University of California
Contractor Assurance System Description
for
Lawrence Berkeley National Laboratory
LBNL PUB-5520

Revision 1

August 2010

REVIEW AND APPROVAL

The Department of Energy, University of California, and Lawrence Berkeley National Laboratory approve the UC Assurance Plan.

August 27 2010

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TABLE OF CONTENTS

OVERVIEW 1

SECTION 1 GOVERNANCE 4

1.1 UNIVERSITY OF CALIFORNIA GOVERNANCE 4

SECTION 2 LBNL ORGANIZATION 8

2.1 LBNL MANAGEMENT AND STAFF 8

2.2 OFFICE OF INSTITUTIONAL ASSURANCE 9

2.3 INTERNAL AUDIT SERVICES 10

SECTION 3 LBNL ASSURANCE PROCESS 12

3.1 ASSURANCE PROCESS 12

3.2 OPERATIONS ASSURANCE PLANS 12

3.3 ASSESSMENT 13

3.4 PERFORMANCE MEASURES 15

3.5 ISSUES MANAGEMENT 15

3.6 CONTINUOUS IMPROVEMENT 18

APPENDIX A: LBNL CONFORMANCE WITH DOE-UC CONTRACT 31, CLAUSE H REQUIREMENTS A-1

APPENDIX B: REFERENCES B-1

APPENDIX C: GLOSSARY C-1

RECORD OF REVISIONS

Rev. No.	Date	Description
1	August 2010	Revised to address requirements of Contract 31 Clause H.30. Added overview of CAS roles and responsibilities. Expanded description of UC Governance and LBNL Organization. Eliminated ES&H-specific references required by DOE Order 226.1A.

OVERVIEW

Introduction

Lawrence Berkeley National Laboratory (LBNL) is managed and operated by the University of California (UC) under Contract No. DE-AC02-05CH11231 (Contract 31) with the U.S. Department of Energy (DOE).

The UC Contractor Assurance System (CAS) for LBNL is a system of processes and tools designed to ensure that the Laboratory's mission objectives are met; its workers, public, and environment are protected; its operational, facility, and business systems are effectively run; and requirements of the UC/DOE contract are met. The CAS description is developed through a partnership of UC and LBNL. The DOE Berkeley Site Office (BSO) is provided timely notification of significant assurance-system changes prior to the changes. Table 1 outlines contractor assurance roles and responsibilities.

A critical element of the system is a strong partnership among UC, LBNL, and DOE. This partnership is evident in the frequent formal and informal communications at all levels, transparency of management systems and processes, timely flow of information, and joint resolution of issues. It is formalized in the LBNL, UC, DOE-BSO Operating Principles signed by the leadership of all three parties in July, 2010.

Table 1. Contractor Assurance Roles and Responsibilities

Participant	Roles and Responsibilities	Process/Tool
UC	• Develop and approve CAS description • Establish goals and objectives • Monitor performance and provide feedback • Issue annual Assurance Letter	• Quarterly Assurance process • Contract Assurance Council • Lab Advisory Board • Operational awareness • UC/LBNL/BSO Operating Principles • LBNL Internal Audit • LBNL Audit Committee
Lab Senior Management	• Develop and approve CAS description • Establish institutional goals and objectives • Identify institutional risks • Monitor performance and provide feedback • Provide input to UCOP for annual Assurance Letter	• Strategic planning • Quarterly Assurance process • Performance measures • Reviews and assessments • Issues management • Continuous improvement • LBNL Audit Committee • UC/LBNL/BSO Operating Principles

Participant	Roles and Responsibilities	Process/Tool
		• Operations Top Risk Review
Operations Directors	• Establish goals and objectives • Develop and implement functional area assurance plans • Direct and monitor performance • Implement improvement actions/initiatives	• Strategic planning • Quarterly Assurance process • Functional area measures • Reviews and assessments • Issues management • Continuous improvement • Operations Top Risk Review
Office of Institutional Assurance	• Develop and maintain CAS description and related institutional processes • Support senior management and operations directors in implementing CAS • Develop and maintain risk registry • Develop annual assurance reports	• Quarterly Assurance process • Reviews and assessments • Management meetings and committees • Issues management • Continuous improvement • Operations Top Risk Review
DOE-BSO	• Review and approve CAS description • Monitor performance and provide feedback to UC and LBNL	• Quarterly Assurance process • Operational awareness • Reviews and assessments • UC/LBNL/BSO Operating Principles

The foundation of the CAS is the Quarterly Assurance process—a formal and documented overview of performance results, risks and concerns, and assurance activities (including the Performance Evaluation and Measurement Plan). Performance for each LBNL Operations function is reviewed quarterly by respective managers from UC, LBNL, and BSO. Significant issues and concerns that arise from the functional meetings and other CAS elements are reviewed with senior UC, LBNL, and BSO management, and improvement actions are implemented, as appropriate. This process includes a comprehensive year-end assessment report.

The success of the CAS is directly reflected in LBNL's ability to self-identify and correct issues. Through effective implementation of the CAS, LBNL is able to identify and resolve problems and performance trends before they become significant issues, systematically integrate and align work based on risk and performance, and improve work by incorporating Lessons Learned.

Objectives

The CAS description is designed to fulfill the following main objectives:

- Conform to the requirements of DOE-UC Contract 31, Clause H.30—*Contractor Assurance System.*
- Satisfy the DOE Deputy Director for Field Operations' definition of Assurance at Office of Science Laboratories.
- Describe the UC Governance role to oversee and hold LBNL Management accountable for achieving desired mission outcomes.
- Detail the communication and reporting relationship between LBNL and the University of California, as implemented by LBNL Management, the Office of Institutional Assurance (OIA) and the UC Governance process.
- Describe the process for assuring acceptable performance of LBNL Operations functions to DOE, LBNL Management, and the University of California Office of the President (UCOP).
- Describe the methodology to promote continuous improvement of LBNL operating and infrastructure programs and systems.

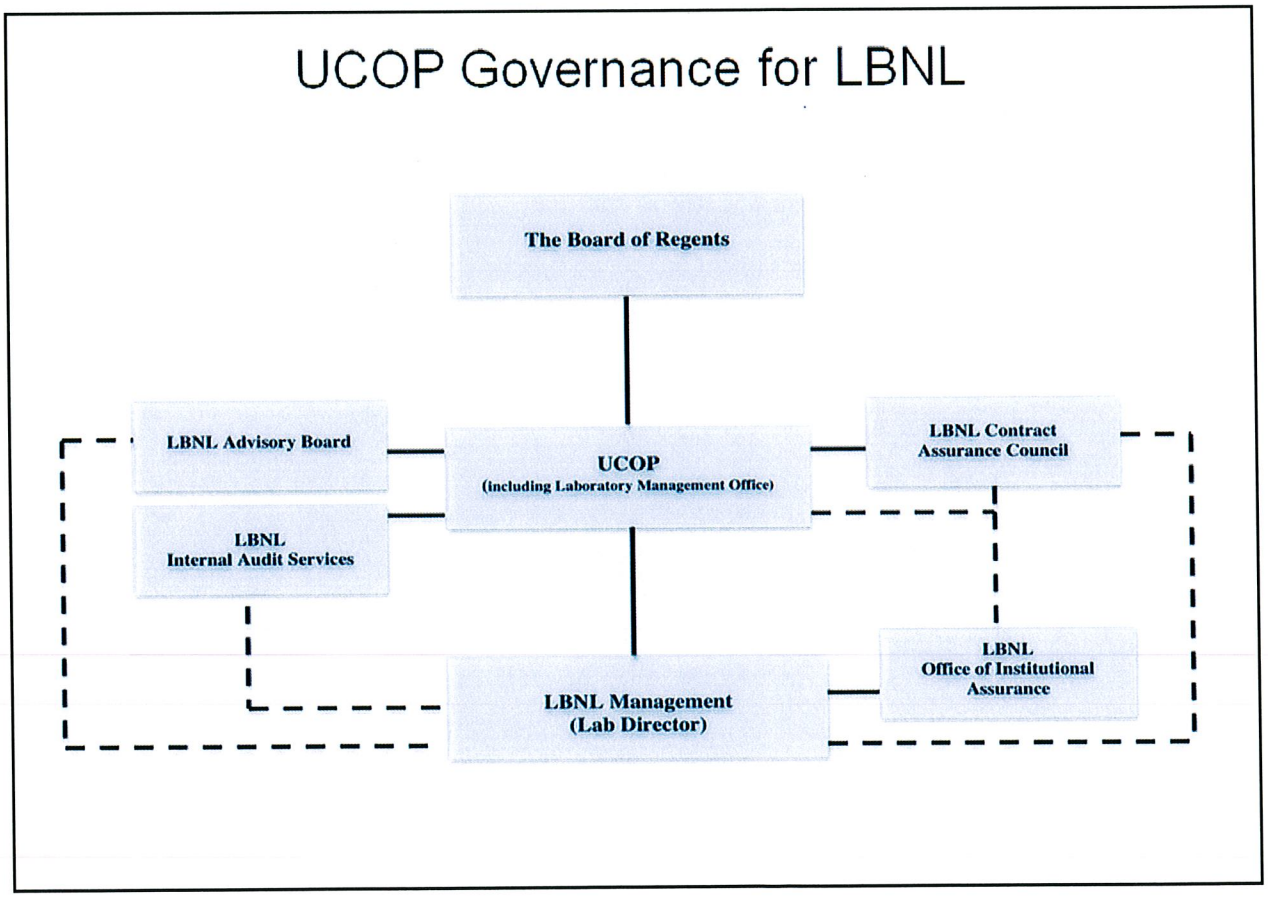
Applicability

The CAS applies to all LBNL Operations functions as implemented in all Laboratory organizations, including Science divisions, and all LBNL staff, participating guests, students, and subcontractors. For example, the CAS includes monitoring and evaluating financial; Environment, Safety, & Health; and property-management activities implemented in Science divisions as well as in Operations divisions.

SECTION 1
GOVERNANCE

1.1 University of California Governance

The University of California maintains fiduciary, oversight, and assurance responsibilities as the management and operating contractor for LBNL. UC oversees LBNL operations in a responsive, anticipatory, proactive, mission-enabling, and cost-effective manner that is valued by the DOE Office of Science. The UC Governance process enables it to oversee and provide reasonable assurance that the objectives of LBNL Management systems and controls will be effective and efficient.



The Board of Regents

The University of California is chartered under the constitution of the State of California as a separate and independent institution. Its governing body is the Board of Regents. The Board appoints the President of the University, the Officers of the Regents (the General Counsel, Treasurer, Secretary and Chief of Staff, and Chief Compliance and Audit Officer). The President, with prior approval of the Regents, appoints the Campus Chancellors and the LBNL Director. UC is the sole contractor for LBNL. Therefore, changes to the DOE-UC prime contract for LBNL, other than contract appendices, require Regents' approval.

The Regents' Committee on Oversight of the DOE Laboratories is a standing committee of the Board of Regents that considers matters concerning DOE and relating to LBNL; Los Alamos National Security, LLC; and Lawrence Livermore National Security, LLC.

UC Office of the President (UCOP)

Management responsibility for the University is formally delegated by the Board of Regents to the University President and from the President to other Officers of the University. The Executive Vice President (EVP) for Laboratory Management, in the UCOP, is a UC officer reporting to the President with line management responsibility for oversight of LBNL. UCOP management oversight of LBNL is provided through the EVP, Laboratory Management Office (LMO), the LBNL Advisory Board, and the LBNL Contract Assurance Council (CAC).

The LBNL Director is an officer of the University who is selected by the President, subject to the approval of the Regents and the concurrence of DOE. The Lab Director reports directly to the University President and is considered the equivalent of a University Chancellor.

Laboratory Management Office (LMO)

Housed within UCOP, the LMO plays a central role in supporting the University's prime contract duties associated with LBNL, and in assuring UCOP has the information it needs to effectively execute its oversight while limiting the University's liability exposure.

Governance functions performed by the Laboratory Management Office include:

- Responsibility for UC management of prime contract administration and governance at LBNL
- Assurance of the health and vitality of scientific and technological programs in meeting the mission of LBNL through the LBNL Advisory Board by engaging both external and UC scientific, management and technical experts to review performance and advise senior UC management and LBNL leaders
- Providing oversight and fostering critical self-evaluation of business and operations functions at LBNL
- Keeping the Regents, UC President, EVP, other University officers and senior management, and the University's Academic Senate leaders informed of performance, important issues, and risks associated with the operation of Laboratories

- Assisting UCOP in an external five-year performance review of the Laboratory Director
- Interfacing directly with the DOE Office of Science management, other senior DOE leaders, and the DOE BSO to assure that UC and LBNL are meeting mission and operations contract commitments and performance goals

LBNL Advisory Board

The LBNL Advisory Board was created under the new prime contract management model proposed by the University for Berkeley Lab in 2004. The Advisory Board reports to the UC President and is co-chaired by members selected by the President (one internal to UC and one external). The Advisory Board is composed primarily of external members who are nationally recognized scientific leaders. Board members serve for five years, and terms are renewable and staggered. The EVP and LBNL Director, among others, are ex-officio members. Senior UCOP managers are members of the Advisory Board, as is a representative from the University's faculty. Staff support for the Advisory Board is provided by LMO.

The Advisory Board:

- Provides advice to the UC President about the scientific and operational aspects of LBNL. As an ex-officio member, the LBNL Director actively engages with the Advisory Board and benefits from direct interactions.
- Evaluates and makes recommendations on overall content and direction of LBNL scientific programs, UC governance of LBNL management, and the effectiveness of LBNL and UC contract assurance functions
- Comments on the vision and strategy of LBNL; the effectiveness of the leadership, programs, and projects; quality of the scientific staff and the intellectual and work environment; and the efficiency, effectiveness, and safe conduct of operations

LBNL Contract Assurance Council

The LBNL Contract Assurance Council advises the EVP for Laboratory Management in UCOP to ensure 1) the effective governance of Berkeley Lab and 2) that performance of work under the LBNL contract meets the terms of the contract as well as the bylaws and standing orders of UC.

The Council is expected to advise the EVP in the following areas:

- Adequacy of the Contractor Assurance System (CAS)
- Adequacy of Laboratory policies, systems, procedures, and practices to protect DOE and UC assets
- Adequacy of performance measures, metrics, and results
- Efficiency and effectiveness of systems
- Management initiatives and improvements
- Areas that will require third-party assessments

- Resources required from UC to assist the Laboratory in meeting its mission and requirements

The EVP chairs and acts on the advice of the CAC and works with DOE and LBNL management to ensure compliance with the LBNL contract. The EVP communicates with the DOE BSO to provide notification of significant issues and solicit input. The EVP also coordinates the application of University resources to assist the Laboratory Director in fulfilling the Laboratory mission.

The UC representatives on the Council provide their expertise and that of their offices in the UC Office of the President to assist and support the effective and efficient operation of the Laboratory. The LBNL CAC includes an appropriate mix of senior officers of the University and external members who are not UC employees. The members of the Council are appointed by the EVP.

The Council meets monthly to provide advice to the EVP in areas within the Council's responsibilities. The Council advises the EVP on management issues that need Laboratory attention, the status of progress in addressing these issues, and recommendations on how best to work with the management of the Laboratory to ensure effective management of the Laboratory. Senior LBNL management representatives attend the meetings to engage directly with the Council on management matters. The agenda may include priority areas of interest or concern to the Council, LBNL management response to areas of concern, and information sharing on areas of interest.

SECTION 2
LBNL ORGANIZATION

2.1 LBNL Management and Staff

The LBNL Director is an officer of the University with overall responsibility for the strategic direction and day-to-day management of LBNL. The Director and his or her senior management team (LBNL Management) set the strategic direction, deploy resources, and develop management systems and process controls to address risks. In fulfilling its duties, LBNL Management has the responsibility for Laboratory stewardship, mission accomplishment, program development, and operational excellence. Its primary functions include:

- Providing the intellectual leadership and management expertise necessary and appropriate to manage, operate, and staff LBNL
- Accomplishing the research mission and roles assigned by DOE
- Establishing detailed strategies and implementation plans required to achieve DOE and UCOP performance expectations and to guide the work of the Laboratory
- Developing and implementing management systems and process controls to achieve objectives within acceptable risks
- Developing and implementing assurance processes that monitor effectiveness of management systems and process controls
- Taking appropriate actions to improve Laboratory performance based on self-assessment results and feedback received from UC Governance

LBNL line management and staff conduct the daily work, processes, and activities of the Laboratory using management systems and process controls to achieve the objectives set by LBNL Management. Line managers and staff regularly evaluate performance with assessment tools developed by Lab Management, line organizations, and the Office of Institutional Assurance (OIA). These self-assessments are conducted to assure that performance is effective and meets regulatory and contractual requirements. Findings and risks are reported to LBNL Management and the OIA; corresponding corrective actions are developed and tracked to resolution. Line managers regularly engage DOE and BSO on performance results and assurance activities.

LBNL has established several management committees that also serve important assurance functions. These committees ensure risk identification and management in high-profile areas, and are normally chaired by senior LBNL Management. Examples these committees include:

- American Recovery and Reinvestment Act (ARRA) Steering Committee
- Capital Projects Review Committee

- Cost Allowability Funding Determination Board
- LBNL Audit Committee
- Safety Advisory Committee
- Radiation Safety Committee
- Institutional Biosafety Committee

2.2 Office of Institutional Assurance (OIA)

LBNL Management allocates resources to staff the OIA, which manages CAS implementation at LBNL. The OIA provides oversight of LBNL's management systems and operating processes to ensure that compliance, best-management practices, and continuous improvement are achieved at LBNL in support of excellence in science. OIA partners with LBNL Management and UC Governance to develop and maintain LBNL's contractor assurance system and to monitor operational performance. OIA works with managers, supervisors, and staff to establish performance measures, develop assessment protocols, identify deficiencies, and implement improvements. OIA has critical oversight, feedback, and process-improvement roles with respect to performance deficiencies, and maintains centralized tracking of issues/corrective actions and Lessons Learned for regular reporting to relevant line managers, LBNL Management, UC Governance, and DOE. OIA has the added responsibility of informing LBNL Management and UC Governance about significant risk issues and verifying process improvements.

The OIA includes the Office of Contract Assurance (OCA). OCA responsibilities for CAS include:

1. Providing a structure for oversight and assurance activities
2. Implementing and maintaining an institutional performance management program. This program includes:
    a. Assessments and reviews: Develop comprehensive assessment programs for Laboratory operations, including self-assessments, peer reviews, and technical reviews. Manage self-assessments, including the development of assessment mechanisms and review protocols with appropriate organization and program management, maintenance of the assessment process, and review and verification of assessment results.
    b. Performance measures: Establish and maintain measures to monitor DOE contract performance, including Laboratory and division-specific performance of vital operations. Measures are linked to the DOE mission and used to monitor internal controls, trends, and progress in fulfilling Laboratory missions.
    c. Issues Management: Establish an issues management program for all Laboratory operations that allows for tracking and managing corrective actions that result from assessment findings. These data are entered into a single Corrective Action Tracking System (CATS) to ensure corrective actions are tracked to resolution. Using a risk-based graded approach, corrective actions are verified for implementation and validated for effectiveness.

d. Continuous improvement and Lessons Learned: Develop and maintain mechanism for regular reporting to UCOP, LBNL Management, LBNL Contract Assurance Council, and DOE on LBNL performance, operating risks, and the status, trends, and issues arising from oversight and assurance activities. Develop and maintain a Laboratory-wide Lessons Learned Program to provide a systemic approach toward continuous improvement. Evaluate Lessons Learned and distribute them to appropriate parties, including divisions, the Laboratory, and the DOE complex. Ensure Lessons Learned are integrated into work practices.

OCA is an internal assurance organization, authorized to have unrestricted access to personnel, records, and other information sources necessary to carry out its duties. OCA staff possesses the requisite experience, training, and skills to manage the CAS. Appropriate qualification standards are maintained in staff position descriptions.

2.3 Internal Audit Services (IAS)

The mission of Internal Audit Services (IAS) is to assess and monitor the LBNL community in the performance of its oversight, management, and operating responsibilities in relation to governance processes, systems of internal controls, and compliance with laws, regulations, contracts, and policies of LBNL, UC, and DOE.

IAS provides an independent and objective assurance and consulting activity guided by a philosophy of adding value to improve Laboratory operations. It assists Laboratory Management in accomplishing its objectives by bringing a systematic and disciplined approach to evaluate and improve the effectiveness of the organization's risk-management, control, and governance processes.

IAS develops an Annual Audit Plan that includes audits suggested by LBNL Management and a limited number of UC-wide topics. The final listing of audits is subject to a risk assessment and approved by the LBNL Audit Committee, which is chaired by the LBNL Director. The Committee meets quarterly to discuss audit results, issues raised by these results, and plans for future audits.

IAS has been granted authority through its charter and the UC Internal Audit Management Charter approved by the Board of Regents. IAS functions under the policies established by the Regents and LBNL Management under delegated authority. IAS has authorized, full, free, and unrestricted access to information including records, computer files, property, and personnel of the Laboratory required in the performance of audits. The work of IAS is unrestricted except where limited by law. IAS is free to review and evaluate all policies, procedures, and practices of any Laboratory activity, program, or function. IAS also performs, as requested by LBNL Management, independent advisory assessments in areas of management concern.

If internal auditors find any credible allegations of significant wrongdoing (including any wrongdoing for personal financial gain) by or about the LBNL Director or an LBNL executive, or any other credible allegations that, if true, could cause significant harm or damage to the reputation of UC directly, they must take the information to the UC Senior Vice President-Chief Compliance and Audit Officer, and the Regents' Committee on Compliance and Audit Chair. These allegations will be reported to the Regents' Board Chair at the discretion of the Senior Vice President-Chief Compliance and Audit Officer or the Regents' Committee on Compliance and Audit Chair. These reporting relationships

ensure departmental independence, promote comprehensive audit coverage, and ensure adequate consideration of audit recommendations.

SECTION 3
LBNL ASSURANCE PROCESS

3.1 Assurance Process

Assurance activities evaluate effectiveness of management systems and process controls, and consistency of performance with DOE missions. These activities also identify operational deficiencies and drive issues management through corrective action development and implementation. The strategic output is to provide UCOP and LBNL management with regular data and information on performance trends and significant or emerging risks.

Laboratory organizations must regularly evaluate and improve the performance of their units. Key assurance activities performed by LBNL organizations include:

- Performing self-assessments
- Performing independent assessments
- Implementing performance measures
- Identifying and effectively correcting deficiencies
- Continuously improving processes, products, and services

The OIA uses assurance-process results to ensure:

- LBNL management systems and process controls are working as intended with regard to managing the Laboratory's risk while accomplishing its mission
- Timely and appropriate communication to LBNL Management, UCOP, and DOE, including electronic access or assurance-related information
- Data and information on the status, progress, and resolution of performance issues are readily available through Web-based reports and printed materials

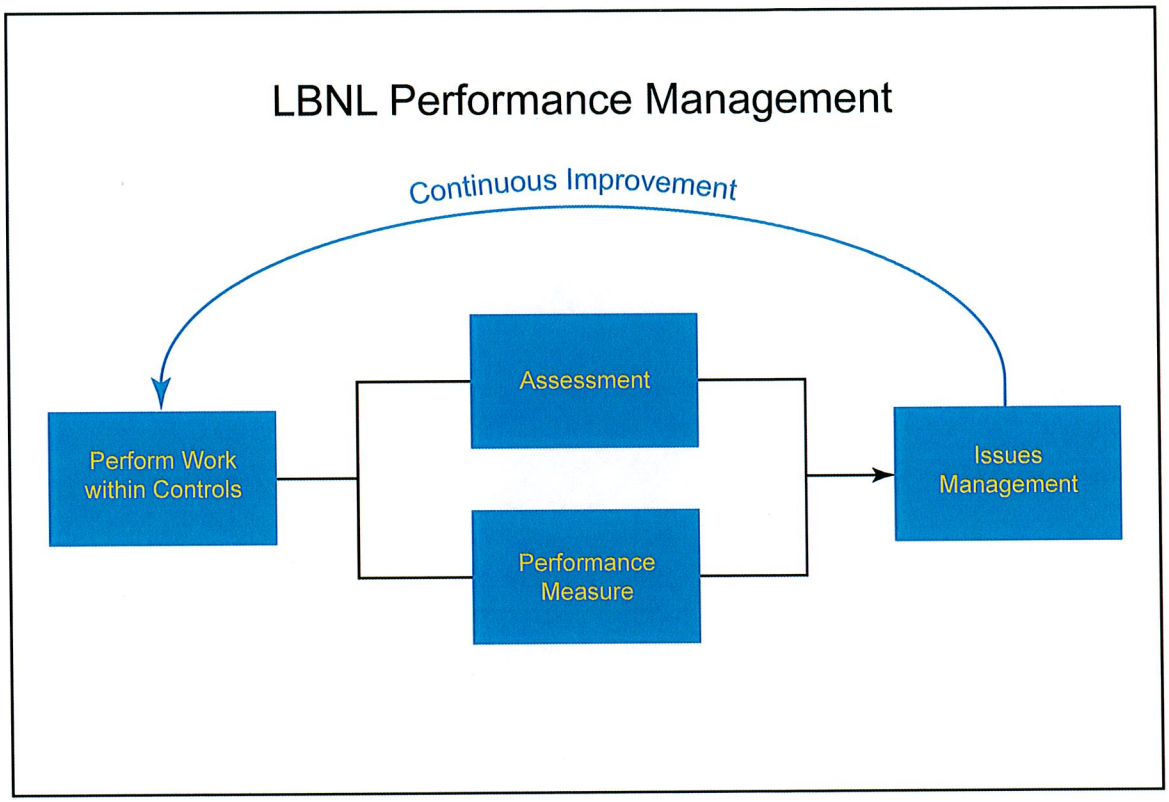
3.2 Operations Assurance Plans

LBNL Operations functions have integrated their assurance systems with other management systems. The Operations assurance plans describe how assurance activities are implemented for each respective function, and detail:

- Self-assessments
- Independent assessments
- Performance measures
- Reporting mechanisms
- Issues management
- Lessons Learned and Best Practices

Operations assurance plans are developed, approved, and maintained by LBNL Operations managers with input from UCOP and BSO. Plans can be modified at any time in response to changes in risks and activities.

Based on the content of each respective Assurance Plan, the LBNL Operations function manager prepares an Assurance Report (described in Section 3.6.1) at least quarterly. Each report is provided to BSO, UCOP, and LBNL Management for review. Additionally, each function holds an Assurance Meeting with representatives from BSO, UCOP, and LBNL to discuss the report and related performance.



3.3 Assessment

Assessments are a primary mechanism for assuring that LBNL organizations and activities function effectively, progress toward strategic goals, and satisfy Laboratory mission needs. Two forms of assessment are performed at LBNL:

- Self-assessments conducted by senior managers, line managers, and staff responsible for the assessed areas
- Independent assessments performed by LBNL organizations independent of the assessed programs or by external parties independent of LBNL

These assessments incorporate differing areas of focus and multiple perspectives to produce complementary forms of assurance to LBNL Management, UCOP, and DOE. LBNL maintains an institutional assessment schedule, and the scope and frequency of assessments are specified in the Operations functions' Assurance Plans.

3.3.1 Self-Assessment

Self-assessments are internal assessments of the LBNL functions performed by functional managers, line managers, and staff. Operations functions develop scope, criteria, and methodology based on the primary risks inherent in work activities. These functions implement assessment protocols that assess LBNL Management systems and process controls for operational effectiveness and fulfillment of LBNL Management goals.

LBNL functional managers regularly assess the performance of their organizations and functions to determine how well objectives and goals are met. Self-assessments focus on identifying and resolving both singular and systematic management issues and problems that may hinder the organization in achieving its scientific and operational objectives. Management also considers any previous findings from self-assessments and independent assessments.

Assessments may involve direct observation of work, testing controls, worker and customer interviews, documentation reviews, and benchmarking against other organizations. Self-assessment results should be documented and used for continuous improvement. Assessment reports should identify findings, observations, and noteworthy practices.

3.3.2 Independent Assessment

Independent assessments review operational effectiveness and adherence to missions, goals, and objectives. Independent assessments are formal assessments that include established protocols for conducting assessments and providing feedback to the assessed organizations. The type and frequency of independent assessments are based on the status, complexity, risk, and importance of the activities or processes being assessed. Independent assessments provide an objective form of feedback to Laboratory management that is useful in evaluating performance and identifying performance deficiencies and noteworthy practices.

Independent assessment results are documented in an assessment report. The assessed organization is responsible for responding to the assessment findings. This includes tracking deficiencies, developing and implementing corrective actions, and communicating noteworthy practices as appropriate. OIA coordinates this process.

Independent assessments are performed by:

- Parties within LBNL who are free of direct responsibility in the areas they assess and are technically and/or programmatically knowledgeable personnel. LBNL organizations that routinely conduct independent assessments include OCA; the Environment, Health and Safety Division; Internal Audit Services; and the Safety Advisory Committee.
- Parties external to LBNL. These reviews may be performed by regulatory agencies, DOE representatives, peers within the DOE complex, or experts from private industry. Reviews may be initiated by external regulatory agencies intent on ensuring that LBNL operations are compliant with federal, state, and local regulations. DOE headquarters and BSO representatives may also perform reviews to evaluate operations and assess implementation of applicable DOE orders and directives. Reviews may also be initiated by the Laboratory.

Examples of independent assessments include:

- External audits
- Peer reviews
- Regulatory agency reviews
- Private industry/consultant reviews
- Internal audits
- Corrective action effectiveness reviews

3.4 Performance Measures

Performance measures are a vital tool in monitoring performance, analyzing data, and identifying adverse trends before they become significant issues. Performance measures are used to communicate progress in satisfying LBNL's mission to DOE, UCOP, and LBNL Management. Performance measures may also be used to benchmark LBNL performance against other organizations. LBNL uses both leading measures with predictive qualities to drive future performance and lagging measures to assess past performance.

3.4.1 Performance Evaluation and Measurement Plan

The Performance Evaluation and Measurement Plan (PEMP) serves as DOE's primary basis for review of the contractor's performance relative to high-priority outcomes for incentive fee and term extension. The performance evaluation provides a standard used to determine whether LBNL is managerially and operationally in control of the Laboratory and is meeting the mission requirement and performance expectations/objectives of DOE as stipulated within the contract.

The PEMP appraisal process institutes a common structure and scoring system across all of the Office of Science laboratories. Structured around eight performance goals, the appraisal process emphasizes the importance of delivering the science and technology necessary to meet the missions of DOE; of operating the Laboratory in a safe, secure, responsible, and cost-effective way; and of assessing the leadership, stewardship, and value provided by the senior leadership of LBNL and UC. Input is solicited from all the major sponsors of work at LBNL.

3.4.2 Operations Performance Measures

Delivering efficient, effective, and responsive management systems and resources that enable the successful achievement of LBNL missions is a key objective of the LBNL Operations organizations. Each primary Operations function includes performance measures in its respective Assurance Plan. These performance measures are a risk-based strategic planning and management tool to monitor performance against operational/functional goals and are aligned with LBNL missions.

3.5 Issues Management

Through the Issues Management Program, LBNL promptly identifies and manages issues to:

- Determine risk and significance
- Identify causes
- Develop and effectively implement corrective actions to ensure successful resolution and prevent the same or similar problems from occurring

Findings are addressed on a graded approach. Depending on significance, findings may merit corrective action plan development, root cause analysis, extent-of-condition review, and effectiveness review.

OIA meets with the LBNL Chief Operating Officer monthly to raise significant concerns and review progress in implementing corrective actions. As appropriate, OIA will also elevate concerns to the LBNL Contract Assurance Council. When applicable, functional managers and OIA develop Lessons Learned for distribution to affected organizations and the Laboratory.

3.5.1 Issues Tracking

Proper management of corrective actions is a multistep process. These steps include:

1. Issue Identification

LBNL identifies, documents, and manages program and performance deficiencies and their associated corrective actions through resolution to prevent the same or similar problems from occurring. Program and performance deficiencies may be identified through employee concerns, internal or external oversight assessment findings, performance measures, day-to-day management oversight, or suggested process improvements.

LBNL/PUB 5519(1), *Issues Management Program Manual*, outlines the process for issues identification.

2. Issue significance and risk

Identified concerns and deficiencies are addressed in a timely manner, as appropriate for each issue's significance, using a graded approach based on the potential risk associated with the condition.

For issues considered to be of a high risk or significance, a root cause analysis and extent-of-condition review are performed, and a corrective action plan is prepared. Effectiveness reviews are also performed to evaluate the corrective actions. Interim corrective actions and mitigation measures are typically implemented to address immediate concerns.

LBNL/PUB 5519(1) outlines the criteria for assigning risk and significance. Based on this guidance, the rigor with which controls are applied to an issue is determined.

3. Corrective action development

Once an issue is identified, corrective action is developed and implemented to mitigate and prevent that issue from recurring. Issues are analyzed for causes on a graded approach. Depending on the significance and potential risk associated with an issue, causal analysis involves:

- Formal root cause analysis performed by trained LBNL experts or
- Apparent causal analysis performed by responsible LBNL staff

LBNL/PUB-5519(2), *Root Cause Analysis Program Manual*, outlines the criteria for performing causal analysis.

4. **Manage and track corrective actions to resolution**

   Issues and their associated corrective actions are tracked to resolution in the Corrective Action Tracking System (CATS). To manage issues effectively, each associated corrective action is assigned to a Responsible Person, who is responsible for ensuring that the corrective action is successfully resolved by a realistic due date.

   LBNL/PUB 5519(1) outlines the requirements for managing and tracking issues and their associated corrective action(s) to resolution.

5. **Verification of issue closure**

   Upon completion of each corrective action(s), verification of completion is performed prior to closure. Objective evidence is reviewed to ensure that the associated corrective action(s) is complete and satisfies the corrective action(s) identified.

   LBNL/PUB 5519(1) outlines the requirements and criteria for verification of issue closure.

3.5.2 Data Monitoring and Analysis

LBNL managers are responsible for ensuring analysis of issues, individually and collectively, in order to identify programmatic or system issues, recurrence of issues, and trends and vulnerabilities at a lower level before significant problems arise. The requirements for trending, trend-code assignment, data collection, and analysis are contained in LBNL/PUB-5519 (3), *Data Monitoring and Analysis Program Manual.*

3.5.3 Effectiveness Review

Effectiveness reviews either provide confidence that corrective actions are effective, or identify that the original corrective actions were not adequate or not implemented effectively.

Effectiveness reviews are typically performed on only the most significant issues. A graded approach, based on significance and risk, is used when conducting an effectiveness review.

LBNL/PUB 5519(1) outlines the requirements and criteria for performance of effectiveness reviews.

3.5.4 Extent-of-Condition Review

An extent-of-condition review is performed to identify and correct issues, deficiencies, weaknesses, or problems that persist across the Laboratory (either by location, activity, or program). The review determines whether the issue has occurred elsewhere and if the same root or underlying causes of the issue may be affecting performance in those areas. Extent-of-condition reviews are performed using a graded approach based on significance and risk factor.

LBNL/PUB 5519(1) outlines the requirements and criteria for performance of extent of condition reviews.

3.6 Continuous Improvement

Continuous improvement is an ongoing process that uses feedback information and Lessons Learned to improve processes, products, and services; and prevent or minimize operational problems (i.e. contractual, legal, financial, and ES&H deficiencies).

Continuous improvement involves:

- Analyzing performance trends identified through assessments, performance measures, and adverse events to identify improvement opportunities
- Engaging management in prioritizing risk reduction and improvement opportunities
- Developing and disseminating Lessons Learned and best practices within specific Laboratory organizations, Lab-wide, and/or to the DOE complex.

3.6.1 Operations Risk Review

The LBNL Chief Operating Officer conducts a bi-weekly review of operations risk called the Ops Top Risk Review. The intent of the review is to ensure that high risk issues are being identified and mitigated or resolved. The inputs to this review include: 1) High risk issues identified by LBNL Management through assurance processes, customer feedback and operational awareness, 2) High risk issues identified through the OIA Operations Risk Registry, and 3) Issues raised by other sources such as UC, IAS, OIA, and DOE. The primary outputs from the review are actions and status on actions to mitigate the risks or to resolve the issues. These outputs are reviewed with UC on a routine basis.

The OIA Operations Risk Registry is designed to:

A. Monitor risks or potential threats to Laboratory mission and reputation regarding:
   - Regulatory and contractual compliance
   - Worker safety and health
   - Environmental stewardship
   - Financial and asset management
   - Physical and cyber security
   - Human resources management
   - Research integrity

B. Provide input to Operations Top Risk Review on high risk issues.

C. Document risk mitigation

The primary sources for the OIA Operations Risk Registry are the DOE Annual Performance Appraisal of LBNL, results of tri-party Quarterly Assurance meetings, and high-risk issues identified through assessments.

3.6.2 Management Reporting

In addition to ongoing management oversight, LBNL uses several formal reporting mechanisms to communicate trends, risks, and significant issues to BSO, UCOP, and LBNL Management. LBNL Management uses this information and, as appropriate, feedback from BSO and UCOP to prioritize risk mitigation and improvement opportunities. These reporting mechanisms include:

1. **Contract Assurance Council Reports**

   LBNL prepares oral and written reports for the LBNL Contract Assurance Council (CAC). The CAC holds monthly meetings to discuss LBNL performance and assurance issues. Quarterly CAC meetings are longer than regular monthly meetings, allowing for more comprehensive discussion.

   LBNL reports detail:

   - Status and development of the Contractor Assurance System (CAS)
   - Significant issues and risks detected through the assurance process
   - Corrective action status of findings from external assessments and significant findings from self-assessments
   - Results of tri-party Quarterly Assurance meetings
   - Annual Assessment Reports

2. **Assurance Reports for BSO, UCOP, LBNL Management**

   Primary Operations functions prepare Assurance Reports that are provided to BSO, UCOP, and LBNL Management at least quarterly. Each Assurance Report provides an overview of LBNL performance and recent assurance activities, including activities detailed in the respective functional Assurance Plan; performance against the PEMP's Goals, Objectives, and Notable Outcomes; and related activities. These reports provide the basis for each function's Assurance Meeting. Following the functional meetings; senior BSO, UCOP, and LBNL Management meet to discuss significant risks and concerns and corresponding mitigations.

3. **Annual Contract Self-Appraisal Report**

   UCOP submits an annual Contract 31 Self-Appraisal Report on behalf of LBNL to BSO. This document reports LBNL's success in achieving the five Management and Operations Goals, Objectives, and Notable Outcomes detailed in the PEMP. The report also incorporates performance outside the specific Objectives and Notable Outcomes, including identification of key achievements and opportunities for improvement.

   The primary Operations functions have also established formal mechanisms to communicate trends, risks, and significant issues. These processes are described in the respective function-specific Assurance Plans.

4. **Annual Assurance Letter**

   The Federal Managers' Financial Integrity Act (FMFIA) requires agencies to establish and maintain internal control. The agency head must annually evaluate and report on the control and financial systems that protect the integrity of federal programs. The requirements of FMFIA serve as an umbrella under which other reviews, evaluations, and audits should be

coordinated and considered to support management assertions about the effectiveness of internal control over operations, financial reporting, and compliance with laws and regulations.

The University of California Office of the President's (UCOP's) Laboratory Management Office will issue an opinion regarding the Laboratory's system of internal accounting and management controls in effect during the fiscal period. Included with its internal control assertion is information about the internal accounting and management controls, reportable issues, and corrective action plans provided by the Laboratory Director based on input from Chief Financial Officer management and staff.

3.6.2 Lessons Learned and Best Practices

The LBNL Lessons Learned and Best Practices Program is designed to ensure ongoing performance improvement, prevent the recurrence of significant adverse events/trends, and determine implementation strategies that will help LBNL successfully meet the missions and goals set forth by DOE.

OIA/OCA manages the Lessons Learned and Best Practices Program and maintains the LBNL Lessons Learned and Best Practices Database. The Database is designed to allow all LBNL staff to enter lessons and best practices they feel are worth communicating to the LBNL community. Once submitted to the Database, entries are reviewed by appropriate Subject Matter Experts and disseminated to LBNL staff via targeted e-mail listings. The Database also serves as a repository of all LBNL Lessons Learned and best practices from internal and external sources.

OIA/OCA and LBNL managers review Lessons Learned from external sources (e.g., DOE corporate Lessons Learned, industry notifications, etc.) for applicability to the LBNL Lessons Learned Program.

LBNL/PUB 5519(4), *Lessons Learned and Best Practices Program Manual*, outlines the requirements for sharing internal and external operational experiences within specific Laboratory organizations, Laboratory-wide, or with other facilities across the DOE complex.

Appendix A

LBNL Conformance with DOE-UC Contract 31, Clause H Requirements

The LBNL Contractor Assurance System, as documented in the UC Contractor Assurance System Description for LBNL (LBNL/PUB-5520), conforms to all requirements identified in the DOE-UC Contract 31, Clause H.30-Contractor Assurance System.

Contract 31, Clause H.30	UC CAS Description (LBNL/PUB-5520)
1. A comprehensive description of the CAS with processes, key activities, and accountabilities clearly identified.	Entirety of UC CAS Description, PUB-5520
2. A method for verifying/ensuring effective assurance processes. Third-party audits, peer reviews, independent assessments, and external certification (such as VPP and ISO 9001 or ISO 14001) may be used.	Section 3.3, *Assessment*
3. Timely notification to the contracting officer of significant assurance system changes prior to the changes.	*Overview*
4. Rigorous, risk-based, credible self-assessments, and feedback and improvement activities, including use of nationally recognized experts, and other independent reviews to assess and improve the contractor's work process and to carry out independent risk and vulnerability studies.	Section 3.3, *Assessment*
5. Identification and correction of negative performance/compliance trends before they become significant issues.	Section 3.3, *Assessment* Section 3.4, *Performance Measures* Section 3.5, *Issues Management*
6. Integration of the assurance system with other management systems, including Integrated Safety Management.	Section 3.1, *Assurance Process*
7. Metrics and targets to assess performance, including benchmarking of key functional areas with other DOE contractors, industry, and research institutions. Assure development of metrics and targets that result in efficient and cost-effective performance.	Section 3.4, *Performance Measures*
8. Continuous feedback and performance improvement.	Section 3.6, *Continuous Improvement*
9. An implementation plan (if needed) that considers and mitigates risks for the CAS.	N/A
10. Timely and appropriate communication to the Contracting Officer, including electronic access, of assurance-related information.	Section 3.1, *Assurance Process* Section 3.6, *Continuous Improvement*

Appendix B

References

Source Requirements Documents

1. DOE Contract No. DE-AC02-05CH11231, Clause H.30—*Contractor Assurance System*
2. LBNL *Regulations and Procedures Manual*
3. Lawrence Berkeley National Laboratory, University of California, U.S. Department of Energy-Berkeley Site Office Operating Principles, July, 2010

Implementing Documents

1. LBNL/PUB 5519(1), *Issues Management Program Manual*, rev. 3
2. LBNL/PUB-5519(2), *Root Cause Analysis Program Manual*, rev. 2
3. LBNL/PUB-5519 (3), *Data Monitoring and Analysis Program Manual*, rev. 0
4. LBNL/PUB-5519(4), *Lessons Learned and Best Practices Program Manual*, rev. 1
5. LBNL/ PUB-3111, *Operating and Quality Management Plan*, rev. 10
6. LBNL/ PUB-5344, *Environment, Safety and Health Assurance Plan*
7. LBNL *Cyber Security Assurance Plan*
8. LBNL *Emergency Management & Fire Protection Assurance Plan*
9. LBNL *Facilities Assurance Plan*
10. LBNL *Financial Management Assurance Plan*
11. LBNL *Human Resources Assurance Plan*
12. LBNL *Personal Property and Motor Vehicle Management Assurance Plan*
13. LBNL *Physical Security Assurance Plan*
14. LBNL *Procurement Assurance Plan*
15. LBNL *Advisory Board Charter* (controlled copy on OIA Web site)
16. LBNL *Contract Assurance Council Charter* (controlled copy on OIA Web site)
17. LBNL *Internal Audit Services Charter* (controlled copy on IAS Web site)
18. OIA Operations Risk Registry System Description (controlled copy on OCA Web site)

Appendix C

Glossary

ARRA	American Recovery and Reinvestment Act
BSO	Berkeley Site Office
CAC	Contract Assurance Council
CAS	Contractor Assurance System
CATS	Corrective Action Tracking System
DOE	Department of Energy
EVP	Executive Vice President
FMFIA	Federal Managers' Financial Integrity Act
IAS	Internal Audit Services
LBNL	Lawrence Berkeley National Laboratory
LMO	Laboratory Management Office
OCA	Office of Contract Assurance
OIA	Office of Institutional Assurance
PEMP	Performance Evaluation and Measurement Plan
UC	University of California
UCOP	University of California Office of the President