.
- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.]

- (3) 3 Identification of onsite radioactive contamination greater than 10 times the total contamination values in 10 CFR 835 Appendix D and that is found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and areas controlled in accordance with 10 CFR 835.1102(c). For tritium, the reporting threshold is 10 times the removable contamination values in 10 CFR Part 835, Appendix D.

[Notes:

- (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.

- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.]
- (4) 4 Identification of onsite legacy radioactive contamination greater than 10 times the total contamination values in 10 CFR 835 Appendix D and that is found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and areas controlled in accordance with 10 CFR 835.1102(c). For tritium, the reporting threshold is 10 times the removable contamination values in 10 CFR Part 835, Appendix D.

[Notes:

- (a) Legacy radioactive contamination is radioactive contamination resulting from historical operations that are unrelated to current activities.
- (b) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.]

Subgroup C    Radiation Exposure

#    SC    Criterion

- (1)    \*1    Determination of a dose that exceeds the limits specified in 10 CFR Part 835, Subpart C, Occupational Radiation Protection or DOE O 5400.5, Chapter II, Item 1 [i.e., 100 mrem Total Effective Dose Equivalent (TEDE) for offsite exposures to a member of the public].

- 
- (2) 2 Any unmonitored exposure that exceeds the values for providing personnel dosimeters and bioassays as stated in 10 CFR 835.402(a) or 10 CFR 835.402(c).
  - (3) 3 Any single occupational exposure that exceeds an expected exposure or dosimetry result by: (1) 500 mrem Committed Effective Dose Equivalent (CEDE), or (2) the greater of 10 percent or 100-mrem effective dose equivalent due to external exposure.
  - (4) 3 Determination of an estimated annual dose that exceeds 10 mrem Total Effective Dose Equivalent (TEDE) for offsite exposures to a member of the public from air pathways only.

Subgroup D Personnel Contamination

# SC Criterion

- (1) \*2 Any occurrence requiring offsite medical assistance for contaminated personnel, including transporting a person to an offsite medical facility or bringing offsite medical personnel onsite to perform treatment or decontamination.
- (2) 2 Identification of personnel or clothing contamination offsite due to DOE operations that exceeds the values for total contamination found in 10 CFR Part 835, Appendix D. For tritium use the values for removable contamination found in 10 CFR Part 835, Appendix D.
- (3) 4 Any onsite contamination of personnel or clothing (excluding site-provided protective clothing) that exceeds 10 times the values for total contamination identified in 10 CFR Part 835, Appendix D. The contamination level must be based on direct measurement and not averaged over any area. This criterion does not apply to tritium contamination.

**Group 7 - Nuclear Explosive Safety**

# SC Criterion

- (1) \*1 Damage to a nuclear explosive that results in a credible threat to nuclear explosive safety.

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- (2) 2 The unauthorized introduction of electrical energy into a nuclear explosive.
  - (3) 2 The unauthorized compromise of a nuclear explosive safety feature when installed on a nuclear explosive.
  - (4) 2 Inadvertent substitution of a nuclear explosive for a nuclear explosive-like assembly (NELA) or vice versa.
  - (5) 2 A violation of a nuclear explosive safety rule (NESR).
  - (6) 2 Damage to a training unit during training operations indicative of a hazard to a nuclear explosive.
  - (7) 3 The use of uncertified personnel or unauthorized equipment/tooling during a nuclear explosive operation.
  - (8) 3 A violation of the two-person concept of operations.
  - (9) 3 Revocation of the Personnel Assurance Program (PAP) certification of an individual (for cause).

### **Group 8 - Transportation**

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>  |
|----------|-----------|---|
| (1)      | *1        | Any offsite transportation incident involving hazardous materials that would require immediate notice pursuant to 49 CFR Part 171.15, namely: <ul style="list-style-type: none"> <li>(a) As a direct result of hazardous materials:               <ul style="list-style-type: none"> <li>(i) A person is killed,</li> <li>(ii) A person receives injuries requiring hospitalization,</li> <li>(iii) Estimated property damage exceeds \$50,000,</li> <li>(iv) An evacuation of the general public occurs lasting 1 hour or more,</li> <li>(v) One or more transportation arteries or facilities are closed or shut down for 1 hour or more, or</li> </ul> </li> </ul> |

- (b) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive materials, or
  - (c) Fire, breakage, spillage, or suspected contamination occurs involving shipment of infectious substances (etiologic agents), or
  - (d) There has been a release of a marine pollutant in a quantity exceeding 450 liters (119 gallons) for liquids or 400 kilograms (882 pounds) for solids, or
  - (e) The operational flight pattern or routine of an aircraft is altered.
- (2) 3 Any offsite transport of hazardous material, including radioactive material, whose quantity or nature (e.g., physical or chemical composition) is different than intended, such that the receiving organization's operations were impacted/disrupted or the transport resulted in the initiation of corrective actions by the originating organization.
- (3) 4 Any onsite transport of hazardous material, including radioactive material, whose quantity or nature (e.g., physical or chemical composition) is different than intended, such that the receiving organization's operations were impacted/disrupted or the transport resulted in the initiation of corrective actions by the originating organization.
- (4) 4 Any packaging or transportation activity involving the onsite release of radioactive materials, etiologic agents, hazardous substances, hazardous waste, or marine pollutants.

**Group 9 - Noncompliance Notifications**

#	SC	Criterion
(1)	3	Any enforcement action (other than associated with the Price Anderson Amendment Act) involving 10 or more cited violations, and/or an assessed fine of \$10,000 or more.

[Note: This criterion applies to the enforcement action as initially received from the regulator. Thus the enforcement action would

still be reportable even if the fine is later reduced below \$10,000 or the number of violations reduced below 10.]

- (2) 4 Any written notification from an outside regulatory agency that a site/facility is considered to be in noncompliance with a schedule or requirement (e.g., Notice of Violation, Notice of Intent to Sue, Notice of Noncompliance, Warning Letter, Finding of Violation, Finding of Alleged Violation, Administrative Order, or a similar type of notification or enforcement action).

### Group 10 - Management Concerns/Issues

# SC Criterion

- (1) 2 Any event resulting in the initiation of a Type A or B accident investigation as categorized by DOE O 225.1A, *Accident Investigation*.

[Note: This reporting criterion may raise the significance category of an occurrence already reported under separate criteria. Multiple reporting criteria should be noted when appropriate.]

- (2) 1-4<sup>†</sup> An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, based on an evaluation of the potential risks and the corrective actions taken.

[<sup>†</sup> Note: An SC 1 occurrence report requires Prompt Notification.]

- (3) 1-4<sup>†</sup> A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken.

[<sup>†</sup> Note: An SC 1 occurrence report requires Prompt Notification.]

- (4) \*4 Any occurrence that may result in a significant concern by affected state, tribal, or local officials, press, or general population; that



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could damage the credibility of the Department; or that may result in inquiries to Headquarters.

- (5) \*4 Any occurrence of such significant immediate interest to offsite personnel and organizations that it warrants prompt notification to the DOE Headquarters Operations Center (DOE HQ OC), and which is not already designated elsewhere in this set of reporting criteria to have prompt notification [denoted by having an asterisk (\*) next to the significance category].

## **SECTION 7. INFORMATION SECURITY REQUIREMENTS.**

Occurrence Reports containing any classified information, Unclassified Controlled Nuclear Information (UCNI), or other controlled information must not be entered into the ORPS database. Facility Managers must ensure that a review is performed prior to ORPS data entry to preclude contamination of the database with classified, UCNI, official use only, or other controlled information.

Any ORPS report determined to be classified or controlled by current classification or control guidance must be submitted using the appropriate secure transmission means. However, with the exception of entry into the ORPS database, all other reporting requirements identified in this Manual must be met. In addition, an unclassified version of the occurrence report that has been sanitized of all controlled information must be submitted to ORPS within the required time frames specified in Section 5.

Implementing procedures should identify the requirements for distribution of reports containing classified or controlled information. In those instances where UCNI data may still be present in the ORPS database, appropriate security procedures related to the handling of such data need to be followed.

[Note: Occurrence reports involving incidents of counterintelligence concern (e.g., foreign persons, governments, organizations, entities or influence) will not be entered or referenced in the ORPS database.]

## **SECTION 8. UTILIZATION OF REPORTABLE OCCURRENCE INFORMATION.**

- 8.1 Operational Database. The Office of Environment, Safety and Health (EH-1) is responsible for maintaining an unclassified central database, the Occurrence Reporting and Processing System (ORPS). Occurrence Report documentation and distribution requirements will be satisfied by utilization of ORPS, with the exception of those involving classified information or UCNI. Reports for occurrences involving classified information or UCNI will be prepared in written form. After the classified information and UCNI is removed, the report must be entered into ORPS.

- 8.2 Utilization. Each Facility Manager must collect and disseminate to their personnel information from occurrences related to their facilities and similar DOE facilities. This information includes both lessons learned and good practices. Each Facility Manager should use this information for trending and analysis and for early identification and correction of deteriorating conditions.

One of the major purposes of this reporting system is to provide feedback of safety and operational information identified in the Occurrence Reports to other DOE facilities. In addition, Headquarters oversight and assessment organizations should use ORPS information to prepare Safety Notices and other feedback documents. These uses are dependent on the quality of the information reported, which means the information should be thorough and accurate. To this end, Occurrence Reports should contain sufficient information about the facility operations and the occurrence to facilitate action by other personnel who are unfamiliar with details of the facility, equipment, process, or procedures.

Operations and engineering units, as well as other support organizations, should be involved in the identification and assessment of reportable occurrences. Site information, such as operations logs and engineering evaluations, should be used in this process.

Engineering judgment should be used during the review of events and conditions to ensure that precursors to occurrences are identified and reported. An occurrence that is not serious, given the conditions under which it happened, might under different initial conditions be a precursor to a serious event at the same or other facilities.

## **SECTION 9. IMPLEMENTING PROCEDURES.**

Contractors at facilities must develop and maintain implementing procedures for the occurrence reporting and utilization requirements stated in this Manual within 90-days of the requirements in the Contractor Requirements Document being incorporated into their contracts. For DOE-owned and -operated facilities, the responsible DOE organization must implement the requirements of this Manual within 90-days of the Manual approval date.

## **SECTION 10. INSTRUCTIONS FOR COMPLETING AN OCCURRENCE REPORT.**

Specific instructions on the reporting of occurrences via hard copy or the electronic database, the Occurrence Reporting and Processing System (ORPS), are listed in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*. The documentation and distribution requirements of this Manual will be satisfied by utilization of ORPS. All reports containing classified information or Unclassified Controlled Nuclear Information (UCNI) must be submitted in hard copy in accordance with established security requirements (see

Section 7). In addition, an unclassified version of the Occurrence Report that has been sanitized of all controlled information must be submitted to ORPS within the time frames specified in Section 5.

**SECTION 11. OCCURRENCE REPORTING MODEL AND CAUSAL ANALYSIS  
TREE**

# OCCURRENCE REPORTING MODEL

Significance Category	Timelines <sup>1</sup>	Prompt Notification	Investigation	Causal Analysis	Corrective Actions	Report Approvals	Corrective Action Closures	Corrective Action Effectiveness	Lessons Learned <sup>3</sup>
Operational Emergencies (defined by DOE O 151.1A)	Cat: ASAP PN: NLT 15 min if further classified; NLT 30 min if not further classified WN: COB next business day not to exceed 80 hrs UR: As needed FR: 45 days	DOE Facility Representative & DOE Headquarters Operations Center (OC)	Team with Trained Investigator. DOE Consider Accident Investigation.	Root Cause Determined	Remedy Problem, Prevent Recurrence, & Preclude Similar Problems	DOE Facility Representative & DOE Program Manager Approval	Contractor Document & Independently Verify	Contractor Assess Effectiveness to Prevent Recurrence	Enter into DOE LL Database & Coverage in OE Summary
Significance Category 1 Reportable Occurrence	Cat: NLT 2 hrs PN: NLT 2 hrs WN: COB next business day not to exceed 80 hrs UR: As needed FR: 45 days	DOE Facility Representative & DOE Headquarters OC	Team with Trained Investigator. DOE Consider Accident Investigation.	Root Cause Determined	Remedy Problem, Prevent Recurrence, & Preclude Similar Problems	DOE Facility Representative & DOE Program Manager Approval	Contractor Document & Independently Verify	Contractor Assess Effectiveness to Prevent Recurrence	Enter into DOE LL Database & Coverage in OE Summary.
Significance Category R. Includes All Recurring Category 1, 2, 3, and/or 4 Reportable & Non-Reportable Occurrences	Cat: NLT 2 hrs WN: COB next business day UR: As needed FR: 45 days		Trained Investigator	Root Cause Determined	Remedy Problem, Prevent Recurrence, & Preclude Similar Problems	DOE Facility Representative Approval	Contractor Document & Independently Verify	Contractor Assess Effectiveness to Prevent Recurrence	Enter into DOE LL Database & Optional Coverage in OE Summary
Significance Category 2 Reportable Occurrence	Cat: NLT 2 hrs PN: NLT 2 hrs WN: COB next business day UR: As needed FR: 45 days	DOE Facility Representative (DOE HQ OC at Field Office Discretion) <sup>2</sup>	Trained Investigator	Apparent Cause Determined	Remedy Problem & Prevent Recurrence	DOE Facility Representative Approval	Document & Verify by Sampling	Optional	Enter into DOE LL Database & Optional Coverage in OE Summary
Significance Category 3 Reportable Occurrence	Cat: NLT 2 hrs PN: NLT 2 hrs WN: NLT 2 business days UR: As needed FR: 45 days	DOE Facility Representative (DOE HQ OC) <sup>2</sup>	Critique/ Fact Finding	Apparent Cause Determined	Remedy Problem	Contractor Approval	Document (Verification Optional)	Optional	Per Site Specific Process
Significance Category 4 Reportable Occurrence	Cat: NLT 2 hrs PN: NLT 2 hrs (as required) Short Form Report: NLT 2 business days	(DOE Facility Representative & DOE HQ OC) <sup>2</sup>	No reporting of causal analysis or lessons learned in ORPS. The reporting of corrective actions is optional. Reportable and non-reportable occurrences are managed per contractor-specific corrective action programs.						

<sup>1</sup> Cat: Categorization Time from Discovery Date and Time  
PN: Prompt Notification from Categorization Date and Time  
WN: Written Notification from Categorization Date and Time  
UR: Update Report  
FR: Final Report from Categorization Date and Time

NLT: No Later Than  
COB: Close of Business

<sup>2</sup> Specific Significance Category 2, 3, and 4 occurrences (identified with an asterisk in the reporting criteria listed in Section 6) also require Prompt Notification to the DOE HQ EOC.

<sup>3</sup> LL: Lessons Learned  
OE: Operating Experience

# Causal Analysis Tree Rev. 0



A1 Design / Engineering Problem	A2 Equipment / Material Problem	A3 Human Performance LTA	A4 Management Problem	A5 Communications LTA	A6 Training Deficiency	
<p>B1 DESIGN INPUT LTA C01 Design input cannot be met C02 Design input obsolete C03 Design input not correct C04 Necessary design input not available</p> <p>B2 DESIGN OUTPUT LTA C01 Design output scope LTA C02 Design output not clear C03 Design output not correct C04 Inconsistent design output C05 Design input not addressed in design output C06 Drawing, specification, or data error C07 Error in equipment or material selection C08 Errors not detectable C09 Errors not recoverable</p> <p>B3 DESIGN / DOCUMENTATION LTA C01 Design / documentation not complete C02 Design / documentation not up-to-date C03 Design / documentation not controlled</p> <p>B4 DESIGN / INSTALLATION VERIFICATION LTA C01 Independent review of design / documentation LTA C02 Testing of design / installation LTA C03 Independent inspection of design / installation LTA C04 Acceptance of design / installation LTA</p> <p>B5 OPERABILITY OF DESIGN / ENVIRONMENT LTA C01 Ergonomics LTA C02 Physical environment LTA C03 Natural environment LTA</p>	<p>B1 CALIBRATION FOR INSTRUMENTS LTA C01 Calibration LTA C02 Equipment found outside acceptance criteria</p> <p>B2 PERIODIC / CORRECTIVE MAINTENANCE LTA C01 Preventive maintenance for equipment LTA C02 Predictive maintenance LTA C03 Corrective maintenance LTA C04 Equipment history LTA</p> <p>B3 INSPECTION / TESTING LTA C01 Start-up testing LTA C02 Inspection / testing LTA C03 Post-maintenance / Post-modification testing LTA</p> <p>B4 MATERIAL CONTROL LTA C01 Material handling LTA C02 Material storage LTA C03 Material packaging LTA C04 Material shipping LTA C05 Shelf life exceeded C06 Unauthorized material substitution C07 Marking / labeling LTA</p> <p>B5 PROCUREMENT CONTROL LTA C01 Control of changes to procurement specifications / purchase order LTA C02 Fabricated item did not meet requirements C03 Incorrect item received C04 Product acceptance requirements LTA</p> <p>B6 DEFECTIVE, FAILED OR CONTAMINATED C01 Defective or failed part C02 Defective or failed material C03 Defective weld, braze or soldering joint C04 End of life failure C05 Electrical or instrument noise C06 Contaminant</p>	<p>B1 SKILL BASED ERROR C01 Check of work was LTA C02 Step was omitted due to distraction C03 Incorrect performance due to mental lapse C04 Infrequently performed steps were performed incorrectly C05 Delay in time cause d LTA actions C06 Wrong action selected based on similarity with other actions C07 Omission / repeating of steps due to assumptions for completion</p> <p>B2 RULE BASED ERROR C01 Strong rule incorrectly chosen over other rules C02 Signs to stop were ignored and step performed incorrectly C03 Too much activity was occurring and error made in problem solving C04 Previous success in use of rule reinforced continued use of rule C05 Situation incorrectly identified or represented resulting in wrong rule used</p> <p>B3 KNOWLEDGE BASED ERROR C01 Attention was given to wrong issues C02 LTA Conclusion based on sequencing of facts C03 Individual justified action by focusing on biased evidence C04 LTA review based on assumption that process will not change C05 Incorrect assumption that a correlation existed between two or more facts C06 Individual underestimated the problem by using past events as basis</p> <p>B4 WORK PRACTICES LTA C01 Individual's capability to perform work LTA [Examples include: Sensory / perceptual capabilities LTA, Motor / physical capabilities LTA, and Attitude / psychological profile LTA.] C02 Deliberate violation</p>	<p>B1 MANAGEMENT METHODS LTA C01 Management policy guidance/ expectations not well-defined, understood or enforced C02 Job performance standards not adequately defined C03 Management direction created insufficient awareness of impact of actions on safety / reliability C04 Management follow-up or monitoring of activities did not identify problems C05 Management assessment did not determine cause s of previous event or known problem C06 Previous industry or in-house experience was not effectively used to prevent recurrence C07 Responsibility of personnel not well-defined or personnel not held accountable C08 Corrective action responses to a known or repetitive problem was untimely C09 Corrective action for previously identified problem or event was not adequate to prevent recurrence</p> <p>B2 RESOURCE MANAGEMENT LTA C01 Too many administrative duties assigned to immediate supervisor C02 Insufficient supervisory resources to provide necessary supervision C03 Insufficient manpower to support identified goal / objective C04 Resources not provided to assure adequate training was provided / maintained C05 Needed resource changes not approved / funded C06 Means not provided to assure procedures / documents / records were of adequate quality and up -to-date C07 Means not provided for assuring adequate availability of appropriate materials / tools C08 Means not provided for assuring adequate equipment quality, reliability, or operability C09 Personnel selection did not assure match of worker motivations / job descriptions C10 Means / method not provided for assuring adequate quality of contract services</p>	<p>B3 WORK ORGANIZATION &amp; PLANNING LTA C01 Insufficient time for worker to prepare task C02 Insufficient time allotted for task C03 Duties not well-distributed among personnel C04 Too few workers assigned to task C05 Insufficient number of trained or experienced workers assigned to task C06 Planning not coordinated with inputs from Walk downs/ task analysis C07 Job scoping did not identify potential task interruptions and / or environmental stress C08 Job scoping did not identify special circumstances and / or conditions C09 Work planning not coordinated with all departments involved in task C10 Problem performing repetitive tasks and / or subtasks C11 Inadequate work package preparation</p> <p>B4 SUPERVISORY METHODS LTA C01 Tasks and individual accountability not made clear to worker C02 Progress / status of task not adequately tracked C03 Appropriate level of in-task supervision not determined prior to task C04 Direct supervisory involvement in task interfered with overview role C05 Emphasis on schedule exceeded emphasis on methods / doing a good job C06 Job performance and self-checking standards not properly communicated C07 Too many concurrent tasks assigned to worker C08 Frequent job or task "shuffling" C09 Assignment did not consider worker's need to use higher-order skills C10 Assignment did not consider worker's previous task C11 Assignment did not consider worker's ingrained work patterns C12 Contact with personnel too infrequent to detect work habit/attitude changes C13 Provided feedback on negative performance but not on positive performance</p> <p>B5 CHANGE MANAGEMENT LTA C01 Problem identification did not identify need for change C02 Change not implemented in timely manner C03 Inadequate vendor support of change C04 Risks / consequences associated with change not adequately reviewed / assessed C05 System interactions not considered C06 Personnel / department interactions not considered C07 Effects of change on schedules not adequately addressed C08 Change -related training / retraining not performed or not adequate C09 Change -related documents not developed or revised C10 Change -related equipment not provided or not revised C11 Changes not adequately communicated C12 Change not identifiable during task C13 Accuracy / effectiveness of change not verified or not validated</p>	<p>B1 WRITTEN COMMUNICATIONS METHOD OF PRESENTATION LTA C01 Format deficiencies C02 Improper referencing or branching C03 Checklist LTA C04 Deficiencies in user aids (charts, etc.) C05 Recent changes not made apparent to user C06 Instruction step / information in wrong sequence C07 Unclear / complex wording or grammar</p> <p>B2 WRITTEN COMMUNICATION CONTENT LTA C01 Limit inaccuracies C02 Difficult to implement C03 Data / computations wrong / incomplete C04 Equipment identification LTA C05 Ambiguous instructions / requirements C06 Typographical error C07 Facts wrong / requirements not correct C08 Incomplete / situation not covered C09 Wrong revision used</p> <p>B3 WRITTEN COMMUNICATION NOT USED C01 Lack of written communication C02 Not available or inconvenient for use</p> <p>B4 VERBAL COMMUNICATION LTA C01 Communication between work groups LTA C02 Shift communications LTA C03 Correct terminology not used C04 Verification / repeat back not used C05 Information sent but not understood C06 Suspected problems not communicated to supervision C07 No communication method available</p>	<p>B1 NO TRAINING PROVIDED C01 Decision not to train C02 Training requirements not identified C03 Work incorrectly considered "skill of the craft"</p> <p>B2 TRAINING METHODS LTA C01 Practice or hands -on experience LTA C02 Testing LTA C03 Refresher training LTA C04 Inadequate presentation sequence</p> <p>B3 TRAINING MATERIAL LTA C01 Training objectives LTA C02 Inadequate content C03 Training on new work methods LTA C04 Performance standards LTA</p>
					<p><b>A7 Other Problem</b></p> <p>B1 EXTERNAL PHENOMENA C01 Weather or ambient conditions LTA C02 Power failure or transient C03 External fire or explosion C04 Other natural phenomena LTA</p> <p>B2 RADIOLOGICAL / HAZARDOUS MATERIAL PROBLEM C01 Legacy contamination C02 Source unknown</p>	
					<p>USED ONLY FOR ORPS CODING</p>	
					<p>Level A nodes are <u>underlined</u> Level B nodes are in ALLCAPS. Level C nodes are in "sentence case." LTA = Less than adequate</p>	

**SECTION 12. REFERENCES**

- a. 10 CFR Parts 205, 350 - 354, *Report of Major Electric Utility Systems Emergencies*.
- b. 10 CFR Part 820, *Procedural Rules For DOE Nuclear Activities*
- c. 10 CFR Part 830, *Nuclear Safety Management*
- d. 10 CFR Part 835, *Occupational Radiation Protection*
- e. 29 CFR Part 1904, *Recording and Reporting Occupational Injuries and Illnesses*
- f. 29 CFR Part 1910, *Occupational Safety and Health Standards*
- g. 36 CFR Chapter 12, Subchapter B, *Records Management*
- h. 40 CFR Part 61, *National Emission Standards for Hazardous Air Pollutants*
- i. 40 CFR Part 302, *Designation, Reportable Quantities, and Notification*
- j. 40 CFR Part 355, *Emergency Planning and Notification*
- k. 49 CFR, Parts 106-180, 200-250, and 350-399, *Transportation*
- l. DOE G 231.1-1, *Occurrence Reporting Performance Analysis and Reporting Guide*
- m. DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*
- n. DOE G 1324.5B, *Implementation Guide for use with 36 CFR Chapter XII -- Subchapter B Records Management*
- o. DOE O 151.1A, *Comprehensive Emergency Management System*
- p. DOE O 225.1 A, *Accident Investigations*
- q. DOE O 231.1A, *Environment, Safety, and Health Reporting*
- r. DOE O 471.2A, *Information Security Program*
- s. DOE O 471.1A, *Identification and Protection of Unclassified Controlled Nuclear Information*

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- t. DOE M 471.1A, *Identification and Protection of Unclassified Controlled Nuclear Information Manual*
  - u. DOE O 471.3-1, *Identifying and Protecting Official Use Only Information*
  - v. DOE M 471.3-1, *Identifying and Protecting Official Use Only Information*
  - w. DOE N 471.3, *Reporting Incidents of Security Concern*
  - x. DOE M 475.1-1A, *Identifying Classified Information*
  - y. DOE 5400.5, *Radiation Protection of the Public and the Environment*
  - z. DOE 5480.19, *Conduct of Operations Requirements for DOE Facilities*
  - aa. DOE 5480.30, *Nuclear Reactor Safety Design Criteria*
  - bb. DOE-STD-1045-93, *Guide to Good Practices for Notifications and Investigation of Abnormal Events*
  - cc. DOE-STD-1063-2000, *Facility Representatives*
  - dd. DOE-STD-3009-94, *Preparation Guide for U.S Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*
  - ee. DOE-STD-7501-99, *The DOE Corporate Lessons Learned Program*
  - ff. Executive Order 12333, United States Intelligence Activities. w. National Defense Authorization Act for Fiscal Year 2000, Public Law 106-65

### **SECTION 13. DEFINITIONS.**

The following is a list of definitions designed to avoid repetition in the body of the document.

- a. **BUSINESS DAY.** The normal administrative day of the reporting organization (e.g., Monday through Friday, 0800 to 1700) during which normal work activities are conducted. It is not meant to encompass the 24 hours in a day, even if the facility is operated or maintained on a 24-hour basis.

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- b. CONDITION. Any as-found state, whether or not resulting from an event, that may have adverse safety, health, quality assurance, operational or environmental implications. A condition is usually programmatic in nature; for example, errors in analysis or calculation; anomalies associated with design or performance; or items indicating a weakness in the management process are all conditions.
- c. DISCHARGE. Includes, but is not limited to, any spilling, leaking, pumping, pouring, emitting, emptying, or dumping of oil, but excludes discharges in compliance with a permit under Chapter 402 of the Clean Water Act (CWA); discharges resulting from circumstances identified and reviewed and made a part of the public record with respect to a permit issued or modified under Chapter 402 of the CWA and subject to a condition in such permit; or continuous or anticipated intermittent discharges from a point source, identified in a permit or permit application under Chapter 402 of the CWA, that are caused by events occurring within the scope of relevant operating or treatment systems.
- d. DISCOVERY DATE AND TIME. The discovery date and time is when the facility staff discovered or became aware of the event or condition. The facility staff is those personnel assigned to the facility and cognizant of the area in which the event or condition is identified.
- e. DOSE EQUIVALENT
- 1) Committed Dose Equivalent. The predicted total dose equivalent to a tissue or organ over a 50-year period after a known intake of a radionuclide into the body. It does not include contributions from external dose. (See DOE O 5400.5 for further definitions.)
  - 2) Committed Effective Dose Equivalent (CEDE). The sum of the committed dose equivalents to various tissues in the body, each multiplied by the appropriate weighting factor. (See DOE O 5400.5 for further definitions.)
  - 3) Effective Dose Equivalent. The summation of the products of the dose equivalent received by specified tissues of the body and a tissue-specific weighting factor. (See DOE O 5400.5 for further definitions.)
  - 4) Total Effective Dose Equivalent (TEDE). The sum of the effective dose equivalent for external exposures and the committed dose equivalent for internal exposures.
- f. EVENT. Something significant and real-time that happens (e.g., pipe break, valve failure, loss of power, environmental spill, earthquake, tornado, flood).



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- g. FACILITY. Any equipment, structure, system, process, or activity that fulfills a specific purpose. Examples include accelerators, storage areas, fusion research devices, nuclear reactors, production or processing plants, coal conversion plants, magnetohydrodynamic experiments, windmills, radioactive waste disposal systems and burial grounds, environmental restoration activities, testing laboratories, research laboratories, transportation activities, and accommodations for analytical examinations of irradiated and unirradiated components.
  - h. FACILITY MANAGER. That individual, or designee, usually but not always a contractor, with direct line responsibility for operation of a facility or group of related facilities, including authority to direct physical changes to the facility. For purposes of this Manual, a Facility Manager could also be responsible for a program or activity.
  - i. FACILITY REPRESENTATIVE. For each major facility or group of lesser facilities, an individual or designee assigned responsibility by the Head of Field Element/Operations Organization (including NNSA) for monitoring the performance of the facility and its operations. This individual should be the primary point of contact with the facility operating personnel and will be responsible to the appropriate Secretarial Officer/Deputy Administrator (NNSA) and Head of Field Element/Operations Organization for implementing the requirements of this Manual.
  - j. FEDERALLY PERMITTED RELEASE. Any release that satisfies the definition of “federally permitted release” in 40 CFR 302.3.
  - k. HAZARDOUS SUBSTANCE OR MATERIAL.
    - (1) Department of Energy - Hazardous Material. Any solid, liquid, or gaseous material that is chemically toxic, flammable, radioactive, or unstable upon prolonged storage, and that exists in quantities that could pose a threat to life, property, or the environment.
    - (2) Department of Transportation - Hazardous Materials (see 49 CFR 171.8 and 172.101). A substance or material, including a hazardous substance, which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce and which has been so designated.
    - (3) Comprehensive Environmental Response, Compensation and Liability Act Hazardous Substances (see 40 CFR 302).

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- (4) Occupational Safety and Health Administration (OSHA) Hazardous Chemical (see 29 CFR 1910.1000 and 29 CFR 1910.1200). Any chemical which is a physical or a health hazard.
- (5) Superfund Amendments and Reauthorization Act Title 3 Extremely Hazardous Substances (see 40 CFR 355). These are not defined but appear on lists in Appendix A and Appendix B of 40 CFR 355.
- l. ITEM.
- (1) An all-inclusive term used in place of the following: appurtenance, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, or support systems, documented concepts, or data.
- (2) When used in reference to nuclear material, a visible, single piece or container of nuclear material with a unique identification and known nuclear material mass.
- m. LESSONS LEARNED. A “good work practice” or innovative approach that is identified and shared, or an adverse work practice or experience that is shared to avoid recurrence.
- n. MEMBER OF THE PUBLIC. Persons who are not occupationally associated with DOE facilities or operations; (i.e., persons whose assigned occupational duties do not require them to enter the DOE site).
- o. NON-REPORTABLE EVENT. An event that falls within the ORPS Reporting Groups, does not exceed any of the specific ORPS Reporting Criteria, and the reporting organization has determined to be included in the required ORPS Performance Analysis activity.
- p. NOTIFICATION REPORT. The initial documented report, to the Department, of an event or condition that meets the reporting criteria defined in this Manual.
- q. OCCURRENCE. One or more (i.e., recurring) events or conditions that adversely affect, or may adversely affect, DOE (including NNSA) or contractor personnel, the public, property, the environment, or the DOE mission. Events or conditions meeting the criteria thresholds identified in this Manual or determined to be recurring through performance analysis are occurrences.
- r. OCCURRENCE INVESTIGATION. An investigation conducted according to site-specific procedures and/or when determined by DOE procedures that a Type A or B investigation is required.

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- s. OCCURRENCE REPORT. A documented evaluation of an event or condition that is prepared in sufficient detail to enable the reader to assess its significance, consequences, or implications and to evaluate the actions being proposed or employed to correct the condition or to avoid recurrence.
  - t. OFFSITE TRANSPORTATION EVENT. Involves movement of materials that are considered to be in commerce, thus requiring compliance with Department of Transportation Hazardous Materials Regulations.
  - u. OIL. Oil of any kind or in any form, including but not limited to petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil.
  - v. ONSITE TRANSPORTATION EVENT. Movement of materials not in commerce and subject to DOE onsite procedures and safety requirements.
  - w. PERFORMANCE DEGRADATION. Failure or degradation of a facility, process, system, or component that reduces the reliability of critical components of the facility whose loss or degradation prevents the system from performing its intended function. Performance degradation does not include: (1) a burned out power indicator light on a piece of radiation monitoring equipment which does not prevent the equipment from detecting elevated radiation levels and alarming as designed; (2) a piece of equipment that is determined to be out of calibration on the conservative side (such as a low level alarm that alarms at a higher value than it should); or (3) the temporary loss of a component where redundant components are maintained operable or in operation and the authorization basis is not compromised.
  - x. PERSONNEL EXPOSURE. An incident of contact or encounter with a hazardous chemical, physical, biological, or energetic agent at one of the exchange boundaries of the organism (e.g., skin, respiratory system, eyes, ears, or digestive system). "Exposure" does not refer to a situation where personnel, protected by appropriate personal protective equipment, are subjected to an environment whose ambient conditions present a harmful level of any one, or combination of, the hazards.
  - y. PRIMARY CONFINEMENT. Provides confinement of hazardous material to the vicinity of its processing. This confinement is typically provided by piping, tanks, glove boxes, encapsulating material, and the like, along with any off gas systems that control effluent from within the primary confinement.

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- z. PROGRAM MANAGER. The individual designated by and under the direction of a Secretarial Officer/Deputy Administrator (NNSA), who is directly involved in the operation of facilities under his or her cognizance, and holds signature authority to provide technical direction through Heads of Field Elements/Operations Offices (including NNSA) to operating personnel for these facilities.
  - aa. PROMPT NOTIFICATION. Timely reporting of the occurrence to the DOE Field Office and the DOE Headquarters Operations Center as required by the Significance Category and the reporting criteria of the occurrence.
  - bb. PROTECTIVE CLOTHING. Clothing identified for radiological use such as yellow coveralls, hoods, booties, rubber overshoes, and PC gloves. These are articles designed for radiological use and are removed at the exit of the radiological area. Company supplied coveralls, laboratory coats, modesty clothing, street clothes, or other clothing not identified as anti-contamination clothing (anti Cs) are to be considered personal clothing for the purposes of ORPS reporting.
  - cc. RELEASE. Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or otherwise disposing of substances into the environment. This includes abandoning/discarding any type of receptacle containing substances in an unenclosed containment structure but does not include permitted containment structures.
  - dd. REPORTABLE OCCURRENCE. Occurrence to be reported in accordance with the criteria defined in this Manual.
  - ee. REPORTABLE QUANTITY. For any Comprehensive Environmental Response, Compensation and Liability Act hazardous substance, including radionuclides and Superfund Amendments and Reauthorization Act Title 3 extremely hazardous substances, with quantities established in 40 CFR Part 302 and Part 355 respectively, release of which requires notification unless Federally permitted.
  - ff. SAFETY CLASS STRUCTURES, SYSTEMS, OR COMPONENTS (SAFETY CLASS SSCs). The structures, systems, or components, including portions of process systems, whose preventive or mitigative function is necessary to limit radioactive hazardous material exposure to the public, as determined from safety analyses. (10 CFR 830.3)

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- gg. SAFETY SIGNIFICANT STRUCTURES, SYSTEMS, OR COMPONENTS (SAFETY SIGNIFICANT SSCs). The structures, systems, or components that are not designated as safety class structures, systems, or components, but whose preventive or mitigative function is a major contributor to defense in depth and/or worker safety as determined from safety analyses. (10 CFR 830.3)
  
  - hh. SECRETARIAL OFFICER. Secretarial Officers are the Secretary, Deputy Secretary, and Under Secretaries; and the Assistant Secretaries and Staff Office Directors reporting to the Secretary either directly or through the Deputy Secretary or Under Secretary. The following designations are also used to identify Secretarial Officers with specific responsibilities in various areas. (1) A Program Secretarial Officer (PSO) is an Assistant Secretary, Office Director, or NNSA Deputy Administrator. In the context of field operations, a PSO funds work at a particular site, facility or laboratory and is a “customer” of the field office. (2) A Lead Program Secretarial Officer (LPSO) is a PSO to whom designated field offices directly report and who has overall landlord responsibilities for the assigned direct reporting elements. (3) A Cognizant Secretarial Officer (CSO) is a term used in the context of field operations to designate a PSO, not the LPSO, who is responsible for a laboratory or bounded set of facilities within a field office’s jurisdiction.
  
  - ii. TECHNICAL SAFETY REQUIREMENTS (TSRS). The limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility and include, as appropriate for the work and the hazards identified in the documented safety analysis for the facility: safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix. (10 CFR 830.3)
  
  - jj. TRAINED INVESTIGATOR. An individual who has been qualified to perform causal analysis in response to a reportable occurrence. The individual should be able to satisfactorily complete the identification of Apparent Causes associated with an occurrence using the Causal Analysis Tree. The individual must also be qualified by their company to perform formal Root Cause analysis. For events that trigger a Type A or Type B DOE Investigation, the requirements contained in DOE O 225.1A, *Accident Investigations*, take precedence relative to the minimum qualifications of individuals performing the investigation/causal analysis.

- kk. TRANSPORTATION EVENT. Any real-time occurrence involving any of the following transportation activities: materials classification, packaging, marking, labeling, placarding, temporary storage incident to transport, shipping paper preparation, loading/unloading, separation/segregation, securing, blocking and bracing, routing, accident reporting, driver and vehicle qualifications, movement of materials, communications and notifications.

Transportation events with injuries or fatalities may also require reporting in accordance with Group 2 criteria.

- ll. UNREVIEWED SAFETY QUESTION (USQ). A situation where (1) the probability of the occurrence or the consequences of an accident or the malfunction of equipment important to safety previously evaluated in the documented safety analysis could be increased, (2) the possibility of an accident or malfunction of a different type than any evaluated previously in the documented safety analysis could be created, (3) a margin of safety could be reduced, or (4) the documented safety analysis may not be bounding or may be otherwise inadequate. (10 CFR 830.3)

**DEPARTMENT OF ENERGY ORGANIZATIONS TO WHICH  
DOE M 231.1-2 IS APPLICABLE**

Office of the Secretary  
Chief Information Officer  
Office of Civilian Radioactive Waste Management  
Office of Congressional and Intergovernmental Affairs  
Office of Counterintelligence  
Departmental Representative to the Defense Nuclear Facilities Safety Board  
Office of Economic Impact and Diversity  
Office of Electric Transmission and Distribution  
Office of Energy Efficiency and Renewable Energy  
Energy Information Administration  
Office of Environment, Safety and Health  
Office of Environmental Management  
Office of Fossil Energy  
Office of General Counsel  
Office of Hearings and Appeals  
Office of Independent Oversight and Performance Assurance  
Office of the Inspector General  
Office of Intelligence  
Office of Management, Budget and Evaluation and Chief Financial Officer  
National Nuclear Security Administration  
Office of Nuclear Energy, Science and Technology  
Office of Policy and International Affairs  
Office of Public Affairs  
Office of Science  
Secretary of Energy Advisory Board  
Office of Security  
Office of Worker and Community Transition

Office of Energy Assurance  
Southeastern Power Administration  
Southwestern Power Administration  
Western Area Power Administration

**DEPARTMENT OF ENERGY ORGANIZATIONS TO WHICH  
DOE M 231.1-2 IS NOT APPLICABLE**

Bonneville Power Administration



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## CONTRACTOR REQUIREMENTS DOCUMENT

### DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*

Regardless of the performer of the work, the contractor is responsible for compliance with the requirements of this CRD. The contractor is responsible for flowing down the requirements of this CRD to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements. In doing so, the contractor must not unnecessarily or imprudently flow down requirements to subcontracts. That is, the contractor will both ensure that it and its subcontractors comply with the requirements of this CRD and only incur costs that would be incurred by a prudent person in the conduct of competitive business.

#### SECTION 1. OCCURRENCE REPORTING

For reportable occurrences, contractors must categorize the occurrences, notify DOE as required, and prepare and submit Occurrence Reports. At sites with more than one facility management contractor, contractors may make arrangements for one of the contractors to prepare and submit reports for the entire site. However, each contractor is responsible for ensuring that Occurrence Reports are submitted for activities within its scope of work.

The documentation and distribution requirements will be satisfied by utilization of a centralized unclassified DOE operational database, the computerized Occurrence Reporting and Processing System (ORPS). However, under no circumstances will Occurrence Reports containing classified information or Unclassified Controlled Nuclear Information (UCNI) be entered into the ORPS database. Requirements regarding security classification are provided in Section 3.

Occurrences involving foreign personnel, governments, organizations, entities or influence must be reported by the contractor to the Office of Counterintelligence or the Office of Defense Nuclear Counterintelligence, as appropriate. Such reporting is not intended to interfere with or delay any actions directed toward protection of personnel or property.

##### 1.1 Event or Condition Identification.

- a. The contractor may identify occurrences by direct observation of equipment or process malfunctions, log or record reviews, operator recognition of their own or others' errors, or other means.
- b. The contractor must take appropriate immediate action to stabilize and/or place the facility/operation in a safe condition and ensure that any potential environmental effects are stabilized and workers are treated for injuries sustained. Also, actions should be

taken to preserve conditions for continued investigation; however, these actions are not to interfere with establishing a safe condition.

- c. The contractor must, upon identification of an abnormal or suspected abnormal event or condition, promptly notify the appropriate contractor line management of the event status and record and/or archive all pertinent information, including details concerning the discovery of the occurrence and actions taken to stabilize or place the facility/operation in a safe condition.

1.2 Event or Condition Categorization. The contractor must categorize all occurrences, except Operational Emergencies, within 2 hours of discovery following the site/facility-specific procedures developed in accordance with this CRD. The significance categories [outlined in the Occurrence Reporting Model, Section 11 of DOE M 231.1-2] are for those occurrences of interest for complex-wide occurrence reporting and are described very generally below. More definitively, Reporting Criteria, listed in Section 2 below, provide very specific reporting criteria and assigns the appropriate significance category to each criterion. Local implementing procedures may increase the reporting requirements but may not decrease the requirements below.

- a. Operational Emergencies (OE). Operational Emergency Occurrences are the most serious occurrences and require an increased alert status for onsite personnel and, in specified cases, for offsite authorities. [Operational Emergencies are defined in DOE O 151.1A, *Comprehensive Emergency Management System*. The prompt notification requirements, definitions, criteria, and classifications of operational emergencies and appropriate responses are provided in DOE O 151.1A.] Written Occurrence Reports, however, must be completed in accordance with this CRD.
- b. Significance Category 1. Occurrences in this category are those that are not Operational Emergencies and that have a *significant impact* on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests.
- c. Significance Category R. Occurrences in this category are those identified as recurring, as determined from the periodic performance analysis of occurrences across a site.
- d. Significance Category 2. Occurrences in this category are those that are not Operational Emergencies and that have a *moderate impact* on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests.
- e. Significance Category 3. Occurrences in this category are those that are not Operational Emergencies and that have a *minor impact* on safe facility operations, worker or public safety and health, regulatory compliance, or public/business interests

- f. Significance Category 4. Occurrences in this category are those that are not Operational Emergencies and that have *some impact* on safe facility operations, worker or public safety and health, public/business interests.

If the consequences are not fully determined or the event exceeds the threshold of more than one criterion (listed in Section 2 below), then the event must be categorized at the higher criteria level being considered. The occurrence criterion must be elevated, maintained, or lowered, as information is made available.

1.3 DOE HQ Operations Center Prompt Notifications.

1.3.1 Operational Emergencies. If an event has been declared an Operational Emergency, the contractor will be responsible for the written Notification Report and for the completion of all other occurrence reporting requirements, as described below. [The requirements for the prompt and follow-up notifications to DOE and other agencies and the appropriate emergency responses to be taken are provided in DOE O 151.1A, *Comprehensive Emergency Management System*. The specific procedures on how these events are categorized and how and when DOE is notified are included in the site/facility-specific emergency response plans or procedures. ]

1.3.2 Prompt Notifications for Significance Category 1, 2, 3, and 4 Reportable Occurrences.

- a. The contractor must notify the DOE Facility Representative (an individual designated by the Head of the Field Element/Operations Organization) in a manner determined locally and the DOE Headquarters Operations Center (DOE HQ OC), as required, of the following reportable occurrences as soon as practical (i.e., promptly), but no later than 2 hours after categorization:
- 1) All Significance Category 1 occurrences require a prompt notification to the Facility Representative and DOE HQ OC.
  - 2) All Significance Category 2 occurrences require a prompt notification to the Facility Representative and, if directed by the Facility Representative, to the DOE HQ OC.
  - 3) All Significance Category 3 occurrences require a prompt notification to the Facility Representative.
  - 4) Additionally, specific Significance Category 2, 3, and 4 occurrences (identified as requiring prompt notification with an asterisk in the reporting

criteria listed in Section 2 below) require prompt notification to the Facility Representative and DOE HQ OC.

- b. The contractor may use the local Field/Site Emergency Operations Center to expedite establishing the communication link required and to record and archive conversations. The prompt notification process is, as follows:
  - 1) The contractor must e-mail the prompt notification of the reportable occurrence to the DOE HQ OC, and follow up with a phone call to the DOE HQ OC to ensure receipt of the e-mail and to clarify any areas that may not be clear.
  - 2) The Prompt Notification must clearly state/select the Significance Category (1, R, 2, 3, or 4) and identify the specific reporting criteria associated with the occurrence.
  - 3) Prompt Notification to the DOE HQ OC must include information on the following items:
    - a) Occurrence Significance Category
    - b) Location and description of the event
    - c) Date and time of discovery
    - d) Damage and casualties
    - e) Impact of event on other activities and operations
    - f) Protective actions taken or recommended
    - g) Weather conditions at the scene
    - h) Level of media interest at scene/facility/site.
    - i) Other notifications made
  - 4) All information should be clear and succinct. Avoid jargon. Uncommon or site/facility-specific abbreviations and acronyms should be fully described.
  - 5) The contractor must follow the appropriate security procedures if the notification to DOE may contain classified or sensitive information.
  - 6) If the occurrence is recategorized, then the occurrence must be reconsidered for prompt notification. If appropriate, the contractor must notify the Facility Representative and the DOE HQ OC as soon as practical, but within the prompt notification time requirements of the new Significance Category for the recategorized occurrence and provide the Occurrence Report number.

- 7) Follow-up notifications must be made to DOE for any further degradation in the level of safety or impact on the environment, health, or operations of the facility or other worsening conditions subsequent to the previous notification. If a degradation results in upgrading the event to an Operational Emergency, the DOE HQ OC must be notified. [See DOE O 151.1A, *Comprehensive Emergency Management System*.]

1.4 Written Notification Report. The contractor must prepare the written Notification Report (including all required fields and all other fields for which information is known) [described in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*] and distribute it per Section 1.6.e below. Direct entry into the computerized Occurrence Reporting and Processing System (ORPS) satisfies this requirement. Any changes in the reporting criteria of the occurrence, which result in a change, either lower or higher, to the Significance Category, must be documented in an Update Report and submitted within the timeframe required for the Notification Report under the new Significance Category. A discussion on the change in categorization must be included in the Description of Occurrence field in the Update Report.

1.4.1 Occurrence Report Preparation. In preparing the Notification Report, and subsequently the Final Report, the following writing instructions must be followed:

- a. The report should enable the general reader to understand the basic “what, who, when, where, how” of the event, the safety issues involved, and the actions taken.
- b. The Subject/Title and the first paragraph of the Occurrence Description should relay the essential nature of the event (i.e., a summary of the occurrence in newspaper style).
- c. All information should be clear and succinct. Avoid redundant and unnecessary text, and lengthy “log book” accounts, unless a discussion of the event in chronological order is considered essential to understanding the event.
- d. Complex and more significant occurrences should warrant a greater level of detail. Significance Category 4 occurrences would likely need only a short paragraph under Occurrence Description. However, all reports should present enough information so that the general reader understands why the event needs to be reported and what the effect is.
- e. Avoid jargon and uncommon or site/facility-specific abbreviations and acronyms. If used, acronyms should be initially spelled out.

- f. Unless necessary to record and explain the event (e.g., suspect/counterfeit items or material), use general descriptions of equipment, procedures, etc., rather than presenting lengthy detailed titles and the numbers and letters assigned to those items.
- g. Quantify the level of contamination, dose, release, and damage (e.g., estimate the acres of wild land burned) when possible, instead of merely stating a reportable limit was exceeded.
- h. Use active rather than passive voice whenever possible. For example, write, “*the electrician* severed the conduit” rather than “the conduit was severed.”
- i. When appropriate for clarification, photos, sketches, and drawings must be maintained with the ORPS occurrence report record. In addition, sites are encouraged but not required to make photos, sketches, and drawings available via a Web page, with the Web page address included as a hyperlink in the ORPS report.

1.4.2 Notification Report Submittal Schedule. The written Notification Report must be submitted according to the following schedule:

- a. Reports for Operational Emergencies and Significance Category 1 Occurrences. Before the close of the next business day from the time of categorization (not to exceed 80 hours).
- b. Reports for Significance Categories R and 2 Occurrences. Before the close of the next business day from the time of categorization.
- c. Reports for Significance Category 3 Occurrences. No later than close of business on the second business day from the time of categorization.
- d. Reports for Significance Category 4 Occurrences. Only a Short Form Report is required by close of business the second business day from the time of categorization.

1.5 Occurrence Investigation and Analysis. The following steps describe an acceptable process for submitting Update Reports and conducting the investigation and analysis of a specific occurrence. [DOE 5480.19, *Conduct Of Operations Requirements For DOE Facilities*, and DOE-STD-1045-93, *Guide to Good Practices for Notifications and Investigation of Abnormal Events*, should be considered when establishing a program for investigation of

occurrences. In cases of conflict between DOE 5480.19 or DOE-STD-1045-93 and this CRD, the requirements of this CRD must be followed.]

In general, the investigative process is used to gain an understanding of the occurrence, its causes, and the corrective actions necessary to prevent recurrence or only remedy the problem, based on the significance of the occurrence. If DOE is doing a Type A or B investigation [defined in DOE O 225.1A], the contractor is not required to perform an identical investigation. [However, the contractor is still required to do the preliminary assembly of information to turn over to the DOE Accident Investigation Board, in accordance with DOE O 225.1A, *Accident Investigation*.]

- a. The contractor should use a graded approach [described in the Occurrence Reporting Model, Section 11 of DOE M 231.1-2] when determining the level of effort required for the investigation into the causes of the occurrence. This graded approach is based on the significance, severity, or risk associated with the event or condition.

For Operational Emergencies, in general, the investigation, problem analysis, and corrective action process should parallel the process for Significance Category 1 occurrences. However, the contractor should consider a graded approach when determining the level of effort for the investigation into the cause of the Operational Emergency. For this purpose, the graded approach is based on whether the Operational Emergency was directly caused by DOE operations or resulted from non-DOE operations or natural phenomena. For example, investigations of an Operational Emergency involving the release of hazardous materials might require an accident investigation or the assembly of a team of investigators and subject matter experts. Investigation of an Operational Emergency resulting from a DOE facility being required to implement protective actions because a non-DOE activity offsite released hazardous materials or an Operational Emergency resulting from an earthquake may not require root cause determination because the initiating event was clearly beyond DOE's control.

- b. All causes must be identified as required and included in the occurrence report. [See the Occurrence Reporting Model, Section 11 of DOE M 231.1-2. The cause codes to be used for reporting are provided in the Causal Analysis Tree, also in Section 11. Guidance on selecting the appropriate cause code is provided in DOE G 231.1-2, *Occurrence Reporting Causal Analysis Guide*.] The Cause Description field should include a brief discussion to clearly link the event to the cause code(s). For those occurrences that require a formal root cause analysis, any of the site approved root cause analysis methodologies are permitted. The methodology used must be included in the Cause Description field of the occurrence report. Additionally, the Cause Description Field must include a brief discussion to describe the linkage of the

identified cause codes to the associated causal factors for the event. In addition to determining the causes of the occurrence, any weaknesses in the facility's implementation of the ISM program must be identified and entered in the ISM field, as discussed in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*.

- c. In addition to submitting an Update Report when the Significance Category of the occurrence has been changed (as stated in Section 1.4), the contractor must submit and distribute an Update Report for all occurrences, with the exception of Significance Category 4 occurrences, if there is any significant and new information about the occurrence. The status of the investigation, recurring consequences, and the identification of additional component defects are activities associated with the occurrence and must be included in Update Reports.
- d. Using a graded approach as described in the Occurrence Reporting Model (see Section 11, DOE M 231.1-2), the contractor should consult in a timely manner with the Facility Representative and the Program Manager, as appropriate, for their assessment, if any, of the occurrence.

1.6 Occurrence Report Closure. The following steps describe an acceptable process for closing out the Final Report for all occurrences except those categorized as Significance Category 4:

- a. The Final Report must be prepared by the contractor and submitted as soon as practical but within 45 calendar days after initial categorization of the occurrence. The Final Report must be prepared using the writing instructions listed in Section 1.4.1 and must document the following:
  - (1) The significance, nature, and extent of the event or condition;
  - (2) The causes of the event or condition (including the root cause, as required), using the codes provided in the Causal Analysis Tree (see Section 11, DOE M 231.1-2);
  - (3) The immediate actions taken and the corrective action(s) to be taken, as required by the Occurrence Reporting Model (see Section 11, DOE M 231.1-2); and
  - (4) The lessons learned.
- b. If the required analysis cannot be completed within 45 calendar days after initial categorization, an Update Report must be submitted within the 45 days. The Update Report must provide a detailed explanation of the delay and provide an estimated date for submittal of the Final Report. This information must be reported in the



“Evaluation” block of the Occurrence Report. It is expected that the analysis of most occurrences will be completed and the Final Report submitted within the 45 calendar days. However, for certain occurrences, such as those requiring an accident investigation, it is understood that the information required for the Final Report may not be available within this time. For occurrences resulting in an accident investigation, all causes (direct, contributing, and root) identified in the accident investigation report, as well as the corrective actions developed in response to the judgments of need, must be included in the Final Report.

- c. If the Final Report is not approved by the Facility Representative or the Program Manager as appropriate, then the contractor must submit the revised Final Report within 21 calendar days of the disapproval. If it cannot be resubmitted within this time, an Update Report must be submitted within the 21 calendar days explaining the delay and providing an estimated date for resubmittal of the Final Report. This information must be reported in the “Evaluation” block of the Occurrence Report.
- d. All Occurrence Reports must be distributed as soon as practical to the following:
  - Facility Representative
  - Program Manager
  - Heads of all Field organizations (including NNSA)
  - Office of Environment, Safety and Health (Office of Performance Assessment and Analysis) and Administrator (NNSA) and
  - DOE Management and Operations or Integrating contractors

If the Occurrence Reports are entered into the ORPS database, the distribution requirement is automatically satisfied.

- e. Depending on the Significance Category, the contractor must track all corrective actions to closure, including independent verification or sampling of corrective actions identified to prevent recurrence, at the facility level and also evaluate the effectiveness of the corrective actions to prevent recurrence (if applicable). Site/contractor corrective action programs will include management of Significance Category 4 occurrences, whose corrective actions are not managed through ORPS.

The cognizant contractor may use the ORPS database to track the status of Final Report corrective actions. For those facilities that do not choose to use ORPS to track the status of their corrective actions, the specific corrective action tracking number from the local corrective action tracking system must be entered into ORPS. Any changes made to the corrective actions tracked in the local corrective action system must follow the site's approved change process and should be updated in ORPS. For

Significance Category 2 and higher reports, any text change to a corrective action previously entered in ORPS must be updated in ORPS with Facility Representative approval. A status report of all incomplete Occurrence Reports (not Final) and incomplete corrective actions (for those sites who choose to track the status of their corrective actions using ORPS) will be available at any time from the ORPS database.

- f. Retain all supporting information pertaining to each occurrence or report (e.g., graphs, analyses, and formal investigation reports). [See Departmental Records Disposition Schedules, in 36 CFR Chapter 12, Subchapter B, RECORDS MANAGEMENT.]
- 1.7 Short Form Reports. A Short Form Report must be prepared and submitted for all Significance Category 4 occurrences no later than 2 business days after categorization of the occurrence. [Short Form report is described further in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide.*] This report will satisfy all of the written reporting requirements for these occurrences.
- 1.8 Performance Analyses and Identification of Recurring Occurrences. Each contractor at a site must perform ongoing, but as a minimum quarterly, analyses of events during a 12-month period to look for trends. This periodic performance analysis must evaluate occurrences of all significance categories plus contractor-determined non-reportable events in order to prevent serious events from occurring. Contractors must report quarterly performance analysis results to contractor and DOE line management in order to achieve improvements.

Occurrences identified as recurring must be submitted by the contractor as a new occurrence report for notification of the recurring issue, with investigation, root cause analysis, and corrective actions identified. Previous individual Occurrence Report Numbers associated with the recurring issue must be provided in the Similar Occurrence Report Numbers field. The reporting organization should select the appropriate reporting criteria associated with the recurring issue. If no specific reporting criteria can be identified, the Reporting Criteria should be listed as Group 10, Criteria #2.

Recurring occurrences must be categorized and reported collectively as a Significance Category R occurrence, even if each individual occurrence had been originally categorized at a higher or lower significance level (e.g., as Significance Category 1 or 4 or even as non-reportable occurrences). [See Occurrence Reporting Model, Section 11 of DOE M 231.1-2, requirements for a Significance Category “R” occurrence. More information on the performance analysis requirements for all occurrence reports and specifics on recurring occurrences are provided in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide.*]

- 1.9 Training. Appropriate training programs for the requirements of this CRD must be established for contractor personnel. These training programs must include the following:
- a. Indoctrination in the objectives and process of occurrence reporting as defined in the occurrence reporting requirements documents.
  - b. Identification of reportable occurrences and their categorization, notification, and associated reporting requirements; analysis, determination, and coding of causes; identification of generic implications; and management of corrective actions.
  - c. Utilization of ORPS, including input of occurrence reports and obtaining information from the database.
  - d. Utilization of the Causal Analysis Tree (see Section 11, DOE M 231.1-2).
  - e. Where applicable, the preparation of occurrence reports that may include classified information or unclassified controlled information (e.g. OOU or UCNI), including the sanitization of the report for entry into ORPS.

## **SECTION 2. REPORTING CRITERIA.**

The following are the reporting criteria, categorized into 10 major groups and appropriate subgroups related to DOE operations. This list provides a minimum set of requirements necessary to develop local procedures and report occurrences applicable to local operations. Categorization of occurrences must be done at the criterion level.

Contractor corrective action programs will manage actions for important events that do not meet the ORPS reporting herein (as well as Significance Category 4 occurrences, whose corrective actions are not managed through ORPS).

The reporting of safeguards and security events is addressed by DOE N 471.3, *Reporting of Events of Security Concern*. Such events are no longer reported in ORPS unless they involve other consequences that met the ORPS reporting criteria presented herein.

This Manual does not absolve the cognizant parties from making required reports to other agencies.

- 2.1 Major Criteria Groups. The 10 major groups of categorized occurrences are as follows.
- Group 1 - Operational Emergencies
  - Group 2 - Personnel Safety
  - Group 3 - Nuclear Safety Basis

- Group 4 - Facility Status
- Group 5 - Environmental
- Group 6 - Contamination/Radiation Control
- Group 7 - Nuclear Explosive Safety
- Group 8 - Transportation
- Group 9 - Noncompliance Notifications
- Group 10 - Management Concerns/Issues

## 2.2 Categorizing Instructions

1. An event can meet multiple reporting criteria that establish it as an occurrence. **All of the specific reporting criteria applicable for an occurrence must be identified.** Some criteria are “secondary” in that they compliment other reporting criteria that require occurrence reporting. In these cases, all of the applicable criteria must be recorded. Each criterion is denoted by its Group, Subgroup (if applicable), and sequence number (#). Thus, for example, the violation of a safety limit is denoted as Group 3, Subgroup A, Sequence (1) or “3A(1).”
2. The reporting criteria presented below list a specific Significance Category (SC) for each criterion, between the sequence number (#) and the criterion text. Significance Categories are designated as “OE” for Operational Emergencies, “R” for recurring occurrences, or 1, 2, 3, or 4. Thus, for example, the Significance Category for a Stop Work Order issued by a DOE office, criterion 4B(1), is SC 2.
3. Operational Emergencies, Significance Category 1, and some other occurrences in lesser significance categories require prompt notification to the DOE HQ OC. **Asterisks (\*) next to the significance categories below denote those occurrences requiring prompt notification to the DOE HQ OC.** Section 5.3.2 of this Manual defines the prompt notification requirements.
4. Initiating events that are considered Operational Emergencies (see DOE O 151.1A) must be reported in Group 1. In addition, Type A or B accident investigations (see DOE O 225.1A) must be reported. While some Operational Emergencies and some other ORPS occurrences involve conditions that would be sufficient to initiate accident investigations, criterion 10(1) herein will report the actual initiation of Type A or B accident investigations.

2.3 Occurrence Reporting Criteria

**Group 1 - Operational Emergencies**

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>   |
|----------|-----------|--|
| (1)      | *OE       | An Operational Emergency not needing further classification. (Defined in DOE 151.1A, Chapter 5, Paragraph 2) |
| (2)      | *OE       | An Alert. (Defined in DOE 151.1A, Chapter 5, Paragraph 3a)   |
| (3)      | *OE       | A Site Area Emergency. (Defined in DOE 151.1A, Chapter 5, Paragraph 3b)                                      |
| (4)      | *OE       | A General Emergency. (Defined in DOE 151.1A, Chapter 5, Paragraph 3c)  |

**Group 2 - Personnel Safety and Health**

Subgroup A Occupational Illnesses/Injuries

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>   |
|----------|-----------|--|
| (1)      | *1        | Any occurrence due to DOE operations resulting in a fatality or terminal injury/illness. For fatalities caused by overexposures, the intent of this criterion is to report those caused by acute rather than chronic effects. For fatalities caused by overexposures, the intent of this criterion is to report those caused by acute rather than chronic effects. |
| (2)      | *1        | Any single occurrence requiring in-patient hospitalization of three or more personnel.   |
| (3)      | 2         | Any single occurrence resulting in three or more personnel having Days Away, Restricted or Transferred (DART) cases. (Per 29 CFR Part 1904.7)  |
| (4)      | *2        | Personnel exposure to chemical, biological or physical hazards above limits established by the Occupational Safety and Health Administration (refer to 29 CFR Part 1910) or American Conference of Governmental Industrial Hygienists, whichever is lower, and that requires the administration of medical treatment beyond simple first aid on the same           |

day as the exposure. [29 CFR 1904.7(b)(5)(i) and (ii) define “medical treatment” and “first aid.”]

- (5) 3 Personnel exposure to chemical, biological or physical hazards above limits established by the Occupational Safety and Health Administration (refer to 29 CFR Part 1910) or American Conference of Governmental Industrial Hygienists.
- (6) 3 Any single occurrence resulting in a serious occupational injury. A serious occupational injury is an occupational injury that:
  - (a) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received;
  - (b) Results in a fracture of any bone (except simple fractures of fingers, toes, or nose, or a minor chipped tooth);
  - (c) Causes severe hemorrhages or severe damage to nerves, muscles, or tendons;
  - (d) Damages any internal organ; or
  - (e) Causes second- or third-degree burns, affecting more than five percent of the body surface.

Subgroup B Fires/Explosions

# SC Criterion

- (1) \*1 Any unplanned fire or explosion within primary confinement/containment boundaries for nuclear or hazardous material within a facility.

[Note: Facility specific documents need to define what constitutes the primary confinement/containment boundary.]

- (2) \*2 Any unplanned fire or explosion in a nuclear facility that activates a fire suppression system (e.g., halon discharge, sprinkler heads activating), is extinguished by a fire department, or disrupts normal facility operations.

[Note: The activation or degradation of Safety Class and Safety Significant fire suppression systems are addressed by Group 4 Criteria.]

- (3) \*3 Any unplanned fire or explosion in a non-nuclear facility that:
- a) Activates a fire suppression system,
  - b) Takes longer than 10 minutes to extinguish following the arrival of fire protection personnel, or
  - c) Disrupts normal operations in a high hazard facility.
- (4) \*4 Any wild land fire (e.g., forest fire, grassland fire) or other fire outside of a DOE facility that has the potential to threaten the facility.

Subgroup C Hazardous Energy Control

# SC Criterion

- (1) 2 Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or disturbance of a previously unknown or mislocated hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas) resulting in a person contacting (burn, shock, etc.) hazardous energy.
- (2) 3 Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site condition that results in the unexpected discovery of an uncontrolled hazardous energy source (e.g., live electrical power circuit, steam line, pressurized gas). This criterion does not include discoveries made by zero-energy checks and other precautionary investigations made before work is authorized to begin.

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**Group 3 - Nuclear Safety Basis**

Subgroup A    Technical Safety Requirement Violations

#    SC    Criterion

- (1)    \*1    Any violation of a Hazard Category 1, 2, or 3 nuclear facility's Technical Safety Requirement (or Operational Safety Requirement) Safety Limit.

[Note: Safety Limits are high-level Technical Safety Requirement controls, used infrequently across the DOE Complex. A Safety Limit is a limit on process variables associated with those safety class physical barriers, generally passive, that are necessary for the intended facility function and that are required to guard against the uncontrolled release of radioactive materials. (Reference - 10 CFR 830.3)]

- (2)    2    Any violation or noncompliance of a Hazard Category 1, 2, or 3 nuclear facility's Technical Safety Requirement (or Operational Safety Requirement) Limiting Control Setting, Limiting Condition for Operation, Administrative Control, or Surveillance Requirement.

Exception: An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function. (See separate criterion for late surveillance tests below.)

- (3)    3    Any violation or noncompliance of a hazard control specified in a Hazard Category 1, 2, or 3 nuclear facility's DOE approved Documented Safety Analysis [issued pursuant to 10 CFR 830.204 and including Basis for Interim Operation (BIO), etc.], or DOE issued Safety Evaluation Report that are not addressed by Criteria 3A(1) and 3A(2).

Exceptions:

- (a)    An event consisting solely of a violation of a safety management program (e.g., quality assurance, personnel training) cited in the Documented Safety Analysis.
- (b)    An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function. (See separate criterion for late surveillance tests below.)



- (4) 4 An event consisting solely of a surveillance test performed after the prescribed surveillance period, and in which the equipment was found to be capable of performing its specified safety function.

Subgroup B Documented Safety Analysis Inadequacies

# SC Criterion

- (1) 2 Determination of a positive Unreviewed Safety Question (USQ) that reveals a currently existing inadequacy in the documented safety analysis [e.g., Safety Analysis Report (SAR) or Basis for Interim Operation (BIO)].
- (2) 3 Declaration of a potential inadequacy of the documented safety analysis (a potential positive USQ). [Per 10 CFR 830.203(g)]

Subgroup C Nuclear Criticality Safety

# SC Criterion

- (1) \*1 A loss of multiple nuclear criticality process-condition controls, where processes include operation, transport, and storage of fissionable materials, such that no valid controls are available to prevent a criticality accident.
- (2) 2 A loss of one or more nuclear criticality process-condition controls such that an accidental criticality is possible from the loss of an additional process-condition control, where processes include operation, transport, and storage of fissionable materials.

### **Group 4 - Facility Status**

[Note: The criteria below apply to both nuclear and non-nuclear facilities, where applicable.]

#### Subgroup A Safety Structure/System/Component Degradation

<u>#</u>	<u>SC</u>	<u>Criterion</u>
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- |     |   |   |
|-----|---|---|
| (1) | 3 | Performance degradation of any Safety Class or Safety Significant Structure, System, or Component (SSC) that prevents satisfactory performance of its design function when it is required to be operable. |
| (2) | 4 | Performance degradation of any Safety Class SSC when not required to be operable.   |

#### Subgroup B Operations

<u>#</u>	<u>SC</u>	<u>Criterion</u>
----------	-----------	------------------

- |     |    |  |
|-----|----|--|
| (1) | *2 | A Stop Work Order issued by a DOE office.  |
| (2) | 2  | Actuation of a Safety Class Structure, System, or Component (SSC), or its alarms, resulting from an actual unsafe condition. Spurious alarms (e.g., due to electronic noise, radon/thoron decay) should not be reported.   |
| (3) | 3  | Actuation of a Safety Significant Structure, System, or Component (SSC), or its alarms, resulting from an actual unsafe condition. Spurious alarms (e.g., due to electronic noise, radon/thoron decay) should not be reported.   |
| (4) | 3  | Any facility evacuation, not including a precautionary evacuation, in response to an actual event. If the event fell under another reporting criterion, then evacuation should be reported as well by noting multiple reporting criteria for the single occurrence.                                |
| (5) | 4  | A facility operational event caused by deviating from a written procedure or using an inadequate procedure resulting in an adverse effect on safety, such as: an inadvertent facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes), facility or |

operations shutdown due to alarm response procedures, inadvertent process liquid transfer, or inadvertent release of hazardous material from its engineered containment.

(6) \*4 A facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes) directed by management for safety reasons.

(7) 4 A facility or site stand-down resulting from safety reasons reportable as an occurrence or occurrences.

[Note: This is a secondary reporting criterion and does not require a separate occurrence report.]

(8) 4 Any event or condition that would prevent immediate facility or offsite emergency response capabilities.

Subgroup C Suspect/Counterfeit and Defective Items or Material

# SC Criterion

(1) 3 Discovery of any suspect/counterfeit item or material found in a Safety Class or Safety Significant Structure, System, or Component (SSC).

A suspect item or material is one whose documentation, appearance, performance, material, or other characteristics may have been misrepresented by the vendor, supplier, distributor, or manufacturer. A counterfeit item or material is one for which sufficient evidence exists that deliberate misrepresentation has occurred.

(2) 4 Discovery of any suspect/counterfeit item or material other than office supplies, office equipment, or household products.

(3) 4 Discovery of any defective item or material, other than a suspect/counterfeit item or material, in any application whose failure could result in a loss of safety function, or present a hazard to public or worker health and safety.

A defective item or material is any item or material that does not meet the commercial standard or procurement requirements as defined by catalogues, proposals, procurement specifications, design specifications,

testing requirements, contracts, or the like. It does not include parts or services that fail or are otherwise found to be inadequate because of random failures or errors within the accepted reliability level.

### **Group 5 - Environmental**

#### Subgroup A Releases

<u>#</u>	<u>SC</u>	<u>Criterion</u>
----------	-----------	------------------

- |     |    |  |
|-----|----|--|
| (1) | *2 | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility, that is above permitted levels and exceeds the reportable quantities. (See specifications in 40 CFR 302 or 40 CFR 355.)  |
| (2) | 2  | Any discharge that exceeds 100 gallons of oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. For operations involving oil field crude or condensate, any discharge of 100 barrels or more is reportable under this criterion. |
| (3) | 4  | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility that is above permitted levels and exceeds 50 percent of the reportable quantities. (See specifications in 40 CFR 302 or 40 CFR 355.)   |
| (4) | 4  | Any release (onsite or offsite) of a hazardous substance, material, waste, or radionuclide from a DOE facility that must be reported to outside agencies in a format other than routine periodic reports. (However, oil spills of less than 10 gallons and with negligible environmental impact need not be reported in ORPS.)         |

#### Subgroup B Ecological and Cultural Resources

<u>#</u>	<u>SC</u>	<u>Criterion</u>
----------	-----------	------------------

- |     |   |  |
|-----|---|--|
| (1) | 2 | Any occurrence causing significant impact to any ecological resource for which DOE is a trustee (e.g., destruction of a critical habitat, damage to an historic/archeological site, damage to wetlands). |
|-----|---|--|

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**Group 6 - Contamination/Radiation Control**

Subgroup A    Loss of Control of Radioactive Materials

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>   |
|----------|-----------|--|
| (1)      | 2         | Identification of radioactive material offsite due to DOE operations/activities that exceeds applicable DOE-approved authorized limits (see DOE O 5400.5). This applies to items/areas consisting of radioactive material. This does not apply to items with surface radioactive contamination. See Criterion 6B(1) below for criteria for identification of items with surface radioactive contamination. |
| (2)      | 2         | Loss of radioactive material that exceeds 100 times the specified quantities [see specifications in 10 CFR Part 835, Appendix E] (excluding consumer products such as smoke detectors), or loss of accountability of such material for more than 24 hours. The 24-hour time period begins when the loss of accountability is discovered.   |
| (3)      | 3         | Loss of radioactive material which exceeds 1 times and no greater than 100 times the specified quantities [see specifications in 10 CFR Part 835, Appendix E] (excluding consumer products such as smoke detectors) or loss of accountability of such material for more than 24 hours. The 24-hour time period begins when the loss of accountability is discovered.                                       |

Subgroup B    Spread of Radioactive Contamination

- | <u>#</u> | <u>SC</u> | <u>Criterion</u>  |
|----------|-----------|---|
| (1)      | 2         | Identification of radioactive contamination offsite due to DOE operations/activities that exceeds applicable DOE-approved authorized limits. (See DOE 5400.5 or, if there are none, the values found in 10 CFR Part 835, Appendix D)                    |
|          |           | [Note: All releases of property containing or potentially containing residual radioactivity are subject to requirements in DOE 5400.5. Compliance with 10 CFR Part 835, Appendix D values does not necessarily satisfy the requirements in DOE 5400.5.] |
| (2)      | 2         | Identification of onsite radioactive contamination greater than 100 times the total contamination values (see 10 CFR 835 Appendix D) and that is  |

found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and certain areas that are controlled [defined in 10 CFR 835.1102(c)]. For tritium, the reporting threshold is 100 times the removable contamination values. (See 10 CFR Part 835, Appendix D)

[Notes:

- (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.
- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.]

- (3) 3 Identification of onsite radioactive contamination greater than 10 times the total contamination values (see 10 CFR 835 Appendix D) and that is found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and certain areas that are controlled [defined in 10 CFR 835.1102(c)]. For tritium, the reporting threshold is 10 times the removable contamination values. (See 10 CFR Part 835, Appendix D.)

[Notes:

- (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.
- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.]

- (4) 4 Identification of onsite legacy radioactive contamination greater than 10 times the total contamination values (see 10 CFR 835 Appendix D) and

that is found outside of the following locations: Contamination Areas, High Contamination Areas, Airborne Radioactivity Areas, Radiological Buffer Areas, and certain areas that are controlled [defined in 10 CFR 835.1102(c)]. For tritium, the reporting threshold is 10 times the removable contamination values. (See 10 CFR Part 835, Appendix D.)

[Notes:

- (a) Legacy radioactive contamination is radioactive contamination resulting from historical operations that are unrelated to current activities.
- (b) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.
- (c) The exclusion from reporting contamination in a Radiological Buffer Area applies only when the area has been established next to a Contamination Area, High Contamination Area or Airborne Radioactivity Area and its exit requirements have adopted guidance from Article 338.2 of DOE-STD-1098-99.

Subgroup C    Radiation Exposure

<u>#</u>	<u>SC</u>	<u>Criterion</u>
(1)	*1	Determination of a dose that exceeds the specified limits. [See specifications in 10 CFR Part 835, Subpart C, Occupational Radiation Protection or DOE O 5400.5, Chapter II, Item 1 [i.e., 100 mrem Total Effective Dose Equivalent (TEDE) for offsite exposures to a member of the public].
(2)	2	Any unmonitored exposure that exceeds the values for providing personnel dosimeters and bioassays. [See 10 CFR 835.402(a) or 10 CFR 835.402(c)]
(3)	3	Any single occupational exposure that exceeds an expected exposure or dosimetry result by: (1) 500 mrem Committed Effective Dose Equivalent (CEDE), or (2) the greater of 10 percent or 100-mrem effective dose equivalent due to external exposure.

- (4) 3 Determination of an estimated annual dose that exceeds 10 mrem Total Effective Dose Equivalent (TEDE) for offsite exposures to a member of the public from air pathways only.

Subgroup D Personnel Contamination

# SC Criterion

- (1) \*2 Any occurrence requiring offsite medical assistance for contaminated personnel, including transporting a person to an offsite medical facility or bringing offsite medical personnel onsite to perform treatment or decontamination.
- (2) 2 Identification of personnel or clothing contamination offsite due to DOE operations that exceeds the values for total contamination. (See 10 CFR Part 835, Appendix D.) For tritium, use the values for removable contamination. (See 10 CFR Part 835, Appendix D.)
- (3) 4 Any onsite contamination of personnel or clothing (excluding site-provided protective clothing) that exceeds 10 times the values for total contamination (see 10 CFR Part 835, Appendix D). The contamination level must be based on direct measurement and not averaged over any area. This criterion does not apply to tritium contamination.

**Group 7 - Nuclear Explosive Safety**

# SC Criterion

- (1) \*1 Damage to a nuclear explosive that results in a credible threat to nuclear explosive safety.
- (2) 2 The unauthorized introduction of electrical energy into a nuclear explosive.
- (3) 2 The unauthorized compromise of a nuclear explosive safety feature when installed on a nuclear explosive.
- (4) 2 Inadvertent substitution of a nuclear explosive for a nuclear explosive-like assembly (NELA) or vice versa.
- (5) 2 A violation of a nuclear explosive safety rule (NESR).



- (6) 2 Damage to a training unit during training operations indicative of a hazard to a nuclear explosive.
- (7) 3 The use of uncertified personnel or unauthorized equipment/tooling during a nuclear explosive operation.
- (8) 3 A violation of the two-person concept of operations.
- (9) 3 Revocation of the Personnel Assurance Program (PAP) certification of an individual (for cause).

**Group 8 Transportation**

# SC Criterion

- (1) \*1 Any offsite transportation incident involving hazardous materials that would require immediate notice (see 49 CFR Part 171.15), namely:
  - (a) As a direct result of hazardous materials:
    - (i) A person is killed,
    - (ii) A person receives injuries requiring hospitalization,
    - (iii) Estimated property damage exceeds \$50,000,
    - (iv) An evacuation of the general public occurs lasting 1 hour or more,
    - (v) One or more transportation arteries or facilities are closed or shut down for 1 hour or more, or
  - (b) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive materials, or
  - (c) Fire, breakage, spillage, or suspected contamination occurs involving shipment of infectious substances (etiologic agents), or
  - (d) There has been a release of a marine pollutant in a quantity exceeding 450 liters (119 gallons) for liquids or 400 kilograms (882 pounds) for solids, or
  - (e) The operational flight pattern or routine of an aircraft is altered.

- (2) 3 Any offsite transport of hazardous material, including radioactive material, whose quantity or nature (e.g., physical or chemical composition) is different than intended, such that the receiving organization's operations were impacted/disrupted or the transport resulted in the initiation of corrective actions by the originating organization.
- (3) 4 Any onsite transport of hazardous material, including radioactive material, whose quantity or nature (e.g., physical or chemical composition) is different than intended, such that the receiving organization's operations were impacted/disrupted or the transport resulted in the initiation of corrective actions by the originating organization.
- (4) 4 Any packaging or transportation activity involving the onsite release of radioactive materials, etiologic agents, hazardous substances, hazardous waste, or marine pollutants.

**Group 9 - Noncompliance Notifications**

# SC Criterion

- (1) 3 Any enforcement action (other than associated with the Price Anderson Amendment Act) involving 10 or more cited violations, and/or an assessed fine of \$10,000 or more.

[Note: This criterion applies to the enforcement action as initially received from the regulator. Thus the enforcement action would still be reportable even if the fine is later reduced below \$10,000 or the number of violations reduced below 10.]

- (2) 4 Any written notification from an outside regulatory agency that a site/facility is considered to be in noncompliance with a schedule or requirement (e.g., Notice of Violation, Notice of Intent to Sue, Notice of Noncompliance, Warning Letter, Finding of Violation, Finding of Alleged Violation, Administrative Order, or a similar type of notification or enforcement action).

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**Group 10 - Management Concerns/Issues**

- | #   | SC               | Criterion   |
|-----|------------------|---|
| (1) | 2                | <p>Any event resulting in the initiation of a Type A or B accident investigation. (See DOE O 225.1A, <i>Accident Investigation</i>.)</p> <p>[Note: This reporting criterion may raise the significance category of an occurrence already reported under separate criteria. Multiple reporting criteria should be noted when appropriate.]</p>   |
| (2) | 1-4 <sup>†</sup> | <p>An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern to other facilities or activities in the DOE complex. One of the four significance categories should be assigned to the occurrence, based on an evaluation of the potential risks and the corrective actions taken.</p> <p>[<sup>†</sup> Note: An SC 1 occurrence report requires Prompt Notification.]</p> |
| (3) | 1-4 <sup>†</sup> | <p>A near miss, where no barrier or only one barrier prevented an event from having a reportable consequence. One of the four significance categories should be assigned to the near miss, based on an evaluation of the potential risks and the corrective actions taken.</p> <p>[<sup>†</sup> Note: An SC 1 occurrence report requires Prompt Notification.]</p>  |
| (4) | *4               | <p>Any occurrence that may result in a significant concern by affected state, tribal, or local officials, press, or general population; that could damage the credibility of the Department; or that may result in inquiries to Headquarters.</p>   |
| (5) | *4               | <p>Any occurrence of such significant immediate interest to offsite personnel and organizations that it warrants prompt notification to the DOE Headquarters Operations Center (DOE HQ OC), and which is not already designated elsewhere in this set of reporting criteria to have prompt notification [denoted by having an asterisk (*) next to the significance category].</p>  |

### **SECTION 3. INFORMATION SECURITY REQUIREMENTS.**

Occurrence Reports containing any classified information, Unclassified Controlled Nuclear Information (UCNI), or other controlled information must not be entered into the ORPS database. Contractors must ensure that a review is performed prior to ORPS data entry to preclude contamination of the database with classified, UCNI, official use only, or other controlled information.

Any ORPS report determined to be classified or controlled by current classification or control guidance must be submitted using the appropriate secure transmission means. However, with the exception of entry into the ORPS database, all other reporting requirements identified in this Manual must be met. In addition, an unclassified version of the Occurrence Report that has been sanitized of all controlled information must be submitted to ORPS within the required time frames specified in Section 1.

Implementing procedures should identify the requirements for distribution of reports containing classified or controlled information. In those instances where UCNI data may still be present in the ORPS database, appropriate security procedures related to the handling of such data need to be followed.

[Note: Occurrence reports involving incidents of counterintelligence concern (e.g., foreign persons, governments, organizations, entities or influence) will not be entered or referenced in the ORPS database.]

### **SECTION 4. UTILIZATION OF REPORTABLE OCCURRENCE INFORMATION.**

- 4.1 Operational Database. Occurrence Report documentation and distribution requirements will be satisfied by utilization of the Occurrence Reporting and Processing System (ORPS), with the exception of those involving classified information or UCNI. Reports for occurrences involving classified information or UCNI will be prepared in written form. After the classified information and UCNI is removed, the report must be entered into ORPS.
- 4.2 Utilization. Each contractor must collect and disseminate to their personnel information from occurrences related to their facilities and similar DOE facilities. This information includes both lessons learned and good practices. Each contractor should use this information for trending and analysis and for early identification and correction of deteriorating conditions.

One of the major purposes of this reporting system is to provide feedback of safety and operational information identified in the Occurrence Reports to other DOE facilities. To this end, Occurrence Reports should contain sufficient information about the facility

operations and the occurrence to facilitate action by other personnel who are unfamiliar with details of the facility, equipment, process, or procedures.

Operations and engineering units, as well as other support organizations, should be involved in the identification and assessment of reportable occurrences. Site information, such as operations logs and engineering evaluations, should be used in this process.

Engineering judgment should be used during the review of events and conditions to ensure that precursors to occurrences are identified and reported. An occurrence that is not serious, given the conditions under which it happened, might under different initial conditions be a precursor to a serious event at the same or other facilities.

#### **SECTION 5. IMPLEMENTING PROCEDURES.**

Contractors must develop and maintain implementing procedures for the occurrence reporting and utilization requirements stated in this CRD within 90-days of the requirements being incorporated into their contracts.

#### **SECTION 6. INSTRUCTIONS FOR COMPLETING AN OCCURRENCE REPORT VIA HARD COPY.**

Specific instructions on the reporting of occurrences via hard copy or the electronic database, the Occurrence Reporting and Processing System (ORPS), are listed in DOE G 231.1-1, *Occurrence Reporting and Performance Analysis Guide*. The documentation and distribution requirements of this CRD will be satisfied by utilization of ORPS. All reports containing classified information or Unclassified Controlled Nuclear Information (UCNI) must be submitted in hard copy in accordance with established security requirements (see Section 3). In addition, an unclassified version of the Occurrence Report that has been sanitized of all controlled information must be submitted to ORPS within the time frames specified in Section 1.