Projects and Infrastructure
Modernization Division (PIMD)

Project Management Governance Framework for <$20M (Threshold 1-3) Projects
Review and Approval

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Approved By: Todd M. Hancock
Date: 03 / 08 / 2021
Todd Hancock, Division Director, PIMD, LBNL
<table>
<thead>
<tr>
<th>Revision Author</th>
<th>Revision #</th>
<th>Revision Date</th>
<th>Changes Described</th>
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<tr>
<td>Kat Wentworth</td>
<td>0</td>
<td>January 12, 2021</td>
<td>Formal publication and initial release</td>
</tr>
<tr>
<td>Kat Wentworth</td>
<td>1</td>
<td>February 24, 2021</td>
<td>Integrated feedback from Division rollout</td>
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**Purpose**
This document specifies the approach that will be used to manage projects with a Total Estimated Cost that is less than $20M. The requirements detailed in this document will also ensure an appropriate level of project development, oversight, and monitoring is in place to consistently and efficiently deliver successful projects across the organization.

**Target Audience**
This document applies to all PIMD personnel engaged in managing <$20M projects.

**Introduction**
PIMD projects vary, involve multiple parties, and are located on and off LBNL campus. As such, it is important that project management has a consistent framework to manage and execute projects across the entire organization.

The requirements detailed in this document will ensure an appropriate level of project development, oversight, management, and monitoring is in place to consistently and efficiently deliver successful projects across PIMD.

This document outlines a Graded Approach to project management requirements as allowed within the guidance of DOE O 413.3B as adapted for smaller projects. The objective of this document and DOE O 413.3B is to deliver every project at the original performance baseline, on schedule, within budget, and fully capable of meeting mission performance, safeguards and security, quality assurance, sustainability, and environmental, safety and health requirements, unless impacted by a Directed Change.

**Scalability**
Project Teams must govern projects in accordance with the requirements of the project’s assigned Governance Thresholds. For the purposes of this document, projects will be categorized by the Total Estimated Cost (TEC), Risk, and Complexity. TEC will be a primary factor to determine the project management deliverables and earned value reporting requirements. The Governance Thresholds are as follows:

- Governance Threshold 1: Less than or equal to $1 Million
- Governance Threshold 2: Greater than $1 Million, but less than $10 Million
- Governance Threshold 3: Greater than or equal to $10 Million but less than $20 Million
- Governance Threshold 4: $20 Million and greater

**Table 1 - Scalability Requirements**

<table>
<thead>
<tr>
<th>Governance Threshold 1</th>
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<th>Governance Threshold 3</th>
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<td>Total Estimated Cost</td>
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<td>$1m to &lt;$10m</td>
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<td>Low/Med</td>
<td>Med/High</td>
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<tr>
<td>Risk</td>
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<td>Low/Med</td>
<td>Med/High</td>
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The PIMD Advisory Committee (PIMD-AC) is chaired by the PIM Division Director and composed of leadership from the Lab Directorate, Projects and Infrastructure Modernization Division (PIMD), Project Controls (Engineering Division), University of California Office of the National Laboratories (UCNL), Facilities (FAC), Environment, Health and Safety (EHS) and Office of the Chief Financial Officer (OCFO). PIMD-AC convenes monthly to review and make recommendations on at defined Stage Gates for Threshold 3 & 4 projects. If PIMD-AC is unable to convene, the PIM Division Director will request concurrence on a proposed course of action from PIMD-AC membership electronically. The PIM Division Director may choose to take any identified project change to PIMD-AC for review.

The BASO, PMO, or the PIMD-AC may assign a Threshold based on a project’s complexity, or risk profile, or on its Total Estimated Cost.

**Project Approval and Authorization**

**NOTE:** Authorization must be in place before a project enters into commitments and/or the expenditure of funds.

**Project Approval vs. Project Authorization**

Project Approval refers to the internal control process, wherein Stakeholders confirm their review and acceptance of the project plan.

Project Authorization grants the right to advance the project and delegates to the Project Manager the authority to enter into commitments and/or expend funds.

Both project Approval and Authorization are managed and documented using the “Project Planning Guide (PPG) Package”, with the Project Authorizer, PIMD Division Director for Thresholds 1-3, as the last signatory in the review order. For Threshold 3 projects, PIMD Advisory Committee must review and make recommendations before Scoping Start, Planning Complete and Design Complete Stage Gates.

After project authorization, OCFO will issue a project identification number.

**Stage Gate Process**

The Approval and Authorization of projects must be performed in accordance with the Stage Gate Process, as illustrated in Figure 1. Projects must be reviewed according to the Stage Gate Approval and Authorization Matrix, Tab 1 of the Project Planning Guide (PPG). Approval and Authorization signatures from all reviewers are required for the project to advance.

1. Stage Gates allow for the stakeholders to have additional oversight of the project and allows the project team to provide updates on all aspects (e.g. scope, schedule, resources, risks, benefits, and costs).
2. Stage Gates also allow the stakeholders to provide direction or request modifications to the project’s execution plan.
3. **Stage Gate Authorization** provides the opportunity for projects to be reviewed and either allowed to continue or be halted at logical points within the project—this can be thought of as a “go-no go” authorization approach.

4. **Stage Gate Approval and Authorization** can also be used to provide better control, oversight, and insight for projects with high risks or uncertainties.

The commitment or expenditure of funds in support of work beyond the authorized Stage Gate is considered unauthorized. Exceptions to this requirement must be approved by the PIMD Division Director.

**Figure 1 - Project Phases, Stage Gates and Documentation**

![Diagram](image)

See Table 2 for Project Stage Gate Support Documentation details.

**Project Planning Guide (PPG) Package**

1. Creation of the Project Planning Guide (PPG) Package is a requirement to initiate any project and must be updated at each Stage Gate. Decision points requiring sign-off on the PPG are:
   a. Scoping Start Stage Gate - to be submitted at the time seed monies are sought to complete conceptual planning/scoping.
   b. Planning Complete Stage Gate - to be submitted at the completion of conceptual planning and before design services are started.
   c. Design Complete Stage Gate - to be submitted at the time the design is complete, reviewed and ready for bid.
d. Closeout Completion Stage Gate - to be submitted at the time construction is complete.

2. A single PPG Package must be created for each project and must include documentation required based on the Stage Gate, see the PPG Instructions, Tab 0 of the Project Planning Guide (PPG) Package.
   a. The PPG Package must sufficiently define the project scope, cost, schedule, and risk to move the project through Stage Gate reviews.
      i. Project Manager ensures and Project Director validates that the PPG Package contents are updated and complete prior to submission for the Stage Gate Review.
   b. To obtain Project Authorization, Project Teams must complete:
      i. For Threshold 1:
         1. a complete and updated PPG package
      ii. For Threshold 2 and Threshold 3:
         1. a complete and updated PPG package, including
            a. a Project Plan document for Planning Complete Stage Gate approval.
      iii. For Threshold 4, see DOE Order 413.3B and the projects approved Project Execution Plan.
   c. Project Coordinators are to route the PPG Package according to the Stage Gate Approval and Authorization Matrix, Tab 1 of the Project Planning Guide (PPG).

3. The PPG Package must be approved and authorized prior to proceeding with work on the project.

4. If a project requires additional funding or a change in fiscal years to complete the project scope, the change authorization is documented with a Baseline Change Proposal in accordance with the Change Control process below and added to the PPG Package documents.

Additional Review
For Governance Threshold 3 and 4 projects, the PIMD Advisory Committee (PIMD-AC) reviews and makes recommendations at the following Stage Gates:

a. Scoping Start
b. Planning Complete
c. Design Complete
d. Closeout Complete
e. Baseline Change Proposals requiring Re-authorization

Project Managers and Project Directors must submit the updated PMP and request to present at an upcoming meeting.

Issues or concerns identified during the review must be resolved, or suitably addressed (e.g. by addition of a schedule activity) prior to the Stage Gate being Authorized. The Project Manager and Project Director to determine the approach for documenting and resolving outstanding issues.
Stage Gate Review Outcome Options
The PIMD Division Director evaluates and decides the outcome of each Stage Gate or BCP Review from the following:

A. Authorize/Authorize as Noted
Criteria or conditions for the Stage under review are met, and written approval is provided to move to the next Stage of the project or seek additional Authorization where required.

B. Stop
The project no longer meets the business objectives, value is lost, and/or the risks are too great. A decision is made to terminate the project and reassign resources. Includes projects that will be re-evaluated at a future date.
Table 2: Project Requirements and Deliverables by Threshold

- Threshold 1 projects will primarily use the PPG Excel Workbook for document elements listed below.
- Threshold 2 & 3 projects will primarily use the Project Plan template to organize the documents below, including use the PPG Excel Workbook, schedule and cost information from Project Controls tools and other sources in combination.
- All projects use Tab 1 signature page of the PPG Excel Workbook for project authorization.

<table>
<thead>
<tr>
<th>Document</th>
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<th>Threshold 1</th>
<th>Threshold 2</th>
<th>Threshold 3</th>
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<td></td>
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<td>$1M \times &lt;10M$</td>
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<td>Stakeholder Communication / Engagement Plan **</td>
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**Design**

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<td>Technology Readiness Assessment determination</td>
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**Execution, Monitoring & Controls**

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<td>Cost Plan / Spend Plan</td>
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<td><strong>Change Order Log (A/E, Construction contracts etc.)</strong></td>
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**Closeout**

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<td>Warranties, Operations and Maintenance Manuals, &amp; Training</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Closeout Report / Checklist **</td>
<td>Project Manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Present to PIMD Advisory Committee</td>
<td>Project Manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Circulate PPG for Closeout Complete Stage Gate</td>
<td>Project Manager to compile and update documents in a package, including PPG Excel Tabs, Project Plan template and other as required</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Accounting Closeout &amp; PID Closure</td>
<td>Project Manager</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

* Project controls supports development and documentation
** Project coordinator supports development and documentation

### Project Phases

**Pre-Project - Obtain Scoping and Estimating Funding**

To obtain seed money to complete conceptual planning/scoping, the Project Manager creates and Project Coordinator distributes Project Planning Guide (PPG) Package for **Scoping Start Stage Gate** approval and authorization.

- After approval of the PPG for scoping and estimating, a Project Identification (PID) or Work Order (WO) number (unique identifier) for the project initiation will be assigned by OCFO.

**Initiation Phase**

Note: If confirmation of basic scope, need by date, ROM cost, funding source has been done already, the project may submit a Planning Guide (PPG) Package for **Planning Complete Stage Gate** approval and authorization and move directly to Planning.

1. Objective
   a. Obtain authorization of project funding before proceeding to the Planning Phase.

2. Activities
   a. Project Identification
      i. Division and/or Department typically receives notification from the Facilities Portfolio Manager of a request for a new project, however, requests may also be received directly from a client for assistance on a potential new project.
      ii. A weekly “Project Initiation” meeting is held by the Facilities Portfolio Manager to discuss which implementing organization (PIM or FAC) is best suited to manage the project.
iii. A Project Manager is assigned by the Department Head.
iv. The Project Manager adds the project to the Master Project List.
v. The Project Manager talks with the customer, (and possibly estimating, the FAM, Facilities planning, etc.) to confirm project scope and obtain any needed information.
vi. Project Manager may need to work with the Facilities Portfolio Manager and OCFO to identify the appropriate funding source for the project.
vii. Project Manager prepares a PPG for authorization of funding and assignment of a PID.

3. Phase Completion
   a. The Project Manager creates and Project Coordinator distributes a Project Planning Guide (PPG) Package for **authorization of funding and assignment of a PID**.

**Planning Phase (Not Technical Deliverables)**

1. Objective
   a. The Project Manager and Project Director, with Project Controls support (Thresholds 2, 3 & 4) must **prepare a preliminary** Scope, Schedule, Cost during the Planning Phase.

2. Activities
   a. Project Manager coordinates with science customers, FAC, EHS, Estimating, Procurement, and other stakeholders to further define Scope, Schedule, Budget, funding, risks, procurement strategy, and staffing.
      i. Planning may include conceptual studies, sampling, work control document development, etc.
      ii. See Figure 4 and Cost Estimating Tables below for reference.
   b. For projects with a budget greater than $1M (Thresholds 2 & 3), the Project Manager must submit a Project Plan.
   c. Project Manager obtains Facilities Engineering review and approval on the preliminary design (if applicable).

3. Phase Completion
   a. Produce a Project Plan.
   b. The initial performance baseline has been set, approved, and formally authorized by the PIM Division Director.
Figure 4: Cost Influence Diagram

Tables from DOE G 413.3-21 Cost Estimating Guide

<table>
<thead>
<tr>
<th>Cost Estimate Classification</th>
<th>Level of Definition (% of Complete Definition)</th>
<th>Primary Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 5, Concept Screening</td>
<td>0% to 2%</td>
<td>Stochastic, most parametric, judgment (parametric, specific analogy, expert opinion, trend analysis)</td>
</tr>
<tr>
<td>Class 4, Study or Feasibility</td>
<td>1% to 15%</td>
<td>Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)</td>
</tr>
<tr>
<td>Class 3, Preliminary, Budget Authorization</td>
<td>10% to 40%</td>
<td>Various, including combinations (detailed, unit cost, or activity-based; parametric, specific analogy; expert opinion; trend analysis)</td>
</tr>
<tr>
<td>Class 2, Control or Bid/Tender</td>
<td>30% to 70%</td>
<td>Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)</td>
</tr>
<tr>
<td>Class 1, Check Estimate or Bid/Tender</td>
<td>50% to 100%</td>
<td>Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)</td>
</tr>
</tbody>
</table>

Table 4-2. Generic Cost Estimate Classifications and Primary Characteristics
<table>
<thead>
<tr>
<th>ESTIMATE CLASS</th>
<th>DEGREE OF PROJECT DEFINITION (Expressed as % of complete definition)</th>
<th>END USAGE (Typical purpose of estimate)</th>
<th>METHODOLOGY (Typical estimating method)</th>
<th>EXPECTED ACCURACY RANGE (Typical variation in low and high ranges)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 5</td>
<td>0% to 2%</td>
<td>Concept screening</td>
<td>Capacity factored, parametric models, judgment, or analogy</td>
<td>L: -20% to -50%</td>
</tr>
<tr>
<td>Class 4</td>
<td>1% to 15%</td>
<td>Study or feasibility</td>
<td>Equipment factored or parametric models</td>
<td>L: -15% to -30%</td>
</tr>
<tr>
<td>Class 3</td>
<td>10% to 40%</td>
<td>Budget authorization or control</td>
<td>Semi-detailed unit costs with assembly level line items</td>
<td>L: -10% to -20%</td>
</tr>
<tr>
<td>Class 2</td>
<td>30% to 70%</td>
<td>Control or bid/tender</td>
<td>Detailed unit cost with forced detailed take-off</td>
<td>L: -5% to -15%</td>
</tr>
<tr>
<td>Class 1</td>
<td>70% to 100%</td>
<td>Check estimate or bid/tender</td>
<td>Detailed unit cost with detailed take-off</td>
<td>L: -3% to 10%</td>
</tr>
</tbody>
</table>

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.

Table 4.3 – Cost Estimate Classification for Process Industries

Execution Phase (Technical Deliverables)

1. Objective
   a. Project Team works toward technical deliverables (Key Performance Parameters (KPPs)), including Design and Construction.

2. Activities
   a. Project Manager holds a kickoff meeting with the project team to review the project plan and deliverables.
   b. Project Manager and Project Coordinator manage routine communication and coordination with stakeholders - Science customers, Procurement, FAC Planning, FAC Engineering, FAC Outage Coordinator, EHS reviews, LOTO reviews, Environmental Services Group, Radiation Protection Group, etc.
   c. If part of the technical deliverable scope:
      - Update or augment planning work (conceptual studies, sampling, work control doc development, etc.).
      - Design work (Engineering or Architectural design deliverables).
      - Project Manager obtains Facilities Engineering review and approval on the final design.

1. Project Manager updates and Project Coordinator distributes Project Planning Guide (PPG) Package, including PMP if applicable, for Design Complete Stage Gate approval and authorization to proceed with Construction.

2. Note: Construction start without Design Stage Gate Authorization is Unauthorized.
   - Construction work (Physical demo, modification, and new build).
   - Timely completion of Technical Completion Reports.
1. Complete Final inspection and Punch list
2. Record Drawings
3. Commissioning reports
4. Operation and Maintenance (O&M) Manuals
5. Guarantees and Warranties to Facilities

d. Safe work in Field throughout Project Execution.
e. The performance baseline is monitored by Project Manager and Project Director.
   Change control is performed as necessary (see Change Control below).
f. At completion of construction, Project Manager updates and Project Coordinator distributes Project Planning Guide (PPG) Package for Closeout Complete Stage Gate approval.

3. Phase Completion
   a. Project Manager and Project Director confirms/documents Key Performance Parameters and technical acceptance of deliverables.
   b. Project Manager documents Client acceptance of work completion and Transition to Operations (TTO) are precursors.

**Closeout Phase (Administrative)**

1. Objective
   a. Project Manager supported by Project Coordinator must document fulfillment of all requirements, including regulatory and procurement activities, and implement the administrative and financial close of the project.
   b. Project Manager must capture lessons learned and enter them into the LBNL Lessons Learned database.

2. Activities
   a. Project Manager confirms construction is complete with a completed final inspection, commissioning, and punch list log and accepted by Facilities Engineering.
   b. Project Manager supported by Project Coordinator must document the following activities during the Closeout Phase:

      ■ Forward any final technical documentation to Facilities

      1. Complete Project Turnover to Operations Memorandum and obtain approval from FAC Engineering.

      ■ Conclude procurements with all vendors/close-out PID

      1. Resolve open subcontract liens.
      2. Approve final payment and release subcontractor retentions (if applicable).

      ■ Release remaining project team members.
      ■ Archive project records.

3. Phase Completion
   a. Department Head must decide whether to close the project.
   b. At end of Closeout, change the project status to Complete in the Master Project List.
Monitoring and Control (Project Management Reporting)
Project Directors, Project Managers, and Project Team members provide recurring verification of progress toward project goals via field safety and progress observations, cost/schedule analysis, risk analysis, quality assurance evaluations, support coordination, stakeholder communication, and other process feedback tools.

Project Directors and Project Managers should ensure the conduct and documentation of Monitoring and Control activities such as the following:

1. Measure and report project performance versus Project Plans (eg. scope, schedule, budget, baseline, etc.)
2. Perform field safety, quality, and work progress checks.
3. Schedule and perform routine communication with project team and subcontractors (eg. Owner, Architect, Contractor (OAC) meetings) regarding scope, schedule, budget, requirements, status, issues, constraints.
4. Schedule and perform monthly project cost/schedule reviews and provide monthly reporting including assessment of work-in-place values (accruals), change logs, project metrics, Management Reserve and Contingency budgets, etc.
5. Provide timely review and processing of subcontractor proposals, Requests for Information (RFIs) technical submittals, invoices, etc.
6. Actively coordinate, forecast, and review status with project supporting organizations within LBNL on project support items such as: Safe Work Planning submittals, Procurement Needs, Facility Work Orders (eg. Lock Out / Tag Out support), Utility Outage Needs, Engineering Design reviews, etc.
7. Routinely review risks (institutional, divisional, project, etc.)
8. Track and review potential issues or impacts via a project change log.
9. Report and review project performance with stakeholder and advisory groups.
10. Identify and document implementation of preventive or corrective actions needed to ensure project goals.

Cross Department/Division Projects (Multiple Project Managers)
For projects with Project Managers from different Departments and/or Divisions, if applicable, the PIMD-AC or Division Directors must:

1. Identify and document a lead Project Manager, who has overall responsibility for the project.
2. Document and assign Department and/or Division responsibilities for the project scope, cost, schedule, risk, authorization and/or approval document, and PID structure.

Integrated Change Control Governance

Project Baselines
Project Team must define which documents are associated with the Project’s baseline that require change control. This must be documented within the approved PPG Package. The project baseline must set by the end Planning Phase include the following components:
- Project Scope
- Project Cost (AACE Class 3)
- Project Schedule (AACE Level 3)

After the project is baselined, the Project Manager and Project Director should manage change control by:

- Identification and initiation of the proposed change
- Assessment of the proposed change
- Analysis of the proposed change on Scope, Cost, and Schedule
- Authorization of the Baseline Change Proposal
- Implementation of the proposed change.

**Change Control Triggers**

For all projects that already have been baselined:

- The Budget at Completion (BAC) plus contingency are set. This is called the Total Estimated Cost (TEC).
- The Baseline Completion Date (BCD), including schedule contingency are set.
- The Baseline Scope has been established and documented in the Project Plan according to the project threshold.

Therefore, any change will require a baseline change proposal be submitted, approved and documented, according to the appropriate change thresholds.

Project change triggers must at minimum include the following:

**Scope and Project Performance Triggers**

- Any Scope Change that changes the description of work necessary to perform and complete a project approved in the PPG Package (or proxy document) requires reauthorization.
- Any Project Performance change including the desired, promised, or required benefits and outcomes resulting from the execution of a project.
- Any scope-driven project change that requires modification or change order to a third-party contract or purchase requisitions.
- Replanning or re-baselining as a result of scope or performance triggers requires a Baseline Change Proposal form authorization consistent with the process described below.

**Schedule Triggers**

- Any change to schedule is approved by the Project Manager.
- Any change to a Level 2 milestone (e.g. NTP, awarding contract, Design complete, Early finish completion) is approved by the Project Director.
- Any change to a Level 1 milestone (e.g. baseline completion date) is approved by the Department Head.
• Any change to the Baseline Completion Date (BCD) greater than 20% of original baseline duration (Ex: 2 month shift is a 20% extension of a 10-month BL). A change to Project Completion Date (outside of schedule contingency), requires a Baseline Change Proposal form authorization.
  ○ Reviewed by:
    ■ Project Director
    ■ Department Head
    ■ PIMD Advisory Committee (only Threshold 3 & 4)
  ○ Authorized by the PIMD Division Director

Cost / Budget Triggers
• Requirements for scenario when the Budget at Completion changes, contingency is used, and the Total Project Cost remains the same.
  ○ Requires a baseline change log entry.
  ○ Requires Contingency release approval:
    ■ Any use of contingency - by Project Manager only
    ■ 20%-50% cumulative - by Project Director
    ■ >50% cumulative- by Department Head
• Request for additional funding for the TEC requires a Baseline Change Proposal form authorization.
  ○ Reviewed by:
    ■ Project Director
    ■ Department Head
    ■ PIMD Advisory Committee (only Threshold 3 & 4)
  ○ Authorized by the PIMD Division Director
Table 3: Change Control for Projects with Total Estimated Cost (TEC) of Less than $20M

<table>
<thead>
<tr>
<th>Authorized by</th>
<th>Project Manager</th>
<th>Project Director</th>
<th>Department Head</th>
<th>PIMD Advisory Committee review &amp; PIMD Division Director</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope</td>
<td>Changes in system requirements, or design that do not affect the scope described in Project Plan or equivalent</td>
<td>Any change to scope as described in Project Plan or equivalent</td>
<td>Any change that affects the ability to satisfy the baseline scope described in Project Plan or equivalent</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td>Any use of contingency.</td>
<td>Any cumulative use of contingency greater than or equal to 20% of original baseline contingency</td>
<td>Any cumulative use of contingency greater than or equal to 50% of original baseline contingency</td>
<td>Any request for additional Funding over the TEC</td>
</tr>
<tr>
<td>Schedule</td>
<td>Any changes to the Performance Measurement Baseline</td>
<td>Any change to a Level 2 milestone</td>
<td>Any change to the Baseline Completion Date (BCD).</td>
<td>Any change to the Baseline Completion Date (BCD) greater than 20% of original baseline duration. (Ex 2 month shift is a 20% extension of a 10 month BL)</td>
</tr>
</tbody>
</table>

Project Managers with support from Project Coordinators must create and maintain change forms and/or logs that support the Integrated Change Control Standard.

Change Form/Logs
The Project Change Order Log, Baseline Change Proposal and supporting documents should be recorded. It is acceptable for the form to be contained as an electronic record within a tool and/or system.

Change records must include corresponding technical substantiation, which support the proposed scope, cost, and schedule impacts.

Change logs must include the elements as defined in the Required Change Elements section below.
**Required Change Elements**

Change forms/logs must define and reflect the following elements:

- Unique change identification number
- Change status, including whether the change has been rejected OR in negotiation OR approved and implemented or is pending approval AND the date at which change was initiated, updated, or closed.
- Type of change
- Time, dollar, scope, and/or project performance impact of change.
- Description of change.

**Contingency Determination**

Contingency must be added to the Base Estimate to reflect Expected Risks and Estimate Uncertainty, and to provide the Baseline Cost Estimate of the project.

Governance Threshold 3 and 4 projects should carry out a Monte Carlo analysis for Class 3 estimates and higher to calculate the Baseline Cost Estimate and High Case Estimate.

The Baseline Cost Estimate is reviewed during the Planning Phase Gate. The Project Team must document the justification for the chosen Contingency within the Baseline Cost Estimate.

**Contingency Release**

A Project Manager can request contingency release up to the total amount authorized according to Table 2. Spending beyond the authorized contingency is unallowable.

Line Item Projects (O 413.3B Projects) must follow the O 413.3B Contingency Release process as defined in the Project Execution Plan.

**Project Key Performance Indicators (KPI)**

PIMD uses Project Key Performance Indicators (KPIs) to track and measure the performance of portfolios and projects, see Appendix A Project Key Performance Indicators (KPIs).

**Roles & Responsibilities**

Project Management Advisory Board - Construction Projects (PMAB-CP)

- The Project Management Office coordinates the Project Management Advisory Board for Science and Engineering projects (PMAB) and for Construction Projects (PMAB-CP)
- Provides observations, recommendations, assistance, and assurance to Project Teams, their line management and Lab Senior Management to ensure that projects are managed and completed successfully.
- Each month, a portfolio of major science, engineering, facilities, and operations projects planned for the LBNL site or involving LBNL’s resources at an off-site location are reviewed by the PMAB and PMAB-CP.
- Proactively identify, pursue and provide advice concerning all project elements including, but not limited to scope, schedule, budget, risks and mitigation, and safety in execution.
- PMAB and PMAB-CP committee membership consists of experienced project managers and functional experts from within and outside the Laboratory, tailored to meet the needs of the specific types of projects.

PIMD Advisory Committee (PIMD-AC)
- Recommends authorization or rejection of projects with costs or benefits of $10M or greater
  - Any additional projects that an individual PIMD-AC member identifies for oversight based on risk, strategic impact, cross-Division complexity or potential issues.
- Monitors project progress, validates status, and determines correction action as necessary.

PIMD Division Director
- Chairs PIMD Advisory Committee meetings.
- Authorizes all level PPG Packages for Threshold 1-3 projects at each Stage Gate.
- Serve as Sponsor’s Representative on all Projects.
- Approves or authorizes changes to the baseline scope, cost, schedule, and resources depending on Threshold.
- Reviews and authorizes project progress at each Stage Gate.
- Monitors project progress, validates status, and determines correction action as necessary.

PIMD Deputy Division Director
- Division Ops
  - Support the Division Director in oversight of division activities
  - Delegate for PIMD Division Director, as needed.
- Project Functions
  - Establish methods of development and monitor project reporting and production of standards, procedures and templates.
  - Establish methods of development and monitor preparation of Project Plans and financial analysis for project reporting.
  - Supports the PIMD Advisory Committee.
  - Conduct compliance assessments.
  - Establish and monitor methods for coordination with LBNL Ops functions outside the division in support of project planning and execution.

PIMD Department Head
- Ensures that governance framework and processes are adhered to.
- Reviews and approves scope, cost, schedule, and risk.
- Review issues and risks for projects within their portfolio.
- Meet with Project Directors and Project Managers to discuss scope, cost, schedule, issues and risks, accruals, resources and overall project performance.
- Attend project reporting meetings.
- Proposes to the Division Director, PMAB, and PIMD-AC to adopt the baseline budget and Project Contingency, if applicable.
- Escalate high priority issues and risks to the leadership team as necessary.
• Reviews and approves project progress at each Stage Gate.

Project Directors
• Responsible for assigned project portfolio compliance with safety, quality, and technical requirements.
• Reviews and approves scope, cost, schedule, and risk.
• Reviews issues and risks for projects within their portfolio.
• Meets with Project Managers to discuss scope, cost, schedule, issues and risks, accruals, resources and overall project performance.
• Attends project review meetings.
• Validates that the PPG Package contents are updated and complete prior to submission for the Stage Gate Review.
• Directs the development of risk analysis, as appropriate, according to Risk Management with support of the PC, CM, Engineering, and others.
• Escalates high priority issues and risks to the leadership team as necessary.
• Reviews and approves project progress at each Stage Gate.
• When monitoring and controlling the project governance framework, the project director needs to ensure that there are adequate meetings, reporting, risk and issue management, assurance, and project management control processes.

Project Manager
• Responsible for overall assigned project compliance with safety, quality, and technical requirements.
• Responsible for overall performance of project personnel and subcontractors.
• Reviews Procedures when assigned to a new project.
• Develops and is responsible for baseline scope, cost, schedule, risk identification, and resources.
• Enters the baseline estimate and contingencies in the system(s) and begins cost and contingency trending.
• Completes required activities and updates as outlined in the PIMD Project Management Procedures.
• Ensures that the PPG Package contents are updated and complete prior to submission for the Stage Gate Review.
• Supports budgeting, forecasting, accrual development, and invoice processing (see Cost Management Procedure).
• Manages RFI and Submittals with support from Project Coordinator.
• Create and/or maintain change forms and/or logs that support the Integrated Change Control Standard.
• Updates project folder as needed.
• Updates budget forecasts.
• Conducts Lessons Learned Review and produces final Reports at Project Close.
• Archives project documents.


- When monitoring and controlling the project governance framework, the project manager needs to ensure that there are adequate meetings, reporting, risk and issue management, assurance, and project management control processes.

Design Manager
- Leverage FA Engineering as technical representative that ensures that A/E are meeting our specifications.
- Oversee work done by outside parties.
- Ensure LBNL Engineering comments are collected and incorporated into the design and construction in a timely fashion.
- Identify and define appropriate and adequate project technical scope parameters.
- Perform periodic reviews of design documents against code, user needs and established lab standards.
- Review and comment on project deliverables (e.g., drawings, specifications, procurement, and construction packages).
- Witness 3rd party testing.
- Support preparation, review, and approval of project completion and closeout documentation.

Construction Managers (supervised by Senior Construction Manager)
- Field level line management responsible for safety, quality, and technical deliverables. Typically the Responsible Individual (RI) for subcontract work.
- Field level oversight of project personnel and subcontractors.
- Coordinate construction/fabrication services.
- Schedule in-house work through the Work Request Center.
- Acquire all necessary permits.
- Prepare a daily construction progress report for each day they are on the job, noting all construction activity.

Estimators (supervised by Chief Estimator)
- Development and/or validation of pre-work project cost estimates.
- Review and validation of cost estimates related to proposed project changes.

Project Coordinators (Supervised by Lead Project Coordinator)
- Reviews Procedures when assigned to a new project.
- Prepares documentation, coordinates approvals, and maintains records for accurate budget control.
- Collects scope, schedule, cost, safety, and customer satisfaction data and prepares status reports.
- Monitors progress against baseline scope, cost, and schedule.
- Enters the baseline estimate and contingencies in the system(s) and begins cost and contingency trending.
• Supports budgeting, forecasting, accrual development, and invoice processing.
• Supports RFI and Submittals management, including maintaining logs.
• Create and/or maintain change forms and/or logs that support the Integrated Change Control Standard.
• Produces reports for Project Director and Project Manager review.
• Manages the integrity of data in project records.
• Updates project folder as needed.
• Plans, coordinates and may oversee special projects in support of project performance.

Project Controls Analyst
• Supports development and update of project schedules (see Schedule Management Procedure).
• Supports budgeting, forecasting, and invoice processing (see Cost Management Procedure).
• Supports development of WBS & work authorization as required.
• Supports risk management with project data.
• Ensures the baseline estimate and contingencies is in the system(s) and begins cost and contingency trending.
• Monitors progress against baseline scope, cost, and schedule.
• Reviews monthly progress and supports CAM/PM in development of variance explanations.
• Monitors changes utilizing Primavera, Cobra, Reports, and a Monthly Dashboard.
• Produces reports for Project Director and Project Manager review.
• Updates Primavera (schedule, status notes, issues, risks, lessons learned, and decisions).

Procurement Representative
• Provide subcontract administration and contractual support.
• Administer subcontracts.
• Assist in source selection and bid solicitations.
• Direct preparation of Requests for Proposal.
• Perform price and cost analysis of Engineering proposals.
• Ensure all contractual provisions are approved and met. Negotiate terms, recommend award of subcontract and prepare necessary justification documentation.
• Prepare subcontract modification changes in scope of work, funding and schedules.
• Recommend resolution of disputes and subcontractor claims.
• Upon completion, perform subcontract closeout.

Environment, Health and Safety Lead
• Assist with soils characterization and soils offhaul processes and contracts to ensure compliance with governmental requirements
• Participate in the early discussions of soils offhaul options and criteria based on the new LBNL Soils Management Plan.
• Ensure EH&S resources are available for project activities.
• Ensure EHS programs are fully integrated into the Project.
• Work with the EHS team to identify and document all EHS requirements and best practices are incorporated into the Project.
• Coordinate the EHS review and approval of the design documents, involving EHS staff as needed.
• Participate in the oversight of project activities involving EHS staff during all phases of the project.
• Provide advice and support to the project team on continuous improvement of EH&S items throughout the Project.
• Review and approve the construction subcontractor safety plans.
• Provide guidance and support to the project team in the areas of EH&S to include, but not limited to, participation in the review of project documentation, oversight of contractor activities in the EH&S areas including project walk-throughs and assessments.

Fire Marshal AHJ

• Provide input throughout the project to ensure fire protection features are identified, defined and managed to completion.
• Provide plan review for compliance with fire code and witness 3rd party testing of fire water piping as applicable.

Commissioning Director

• Ensure LBNL Commissioning comments are collected and incorporated into the design and construction in a timely fashion.
• Identify and define appropriate and adequate project technical scope parameters.
• Perform periodic reviews of design documents against code, user needs and established lab standards.
• Review and comment on project deliverables (e.g., drawings, specifications, procurement, and construction packages).
• Witness 3rd party testing.
• Support preparation, review, and approval of project completion and closeout documentation.

Facilities Area Manager

• Provide technical guidance on their technical requirements if different from the standard specifications and will continue to serve as technical advisors through project completion.
• Represent the interests of all program groups and occupants of the buildings.
• Participate in project meetings and communication planning as needed.
• Participate in project design reviews as well as value engineering sessions.
• Participate in risk assessment meetings.
• Manage and prioritize craft work requests from initiation through completion.
• Provide customer communications for the status of work.
END of Requirements
Appendix A: Project Key Performance Indicators (KPIs)

PIMD uses Project Key Performance Indicators (KPIs) to track and measure the performance of portfolios and projects. These KPIs clearly link operational and individual performance to the Division’ strategy and allow leadership to accurately describe its contribution to the LBNL objectives. KPIs also ensure that projects get completed on time, project managers need to monitor and understand their team’s work process and lead the project towards long-term goals. The results enable leadership to use these indicators to either improve project performance and/or ensure that a project is efficient and cost effective.

Key Performance Indicators and or metrics help bring standardization and repeatability to processes on a jobsite. To frame actionable project KPIs that help to improve the project team’s performance, see Appendix: Project Key Performance Indicators (KPIs) which list of frequently used project KPIs.

PIMD uses three types of Project Key Performance metrics: relative, static, and dynamic.

- Relative metrics are expressed as a percentage and as a result are independent of the size of a project. This allows leadership and project teams to directly compare the performance of small projects with the performance of large projects.
- Static metrics are discrete numerical measures that do not change with time. As a result, they are project size dependent, and leadership and project teams can only use them to compare projects that are roughly the same size.
  - Cost per square foot of constructed area and charge days per lane-mile of highway are examples of static metrics.
- Dynamic metrics are those that vary with time. Dynamic metrics are also project size dependent. These metrics are generally a function of both cost and time. Some include cost, time and a function of physical size. As a result of their mathematical complexity, leadership and project teams must understand the limitations of each and every metric that they choose to use to measure project performance.

**Planned Value (PV)**

This metric is also referred to as Budgeted Cost of Work Scheduled (BCWS).

The planned value is the estimated cost for project activities planned/scheduled as of reporting date.

Compare the Planned Value with the other project KPIs to see whether a project is running ahead of schedule or have already spent a bigger portion of the project’s budget than scheduled to date.

**PV can be calculated by these two formulas:**

- Planned Value = (the hours left scheduled on the project) X (project worker’s hourly rate)
- Planned Value = (Planned % of tasks left to complete) X (project budget)
For example, if a one-year project with a total planned budget of 10 000 USD, the Planned Value after 9 months (if the project is on schedule, its completed 75% of the project activities and it has 25% to go) is 25% of 10 000 USD which makes 2500 USD. Meaning that the project planned value at this point of the project is 2500 USD.

If a project actually spent more to date, it means that its Actual Cost has been higher than the Planned Value.

*Actual Cost (AC)*
The Actual Cost is also referred to as the *Actual Cost of Work Performed (ACWP).*

It indicates how much money a project has spent on a project as to date. There’s no formula for calculating the project’s actual cost, just have to add up all the project-related expenses used to date.

A project budget is calculated considering all the hours planned for the project, so use the time spent on tasks to calculate the Actual Cost spent on salaries, resources etc.

*Earned Value (EV)*
This KPI is also referred to as *Budgeted Cost of Work Performed (BCWP).*

This project KPI shows the approved budget for all the performed project activities by a specified date. It shows how much-planned work the project has actually accomplished and what’s the budget for these accomplishments.

*Cost Variance (CV) - Planned Budget vs Actual Budget*
Project’s cost variance reflects the project expenses.

It indicates whether the estimated cost of the project is below or above the planned baseline. To calculate the Cost Variance, compare the Planned Budget to Actual budget at a given time.

When measuring the Cost Variance, the project team can easily notice whether the project has gone beyond or above the approved budget.

*Schedule Variance (SV)*
Schedule Variance shows how much ahead or behind of planned budget (and scheduled work), a project is running.

- It can be calculated by subtracting the project’s Planned Value of its Earned Value.

In other words, take the time and budget that was initially planned to spend up to date and subtract it from the actual budget spent to date. If the sum is negative, it means that the project has managed to achieve more than planned and have a bigger budget left to spend on remaining tasks.

*Cost Performance Index (CPI) and Schedule Performance Index (SPI)*
The Cost Performance Index (CPI) KPI will inform how much time a project is behind or ahead of the approved project schedule. CPI is the ratio of the planned budget to what a project actually spent to accomplish these tasks.

As the Cost Performance Index suggests the relative value of work done, it can be seen as the indicator of the project’s cost efficiency.

- The cost performance index (CPI) is a measure of the conformance of the actual work completed (measured by its earned value) to the actual cost incurred: \( \text{CPI} = \frac{EV}{AC} \).

The Schedule Performance Index (SPI) KPI will inform if a project is ahead or behind the planned project schedule.

- The schedule performance index (SPI) is a measure of the conformance of actual progress (earned value) to the planned progress: \( \text{SPI} = \frac{EV}{PV} \).

In both of the above formulas, a value of 1.0 indicates that the project performance is on target. When CPI or SPI are greater than 1.0, this indicates better-than-planned project performance, while CPI or SPI less than 1.0 indicates poorer-than-planned project performance. The formulas used to calculate the CPI and SPI indices are generally based on cumulative costs.

**Planned Hours Worked vs Actual**

This project metric indicates how many working hours were planned for the project processes compared to the actual time spent. This metric can be applied to different time periods and compare multiple project phases. If the actual amount of hours spent highly exceeds the scheduled time, it’s time to re-estimate the time scheduled for the project.

**Overdue Project Tasks / Crossed Deadlines**

This project KPI provides an overview of how many project activities are overdue.

- This KPI is a calculated percentage of projects with crossed deadlines compared to all the completed project activities.

If there is a high percentage of overdue tasks; the project team may need additional resources or execution strategy.

**Missed Milestones**

Similar to the number of overdue/missed deadlines, this KPI is widely used in project dashboards. It indicates whether a project overestimated its capacities and are running behind schedule or the project is doing just fine, never missing a milestone.

It is typical to miss a couple of milestones during a long-term project process, but if it’s becoming a rule instead of the exception, it may be an indicator that the project team needs to review the lifecycle of a project.

**Percentage (%) of Task Completed**
Enter the planned time for each project activity so that the KPI won’t reflect the number of various-size tasks but the time spent. The leadership and project teams will get more accurate reporting and understand what phase projects are actually in.

**Percentage (%) of Project Completed on Time**
This project KPI indicates the number of projects completed on time compared to crossed deadlines.

If the leadership or project teams are not able to keep this percentage over 80%, it might be necessary to reassess resources and/or contracting strategy or accept fewer projects from customers.

**Percentage (%) of Projects Completed on Budget**
The percentage of projects delivered within a percentage of the authorized amount excluding unreleased contingency, at the time time of original authorization (100% funding).

**Percentage (%) of Cancelled Projects**
This metric is widely used by organizations that frequently take up new projects. But the number of cancelled projects also reflects the organization’s capability to plan ahead. Foreseeing whether a project is going to be successful and the project team sufficiently qualified to achieve all the project goals.

Perceive the percentage of cancelled projects as a reflection on the sustainability of the organization’s or customers decisions.

**Contingency Index**
Contingency index is a measurement of work progress relative to contract contingency drawdown, computed as the ratio of physical percent complete to percent contingency expended as follows:

- Contingency Index = Physical %R Complete / % Contingency Expended

Contingency Index of 1.0 or greater reflects a contingency drawdown at the same or slower rate compared to the project progress. When a contingency index is less than 1.0, it indicates that contingency is drawn down at the faster rate compared to the progress, which usually can be a sign of potential cost overrun.
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