

Chapter 15 OCCURRENCE REPORTING

Contents

Approved by Jack Salazar

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15.1 Purpose

15.2 Responsibilities

15.2.1 Division Directors

15.2.2 Division ORPS Designees

15.2.3 Environment, Health, and Safety Division

15.2.4 Office of Contractor Assurance (OCA)

15.2.5 Employees, Supervisors, and Subcontractors

15.3 Occurrence Reporting Process

15.3.1 Discovery of Abnormal Occurrence

15.3.2 Reportability of Occurrence

15.3.3 Significance of Occurrence

15.3.4 Prompt Notification of DOE

15.3.5 Written Notification Report

15.3.6 Occurrence Investigation and Causal Analysis

15.3.7 Update and Final Occurrence Reports

15.3.8 Performance Analysis and Identification of Recurring Occurrences

15.3.9 Training

15.4 Appendices

15.4.1 Appendix A. Reportable Occurrences and Significance Categories

15.4.1.1 Group 1 — Operational Emergencies

15.4.1.2 Group 2 — Personnel Health and Safety

15.4.1.3 Group 3 — Nuclear Safety Basis

15.4.1.4 Group 4 — Facility Status

15.4.1.5 Group 5 — Environmental

- 15.4.1.6 Group 6 — Contamination/Radiation Control
- 15.4.1.7 Group 7 — Nuclear Explosive Safety
- 15.4.1.8 Group 8 — Transportation
- 15.4.1.9 Group 9 — Noncompliance Notifications
- 15.4.1.10 Group 10 — Management Concerns/Issues

15.4.2 Appendix B. ORPS Report Worksheet

15.4.3 Appendix C. Short Form Worksheet

15.4.4 Appendix D. Surface Contamination Values (10 CFR Part 835, Appendix D)

15.4.5 Appendix E. Causal Analysis Tree

NOTE:



. Denotes a new section.



. Denotes the beginning of changed text within a section.



. Denotes the end of changed text within a section.

15.1 Purpose

The Occurrence Reporting and Processing System (ORPS) at Lawrence Berkeley National Laboratory (LBNL) notifies and keeps Laboratory management and applicable elements of the Department of Energy (DOE) informed of abnormal occurrences that could adversely affect:

- a. the health and safety of employees, guests, visitors, and the general public;
- b. the environment;
- c. the intended purpose of LBNL facilities; or
- d. the credibility of the DOE and/or LBNL.

The ORPS procedures described herein provide the criteria for reporting occurrences and the timely processing of occurrence information to Laboratory and DOE management. All LBNL divisions and departments, including subcontractors performing work at Berkeley Lab, are responsible for following ORPS procedures. Reportable occurrences require that the description, significance, causal factors, and corrective actions of the occurrence are fully documented and transmitted to the DOE ORPS Database. Processing the reportable occurrences includes categorization of occurrences, timely DOE notification, and submittals of updated and final ORPS reports. The completed ORPS reports are used to analyze

environment, safety, and health (ES&H) performance, to develop lessons learned, and to prevent recurrence of undesirable occurrences at LBNL and other DOE facilities. The LBNL ORPS procedures meet the requirements of DOE Order 231.1A, Environment, Safety and Health Reporting, and DOE Manual 231.1-2, Occurrence Reporting and Processing of Operations Information.

Note: This revision to PUB-3000 Chapter 15 cancels and supersedes LBID-2488, *Occurrence Reporting and Processing System (ORPS)*, Rev 1, of March 2007.

15.2 Responsibilities

15.2.1 Division Directors

LBNL divisions are responsible for the timely reporting of adverse and/or abnormal occurrences, as described herein, that occur at facilities or operations within their organizational purview. Division directors have overall responsibility for implementing these procedures, ensuring that the division has the appropriate resources to monitor day-to-day activities, reporting on abnormal occurrences, investigating the causes of such occurrences, and instituting corrective actions to prevent recurrence of the occurrences. Division directors must concur that occurrences are ORPS reportable; and, if reportable, they must approve the final ORPS reports before submission to the DOE ORPS database. Note: For the purposes of the DOE ORPS Program, division directors are sometimes referred to as the "Facility Manager."

15.2.2 Division ORPS Designees

Division directors are to assign individual(s) from their organizations to assist in the implementation of these procedures. Assigned designees should have positions and work responsibilities that allow them to actively monitor day-to-day operations of division facilities. They should assist division line managers and staff in the notification, categorization, investigation, mitigation, and report preparation of all reportable occurrences within the division. Because of the importance of timely notification and reporting, designees must be familiar with the ORPS procedures described herein. Appropriate designees are deputy division directors, division safety managers, or division safety coordinators.

15.2.3 Environment, Health and Safety Division

EH&S technical staff are to assist divisions as necessary to respond to, mitigate, categorize, and investigate occurrences, and are responsible for administering the LBNL Occurrence Reporting Program and for supporting division directors and their designees in ORPS report processing. EH&S is the primary point of contact when reporting and tracking LBNL occurrences to the DOE Berkeley Site Office (BSO) and other DOE program elements, as appropriate. EH&S also provides the occurrence data and information input to the DOE online ORPS database. Note: Due to their knowledge of hazards, awareness of ORPS criteria thresholds, and response roles, EH&S staff may initially categorize occurrences in the absence of division directors or designees and confirm the categorization later with division management.

15.2.4 Office of Contractor Assurance (OCA)

The Office of Contractor Assurance provides oversight for the Issues Management Program, maintains the Corrective Action Tracking System (CATS), and reviews Root Cause Analysis reports, Extent of Condition Review reports, Corrective Action Plans, and Effectiveness Review Reports prior to issuance and approval. OCA also oversees the Causal Analysis Program. The products of these programs are used in the preparation of ORPS reports and, as such, OCA provides a Quality Assurance function to the ORPS process.

15.2.5 Employees, Supervisors, and Subcontractors

Employees, supervisors, and subcontractors are responsible for reporting abnormal incidents, unsafe conditions, and violations to their LBNL line management, appropriate EH&S staff, and/or emergency responders. Supervisors must ensure that employees are made aware of workplace health and safety reporting responsibilities. Supervisors and employees must perform immediate actions to mitigate unsafe conditions, secure occurrence scenes as necessary for investigations, and provide information to assist investigations.

15.3 Occurrence Reporting Process

An overview of the occurrence report process is presented as a flow diagram in [Figure 15.3.1](#).

Additional information is also available at the [LBNL ORPS Web site](#).

15.3.1 Discovery of Abnormal Occurrence

Employees, supervisors, and subcontractors are required to perform their job duties and responsibilities in a safe and environmentally responsible manner; however, if they create or witness an adverse ES&H occurrence or condition in the course of performing work, they must immediately report the occurrence or condition to their division management, safety coordinator, EH&S staff, or any other technical or management individual who has responsibility and/or technical knowledge to stabilize the occurrence or condition.

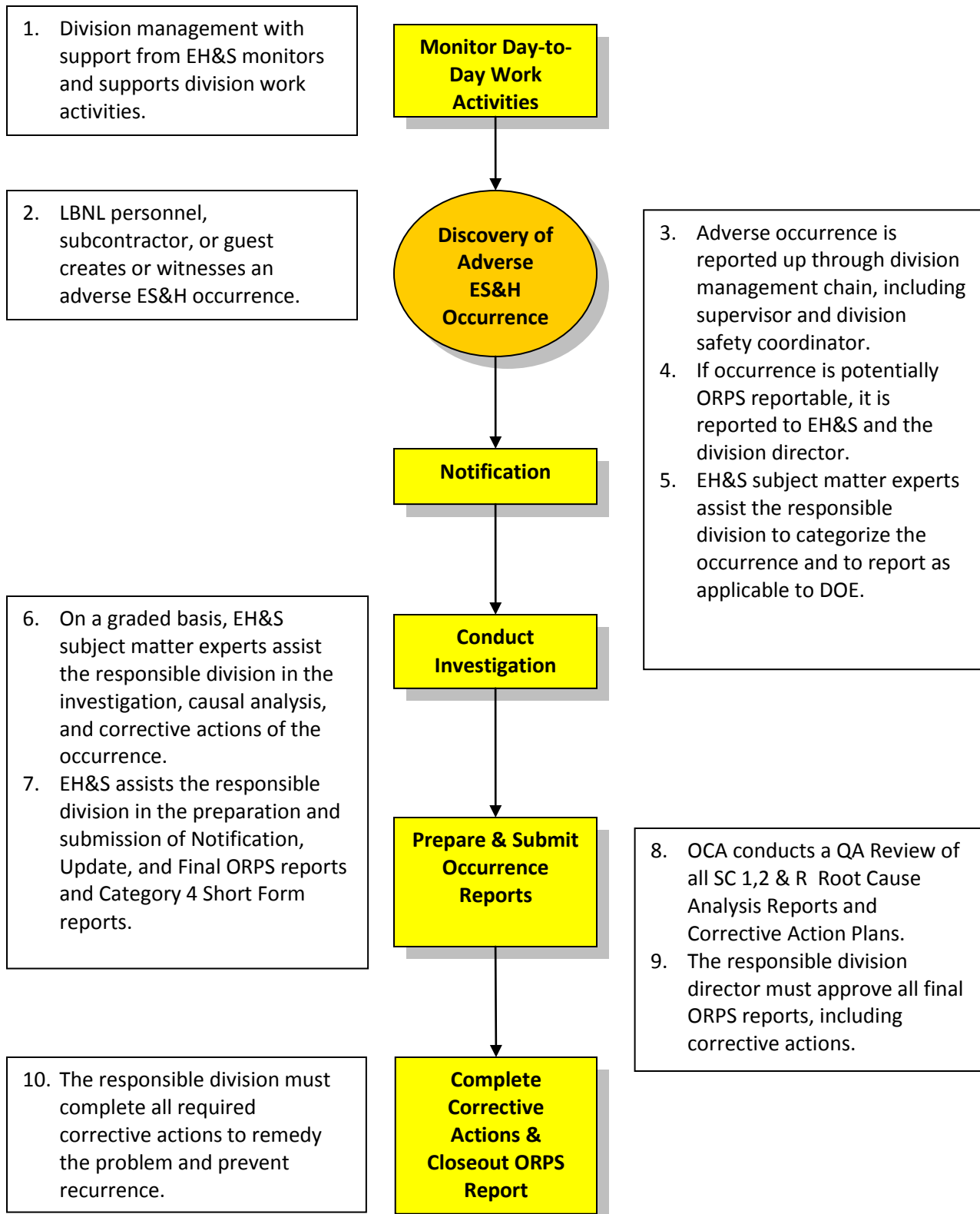


Figure. 15.3.1. LBNL Occurrence Reporting Process Flow

Part of the responsibility of division management, division safety coordinators, and EH&S staff is to monitor day-to-day operations in division facilities and workspaces for adverse ES&H occurrences or conditions. Once an occurrence or condition is discovered or reported to this group of personnel, they will take the following actions:

- a. Take appropriate action to stabilize and/or place the facility/operation in a safe condition, and ensure any potential environmental effects are stabilized and workers are treated for injuries.
- b. Preserve conditions for continued investigation; however, these actions are not to interfere with establishing a safe condition.
- c. Concurrently with the above actions, personnel must inform the appropriate line management and EH&S of the occurrence and its status so that prompt occurrence categorization and DOE notification can begin.
- d. As necessary, personnel should record all pertinent occurrence information and be available to investigators.

The discovery date and time will be established when adequate information is available, but this information should be sought as soon as possible and with urgency at all hours to ensure prompt DOE notification of occurrences. In some circumstances, discovery may await confirmation of an occurrence, or a condition that requires time and resources to complete. Examples are as follows:

- a. For radioactive or hazardous contaminations and exposures, where initial monitoring cannot produce reliable results, discovery will occur when analytical or lab results confirm results are above threshold levels. (Note: Analytical work will be prioritized ahead of scheduled, routine analysis where reasonable.)
- b. For injuries, discovery will occur when the nature of a hospitalization or lost workday is received from appropriate medical or healthcare personnel.
- c. For certain complex hazardous conditions or occurrences, discovery will occur when technically proficient staff have completed the initial evaluation.

15.3.2 Reportability of Occurrence

After discovery of the abnormal occurrence is completed, the affected division with support from EH&S must determine, within two hours, if the occurrence is reportable to DOE under ORPS. The reportable occurrences and the significance of the occurrences are established in DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information. [Appendix A, Reportable Occurrences and Significance Categories](#), of this procedure also provides a complete description of reportable occurrences and applicability to LBNL operations and

activities. Reportable occurrences are organized into the following topical groups and subgroups:

[Group 1: Operational Emergencies](#)

[Group 2: Personnel Safety and Health](#)

[Subgroup 2A: Occupational Illnesses/Injuries](#)

[Subgroup 2B: Fires/Explosions](#)

[Subgroup 2C: Hazardous Energy Control](#)

[Group 3: Nuclear Safety Basis](#)

[Group 4: Facility Status](#)

[Subgroup 4A: Safety Structure/System/Component Degradation](#)

[Subgroup 4B: Operations](#)

[Subgroup 4C: Suspect/Counterfeit and Defective Items or Material](#)

[Group 5: Environmental Subgroup](#)

[Subgroup 5A: Releases](#)

[Subgroup 5B: Ecological and Cultural Resources](#)

[Group 6: Contamination/Radiation Control Subgroup](#)

[Subgroup 6A: Loss of Control of Radioactive Materials Subgroup](#)

[Subgroup 6B: Spread of Radioactive Contamination Subgroup](#)

[Subgroup 6C: Radiation Exposure Subgroup](#)

[Subgroup 6D: Personnel Contamination](#)

[Group 7: Nuclear Explosive Safety](#)

[Group 8: Transportation](#)

[Group 9: Noncompliance Notifications](#)

[Group 10: Management Concerns/Issues](#)

Each group has from two to 13 reportable occurrences. Occurrences under Group 3, Nuclear Safety Basis; Group 7, Nuclear Explosive Safety; and Subgroup 4A, Safety Structure/System/Component Degradation, are not applicable to LBNL, because the Laboratory does not operate any nuclear facilities or Class I, II, or III radiological facilities, and does not have operations involving Technical Safety Requirements, Unreviewed Safety Questions, or Safety Class Structure, System, or Component (SSC). There are several other types of specific occurrences that are identified as not applicable in Appendix A. A total of 55 types of occurrences in the remaining groups are applicable to LBNL operations and require reporting to DOE. If an abnormal occurrence does not correspond to any of the described occurrences, the incident is not reportable under these procedures.

15.3.3 Significance of Occurrence

In DOE M 231.1-2, Occurrence Reporting and Processing of Operations Information, DOE has designated a significance category for each of the described reportable occurrences. Categorization by significance provides a graded approach in processing the occurrences. The most significant occurrences require rigorous and in-depth reporting, investigation, causal analysis, and corrective actions, whereas the least significant occurrences require only a short report and remedy for the problem. The reportability and significance of the occurrence are collectively called the categorization of the occurrence and must be reported no later than two hours after discovery. The significance categories in the ORPS program are as follows:

- a. *Significance Category 1*: Occurrences that have a significant impact on safe facility operations, work or public safety and health, regulatory compliance, or public/business interests.
- b. *Significance Category 2*: Occurrences that have a moderate impact on safe facility operations, work or public safety and health, regulatory compliance, or public/business interests.
- c. *Significance Category 3*: Occurrences that have a minor impact on safe facility operations, work or public safety and health, regulatory compliance, or public/business interests.
- d. *Significance Category 4*: Occurrences that have some impact on safe facility operations, work or public safety and health, regulatory compliance, or public/business interests.

In addition to the above four significance categories, there are two special categories:

- a. Operational Emergencies (OE): Occurrences that are unplanned; significant occurrences or conditions that require time-urgent response from outside the immediate affected site or facility. LBNL emergency-management personnel provide for the prompt notification and follow-up actions as required by DOE O 151.1A, Comprehensive Emergency Management System. LBNL staff who create or witness an operational emergency need only call ext. 7-911 for emergency response and report coordination.
- b. Significance Category R: Occurrences that are identified as recurring occurrences, as determined by periodic analyses of past occurrences at LBNL. The Office of Contractor Assurance conducts such periodic analyses and reports results to LBNL management and DOE.

15.3.4 Prompt Notification of DOE

After categorizing the occurrence as reportable, LBNL must promptly, usually within two hours, notify DOE of the occurrence. The division that has responsibility for the occurrence will contact EH&S to coordinate the notification with various elements of DOE. Prompt notification of DOE is based on the significance of the occurrence, and must meet the following notification requirements:

Significance Category	Timeline	Notification To	Notification Mode
Category 1	No later than two hours after categorization	Berkeley Site Office (BSO) and DOE Headquarters Operations Center (DOE HQ OC)	E-mail and follow-up phone call
Category 2	No later than two hours after categorization	BSO, and, as directed by BSO, DOE HQ OC	E-mail and/or phone call
Category 3	No later than two hours after categorization	BSO	E-mail and/or phone call
Category 4	No prompt notification required		

For special categories, the prompt notification requirements are the following:

Special Category	Timeline	Notifications To	Notification Mode
Operational Emergencies	No later than 15 minutes if classified; no later than 30 minutes if not classified	BSO and DOE HQ OC	Per site emergency response plan
Category R (Recurring Occurrences)	No prompt notification required		
Specific Cat 2, 3, & 4 Occurrences Identified with (*) Asterisks (see Appendix A)	No later than two hours after categorization	BSO and DOE HQ OC	E-mail and follow-up phone call

DOE HQ OC e-mail address is doehqeoc@eom.doe.gov and phone numbers are (202) 586-8100 (voice) and (202) 586-8485 (facsimile). BSO duty officer phone number is (510) 719-1856. Prompt notification of DOE HQ OC should include as much information as possible, including the following details:

- a. Occurrence significance category
- b. Location and description of the occurrence
- c. Date and time of discovery
- d. Damage and casualties
- e. Impact of occurrence 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

All information should be clear and succinct, avoiding any jargon. Uncommon or site- or facility-specific abbreviations and acronyms should be fully described. If the occurrence is recategorized, prompt notification should be done under the requirements of the new

category. Follow-up notification is required if there is further degradation of the occurrence or other worsening conditions subsequent to the previous notification.

15.3.5 Written Notification Report

A follow-up written notification report to DOE is required for all reportable occurrences. Responsible divisions, with assistance from EH&S, should use the ORPS Report Worksheet (Appendix B) to prepare the written notification. The notification report should provide as much information as known, or at least the information required, by the prompt notification ([see Section 15.3.4](#)). The report serves as the basis for the subsequent update and final occurrence reports associated with the occurrence. EH&S enters the information from the worksheet into the DOE ORPS database. Written notification is deemed complete once the information of the occurrence is entered into the DOE ORPS database. Timeline requirements for the written notification are based on the appropriate significance category, as described below:

Significance Category	Timeline
Operational Emergencies Category 1	Before the close of the next business day from categorization, but not to exceed 80 hours.
Categories 2 & R	Before the close of the next business day from categorization.
Category 3	Before the close of business on the second business day from categorization.
Category 4	Short Form Report before the close of business on the second business day from categorization (satisfies all written reporting requirements for Category 4 occurrences).

Any changes in categorization will be documented in an Update Report and submitted within the timeline required under the new category. A justification for the new categorization should be included in the report.

15.3.6 Occurrence Investigation and Causal Analysis

The investigation and analysis process is used to gain an understanding of the occurrence, its causes, and the corrective actions necessary to remedy the problem and to prevent recurrence. The rigor and scope of any occurrence investigation and causal analysis are based on the significance category of the occurrence. EH&S must be contacted to provide assistance and/or coordination for all investigations and causal analyses. EH&S subject matter experts may also be involved to provide technical analysis. OCA and EH&S have trained and experienced investigators and analysts to fully participate in higher-category occurrences that require trained personnel.

Significance Category	Occurrence Investigation	Causal Analysis	Corrective Actions
Operational Emergencies Category 1	Team of trained investigators; DOE accident investigation as appropriate	Root cause determined	QA Review; Remedy problem; prevent recurrence; Effectiveness Review
Category R	Trained investigators	Root cause determined	QA Review; Remedy problem; prevent recurrence; Effectiveness Review
Category 2	Trained investigators	Root cause determined	QA Review; Remedy problem; prevent recurrence; Effectiveness Review
Category 3	Trained investigators	Apparent cause determined	Remedy problem
Category 4	Trained investigators	None required	Remedy problem

- a. For occurrences that are categorized as operational emergencies or Categories 1, R, or 2 occurrences, investigations must be conducted with personnel who have had documented training in accident and/or problem investigation. OCA and EH&S staff are qualified for such investigations.

- b. DOE may conduct a Type A or B investigation for accidents categorized as operational emergencies or Category 1 occurrences. LBNL is not required to conduct an identical investigation under this circumstance.
- c. Guidance for causal analysis is provided in LBNL/PUB-5519 (1), Issues Management Program Manual and LBNL/PUB-5519 (2) Causal Analysis Program Manual. Additional guidance is available from DOE Guide 231.1-2, Occurrence Reporting Causal Analysis Guide. All causes are classified by specific cause codes described in DOE G 231.1-2. The cause codes are also provided in the guidance document's Causal Analysis Tree (Appendix E). EH&S staff are trained in the use of the Causal Analysis Tree and should be consulted for all causal analysis.
- d. Operational emergencies caused by natural phenomena and/or originating off site do not require root cause analysis. Examples are earthquakes and off-site wildland fires.
- e. OCA and EH&S staff are trained to conduct formal root cause analysis using a variety of approved analysis methods, including barrier analysis, five-whys, HPI & culpability analysis, and TapRoot.
- f. Weaknesses in the division's implementation of Integrated Safety Management (ISM) are identified as part of the causal analysis.
- g. Depending on the significance of the occurrence, BSO staff (i.e., facility representatives) should be consulted in a timely manner for their assessment of the occurrence as appropriate.
- h. Divisions are responsible for ensuring all Significance Category (SC) 1, 2, and R Corrective Action Plans are reviewed by OCA prior to final submission. The LBNL Corrective Action Tracking System (CATS) must be used to track all corrective actions identified for each occurrence. With the exception of Significance Category 4 occurrences, corrective actions must also be entered into the ORPS database with reference to the respective CATS identification numbers. For Significance Category 2 or higher reports, text changes to corrective actions in CATS must be transmitted to EH&S for update in the ORPS database. Depending on the significance category, EH&S and BSO may conduct independent verification, sampling, and effectiveness evaluation of the corrective actions.
- i. For operational emergencies, Significance Category 1, R, or 2 occurrences and any text changes made to previously entered corrective actions must have prior BSO approval.

15.3.7 Update and Final Occurrence Reports

The Notification Report in the DOE ORPS database is updated as necessary with new and significant information about the occurrence. Responsible divisions should provide any updated information to EH&S for data entry into the ORPS database. Updated information includes, but is not limited to, new data and investigation results, the status of the investigation, recurring consequences, and identification of additional deficiencies related to the occurrence. The Update Report (or if there is no Update Report, the Notification Report) eventually becomes the Final Occurrence Report when all pertinent information on the investigation and analysis, including significance, nature, and extent of the occurrence, cause(s), corrective actions, lessons learned, and other data as required by the ORPS data fields ([see Appendix B, ORPS Report Worksheet](#)), are entered into the ORPS database. Process requirements for the Final Occurrence Report are based on the significance category of the occurrence:

Significance Category	Final Report Due	Report Approval
Operational Emergencies Category 1	Within 45 calendar days	DOE Berkeley Site Office and DOE HQ Program Office
Category R	Within 45 calendar days	DOE Berkeley Site Office
Category 2	Within 45 calendar days	DOE Berkeley Site Office
Category 3	Within 45 calendar days	Applicable LBNL division/dept.
Category 4	Only Short Form required within two business days	Applicable LBNL division/dept.

- a. Regardless of the significance category of the occurrence, the responsible division director must approve the final ORPS report (which includes an OCA QA review of the CAP for SC 1, 2, or R events) prior to any submission to external organizations such as the Berkeley Site Office or DOE Headquarters. LBNL division directors should utilize EH&S assistance to process the final ORPS report.

- b. If the final report cannot be completed within 45 calendar days after categorization, an Update Report must be submitted prior to the deadline, with a detailed explanation of the delay and an estimated date for submittal of the final report.
- c. For Operational Emergencies and Significance Category 1, R, and 2 final reports, BSO must review, approve, and add any comments, as necessary, within 14 calendar days after receipt of the report. After approval by BSO, Operational Emergencies and Significance Category 1 final reports must be submitted to the DOE HQ Program Office for its review, approval, and comments within 14 calendar days after its receipt of the report.
- d. If the final report is not approved by BSO or DOE HQ, the responsible DOE person rejecting the report must provide the reason for disapproval in the DOE comment section of the report. The LBNL division, with assistance from EH&S, must prepare a revised final report and resubmit to BSO within 21 calendar days of the disapproval. If the revised final report cannot be resubmitted within this time, an Update Report must be submitted within 21 calendar days, explaining the delay and providing an estimated date for resubmittal. This information must be reported in the "evaluation" block of the Occurrence Report.
- e. For Significance Category 4 occurrences, only a "Short Form Report" is required ([see Appendix C for Short Form Worksheet](#)). Responsible divisions should complete the Short Form Worksheet within two business days and submit to EH&S for data entry into ORPS. Other than completing any CATS-tracked corrective actions, the Category 4 occurrence is considered closed when the Short Form Report is in the ORPS database.
- f. The responsible division must retain all supporting information pertaining to each occurrence or report in accordance with LBNL records management policies. Note: Informal documents, such as e-mail messages and initial drafts, are not necessary for retention.

15.3.8 Performance Analysis and Identification of Recurring Occurrences

The Office of Contractor Assurance will perform quarterly analyses of occurrences during a 12-month period to look for trends. This periodic performance analysis must evaluate occurrences of all significance categories plus LBNL-determined nonreportable occurrences in order to prevent serious occurrences. The quarterly performance analysis results will be made available to LBNL management and BSO, in ES&H quarterly reports and/or Operational Awareness meetings.

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 new occurrence report is categorized as a Significance Category R occurrence and must meet all reporting and processing requirements for this category.

15.3.9 Training

Training is provided by EH&S to applicable division personnel who may be involved with the reporting and processing of reportable occurrences. The training course, EHS 802 ~ Reporting Adverse EHS Occurrences in ORPS, includes the objective and process of occurrence reporting, including occurrence identification, categorization, notification, report submission, causal analysis, report closure, corrective action tracking, and utilization of data from the ORPS database.

Employees and supervisors are to receive basic instructions for reporting incidents and unsafe conditions to their line managers, and this will be included in the required training course, *New Employee Orientation*.

15.4 Appendices

15.4.1 Appendix A — Reportable Occurrences and Significance Categories

Lab Notes and Instructions:

1. Reportable occurrences are organized into ten topical groups. Some groups may have subgroups. Each type of occurrence is identified by its group, subgroup (if applicable), and sequence number. Thus, for example, a radiation exposure above threshold levels is denoted as Group 6, Subgroup C, Sequence Number 3, or as 6C(3).
2. [Group 3, Nuclear Safety Basis](#), and [Group 7, Nuclear Explosive Safety](#), are for nuclear facilities and therefore are not applicable to LBNL operations or activities.
3. An actual occurrence can be classified into multiple types of occurrences. For such situations, all of the applicable occurrence types should be identified in the ORPS report.
4. Each reportable occurrence is assigned a significance category, which determines the graded approach for processing the occurrence ([see Section 15.3.3](#)).

5. Reportable occurrences marked with asterisks (*) require prompt notification of DOE (within 15 minutes for operational emergencies, and two hours for all others) regardless of the significance category (SC). LBNL emergency management personnel provide the prompt notification for operational emergencies; for all other reportable occurrences marked with asterisks, contact the EH&S Division Office at ext. 5514 to initiate the prompt notification.

15.4.1.1 Group 1 — Operational Emergencies

Lab Notes: Call 7-911 for all emergency situations. LBNL emergency management personnel will assume all responsibilities for contacting appropriate individuals and organizations for the purpose of meeting ORPS requirements.

SC	No.	Occurrence Description
Operational Emergency	*1	An Operational Emergency not needing further classification, as defined in DOE 151.1A, Chapter 5, Paragraph 2.
	*2	An Alert, as defined in DOE 151.1A, Chapter 5, Paragraph 3a.
	*3	A Site Area Emergency, as defined in DOE 151.1A, Chapter 5, Paragraph 3b.
	*4	A General Emergency, as defined in DOE 151.1A, Chapter 5, Paragraph 3c.

NOTE: Group 1 reportable occurrences (operational emergencies) marked with asterisks (*) require within 15 minutes' prompt notification to DOE. LBNL emergency management personnel provide the prompt notification for the Laboratory.

15.4.1.2 Group 2 — Personnel Safety and Health

Lab Notes:

1. All occupational injuries and illnesses are reported to LBNL Health Services. It is Laboratory policy to medically monitor all potentially serious cases.

2. Follow-up medical appointments or hospitalization for chronic illnesses and injuries are not reportable. For example, a worker who spends a day or two in a hospital from time to time for asbestosis that originated twenty or thirty years ago, or a worker who has follow-up appointments after undergoing disk surgery months ago for a job-related injury, does not need to report further.

Subgroup 2A — Occupational Illnesses/Injuries

SC	No.	Occurrence Description
Cat 1	<u>*1</u>	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.
Cat 1	<u>*2</u>	Any single occurrence requiring in-patient hospitalization of three or more personnel.
Cat 2	3	Any single occurrence resulting in three or more personnel having Days Away, Restricted or Transferred (DART) cases per 29 CFR Part 1904.7.
Cat 2	<u>*4</u>	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

		<p>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."]</p>
Cat 3	5	<p>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.</p>
Cat 3	6	<p>Any single occurrence resulting in a serious occupational injury. A serious occupational injury is an occupational injury that:</p> <ul style="list-style-type: none"> 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 2B — Fires/Explosions

SC	No.	Occurrence Description
Cat 1	<u>*1</u>	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.]
Cat 2	<u>*2</u>	Fire or explosion in a nuclear facility. Not applicable to LBNL.
Cat 3	<u>*3</u>	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.
Cat 4	<u>*4</u>	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 2C — Hazardous Energy Control

SC	No.	Occurrence Description
Cat 2	1	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.
Cat 3	2	Failure to follow a prescribed hazardous energy control process (e.g., lockout/tagout) or a site

		<p>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.</p>
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NOTE: All reportable occurrences (as described in Groups 2–10 of Appendix A) marked with asterisks (*) require within 2 hours’ prompt notification to DOE regardless of the significance category (SC). Contact EH&S at ext. 5514 to initiate the prompt notification.

15.4.1.3 Group 3 — Nuclear Safety Basis

Lab Notes: Group 3 is not applicable to LBNL.

15.4.1.4 Group 4 — Facility Status

Subgroup 4A — Safety Structure/System/Component Degradation

Group 4 is not applicable to LBNL.

Subgroup 4B — Operations

SC	No.	Occurrence Description
Cat 2	*1	A Stop Work Order issued by a DOE office.
Cat 2	2	Actuation of a Safety Class Structure, System, or Component. Not applicable to LBNL.
Cat 3	3	Actuation of a Safety Significant Structure, System, or Component. Not applicable to LBNL.
Cat 3	4	Any facility evacuation, not including a precautionary evacuation, in response to an actual occurrence. If the occurrence fell under another reporting criterion, then evacuation should be reported as well by noting multiple

		reporting criteria for the single occurrence.
Cat 4	5	A facility operational occurrence 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.
Cat 4	<u>*6</u>	A facility or operations shutdown (i.e., a change of operational mode or curtailment of work or processes) directed by management for safety reasons.
Cat 4	7	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.)
Cat 4	8	Any occurrence or condition that would prevent immediate facility or offsite emergency response capabilities.

Subgroup 4C — Suspect/Counterfeit and Defective Items or Material

SC	No.	Occurrence Description
Cat 3	1	Discovery of any suspect/counterfeit item or material found in a Safety Class or Safety Significant Structure, System, or Component (SSC). Not applicable to LBNL.
Cat 4	2	Discovery of any suspect/counterfeit item or material other than office supplies, office equipment, or household products. 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.
Cat 4	3	<p>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.</p> <p>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.</p>

15.4.1.5 Group 5 — Environmental

Lab Notes:

1. Contact the LBNL Environmental Service Group (ext. 7614) for all environmental releases, and for assistance in mitigation and in reporting to local regulatory agencies. If the release involves radioactive material, the Environmental Service Group will contact the Radiation Protection Group.
2. ORPS reporting is not required for courtesy notices provided to the City of Berkeley for releases that are below reporting thresholds.
3. There are no areas of critical habitat or jurisdictional wetlands, and there are no known historical or archeological sites within the Berkeley Lab boundary.

Subgroup 5A — Releases

SC	No.	Occurrence Description
Cat 2	<u>*1</u>	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.
Cat 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.
Cat 4	3	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.
Cat 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 5B — Ecological and Cultural Resources

Not applicable to LBNL ([see Lab Note 3, above](#)).

15.4.1.6 Group 6 — Contamination/Radiation Control

Lab Notes:

1. The LBNL Radiation Protection Group (ext. 7652) must be contacted for all adverse or abnormal radiation-related occurrences, regardless of thresholds or significance category. The Radiation Protection Group provides immediate assistance to mitigate any

adverse or abnormal radiation-related incident and to determine the reportability of the incident.

2. The Radiation Protection Group must contact the LBNL Price Anderson Amendment Act (PAAA) coordinator for all radiation-related incidents.

3. Radioactive material or sources that are discovered on site and that have not been previously included in LBNL inventories or authorizations are considered to be found, not lost, and are not reportable under Subgroup 6A.

4. Consumer products will be interpreted to mean any radioactive material or product that can be purchased without a Nuclear Regulatory Commission (NRC) license or DOE contract, including NRC-exempt quantities and NRC–generally licensed products.

5. Radioactive contamination is not interpreted to include objects that are contained such that the radioactivity is not dispersible and cannot be inadvertently touched by people.

6. Radioactive contamination due to activities under an active LBNL Radiological Work Authorization or Radiological Work Permit is reportable only when the extent of the contamination falls outside the posted radioactive materials area.

7. In Subgroup 6D(3), Personnel Contamination, the term “site-provided protective clothing” will include gloves, protective shoes, or other personal protective equipment (PPE), even though the purpose of the PPE was not specifically for radiological protection.

8. 10 CFR Part 835, Appendix D, values are in Appendix D of this document.

Subgroup 6A — Loss of Control of Radioactive Materials

SC	No.	Occurrence Description
Cat 2	1	Identification of radioactive material off site 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.
Cat 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.
Cat 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 6B — Spread of Radioactive Contamination

SC	No.	Occurrence Description
Cat 2	1	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.]
Cat 2	2	<p>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.</p> <p>[Note: (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.</p> <p>(b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.</p> <p>(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.]</p>
Cat 3	3	<p>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.</p> <p>[Note: (a) This does not apply to contamination from residual radioactive material meeting applicable DOE-</p>

	<p>approved authorized limits.</p> <p>(b) This also does not apply to legacy radioactive contamination, which will be reported under a separate criterion below.</p> <p>(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.]</p>
<p>Cat 4</p>	<p>4</p> <p>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.</p> <p>[Notes: (a) Legacy radioactive contamination is radioactive contamination resulting from historical operations that are unrelated to current activities.</p> <p>(b) This does not apply to contamination from residual radioactive material meeting applicable DOE-approved authorized limits.</p> <p>(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.]</p>

Subgroup 6C — Radiation Exposure

SC	No.	Occurrence Description
Cat 1	<u>*1</u>	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].
Cat 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).
Cat 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.
Cat 3	4	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 6D — Personnel Contamination

SC	No.	Occurrence Description
Cat 2	<u>*1</u>	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.
Cat 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.
Cat	3	Any onsite contamination of personnel or clothing

4	(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.
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15.4.1.7 Group 7 — Nuclear Explosive Safety

Lab Notes: Group 7 is not applicable to LBNL.

15.4.1.8 Group 8 — Transportation

Lab Notes:

1. Radiological materials transported using the defined route between LBNL and the UC Berkeley Campus are deemed to be on-site transfers.
2. On-site releases of radioactive materials due to packaging or transportation are reportable under this section if the amount of the release or contamination exceeds applicable thresholds defined in 10 CFR 835.

SC	No.	Occurrence Description
Cat 1	*1	Any offsite transportation incident involving hazardous materials that would require immediate notice pursuant to 49 CFR Part 171.15, namely: (a) As a direct result of hazardous materials:

		<p>(i) A person is killed,</p> <p>(ii) A person receives injuries requiring hospitalization,</p> <p>(iii) Estimated property damage exceeds \$50,000,</p> <p>(iv) An evacuation of the general public occurs lasting 1 hour or more,</p> <p>(v) One or more transportation arteries or facilities are closed or shut down for 1 hour or more, or</p> <p>(b) Fire, breakage, spillage, or suspected radioactive contamination occurs involving shipment of radioactive materials, or</p> <p>(c) Fire, breakage, spillage, or suspected contamination occurs involving shipment of infectious substances (etiologic agents), or</p> <p>(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</p> <p>(e) The operational flight pattern or routine of an aircraft is altered.</p>
Cat 3	2	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.
Cat 4	3	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.
Cat 4	4	Any packaging or transportation activity involving the onsite release of radioactive materials, etiologic agents, hazardous substances, hazardous waste, or marine pollutants.

15.4.1.9 Group 9 — Noncompliance Notifications

Lab Notes:	
<p>1. Enforcement action is reportable even if the fine is later reduced below \$10,000, or the number of violations is reduced below ten.</p> <p>2. Notices of deficiencies related to permit modifications, renewals, or reports are not ORPS reportable.</p>	

SC	No.	Occurrence Description
Cat 3	1	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.]
Cat 4	2	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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15.4.1.10 Group 10 — Management Concerns/Issues

SC	No.	Occurrence Description
Cat 2	1	Any occurrence 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.]
Cat 1-4	±2	An occurrence, condition, or series of occurrences 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. [† Note: An SC 1 occurrence report requires Prompt Notification.]
Cat 1-4	±3	A near miss, where no barrier or only one barrier prevented an occurrence 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. [† Note: An SC 1 occurrence report requires Prompt Notification.]
Cat 4	*4	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.
Cat 4	<u>*5</u>	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 occurrence sequence number].

15.4.2 Appendix B — ORPS Report Worksheet

Go [here](#) to download an electronic copy of the LBNL ORPS Report Worksheet, in Microsoft Word.

15.4.3 Appendix C — Short Form Worksheet

Go [here](#) to download an electronic copy of the LBNL ORPS Short Form Worksheet, in Microsoft Word.

15.4.4 Appendix D — Surface Contamination Values (10 CFR Part 835, Appendix D)

Table 15.4.1 Surface Contamination Values^[1] in dpm/100 cm^[2]

Radionuclide	Removable ^[2] ^[4]	Total (Fixed and Removable) ^[2] ^[3]
U-nat, U-235, U-238, and associated decay products	1,000 ^[7]	5,000 ^[7]
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	20	500
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200	1,000

Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above[5]	1,000	5,000
Tritium and tritiated compounds[6]	10,000	N/A

Appendix D: Surface Contamination Values

1. The values in this appendix, with the exception noted in footnote 5, apply to radioactive contamination deposited on, but not incorporated into, the interior or matrix of the contaminated item. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides apply independently.
2. As used in this table, disintegrations per minute (dpm) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
3. The levels may be averaged over one square meter, provided the maximum surface activity in any area of 100 cm² is less than three times the value specified. For purposes of averaging, any square meter of surface will be considered to be above the surface contamination value if (1) it is determined from measurements of a representative number of sections that the average contamination level exceeds the applicable value, or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm² area exceeds three times the applicable value.
4. The amount of removable radioactive material per 100 cm² of surface area should be determined by swiping the area with dry filter or soft absorbent paper, applying moderate pressure, and then assessing the amount of radioactive material on the swipe with an appropriate instrument of known efficiency. (Note: The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area will be based on the actual area, and the entire surface will be wiped. It is not necessary to use swiping techniques to measure

removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

5. This category of radionuclides includes mixed fission products, including the Sr-90 that is present in them; it does not apply to Sr-90 that has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

6. Tritium contamination may diffuse into the volume or matrix of materials. Surface contamination evaluations will consider the extent to which such contamination may migrate to the surface in order to ensure the surface contamination value provided in this appendix is not exceeded. Once this contamination migrates to the surface, it may be removable, not fixed; therefore, a "total" value does not apply.

7. (alpha)

15.4.5 Appendix E — Causal Analysis Tree

Go [here](#) to download an electronic copy of the Causal Analysis Tree, in PDF.