



**Lawrence Berkeley National Laboratory**  
**Risk Management Description for Institutional Risks**  
**Effective Date: 3-8-17**

**Rev. 3**

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

**Table of Contents**

**GLOSSARY .....3**

**OVERVIEW .....5**

    Risk Management Universe ..... 5

    Risk Management Life Cycle..... 5

**RISK MANAGEMENT GOVERNANCE STRUCTURES .....6**

    UC Oversight Governance Structure..... 6

    LBNL Internal Governance Structure..... 7

**RISK MANAGEMENT PROTOCOL .....7**

    Identify ..... 7

    Analyze..... 8

    Respond..... 9

    Monitor ..... 10

    Retiring Risk ..... 10

**INTEGRATED INSTITUTIONAL RISK REGISTRY .....10**

    Risk Registry Documentation ..... 11

**Appendix A - Roles and Responsibilities.....13**

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

**GLOSSARY**

<b>Term</b>	<b>Definition</b>
<b>Risk</b>	The <i>possibility</i> of suffering a loss or an unfavorable event, or failure to achieve a planned outcome. It is the product of the probability (or frequency) of the event occurring and magnitude of its impact (or consequence) should the event occur.
<b>Issue</b>	Any adverse safety or operational event, condition, or circumstance <i>that has resulted</i> in injury, illness, damage, loss, or noncompliance; represents a program, safety or operational deficiency; and/or adversely affects the achievement of Laboratory mission, strategic or business objectives.
<b>Institution Risk</b>	A risk the Laboratory faces that has the greatest adverse effect on employee safety and health, operations, finances, environmental, reputation, and/or accomplishing Laboratory mission and/or strategic and tactical objectives. This risk generally is Lab-wide or affects multiple divisions, and is characterized generally as compliance, operational, reputational and strategic.
<b>Division Risk</b>	A risk a Division faces that has an adverse effect on its internal operations or on its stewardship of institutional processes and services. These risks adversely affect safety, operations, budget, reputation, and/or accomplishing the Division's specific mission, strategic or business objectives.
<b>Emerging Risks</b>	Conceivable risks (or concerns raised by management and staff) that require further data (or monitoring) and analysis to understand adequately their nature, impact and/or likelihood of occurrence. These risks may emerge from internal sources or from events experienced by other DOE Laboratory or similar organizations that could adversely affect Laboratory operations.
<b>Impact</b>	The magnitude, significance, or severity of an unfavorable effect and is expressed in terms of high, medium or low. <ul style="list-style-type: none"> <li>• <b>High Impact:</b> Potential for <i>significant</i> adverse safety incident, cost, major delay or significant negative Institution-wide effect.</li> <li>• <b>Moderate Impact:</b> Potential for <i>substantive</i> safety incident, cost, or substantive negative Institutional effect.</li> <li>• <b>Low Impact:</b> Potential for <i>minor</i> safety impact, cost, or minimal negative Institutional effect.</li> </ul>
<b>Probability</b>	The likelihood that an adverse event will occur given the current state of internal control and is expressed in terms of high, medium and low. <ul style="list-style-type: none"> <li>• <b>High Likelihood:</b> has occurred multiple times in the last 12 months or probable that the risk will occur within 12 months.</li> <li>• <b>Moderate Likelihood:</b> has occurred in the last 18-24 months, or more than remote but less than probable chance that the risk will occur within 18-24 months.</li> <li>• <b>Low Likelihood:</b> has not occurred in the past, or a remote chance that the risk will occur.</li> </ul>
<b>Velocity</b>	The rate at which an adverse event will manifest itself given the current state of internal control, expressed at high, moderate or low.

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Term</b>	<b>Definition</b>
	<ul style="list-style-type: none"><li>• <b>High Velocity:</b> can occur in near real time, over minutes to a few days with little opportunity to react in time to prevent serious outcomes</li><li>• <b>Moderate velocity:</b> occurs over weeks to months, and it may be possible to employ some mitigation efforts</li><li>• <b>Low velocity:</b> occurs over months to years, and there is time to plan and establish mitigation measures before the event comes to maturity</li></ul>

# Lawrence Berkeley National Laboratory Institutional Risk Management Framework Description

## OVERVIEW

The Risk Management Description provides the framework to provide the University of California National Laboratory (UCNL) Management, Lawrence Berkeley National Laboratory (LBNL) Senior Management, and the Department of Energy (DOE) Berkeley Site Office (BSO) with an integrated view of the significant risks facing the Laboratory and to help assure that these risks are managed effectively. Laboratory risks are documented in the Integrated Institutional Risk Registry (Risk Registry), the official repository of Institutional risk data.

### Risk Management Universe

The Institutional risk management universe includes risks that pose significant potential threats to Laboratory mission, strategic objectives, and operational goals, and impact:

- Worker safety and health;
- Effectiveness and efficiency of research and operations;
- Community and environmental stewardship;
- Financial and asset management;
- Regulatory and contractual compliance; and
- Laboratory reputation.

### Risk Management Life Cycle

The risk management life cycle, Figure 1, includes 1) identifying risks using various mechanisms, 2) analyzing risks to determine impact and likelihood of occurrences and the potential velocity at which they could occur, 3) responding to risks using various strategies, and 4) monitoring risks to evaluate mitigation strategies and to provide early warning of a potential risk event, and identifying materialized risks through unexpected events (actual issues/incidents). The life cycle is depicted below.

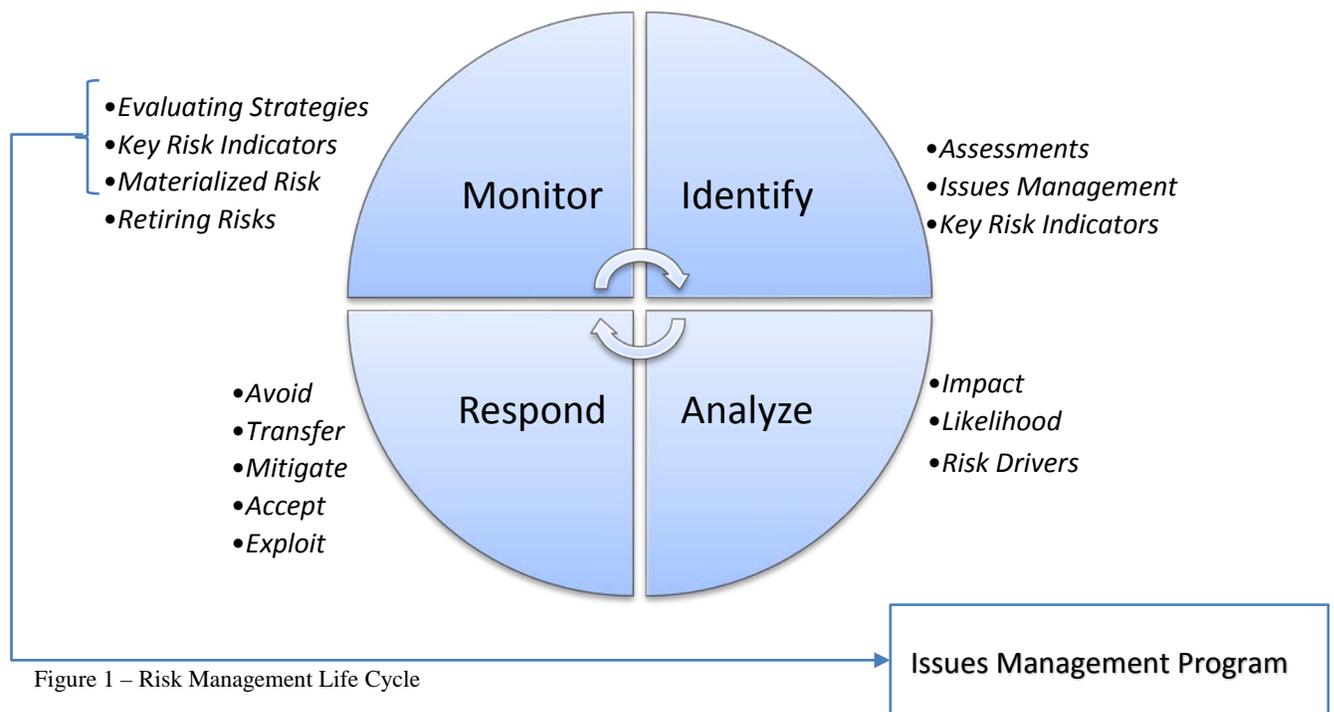


Figure 1 – Risk Management Life Cycle

# Lawrence Berkeley National Laboratory Institutional Risk Management Framework Description

## RISK MANAGEMENT GOVERNANCE STRUCTURES

The UC oversight governance and LBNL internal governance structures, Figures 3 and 4, provide the foundation for Institutional risk management as indicated below. Each entity has a role in the risk management life cycle. LBNL’s governance is specific to ensuring effective execution of the Laboratory’s risk management life cycle. Key roles and responsibilities for Institutional risk management are described in Appendix A – Roles and Responsibilities.

### UC Oversight Governance Structure

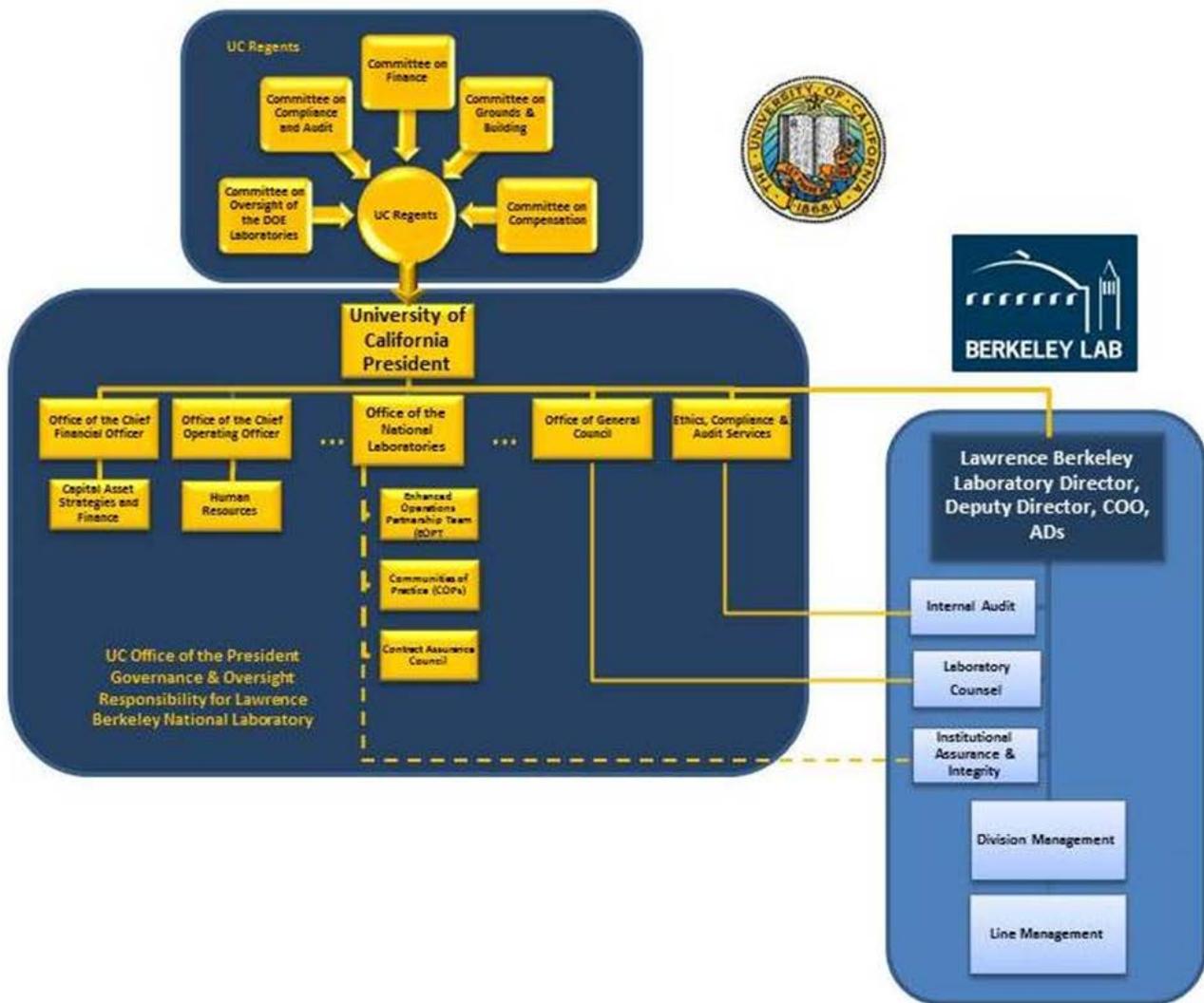


Figure 2 – UC Governance Structure

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

**LBNL Internal Governance Structure**

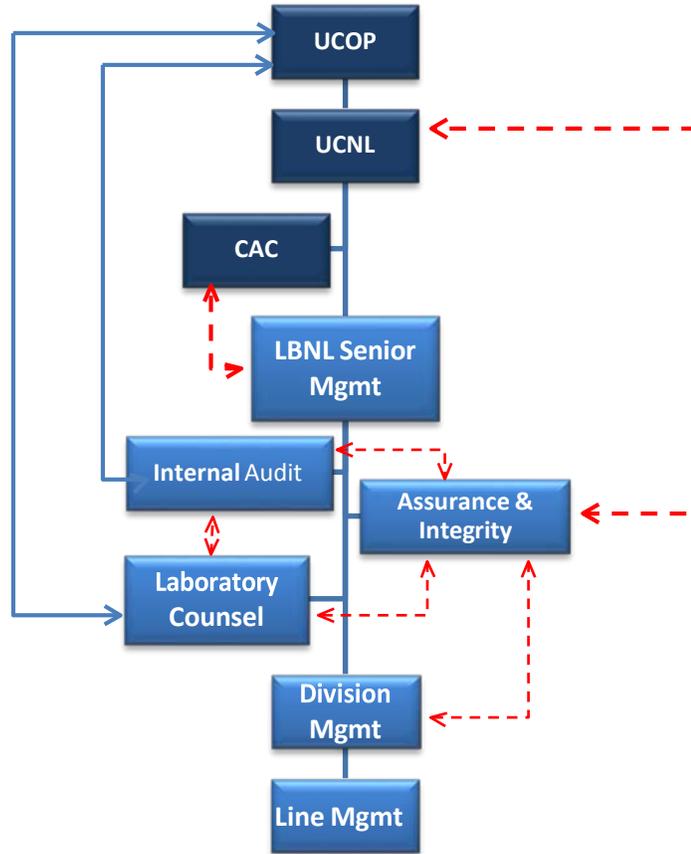


Figure 3 – LBNL Governance Structure

**RISK MANAGEMENT PROTOCOL**

**Identify**

Risks are identified using several methods that generally involve these components:

1. Assessment – management’s qualitative evaluation of risks to achieving mission, strategic and business objectives.
2. Issues Management – quantitative/objective evaluation of materialized risks as evidenced by actual incidents and losses.
3. Key Risk Indicators – quantitative, forward-looking to gauge risks using measures/metrics.

Sources of Institutional risk identification include:

- LBNL Contractor Assurance Council (CAC): *risks discussed with UCNL and LBNL Senior Management. This includes status of response strategy to ensure effective closure/resolution.*
- PEMP Performance Review (Tri-Party and functional-level): *risks discussed with Senior UCNL, LBNL, and BSO managements.*
- Operations Management Performance/Risk meetings: *risks identified by senior*

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

*Operations Leaders.*

- Institutional Issues Management Program: *high risk incidents, adverse effectiveness review results for high risk issues, high risk overdue corrective actions and adverse trends identified through quarterly performance monitoring.*
- Internal Audit Services: *risks identified during the annual risk assessment and audits.*
- Integrated Assessment Schedule: *risks identified as outcomes of the Institutional Integrated Assessment Schedule process.*
- Lessons learned from engaging with other institutions: *risks identified by observing other DOE and NNSA laboratories and sites.*

Institutional risks identified from these sources should be documented in the Risk Registry by the Risk Owner. Assurance & Integrity (A&I) staff can facilitate the documentation as appropriate.

**Analyze**

Once a risk is identified, risks are analyzed and categorized as environmental, injury (worker, safety and health), financial, reputational, operational (research and operations impacts), and/or compliance.

Three factors guide the determination of risk severity: impact, probability of occurrence, and velocity (speed) at which the risk event can manifest itself. Generally, this determination is made considering no mitigation/controls are in place (inherent risk). In addition, sufficient analysis is performed to uncover the risk drivers (conditions/underlying causes creating the risk) to enable effective risk management. Risk severity is characterized as high, medium, or low (refer to the Risk Severity Matrix, Figure 4 below). The A&I Risk Severity Guidelines also can be used as a guide to categorize risks and determine risk severity.

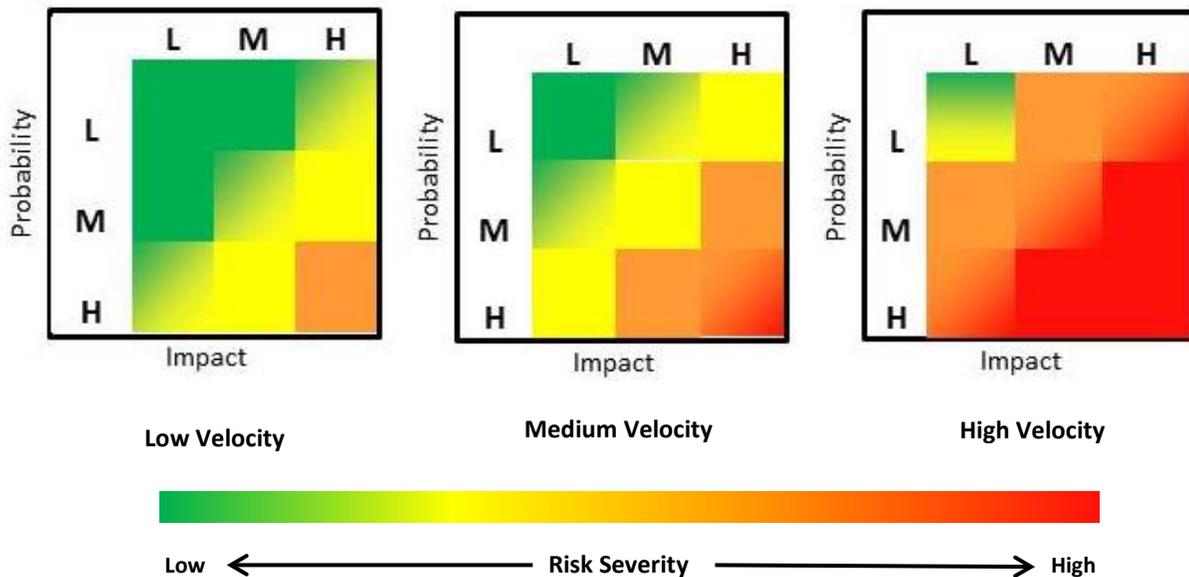


Figure 4 – Risk Severity Matrix

## Lawrence Berkeley National Laboratory Institutional Risk Management Framework Description

Sources for Institutional risk analysis include:

- CAC “deep dives”: *Presentations by Laboratory management that provide detailed information about a risk.*
- Internal project reviews: *Detailed evaluation of project implementation, issues and risks.*
- Internal and external independent reviews: *Detailed assessment of risks in work activities, processes and systems, and associated controls for operational effectiveness.*
- Audits: *independent and objective evaluation of Institutional risks and controls.*
- Management risk discussions: *management’s assessment of conditions, exposures, opportunities and causes of risk.*
- Causal Analysis Methodologies: *highly tested and proven techniques to uncover root cause of risks (risk drivers).*
- Trending Analyses: *qualitative analysis, trend charting, and key risk indicators to track, trend, and analyze risk data.*

### **Respond**

Respond means how a risk will be addressed (response strategy). Decisions about how to respond to risks must be driven by the risk severity, prioritization, the cost of mitigation (return on investment), available resources, and the ability to significantly alter the risk occurrence. In addition, management should consider its risk tolerance for performance variation when determining the risk response. Institutional risk management responses include:

- ***Avoid:*** Action is taken to stop an activity or part of the activity that is causing the risk.
- ***Transfer:*** Action is taken to transfer risk to other parties, such as insuring against losses, to eliminate or minimize risk. This could also include sharing risk across the Institution to minimize the risk to one division.
- ***Mitigate:*** Mitigate is the common risk response and involves using engineered or administrative strategies/controls to eliminate or reduce risk (impact and/or likelihood).

Mitigation/corrective action for materialized Institutional risks (actual issues/incidents) are managed following the Institutional Issues Management Program (*PUB 5519, Issues Management Program Manual*), including documentation of the issue and corrective action(s) in the Corrective Action Tracking System (CATS).

- ***Accept:*** Institutional risks are accepted by Laboratory Management, in consultation with UCNL and division management. Generally, a risk is accepted when:
  - a) Cost of mitigation outweighs benefit: *Cost prohibitive, administratively burdensome, or leads to degradation in other areas.*
  - b) Residual risks are managed to the lowest level of exposure: *Further corrective action would not be an effective use of resources because the unmitigated risk exposure would not substantially impede safety and/or operational performance. Residual risk should be within the risk tolerance acceptable to management.*
  - c) Compensating actions are in place to minimize the effects of the risk: *Corrective action is implemented to alter the exposure, but does not eliminate the risk.*

## Lawrence Berkeley National Laboratory Institutional Risk Management Framework Description

Institutional risk acceptance decisions and the business rationale are documented in the Risk Registry.

- **Exploit:** Partial or no action is taken to prevent the risk from materializing because it presents a strategic or business opportunity.

### **Monitor**

Institutional risk management effectiveness will be evaluated by UCNL and/or LBNL using both qualitative and objective methods.

### **Qualitative**

There are several qualitative methods used to discuss and evaluate Institutional risk management. These include:

- UCNL and CAC ongoing governance, oversight and operational awareness and “deep dive” presentations to CAC;
- Engagement in internal and/or independent project reviews;
- PEMP Tri-party and functional-level performance review meetings;
- Operation Management Performance/Risk meetings;
- Division management internal performance meetings; and
- Scientific program reviews.

### **Objective**

There are several more objective methods used to evaluate risk management. These include:

- Assessments and Audits;
- Key risk indicators (tracking and trending of metrics); and
- Effectiveness Reviews

### **Retiring Risk**

An Institutional risk remains active until Laboratory Management and UCNL’s Vice President of National Laboratories (VPNL), in consultation with the BSO Manager, determines that the risk is managed sufficiently, at which time it is documented as a retired risk in the Risk Registry. Sufficient means that the risk response strategy is designed, implemented and operating effectively and provides reasonable assurance that the risk will not materialize and impede the Laboratory mission and objectives.

## **INTEGRATED INSTITUTIONAL RISK REGISTRY**

The Risk Registry is the Laboratory’s official repository of Institutional risk data and is maintained in a Smartsheet. The Risk Registry contains Institutional risks agreed to by UCNL, LBNL Laboratory Management and the BSO Manager. All risk severity levels of Institutional risks are tracked on the Risk Registry. Access to the Risk Registry is open to Laboratory Senior and Division Management (and designees), Division Assurance Points-of-Contact, and UCNL and A&I staff. Laboratory management (Senior and Division) are responsible for documenting Institutional risks on the Risk Registry. A&I is responsible for maintaining the Risk Registry. The primary functions of the Risk Registry are to:

1. Document and monitor risks that pose significant potential threats to Laboratory

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

mission, strategic objectives, operational goals and reputation.

2. Facilitate risk awareness, communication, prioritization and risk-based decision making.
3. Demonstrate comprehensive, integrated and effective risk management.

**Risk Registry Documentation**

The Risk Registry contains all Institutional risks that are not yet retired. The Risk Registry entry for each risk must contain the following:

Entry Field	Description
<b>Date</b>	The date that the risk is entered in the Risk Registry.
<b>Risk Category</b>	Categorization of the risk as environmental, injury (worker, safety and health), workforce (personnel), financial, reputational, operational (science/research), operational (operations), compliance or external.
<b>UCNL Risk Area</b>	High risk area as characterized by UCNL that require additional attention or intervention.
<b>Risk Statement</b>	A clear and concise description of the exposure in the context of the risk category.
<b>Risk Severity</b>	<p>Impact, likelihood of occurrence and velocity. The severity is expressed by color coding: red (<i>high</i>), yellow (<i>medium</i>) and green (<i>low</i>) to visually indicate the risk significance. Below are the descriptions of the risk severity levels:</p> <ul style="list-style-type: none"> <li>○ <b>High:</b> high likelihood to occur, in near real time and result (or could result) in significant injury, loss, damage and/or significantly impact achievement of mission/business objectives. Requires immediate attention from senior management and requires the application of formal, rigorous controls based on the hierarchy of controls concept.</li> <li>○ <b>Medium:</b> would occur at some point in time, over weeks to months, and result (or could result) in substantive injury, loss, damage and/or impact achievement of mission/business objectives. Requires timely attention from senior management and requires the application of rigorous controls.</li> <li>○ <b>Low:</b> is not likely to occur, but could occur over months to years, and result (or could result) in nominal injury, loss, damage and/or nominally impact achievement of mission/business objectives. Requires some attention from senior management and the application of less formal controls.</li> </ul>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

Entry Field	Description
<b>LBNL Response Strategy/Description</b>	<p>The decision to avoid, transfer, mitigate, accept and/or exploit the risk (refer to the Respond section of this document).</p> <p>The response strategy should include a brief description of the action that is (or will be) implemented to address the risk or significantly lessen the impact and likelihood of the risk occurrence. If analysis is required to determine the response strategy, this could be the first action.</p>
<b>UCNL Mitigating Action(s)/Control(s)</b>	<p>UCNL mitigation strategies, consisting of four processes, that will be applied as appropriate to respond to Institutional risks:</p> <ul style="list-style-type: none"> <li>• Monitoring and performance tracking and trending;</li> <li>• Assessments and reporting;</li> <li>• Development of corrective actions and reporting; and</li> <li>• Effectiveness reviews and corrective action closeout.</li> </ul>
<b>Risk Owner(s)</b>	<p>Responsible individual(s), who has (have) the role, responsibility, authority (including resources) and accountability to effectively manage the risk.</p>
<b>Risk Status</b>	<ul style="list-style-type: none"> <li>• <b>Active:</b> in the process of developing and/or implementing a response strategy. This includes UCNL “action” risks where well defined assessments or corrective actions can readily be identified and pursued.</li> <li>• <b>Monitor:</b> Response strategy is in place and working as intended and is on the path of being mitigated sufficiently.</li> <li>• <b>Watch List:</b> UCNL risk area that requires continuous monitoring to identify specific risks that warrant follow-on assessment and/or corrective action.</li> <li>• <b>Retire:</b> Response strategy provides reasonable assurance that the risk is managed sufficiently.</li> </ul>
<b>Response Status</b>	<p>Response status is expressed in red, yellow and green:</p> <ul style="list-style-type: none"> <li>• <b>Red:</b> response is not proceeding as planned or is hindered.</li> <li>• <b>Yellow:</b> response is proceeding with some disruption and/or unanticipated change to design, scope, timeline and/or resources.</li> <li>• <b>Green:</b> response is proceeding as planned and is expected to address the risk with reasonable assurance.</li> </ul>
<b>Measures/Metrics</b>	<p>Objective methods to evaluate risk response strategies and to support the risk management life cycle, for example, assessments and audits documented on the Integrated Assessment Schedule and key performance/risk indicators.</p>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

**Appendix A - Roles and Responsibilities**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
<b>UCNL</b>	<ul style="list-style-type: none"> <li>• Select, and provide performance feedback for the Lab Director, key personnel, and senior laboratory leadership</li> <li>• Oversee and assure LBNL’s risk management framework and execution.</li> <li>• UCNL management team, in conjunction with LBNL management and the Berkeley Site Office (BSO) Manager identify high-risk areas and significant issues that require additional attention or intervention.</li> <li>• Leverage UC expertise to assess risk management effectiveness (audit, general counsel, human resources,</li> </ul>	<p>Identify and discuss Institutional risk using mechanisms, such as:</p> <ul style="list-style-type: none"> <li>• Participate in CAC Risk Discussions</li> <li>• PEMP Performance Reviews</li> <li>• Internal and independent reviews</li> <li>• Operations Management Performance/ Risk Meeting</li> <li>• Incidents and issues and they arise</li> <li>• Regular engagement with leaders at the Lab</li> </ul> <p>Share lessons learned from other UC-affiliated institutions</p>	<p>Examine risk severity and drivers using mechanisms, such as:</p> <ul style="list-style-type: none"> <li>• CAC “deep dives”</li> <li>• Participate in/charter internal and independent reviews</li> <li>• Benchmarking</li> </ul>	<ul style="list-style-type: none"> <li>• Provide expertise for oversight, and on an as-needed basis, e.g., audit, legal counsel, etc.</li> <li>• Commission independent reviews</li> <li>• Provide financing for UC-funded buildings, infrastructure, or other areas where DOE funding is either not available or not appropriate</li> <li>• Negotiate/ advocate within the UC system on behalf of the Lab, e.g. in obtaining a reduction in the pension fund contributions,</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing governance, oversight and operational awareness, including issues management</li> <li>• “Deep dive” presentations to CAC</li> <li>• Regular engagement with Internal Audit, and Internal Investigations</li> </ul> <p>Engagement in:</p> <ul style="list-style-type: none"> <li>• Internal and/or independent reviews of projects</li> <li>• PEMP Tri-party and functional-level performance review meetings</li> <li>• Operation Management Performance/Risk meetings</li> </ul>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
	etc.) <ul style="list-style-type: none"> <li>Inform, as appropriate, the Regents, UC President, other University officers and senior management, and the University's Academic Senate leaders of LBNL Institutional risks.</li> </ul>			working with labor relations, etc. <ul style="list-style-type: none"> <li>Establish Communities of Practice for learning and sharing of best practices</li> </ul>	<ul style="list-style-type: none"> <li>Key risk indicators</li> <li>Retiring risks (Laboratory Management and VPNL, in consultation with the BSO Manager)</li> </ul>
<b>Contractor Assurance Council (CAC)</b>	<ul style="list-style-type: none"> <li>Advises the VPNL on effective risk identification, prioritization and quality of assessments performed by Laboratory business and operations functions.</li> </ul>	<ul style="list-style-type: none"> <li>Participate in CAC Risk Discussions</li> <li>Share lessons learned from other institutions</li> </ul>	Participate in: <ul style="list-style-type: none"> <li>CAC “deep dives”</li> <li>Participate in internal and independent reviews</li> <li>Benchmarking</li> </ul>	Advise on appropriate /effective response strategies	Participate in: <ul style="list-style-type: none"> <li>Ongoing review and operational awareness</li> <li>“Deep dive” presentations</li> <li>Engagement in internal and/or independent reviews of projects</li> </ul>
<b>LBNL Management (Senior)</b> <i>(Laboratory Director/Deputy Laboratory Director/Associate Laboratory Directors)</i>	<ul style="list-style-type: none"> <li>Top-down ownership and accountability for the Laboratory's risk management framework and</li> </ul>	Identify and discuss Institutional risk using mechanisms, such as: <ul style="list-style-type: none"> <li>CAC Risk Discussions</li> <li>PEMP Performance Reviews</li> </ul>	Examine risk severity and drivers using mechanisms, such as: <ul style="list-style-type: none"> <li>CAC “deep dives”</li> <li>Internal project reviews</li> </ul>	<ul style="list-style-type: none"> <li>Determine appropriate Institutional risk response strategy</li> <li>Determine risk tolerance for</li> </ul>	Evaluate response strategies and manage materialized risks using mechanisms, such as:

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
	<p>execution.</p> <ul style="list-style-type: none"> <li>Evaluates, manages, documents and monitors potential Institutional risks.</li> <li>Establishes risk tolerances and the acceptable levels of residual risk at the Institutional level.</li> </ul>	<ul style="list-style-type: none"> <li>Institutional Issues Management</li> <li>Internal Audits</li> <li>Internal and external assessments/reviews</li> <li>Key risk/performance metrics</li> <li>Lessons learned from other institutions</li> </ul>	<ul style="list-style-type: none"> <li>Internal and external independent reviews</li> <li>Audits</li> <li>Management risk discussions</li> <li>Causal Analysis</li> <li>Benchmarking</li> </ul>	<p>performance variation</p> <ul style="list-style-type: none"> <li>Secure required resources to implement risk response strategies</li> <li>Perform ongoing oversight of risk response implementation and effectiveness</li> <li>Hold ongoing communication of risk performance</li> </ul>	<ul style="list-style-type: none"> <li>“Deep dive” presentations to CAC</li> <li>Engagement in internal and/or independent reviews of projects</li> <li>PEMP Tri-party performance review meetings</li> <li>Division management internal performance meetings</li> <li>Scientific program reviews</li> <li>Assessments, Audits and Issues Management</li> <li>Key risk indicators</li> <li>Effectiveness Reviews</li> <li>Retiring risks (Laboratory Management and VPNL, in consultation with the BSO)</li> </ul>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
					Manager)
<b>Division Management</b>	<ul style="list-style-type: none"> <li>• Primary day-to-day ownership and accountability for the Laboratory’s risk management framework and execution.</li> <li>• Evaluates, manages, documents and monitors division level risks, and communicates and documents those that have potential Institutional impact on the Risk Registry.</li> <li>• Ensure that shared risks are understood and managed collectively.</li> <li>• With LBNL senior management, establishes risk tolerances and the acceptable levels of residual risk at the Division level.</li> </ul>	Identify and discuss Institutional risk using mechanisms, such as: <ul style="list-style-type: none"> <li>• PEMP Performance Reviews</li> <li>• Operations Management Performance/Risk meetings</li> <li>• Institutional Issues Management</li> <li>• Internal Audits</li> <li>• Internal and external assessments/reviews</li> <li>• Key risk/performance metrics</li> <li>• Lessons learned from other institutions</li> </ul>	Examine risk severity and drivers using mechanisms, such as: <ul style="list-style-type: none"> <li>• Internal project reviews</li> <li>• Internal and external independent reviews/assessments</li> <li>• Audits</li> <li>• Management risk discussions</li> <li>• Causal Analysis</li> <li>• Trending Analyses</li> <li>• Benchmarking</li> </ul>	<ul style="list-style-type: none"> <li>• Determine appropriate Institutional risk response strategy</li> <li>• In conjunction with LBNL Management, determine risk tolerance for performance variation</li> <li>• Secure required resources to implement risk response strategies</li> <li>• Perform ongoing oversight of risk response implementation and effectiveness</li> <li>• Communicate risk performance, including materialized risks</li> </ul>	Evaluate response strategies and manage materialized risks using mechanisms, such as: <ul style="list-style-type: none"> <li>• “Deep dive” presentations to CAC</li> <li>• Internal and/or independent reviews of projects</li> <li>• Tri-party functional-level performance review meetings</li> <li>• Operation Management Performance/Risk meetings</li> <li>• Division management internal performance meetings</li> <li>• Scientific program reviews</li> <li>• Assessments, Audits and Issues</li> </ul>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
					Management <ul style="list-style-type: none"> <li>• Tracking and trending of metrics</li> <li>• Effectiveness Reviews</li> </ul>
<b>Line Management/ Principal Investigators</b>	Supports and executes the risk life cycle in their respective divisions.	Identify and discuss Institutional risk using mechanisms, such as: <ul style="list-style-type: none"> <li>• Institutional Issues Management</li> <li>• Internal Audits</li> <li>• Internal and external assessments/reviews</li> <li>• Key risk/performance metrics</li> <li>• Lessons learned from other institutions</li> </ul>	Examine risk severity and drivers using mechanisms, such as: <ul style="list-style-type: none"> <li>• Internal and external independent reviews</li> <li>• Audits</li> <li>• Division risk discussions</li> <li>• Causal Analysis</li> <li>• Trending Analyses</li> </ul>	<ul style="list-style-type: none"> <li>• Implement risk response strategies</li> <li>• Communicate risk performance, including materialized risks</li> </ul>	Evaluate response strategies and manage materialized risks using mechanisms such as: <ul style="list-style-type: none"> <li>• Internal and/or independent reviews of projects</li> <li>• BSO/LBNL functional-level performance review meetings</li> <li>• Division management internal performance meetings</li> <li>• Scientific program reviews</li> <li>• Assessments, Audits and Issues Management</li> </ul>

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
<b>Assurance &amp; Integrity (A&amp;I)</b>	Administers the Laboratory's risk management framework, which includes facilitating and documenting Laboratory Management risk discussions and maintaining current, accurate, and complete risk information on the Risk Registry. Analyzes and trends risks and issues management data.	Facilitate the identification and discussion of Institutional risk using mechanisms, such as: <ul style="list-style-type: none"> <li>• PEMP Performance Reviews</li> <li>• Operations Management Performance/Risk meetings</li> <li>• Institutional Issues Management</li> <li>• Integrated Assessment Schedule</li> <li>• Key risk/performance metrics</li> </ul> Maintain the integrity of the above mechanisms	Support analysis of risk severity and drivers using mechanisms, such as: <ul style="list-style-type: none"> <li>• Management risk discussions:</li> <li>• Causal Analysis</li> <li>• Trending Analyses</li> <li>• Benchmarking</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate appropriateness and effectiveness of response strategies</li> <li>• Communicate risk performance, including materialized risks</li> </ul>	Evaluate Institutional response strategies and the management of materialized risks using mechanisms, such as: <ul style="list-style-type: none"> <li>• PEMP Tri-party functional-level performance review meetings</li> <li>• Operation Management Performance/Risk meetings</li> <li>• Review and analysis of assessments, audits and issues management</li> <li>• Tracking and trending of metrics</li> <li>• Effectiveness Reviews</li> </ul>
<b>Internal Audit Services (IAS)</b>	Serves as an independent function that assists Laboratory and Division	<ul style="list-style-type: none"> <li>• Conduct and communicate results from risk assessments</li> <li>• Perform Internal Audits</li> </ul>	Support analysis of risk severity and drivers using mechanisms, such as: <ul style="list-style-type: none"> <li>• Internal Audits</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate appropriateness and effectiveness of response</li> </ul>	Evaluate Institutional response strategies and the management of materialized risks

**Lawrence Berkeley National Laboratory  
Institutional Risk Management Framework Description**

<b>Key Risk Management Roles and Responsibilities</b>					
<b>ROLE</b>	<b>RESPONSIBILITY</b>	<b>LIFE CYCLE</b>			
		<i>Identify</i>	<i>Analyze</i>	<i>Respond</i>	<i>Monitor</i>
	Management in identifying risks through its annual risk assessment process, and in evaluating and improving the effectiveness of the risk management framework.	<ul style="list-style-type: none"> <li>• Perform Management Advisory Services</li> </ul>	<ul style="list-style-type: none"> <li>• Management Advisory Services</li> <li>• Management risk discussions</li> </ul>	strategies <ul style="list-style-type: none"> <li>• Communicate risk performance, including materialized risks</li> </ul>	using mechanisms, such as: <ul style="list-style-type: none"> <li>• Operation Management Performance/Risk meetings</li> <li>• Internal Audits</li> <li>• Review and analysis of assessments, audits, metrics and issues management</li> </ul>
<b>Laboratory Counsel</b>	Serves as the Laboratory Risk Officer as it pertains to valuing insurance claims and providing legal counsel on Laboratory risk responses.	<ul style="list-style-type: none"> <li>• Identifying risks that are attorney client privilege, which are tracked in a separate risk registry</li> </ul>	<ul style="list-style-type: none"> <li>• Determining the legal implication(s) of risks</li> </ul>	<ul style="list-style-type: none"> <li>• Assist with determining risk responses considering legal implications</li> </ul>	<ul style="list-style-type: none"> <li>• Participates in Risk Management Meetings and risk discussions</li> </ul>