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LAWRENCE BERKELEY NATIONAL LABORATORY

U.S. DEPARTMENT OF ENERGY

FACILITIES DIVISION CAPITAL PROJECTS

CAPITAL PROJECTS PROCEDURES MANUAL

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U.S. DEPARTMENT OF ENERGY

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REVIEW AND APPROVAL

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REVISION HISTORY

Rev #	Rev Date	Sections	Description
0	Feb 2006	All	Reorganize contents of *Project Management Procedures Manual* into *Design & Construction Procedures Manual* and *Construction Standards & Design Requirements*.
1	Sep 2007	B5	Revise requirements for posting safety documents at the job site, to satisfy ISM CAP #6.8 and 6.8a.
2	Nov 2007	B3	Revise to include Plant Operations Design Review Procedure, to satisfy ISM CAP Activity #6.10a and 6.10b.
3	Feb 2009	All	Rename to *Capital Projects Procedures Manual*. Revise to reflect organizational changes, Lab-wide EH&S improvements, HSS safety audit recommendations, 2008 CP internal audit Corrective Actions, and USB soil issues Corrective Actions. Add Review and Approval, Revision History, and Disclaimer. Remove Distribution List.

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DISCLAIMER

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PREFACE

A. MANAGEMENT SYSTEMS DESCRIPTION

These procedures apply to all projects undertaken by Lawrence Berkeley National Laboratory's Facilities Capital Projects Department, generally defined as design and construction of conventional facility projects whose cost is estimated at $5 million or higher. Capital Projects carries out design and construction of new facilities and renovations or modifications to existing facilities, including management of projects subject to Department of Energy Order 413.3A. These procedures provide guidance on the control of project cost, schedule, and scope; performance of the work according to standards for environmental, safety and health, safeguards and security, procurement, and financial reporting; with a goal to deliver a project fully capable of meeting mission need.

B. MISSION

These procedures support the Facilities Capital Projects mission:

In support of the Lawrence Berkeley National Laboratory Scientific mission, deliver cost-effective services and projects safely, on time, on budget, within scope and using a team approach. Build good buildings for LBNL.

C. REVIEW PERIOD

These procedures will be reviewed annually to assess whether any updates are needed.

SECTION A

PROJECT PROCEDURES

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PROJECT INITIATION

A project can be initiated when a client contacts the Facilities Work Request Center by phone, e-mail, or by submitting a Work Request Form to Facilities on the Web page. A project can also be initiated when funding is appropriated by Lawrence Berkeley National Laboratory (LBNL) management for General Plant Projects/Institutional General Plant Projects (GPP/IGPP), or by the Department of Energy (DOE) for Line Item Projects (LIP). Facilities assesses the extent and complexity of the project, and then assigns the project to the appropriate Project Manager. The Project Manager contacts the client to acknowledge receipt of the project request, and begins communications with the client to determine the scope of the project.

Large projects typically proceed in the following phases: Pre-project Planning, Conceptual Design, Preliminary Design, Final Design, Construction, and Project Closeout. Small projects often have scoping and estimating, design, construction, and closeout phases. It may be necessary to initiate a project multiple times due to changes in funding sources or due to the timing of authorizations required to proceed with the project.

A. PROJECT INITIATION FORM

The Project Initiation Form (PIF) will be routed to initiate all new projects. The form is to be prepared by the Project Manager (PM), reviewed by the Project Director (PD), reviewed by the Resource Analyst, then sent to the Capital Projects Department Head for approval.

B. PROJECT INITIATION FOLDER

The Project Initiation Folder (aka Orange Folder) is a file folder (typically orange in color) that is circulated to initiate a project through the groups that provide project support, including design, Environment, Health, and Safety, and the Facilities Environmental Planner, who oversees National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) compliance. The folder contains a routing sheet to initiate the assignment of project personnel and Subject Matter Experts (SMEs) by their respective supervisors and managers.

The Project Administrator is responsible for preparing the Project Initiation Folder, circulating it, and expediting the return of the folder to the Project Manager. Through this process, the project team is assigned and the NEPA/CEQA process is identified and/or resolved. A copy of the approved NEPA/CEQA documentation is kept in the project file; acknowledgment of completion of the review is made by the Environmental Planner in the Project Initiation Folder.

C. TEAM ASSIGNMENTS

The Project Initiation Folder is circulated to supervisors and managers who will assign personnel to support the project. The team personnel assignments are transferred to a project team directory that is distributed to the team and updated as necessary. The directory lists the team members with their title, e-mail, and contact phone numbers. The Project Administrator is responsible for developing, maintaining, and distributing the project team directory.

D. PROJECT FILES

The project files and file directory are set up and maintained by the Project Administrator. The project files are the official project record; all project team members should forward relevant project documents to the Project Administrator for filing. A standard file directory format is available and should be used for all projects. This format can be tailored to the needs of each individual project. Each set of files will have a directory, listing the contents and placement of all project documents. Whenever a folder is retrieved from a file, a place-holder shall be inserted to identify (1) the folder in use, (2) the person removing the folder, and (3) the date the folder was removed.

E. WORK BREAKDOWN STRUCTURE (WBS)

In order to organize project activities and track project costs, a Work Breakdown Structure (WBS) will be established for all projects. A standard WBS, using Project IDs in a "project tree," should be used for all GPP/IGPP, Line Item, and other large construction projects. The Project Manager is responsible for establishing the WBS with the assistance of the Project Administrator, Project Controls staff, and Resource Analyst. The Project Manager will communicate the WBS to the project team Task Managers (refer to section B1, Roles and Responsibilities). The project team members are responsible for verifying that their charges are made against the correct Project ID number. The Project Manager is responsible for verifying that costs for services from the Architect/Engineer (A/E), consultant, construction subcontractor, and other project activities are charged to the correct Project ID number.

F. CLIENT COMMUNICATIONS PLAN

A client communications plan shall be developed for all projects. Client communications start when the project is assigned to a Project Manager and continue throughout the project until closeout. The Project Manager is responsible for developing an effective communications plan that is tailored to the needs of each project.

The client communications plan is designed to help facilitate communications between Facilities Capital Projects and the clients, users, and initiator/sponsor of the project. The plan is intended to establish schedule dates when the project is reviewed with key project personnel. These meetings are scheduled to review project progress, budgets, schedules, scope, risks, critical decisions, changes, and other project information.

PROJECT INITIATION CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Project Initiation Form		
B.	Project Initiation Folder (Orange Folder)		
C.	Team Assignments		
D.	Project Files		
E.	Work Breakdown Structure		
F.	Client Communications Plan		

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PRE-PROJECT PLANNING

Pre-project planning is an interactive process that identifies user needs and evaluates the function, form, and site requirements of the proposed facility. Requests for new capital projects are often handled as studies, resulting in preliminary scope definition and preliminary cost estimates. A strategic assessment of potential environmental impacts, hazards analysis, government regulations, economic, and technology changes is important during this phase.

A. INITIATION

Requests for pre-project planning studies are frequently generated by Facilities Strategic Planning, as a result of the LBNL Unified Project Call Process. Line Item Projects usually have a pre-project planning phase associated with preparation of a Critical Decision-0 (CD-0) submittal. Initiation of these studies follows the standard project initiation process, although it may be tailored in response to the limited duration of these activities.

B. INITIAL DESIGN STUDIES

Initial design studies are performed by either in-house design forces or a consulting Architect/Engineer (A/E) firm. Studies can include siting alternatives, preliminary programming, systems descriptions, design alternatives, and other information needed to identify and define the scope of the project. Preliminary cost estimates shall be prepared for design studies, as necessary.

C. ALTERNATIVES ANALYSIS

Alternatives for a proposed project shall be identified and evaluated. A life-cycle cost analysis with return on investment information is prepared on larger projects. The benefits of the proposed project over other alternatives shall be identified.

D. MISSION NEED STATEMENT (MNS)

A Mission Need Statement (MNS) is prepared for all Line Item Projects for submission to the Department of Energy (DOE). The Mission Need Statement identifies the performance gap between current capabilities and the required capabilities. Detailed requirements for Mission Need Statements can be found in DOE Order 413.3A.

E. ASSESSMENTS

Assessments to gather information and identify potential impacts of the project may be conducted during the pre-project planning phase. These assessments may include reviewing project conformance with the LBNL Institutional Plan, identifying environmental considerations, safety analysis, geotechnical investigations, and other assessments appropriate to the project.

F. CRITICAL DECISION-0 (CD-0): Approve Mission Need

For Line Item Projects, approval of mission need is documented by DOE with Critical Decision-0 (CD-0). The Initiation Phase begins with the identification of a mission-related need. Approval of CD-0 formally establishes a project and begins the process of

conceptual planning and design used to develop alternative concepts and functional requirements.

The Project Director and/or Project Manager performs Pre-conceptual Planning, focusing on the program's goals, safety planning, and design, and prepares a Mission Need Statement. Detailed requirements for these documents are found in DOE Order 413.3A.

CONCEPTUAL DESIGN

The Conceptual Design phase is the formative stage in the design of a facility, and is prepared for developing and quantifying: the physical construction requirements of the project, the budget cost estimate, and the schedule of key design and construction activities. The conceptual design is based upon user requirements accepted by management, and establishes the allocation, size, capacity, and functional needs of the project.

The purpose of the conceptual design is to describe the project, to justify its need, to establish schedule and budget, and to obtain project funding. This section sets forth the actions required by the Project Manager and the tasks performed by the design team in developing the conceptual design.

Project design is accomplished in phases: Conceptual Design, Preliminary Design, Final Design, Construction Support, and Project Closeout. The conceptual design phase, and how it meshes with the other project phases and the budget process, is shown in Department of Energy (DOE) Order 413.3A.

A. INITIATION

The conceptual design is initiated by the Project Manager, using the Project Initiation Form (refer to Section A1, Project Initiation) to request funding. The Resource Analyst will assign Project IDs. The Project Administrator will circulate an Orange Folder for team assignments.

B. PROJECT PLAN

The Project Manager shall prepare a schedule and budget for the conceptual design phase. Key milestone dates, such as submittal of Construction Project Data Sheets, submittal of the Conceptual Design Report, and submittal of Critical Decision-1 (CD-1) documents, should be discussed with the DOE Berkeley Site Office and then incorporated into the project schedule. Task plans are created and agreed to for LBNL design team support.

C. INITIATION MEETING

The Project Manager shall schedule a project initiation meeting with the Project Director to review the proposed scope, schedule, and budget.

D. A/E DESIGN FIRM SELECTION

An Architecture/Engineering (A/E) selection committee shall be formed to select an A/E firm for conceptual design. The committee shall consist of the Project Manager, Procurement representative, client representative, and one or more A/E staff members. A memo is sent from the selection committee chair (always the Procurement representative) to the Capital Projects Department Head to approve the selection committee members. Selection committee members review and score proposals submitted by candidate firms. The members' scoring of the firms is reviewed in a committee meeting, and a shortlist is developed of firms suitable for interview. Interviews are held, short-listed firms are rescored by the committee members, and a selection is made. The selection committee chair sends a memo to the Capital Projects Department Head for approval of the selected firm.

E. PROJECT DESIGN REQUIREMENTS (PDR)

The Project Design Requirements (PDR) document establishes the scope of work for an outside A/E firm. A standard Project Design Requirements document format is available and should be used. The Project Manager, with the assistance of the Project Administrator, will draft a PDR for the project. Information on the project objectives, budget, and project schedule will be included in the draft. The Project Manager will distribute the draft document to the project team for additional input on A/E tasks, project scope summary, and deliverables. The document will reference the LBNL Construction Details and Design Guidelines for detailed design information. Relevant in-house documentation such as programming or prior studies may be attached to the PDR. The PDR is attached to the Task Request for A/E Services and sent to Procurement for incorporation into the contract documents.

F. A/E SUBCONTRACT

The Project Manager will prepare a Task Request for A/E Services, to be approved by the appropriate Project Director and the Capital Projects Department Head. The Project Administrator will initiate a purchase requisition and send the Task Request and PDR to Procurement. Procurement will send a request for proposal to the A/E firm. The Project Manager will review the fee proposal, negotiate or clarify if needed, then send an e-mail to Procurement indicating that the proposed fee is acceptable. Procurement will issue a Purchase Order Subcontract. Contract documents consist of three parts: Purchase Order Subcontract, General Provisions, and Project Design Requirements.

G. DESIGN KICK-OFF MEETING

The Project Manager will schedule a design kick-off meeting with the A/E firm, client, and LBNL project team. The project scope, A/E firm tasks, and conceptual design schedule should be reviewed.

H. DESIGN PROGRESS MEETINGS

Design progress meetings should be scheduled periodically, as determined by the Project Manager. Scope issues, design direction, preliminary cost estimates, etc., should be discussed as necessary.

I. INITIATE ENVIRONMENTAL REVIEW

The Project Manager will request the Facilities Environmental Planner to initiate a National Environmental Policy Act/California Environmental Quality Act (NEPA/CEQA) environmental review of the project. This request should be made at a point early in conceptual design, after a site has been identified and the basic scope parameters have been established. The project team provides information as needed to the Environmental Planner. A copy of the approved NEPA/CEQA documentation is kept in the project file; acknowledgment of NEPA/CEQA completion is made by the Environmental Planner in the project Orange Folder.

J. ARCHITECTURAL DESIGN REVIEW

When the proposed design direction for the project has been established, the Project Manager shall schedule an architectural design review meeting to review the design.

K. FINAL SUBMITTAL

The final submittal from the A/E firm should be a completed Conceptual Design Report (CDR) . A detailed cost estimate should be included as part of the report.

L. PROJECT TOTAL ESTIMATED COST (TEC)/TOTAL PROJECT COST (TPC)

The Project Manager will prepare a Total Estimated Cost (TEC) and Total Project Cost (TPC) for the project, based on the detailed estimate prepared by the A/E firm. These budgets are documented as cost supplements to the CDR, using standard formats. Budget information is displayed on the following forms:

1. Construction Cost Estimate Summary

2. Escalation Analysis

3. Major Components of Cost Estimate

4. Budget Authority/Budget Obligation (BA/BO) Chart

5. Contingency Analysis

6. Engineering, Design, and Inspection (ED&I) Analysis

M. CONSTRUCTION PROJECT DATA SHEETS

Construction Project Data Sheets are prepared for all Line Item Projects. The data sheet is submitted in advance of the other CD-1 documentation, and the submittal date must appear as a milestone on the conceptual design schedule. The Total Estimated Cost, Total Project Cost, major schedule dates, project justification summary, and project description all become fixed with the submittal of the data sheet.

N. CRITICAL DECISION-1 (CD-1): APPROVE ALTERNATIVE SELECTION AND COST RANGE

Critical Decision-1 approval marks the completion of the project Definition Phase, when the conceptual design is developed. Approval of CD-1 provides the authorization to begin the project Execution Phase.

The Project Manager, with assistance from the Integrated Project Team (IPT), which includes the Federal Project Director, other assigned team members from the Berkeley Site Office, and members of the Facilities project team, prepares the required documents (see DOE Order 413.3A). The CD-1 documents will be reviewed by the project team, client, and Facilities Division management prior to transmittal from the Facilities Division Director to the DOE Berkeley Site Office.

CONCEPTUAL DESIGN CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Initiation		
B.	Project Plan		
C.	Initiation Meeting		
D.	A/E Design Firm Selection		
E.	Project Design Requirements (PDR)		
F.	A/E Subcontract		
G.	Design Kick-off Meeting		
H.	Design Progress Meetings		
I.	Initiate Environmental Review		
J.	Architectural Design Review		
K.	Final Submittal		
L.	Project TEC/TPC		
M.	Construction Project Data Sheets		
N.	CD-1 Approval		

PRELIMINARY DESIGN

The Preliminary Design phase begins after conceptual design is completed, or a project study has established the project scope, cost range, and schedule. Preliminary design continues the design effort, utilizing the Conceptual Design Report (CDR) and the project design program as a basis for project development.

Preliminary design usually represents about 25% to 35% of the total design effort. For Line Item Projects, the preliminary design stage is complete when there is sufficient project information to support development of the Performance Baseline. The Performance Baseline is set with Department of Energy (DOE) approval of Critical Decision-2 (CD-2).

A. INITIATION

Since the Preliminary Design phase is often initiated after the receipt of Project Engineering and Design (PED) funding for Line Item Projects or approval of the Planning List for General Plant Project/Institutional General Plant Project (GPP/IGPP) projects, it is usually necessary to initiate the preliminary design as a new project. This includes setting up new Project IDs, updating the Work Breakdown Structure, requesting new team assignments, and creating new project files. The Project Manager will contact the client to inform him/her of the project team assigned to the project and to confirm the scope of work.

B. PROJECT PLAN

The Project Manager prepares a schedule and budget for the project. The Project Manager also prepares a project scope statement and obtains client concurrence. Task plans are created and agreed to for LBNL design team support. Task plans are distributed to the Task Managers (including the project plan, scoping document, schedule, cost plan, and responsibility grid) and copied to the project file.

C. DESIGN METHOD OF PERFORMANCE

Establish the method of performance for the design phase of the job. Determine whether traditional design and construction is appropriate or whether another method of procurement is needed, such as design-build. The “make or buy” decision for design work shall be based on the following:

1. Design of GPP/IGPP and Line Item Project work should generally be done by outside stable or executive Architecture/Engineering (A/E) firms, who are selected using selection criteria based upon qualifications and experience.

2. Extensive work around ongoing research activities or involving high levels of unknowns and uncertainties, or relatively small projects with unusually short lead times, or other unique requirements that prohibit the use of outside A/E subcontractors, should be done with an in-house design team.

The Project Manager will review the proposed method of performance with the Project Director. The decision whether to use in-house staff or an outside A/E firm for preparation of the design should be made by the Project Director.

D. CONSTRUCTION METHOD OF PERFORMANCE

Establish the method of performance of construction on the job. The "make or buy" decision for construction work shall be based on the following:

1. Construction of GPP/IGPP and Line Item Project work should generally be done by outside construction subcontractors, using pre-qualification and competitive bidding procedures.

2. Projects involving extensive work around ongoing research activities, or involving high levels of unknowns and uncertainties, may be done with in-house Small Projects, Preventative Maintenance, or Utilities construction forces, with in-house supervision of labor-only contractor forces, or in-house supervision of multiple subcontractors.

The Project Manager will review the proposed method of performance with the Project Director. The decision whether to use in-house forces or an outside construction subcontractor should be made by the Project Director.

E. ENVIRONMENTAL AND SAFETY REVIEW

1. Obtain NEPA/CEQA review/approval through the LBNL Environmental Planner, in Facilities' Development and Assurance group.

2. Obtain safety review/approval through the EH&S Facilities Projects Coordinator.

F. A/E DESIGN FIRM SELECTION

When an outside A/E firm is to be used for preliminary design, an A/E selection committee shall be formed. The committee shall consist of the Project Manager, Procurement representative, client representative, and one or more design team staff members. A memo is sent from the selection committee chair (always the Procurement Subcontract Administrator) to the Capital Projects Department Head to approve the selection committee members. Selection committee members review and score proposals submitted by candidate firms. The members' scoring of the firms is reviewed in a committee meeting, and a shortlist is developed of firms suitable for interview. Interviews are held, short-listed firms are rescored by the committee members, and a selection is made. The selection committee chair sends a memo to the Capital Projects Department Head for approval of the selected firm.

G. PROJECT DESIGN REQUIREMENTS (PDR)

The Project Design Requirements (PDR) document establishes the scope of work for an outside A/E firm. A standard PDR document format is available and should be used. The Project Manager, with the assistance of the Project Administrator, shall draft a PDR for the project. Information on the project objectives, budget, and project schedule will be included in the draft. The Project Manager will distribute the draft document to the project team for additional input on Architect/Engineer tasks, project scope summary, and deliverables. The document will reference the LBNL Construction Details and Design Guidelines for detailed design information. Relevant in-house documentation such as programming or prior studies may be attached to the PDR. The PDR is attached to the Task Request for A/E Services and sent to Procurement for incorporation into the contract

documents. Revisions to the A/E firm's scope of work will be documented by modifying the PDR to incorporate the changes.

H. A/E SUBCONTRACT

The Project Manager shall prepare a Task Request for A/E Services, to be approved by the appropriate Project Director and the Capital Projects Department Head. The Project Administrator will initiate a purchase requisition and send the Task Request and PDR to Procurement. Procurement will send a request for proposal to the A/E firm. The Project Manager will review the fee proposal, negotiate or clarify if needed, then send an e-mail to Procurement indicating that the proposed fee is acceptable. Procurement will issue a Purchase Order Subcontract. Contract documents consist of three parts: Purchase Order Subcontract, General Provisions, and Project Design Requirements.

I. CONSULTANTS

Consultants for geotechnical studies, surveys, noise and vibration studies, or other specialties should be hired as needed. A competent consultant shall be engaged to perform a failure analysis on projects and control systems that have significant environmental, health, or safety consequences. The process for hiring these consultants is similar to the A/E hiring process, but varies depending on the dollar amount of the subcontract.

J. DESIGN KICK-OFF MEETING

The Project Manager will schedule a design kick-off meeting with the A/E firm, client, and LBNL project team. The project scope, A/E firm tasks, and design schedule should be reviewed.

K. DESIGN PROGRESS MEETINGS

Design progress meetings should be scheduled periodically, as determined by the Project Manager. Scope issues, design direction, preliminary cost estimates, etc., should be discussed as necessary.

L. PROGRESS SUBMITTALS

Typical preliminary design progress submittals would be at the 50% and 100% complete stages. Requirements for the submittals are defined in the PDR document. Submittals will be distributed by the Project Administrator to the project team. The Project Manager will establish a due date for comments to be submitted. Comments will be collected by the Project Administrator and transmitted to the A/E firm.

M. ARCHITECTURAL DESIGN REVIEW

When the proposed design direction for the project has been established, the Project Manager shall schedule an architectural design review meeting. Obtain University of California Regents project design approval (if Total Estimated Cost (TEC) is more than $5 million) and/or approval of site selection if not in general conformance with the LBNL Long-Range Development Plan (LRDP).

N. REPORTS

1. Prepare monthly status and progress reports and submit to the Project Director for review (refer to Section B4, Reporting).

2. Present monthly progress at DOE meetings.

3. Update cost plans and periodically reconcile budget as needed. Review scope, schedule, or budget variances with the Project Director and project sponsor for approval before proceeding with the next phase.

O. CRITICAL DECISION-2 (CD-2): APPROVE PERFORMANCE BASELINE

Critical Decision-2 marks the completion of preliminary design, the first major milestone in the project Execution Phase. Preliminary design is complete when it provides sufficient information for the development of the Performance Baseline.

The Project Manager, with assistance from the Integrated Project Team (IPT), assembles project documents for submittal to DOE for CD-2 approval.

The LBNL Project Management Office reviews the CD-2 documents prior to submittal to DOE. Detailed requirements for this submittal are found in DOE Order 413.3A.

Critical Decisions 2 and 3 may be combined for design build projects in accordance with DOE Order 413.3A.

PRELIMINARY DESIGN CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Initiation		
B.	Project Plan		
C.	Design Method of Performance		
D.	Construction Method of Performance		
E.	Environmental and Safety Review		
F.	A/E Design Firm Selection		
G.	Project Design Requirements (PDR)		
H.	A/E Subcontract Issued		
I.	Consultants Hired		
J.	Design Kick-off Meeting		
K.	Design Progress Meetings		
L.	Progress Submittals		
M.	Architectural Design Review		
N.	Monthly Status and Cost Reports		
O.	CD-2 Approval		

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FINAL DESIGN

The Final Design phase utilizes work from the Preliminary Design phase to develop drawings and specifications for bidding and construction. Final design includes any revisions required from the preliminary design effort.

A. INITIATION

For Non-Cap and General Plant Project/Institutional General Plant Project (GPP/IGPP) funded projects, final design begins with the return of comments on the preliminary design submittal to the Architect/Engineer (A/E). The Project Manager gives direction to the A/E to proceed with final design. For Line Item Projects, the Department of Energy's Critical Decision-2 (Approve Performance Baseline) is required prior to beginning the final design phase. Final design cannot proceed unless the environmental reviews under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) are completed.

B. ADMINISTRATION OF A/E SUBCONTRACT

The Project Manager, working with Procurement, is responsible for administering the A/E subcontract. The Berkeley Lab Procurement Standard Practices Manual provides additional information on administering subcontracts. The A/E subcontract documents consist of three parts: Purchase Order Subcontract, General Provisions, and Project Design Requirements.

Services to be supplied by the A/E are set forth in the PDR. Requests for additional services should be directed to the Procurement Subcontract Administrator, with a copy to the Project Manager. Invoices should be directed to Accounts Payable, with a copy to the Project Manager.

C. DESIGN PROGRESS MEETINGS

Design progress meetings should be scheduled periodically, as determined by the Project Manager. Scope issues, design direction, cost estimates, etc., should be discussed as necessary.

D. PROGRESS SUBMITTALS

Typical final design progress submittals would be at the 50% and 100% complete stages. Requirements for the submittals are defined in the Project Design Requirements (PDR) document. Submittals shall be distributed by the Project Administrator to the project team. The Project Manager shall establish a due date for comments to be submitted. Comments will be collected by the Project Administrator and transmitted to the A/E firm.

E. FINAL SUBMITTAL

The final submittal would be at the 100% complete stage. The submittal should include complete drawings and specifications, ready for bid. Other submittal requirements will be defined in the Project Design Requirements document and typically include calculations, a detailed cost estimate, and if required, a revision to the Energy Conservation Report.

F. THIRD-PARTY STRUCTURAL REVIEW

The Project Manager shall arrange for a third-party structural review, Project Support Services may assist in this review.

G. THIRD-PARTY COST ESTIMATE

The Project Manager may arrange for a third-party cost estimate when a higher level of certainty is desired.

H. REPORTS

1. Prepare monthly status and cost reports and submit to the Project Director for review (refer to Section B4, Reporting).

2. Present monthly progress at DOE meetings.

3. Update cost plans and periodically reconcile budget as needed. Review scope, schedule, or budget variances with the Project Director and project sponsor for approval before proceeding with the next phase.

I. PLAN REVIEW

When the final design is complete, the Project Manager shall request the Project Administrator to prepare a Project Plan Review (Line Item and GPP/IGPP Projects) form. The Project Administrator shall circulate the Plan Review form for sign-off by the project team.

The Project Manager will contact Facilities Project Support Services two weeks before the Final Design submittal is due to allow scheduling of a third party plan check review firm. All Final Design drawings and specifications are to be sent to Project Support Services in pdf format. Project Support Services will obtain a proposal from the plan check firm for their services, the proposal will be reviewed and approved by the Project Manager. Allow two weeks for plan check review.

J. CRITICAL DECISION-3 (CD-3): APPROVE START OF CONSTRUCTION

For Line Item and GPP/IGPP Projects, Critical Decision-3 provides authorization to complete all procurement and construction and/or implementation activities to execute the project. The Project Manager, with assistance from the project team, shall assemble project documents for submittal to DOE for CD-3 approval. The LBNL Project Management Office reviews the CD-3 documents prior to submittal to DOE. Detailed requirements for this submittal are found in DOE Order 413.3A.

FINAL DESIGN CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Initiation		
B.	Administration of A/E Subcontract		
C.	Design Progress Meetings		
D.	Progress Submittals		
E.	Final Submittal		
F.	Third-Party Structural Review		
G.	Third-Party Cost Estimate		
H.	Monthly Status and Cost Reports		
I.	Plan Review		
J.	CD-3 Approval		

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BID AND AWARD

The Bid and Award phase of a project is the transition between design and construction. The method of performance for construction, whether in-house, subcontract, or a combination of the two, determines the activities necessary during this phase. A design-bid-build method is described in the procedure below.

A. PRE-BID PROJECT MANAGEMENT ACTIVITIES

1. Modify Division 1 Specification Section 013500 Special Procedures (formerly 01210 Special Requirements) to be project-specific. Review other Division 1 specifications to see if they apply to the project. Add the General Provisions; changes to the General Provisions are generally limited to adding the names of the Project Manager and Procurement Subcontract Administrator. Check uniformity of the technical specifications. Specifications are to be stamped by the registered professional responsible for the design.

2. The Project Administrator shall assist Procurement in assembling the front-end bid documents, arrange for copying the bid documents (refer to Capital Projects Policy Directive on Document Control Reprographics, Section B2), and coordinate distribution of the bid documents to the bidders.

3. Ensure that Project Plan Review is completed prior to release for bid.

4. A wet-stamped and signed reproducible copy of the contract drawings shall be obtained from the registered professional responsible for the design.

5. Obtain and review the construction cost estimate. Determine the duration of construction.

6. Discuss the subcontracting method for the project, such as small business set-asides, prequalification of subcontractors, Construction Manager/General Contractor (CM/GC), etc., with the Project Director and Procurement.

7. Designate a subcontractor's staging/laydown area and prepare a site location map showing this area. The map can be included in subcontract documents or distributed at the bidder's site visit.

8. Prepare a bid period schedule that includes the date on which it is planned that documents will be available to bidders, as well as the site visit date, bid due date, and subcontract award date.

9. For contracts that will be publicly advertised, prepare an advertisement narrative following the sample format (refer to Sample Advertisement for Prequalification, this section).

10. Post project information and bidding documents to the Future Projects website (http://facilitiesprojects.lbl.gov/).

11. Prepare an estimate of liquidated damages.

12. Submit a purchase requisition to Procurement. Send the specifications, drawings, advertisement, bidding schedule, and liquidated damages estimate to Procurement.

13. Request subcontractor prequalification and small-business set-aside, when appropriate.

B. SITE VISIT

The site visit is an opportunity for interested bidders to see the proposed project area and the existing conditions, and to ask questions about the project. This interaction will help to ensure that LBNL receives the best bid and to reduce conflicts during construction. The site visit is conducted by the LBNL Project Manager at the appointed time and place announced in the advertisement for bids.

The Project Manager's responsibilities include:

1. Invite the A/E representative and Procurement Subcontract Administrator. The client, LBNL design team, Environment, Health, and Safety (EH&S) team lead, and the EH&S Construction Safety representative may be invited when appropriate.

2. Prepare site visit agenda (refer to Bid Walk Agenda, this section).

3. Tour the project area, describe the project scope, identify any bid alternates, phasing requirements, and logistical constraints, and answer questions from the bidders.

4. Prepare a memo to file on the site visit. File memo in the project file.

The Procurement Subcontract Administrator's responsibilities include:

1. Advertise the site visit date and time, including whether attendance is mandatory or non-mandatory.

2. Arrange attendee access to visiting area(s). The Procurement Subcontract Administrator informs subcontractors of the requirements of DOE guidelines for nationals of sensitive and terrorist-sponsoring countries under Subcontractor Site Access Guidelines.

The Project Administrator's responsibilities include:

1. Request site access and parking through LBNL Site Access. If more than five parking spaces are needed, barricades must be requested.

2. Notify building managers of visit, following LBNL rules for foreign nationals (Unclassified Foreign Visits and Assignments).

3. Reserve shuttle bus service if necessary.

The Subcontract Administrator will normally answer questions about the subcontract, obtain a complete list of those in attendance, and copy the Project Manager.

C. BID PERIOD

1. The Project Manager shall designate a technical contact for response to bid questions.

2. The design professional shall prepare any addendum items, including responses to bid questions, and forward them to the Project Manager. The Project Manager shall review the addendum and forward it to Procurement for issuance to the bidders. Any technical addendum information shall be distributed in a timely manner.

3. Procurement shall conduct the bid opening; the Project Manager shall attend.

D. SUBCONTRACT AWARD

1. Price reasonableness must be documented for all contracts at initial contract award and for any significant change orders. Price reasonableness can be determined by a price analysis which either:

   a. compares the proposed prices received in response to a solicitation in which there was adequate price competition to establish price reasonableness, or

   b. compares the proposed prices received with an independently prepared LBNL cost estimate developed by knowledgeable personnel.

   The Project Manager shall document the determination of price reasonableness.

   This price reasonableness process does not apply to leasehold improvement projects. The Laboratory's share of tenant improvement (TI) costs that are performed through the landlord on leased property is determined as part of the lease negotiations. These negotiations determine rental rates, TI allowances, landlord furnished work, and tenant costs based on competitive market conditions. The Project Manager will work with Procurement to ensure that the scope of the tenant improvement work is adequately documented in the lease, and review the TI cost estimate to confirm it accurately reflects the project scope.

2. The Project Manager shall prepare an Award of Subcontract memorandum, and forward it to the Capital Projects Department Head for approval. The signed memorandum shall be sent to Procurement as authorization to issue a subcontract.

3. Procurement shall request from the subcontractor submittal of bonds, insurance, and a safety plan.

4. The Project Manager shall review the subcontractor's safety plan, and then forward it to the EH&S Construction Safety Engineer for review and comment. Upon resolution of comments to the Project Manager's satisfaction, the Project Manager shall approve the subcontractor's safety plan.

5. After bonds and insurance are received and the safety plan is approved, Procurement shall issue a subcontract to the subcontractor for signature. The subcontractor has ten days to sign the subcontract.

6. The Project Manager shall schedule a construction pre-start meeting with the construction subcontractor, A/E, inspector, Construction Safety Inspector, and

Procurement. EH&S representatives and design team members should be included when appropriate. The date for issuance of a Notice to Proceed shall be established at the pre-start meeting.

BID AND AWARD CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A1.	Modify Division 1 Specs		
A2.	Assemble Front-end Documents		
A3.	Project Plan Review Complete		
A4.	Stamped Contract Drawings		
A5.	Construction Cost Estimate		
A6.	Establish Subcontracting Method		
A7.	Subcontractor Laydown Area		
A8.	Bid Period Schedule		
A9.	Prepare Advertisement		
A10.	Future Projects Website		
A11.	Liquidated Damages Estimate		
A12.	Submit Purchase Requisition		
B1.	Site Visit Invitations		
B2.	Gate Access and Parking for Bidders		
B3.	Site Visit Agenda		
B4.	Conduct Site Visit		
B5.	File Site Visit Memo		
C1.	Designate Technical Contact		
C2.	Issue Addenda		
C3.	Bid Opening		
D1.	Price Reasonableness		
D2.	Award of Subcontract Memorandum		
D3.	Bonds, Insurance, Safety Plan Submittal		
D4.	Safety Plan Approved		
D5.	Issue Subcontract		
D6.	Schedule Pre-start Meeting		

IN-HOUSE CONSTRUCTION SUPPORT

For in-house construction, the transition between design and construction includes the preparation of a construction cost estimate that is coordinated by the Capital Projects Project Manager, sign-off, and issuance of a work order. Construction work is initiated when Maximo Work Orders are issued to the crafts by Facilities Small Projects Planner/Scheduler(s) and approved by the Scheduled Work Center Supervisor.

A. The Capital Projects Project Manager or his/her designee shall submit the project drawings, scope of work, schedule, and estimate to the Small Projects Scheduled Work Center Supervisor.

B. The Scheduled Work Center Supervisor shall review the completed estimate, accept or revise it, and return it to the Capital Projects Project Manager. The Project Manager shall review the estimate and solicit comments from the Construction Manager if appropriate.

C. The Capital Projects Project Manager shall review the construction drawings and cost estimate with the client. If agreeable, the client signs the Project Plan Review sheet.

D. The Project Manager shall ensure that the Project Plan Review (Line Item and GPP/IGPP Projects) form is signed off when appropriate.

E. The Issue For Construction drawings, stamped by the registered professional responsible for the design, shall be forwarded to the Scheduled Work Center, along with the signed cost estimate.

F. The Capital Projects Project Manager defines the Work Breakdown Structure, showing how the work should be charged to the project by the Scheduled Work Center craft employees.

G. The Scheduled Work Center Supervisor shall issue the Work Orders to the crafts, with a copy to the Capital Projects Project Manager and Capital Projects Construction Manager.

H. The Capital Projects Construction Manager shall hold a pre-start meeting with the Scheduled Work Center Supervisor, EH&S representative, and leads from the crafts, to discuss safety hazards, schedule, logistics, and work coordination.

WORK ORDER CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Submit Drawings for Estimate		
B.	Review Estimate		
C.	Client Sign-off		
D.	Project Plan Review Sign-off		
E.	IFC Drawings to Scheduled Work Center		
F.	Define Work Breakdown Structure		
G.	Work Orders Issued		
H.	Pre-start Meeting		

SAMPLE ADVERTISEMENT FOR PREQUALIFICATION

ADVERTISEMENT FOR PREQUALIFICATION

Subject to conditions prescribed by the University of California, **Lawrence Berkeley National Laboratory,** responses to the University's prequalification documents for a **Lump Sum** construction Subcontract are sought for the following project:

Building 51B EPB Hall Demolition
Project Number 862
To be performed at
Ernest Orlando Lawrence Berkeley National Laboratory
One Cyclotron Road
Berkeley, CA 94720

Prequalification of Prospective Bidders: The University has determined that bidders who submit bids on this project must be **prequalified**.

Prequalified bidders will be required to have a valid California contractor's license appropriate for the type of work involved.

General Description of Work: Provide all labor, material, tools and equipment to complete all work as described in the plans and specifications. The work includes:

Base Work
Demolition of a steel frame high-bay structure with metal siding and built up roof over a metal deck. Demolish the structure down to, but not including, the floor slab. Size of structure is approximately 38,300 square feet. A thirty (30) ton capacity bridge crane will be removed as part of this scope. Includes hazardous materials abatement and/or monitoring for lead paint, lead dust and minor amounts of asbestos.

Additive Alternate
Demolish Building 51L, a 864 square feet structure and raised concrete slab foundation.

All work (Base and Additive Alternate) is adjacent to existing occupied buildings, a safety program/plan and prior experience is required.

Architect-Engineer: Winzler & Kelly Consulting Engineers

Estimated Price Range and Construction Period: The estimated price range for this project is between $500,000 and $1,000,000. The Base Work construction period is ninety (90) calendar days.

Procedures:

You can get a single set of the prequalification documents on or after **September 29, 2003** from:

UNIVERSITY OF CALIFORNIA
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
ATTN: SALLY CHERENE
ONE CYCLOTRON ROAD
M/S 51-208
BERKELEY, CA 94720
PHONE 510-486-6459

Interested bidders may obtain a copy of the Prequalification Documents from Ms. Sally Cherene by calling the number above or by e-mail: secherene@lbl.gov. The University prefers to distribute the documents by e-mail if possible.

You must send in your prequalification documents on or before **October 10, 2003** to:

UNIVERSITY OF CALIFORNIA
ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY
ATTN: LAURA B. CROSBY
MAIL STATION 69-102

BERKELEY, CA 94720
PHONE 510-495-2607

No prequalification documents will be accepted after **5:00 PM on the designated date.** However, the University reserves the right to request, receive, and evaluate supplemental information after the above time and date at its sole determination.

Bidders will be notified whether or not they are prequalified.

The University expects to request bids from prequalified bidders in mid October. The exact dates, times, and location will be set forth in an "Announcement To Prequalified Bidders."

Prequalification of prospective bidders will be determined by the evaluation of the following factors contained in the Prequalification Questionnaire:

1. California Contractor's license. Any suspension of that license.
2. Years of business in California.
3. Safety record and safety management.
4. Surety.
5. Construction experience.
6. Past performance.
7. Arbitration and litigation claims history.
8. Insurance and Bonding capacity.
9. Financial data and bankruptcy information.

Bidders must comply with the following mandatory requirements in order to prequalify for performance of this project:

1. Contractor must possess a valid license appropriate for the work to be performed.
2. Listing prior similar projects.
3. Contractor's EMR must not have been less than 1.0 in each of the last 3 premium years.
4. Contractor must not have had work completed by a surety on any contract since 1998.
5. Contractor must be able to obtain and furnish certificates of required insurance in the minimum amounts of $3,000,000 per occurrence, $5,000,000.00 Products Completed Operations Aggregate, $1,000,000.00 Personal and Advertising Injury, $5,000,000 General Aggregate, and $1,000,000 business automobile liability.
6. Contractor must not be presently disqualified from performing work for the University of California or another Public Agency or debarred by the U.S. Government.
7. Contractor must submit all required information.

The University will determine, solely at its own discretion, whether a firm is prequalified. The University reserves the right to reject any or all responses to Prequalification Questionnaires and any or all bids and to waive non-material irregularities in any response or bid received.

Any questions or requests for clarification or interpretation of the Prequalification Documents must be submitted in writing **to Laura B. Crosby, Lawrence Berkeley National Laboratory, One Cyclotron Rd., M/S 69-102, Berkeley, CA 94720, fax: (510) 486-5115, e-mail, lbcrosby@lbl.gov.** Questions must be submitted by October 8, 2003 3:30 PM. Questions received after that date may be answered at the discretion of the University.

Addenda, if any, will be FAXed or otherwise sent to prospective bidders prior to the date established for receipt of questionnaires. Addenda will be FAXed, mailed, e-mailed or sent by messenger service to all who are known by the issuing office to have received a complete set of Prequalification Documents and who have provided a FAX number or a street address for receipt of Addenda.

The Lawrence Berkeley National Laboratory is operated by the University of California under Prime Contract DE-AC03-76SF00098 with the U.S. Department of Energy and the work will be performed under a Subcontract subject to the terms of the prime contract. All work will be performed subject to the Davis-Bacon Act.

All information submitted for prequalification evaluation will be considered official information acquired in confidence, and the University will maintain its confidentiality to the extent permitted by law.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
University of California, Lawrence Berkeley National Laboratory

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CONSTRUCTION

A. PRE-START

1. The Project Manager shall prepare an agenda (refer to Construction Pre-start Meeting Agenda, Section B8) and attend the Pre-start Meeting (arranged by Procurement). The Construction Manager shall attend all pre-start and work kick-off meetings.

2. The Project Manager shall verify that the subcontractor's safety program has been reviewed by the Construction Safety Engineer and approved by the Project Manager or designee prior to start of construction (refer to Section B5, Environment, Health, and Safety).

B. SUBMITTALS

1. The Project Administrator will set up a submittal log using standard format.

2. The Project Manager shall send a letter to the construction subcontractor and team members regarding construction submittal procedures. Incoming and outgoing submittals will be managed by the Project Manager.

3. Design submittals are to be routed to the Architect/Engineer (A/E) of record for review.

4. The Project Administrator will maintain the submittal log on a daily basis, including the date the submittal is received from the subcontractor and the date a response was sent to the subcontractor.

5. Submittals shall be reviewed and returned to the subcontractor within seven working days.

C. REQUESTS FOR INFORMATION

1. The Project Manager shall review Requests for Information (RFI) from the construction subcontractor and provide a response, with copies to the appropriate team members. A/E of record and Inspection must be copied on all RFI responses.

2. The Project Manager/Project Administrator shall route design clarification Requests for Information to the A/E of record for response.

3. The Project Administrator shall maintain a log of RFIs, using the standard format, including the date they were received from the subcontractor and the date a response was sent to the subcontractor.

D. CONSTRUCTION PROGRESS

1. The project team shall maintain photographic documentation of the physical progress of the work and ensure that before and after photographs are taken as a minimum.

2. Weekly construction progress meetings shall be held with the construction subcontractor. Minutes of these meetings shall be prepared by the Project Administrator, distributed to the project team, and filed in the project file.

3. Material submittals and shop drawings shall be processed in a timely manner.

4. The Construction Manager shall prepare daily reports and submit them to the Project Manager. The Project Administrator files the daily reports in the project file.

5. The Project Manager shall coordinate and issue construction document clarifications as necessary.

6. The Project Manager shall maintain a list of all pending time and money issues.

E. PROGRESS PAYMENT

1. The Construction Manager shall review all draft invoices with the construction subcontractor on a monthly basis to confirm the percentages of work completed. This review should become the basis for the construction subcontractor's monthly progress payment invoice. The Construction Manager shall initial all final subcontractor invoices, signifying his/her agreement with the schedule of values (job progress), and return the invoice to the Project Manager.

2. The Project Manager shall review and approve progress payment requests (refer to Section B6, Financial Policies).

3. The Project Administrator shall record all progress payments in a subcontract accounting log.

4. The Project Manager may recommend retention changes, such as a reduction of retention at the end of a project, when appropriate.

F. CHANGE ORDER

1. The Project Administrator shall create and maintain a Change Order Log using the standard format. If the Project Manager determines that there is a need for a change, a Change Order number will be assigned and added to the Change Order Log. All construction subcontractor requests for change will be entered and their status tracked in the Change Order Log.

2. The Project Manager shall coordinate development of the changed scope of work, which may include obtaining drawings and specifications from the A/E of record.

3. The Project Manager will determine the approximate value of the proposed change and assign budget for the change.

4. The Project Manager will prepare (or have prepared) a detailed cost estimate for the changed work.

5. The Project Manager will discuss the proposed work with the Construction Manager to determine if circumstances warrant directing a change, and if so, will:

   a. Determine whether to use time and materials or fixed pricing.

   b. Confirm that the dollar amount of the change is within the amount permitted under his/her delegation of authority. If not, the Procurement Buyer must approve the change before proceeding with the work.

   c. Issue a Field Order using the standard form to the construction subcontractor. The Field Order is to specify the estimated dollar amount of the change and the estimated time adjustment (if any) to the subcontract completion date. The Field Order description should reference any design drawings or specifications.

6. The Procurement Buyer shall request a quotation from the subcontractor.

7. The Project Manager and Construction Manager will reconcile the subcontractor's quote with LBNL's cost estimate and negotiate with the subcontractor when necessary.

8. The Project Manager shall determine applicable time extensions, if any.

9. The Project Manager shall send a Construction Subcontract Change Authorization form to Procurement, along with copies of the field order, quotation, LBNL estimate, and any related design documents. A purchase requisition shall be entered into eProcurement to initiate the change to the subcontract.

10. The Procurement Buyer shall issue a subcontract modification to the construction subcontractor. Several subcontract changes may be combined into one subcontract modification. The Project Administrator is to record the subcontract modification number by each Change Order listed in the Change Order Log.

11. The Project Administrator shall record the approved subcontract modification on the Subcontract Accounting Log.

G. CONTRACT MODIFICATIONS MANAGEMENT

Timely handling of construction subcontract modifications (Change Orders) is a vitally important aspect of construction subcontract management. Therefore, during the performance of construction by subcontract, Project Managers shall ensure that the following actions are taken with regard to managing subcontract changes:

1. Review pending subcontract change issues at least weekly. Maintain an up-to-date Change Order Log that contains, at a minimum, the information shown on the Subcontract Modifications Change Order Log. (Note that each Change Order should be classified as: (a) User Request, (b) Design, (c) Unforeseen Condition, (d) Other.)

2. Enter data in Cost Workbook/Cost Sheet in a timely fashion.

3. Subcontract modifications should be processed within 30 days of identification. Should a change issue remain unresolved for more than 30 days, management, Procurement, and legal advice should be consulted to develop a plan for resolution. No change issue should remain unresolved for more than 90 days.

4. Conditional agreements by the subcontractors are not acceptable. Should a subcontractor sign a contract modification conditionally, the Project Director should be notified promptly, and the Procurement Subcontract Administrator should be notified that conditional agreements on subcontract modifications are not acceptable.

5. Disputes should be brought to the attention of the Project Director as soon as they are identified by the Construction Manager. Written recommendations for resolution of the dispute should be prepared and provided to the Project Director within 15 days of receipt of a request for final LBNL decision by a subcontractor.

6. Require daily submittal of time and material work from subcontractor. Review and approve submittal.

H. PURCHASE ORDERS

The Project Manager shall review purchase order status at least monthly on all outstanding purchase orders. The Project Administrator shall maintain an up-to-date Purchase Order

Status Summary that contains, at a minimum, the information shown on the Purchase Order Status Summary (this section).

I. ACCEPTANCE TESTING

The Project Manager shall review pending acceptance testing issues at least weekly. The Project Administrator shall maintain an up-to-date Acceptance Testing Log that contains, at a minimum, the information shown on the Acceptance Testing Log (this section).

J. COMMISSIONING

The Project Manager shall coordinate building system commissioning activities when required. A commissioning consultant shall be hired to prepare a commissioning plan for new buildings.

K. CLAIMS/ARBITRATION

After receipt of a claim from the construction subcontractor, the Project Manager shall:

1. Review potential claim letter(s).

2. Notify the Procurement Subcontract Administrator, Project Director, and legal counsel, when warranted.

3. Collaborate with Procurement in preparing response(s).

4. Keep the project initiator informed of the claim's status.

L. LABOR STANDARDS COMPLIANCE

1. Purpose:

DOE requires that all construction subcontractors comply with the standards set by the U.S. Department of Labor, as contained in LBNL's construction subcontract documents. Subcontractors are required to submit a certified payroll form and a statement of compliance on a weekly basis.

2. Compliance Checking:

The Project Manager has the responsibility to:

a. On-Site Observations/Reports

i Ensure that the Construction Inspector's and Construction Manager's daily reports include the names of all subcontractors and tiers working at the job each day, and the number of trade personnel. If the number of subcontractor personnel varies in any given day, or if the number of trade classifications and apprentices are known, this information should also be noted.

ii Verify that subcontractors have fulfilled all posting requirements at the construction site (wage rates and applicable posters).

iii Forward completed Labor Standards Interview Forms to the Procurement Division according to a mutually agreed time schedule.

b. Subcontractor Employee Interviews

i Conduct periodic interviews of subcontractor employees using the Labor Standards Interview Form SF-1445. The interviewer will meet the subcontractor employee, state purpose and proceed with the Labor Standards Interview without undue pressure by the employee's supervisor or peers.

ii Follow the Labor Standards Interview format and avoid making suggestions or adopting an attitude that could prejudice answers.

iii Keep a record of time spent in the interview and take no more time than is necessary. This record may be useful to satisfy claims of excessive interview time.

c. Reconciliation of Certified Payrolls

Work jointly with the Procurement Department and reconcile certified payrolls with on-site observations/reports and subcontractor employee interviews.

d. Handling Inquiries/Complaints

Gather information as accurately as possible and notify Procurement's Subcontract Administrator of subcontractor's employee inquiries or complaints. Advice should not be provided directly to an employee.

M. ARCHAEOLOGICAL ARTIFACTS

If an archaeological artifact is discovered on a site during construction, all activities within a 50-foot radius shall be halted, and a qualified archaeologist summoned within 24 hours to inspect the site. If the find is determined to be significant and to merit formal recording or data collection, adequate time and funding shall be devoted to salvage the material. Any archaeologically important data recovered during monitoring shall be cleaned, cataloged, and analyzed, and the results presented in a report of finding that meets professional standards.

In the event that human skeletal remains are uncovered during construction or ground-breaking activities, all work within a 50-foot radius shall immediately be halted, and LBNL Security shall be contacted. LBNL Security shall contact the University of California Police Department (UCPD) to evaluate the remains to determine that no investigation of the cause of death is required. The Native American Heritage Commission (NAHC) shall be contacted within 24 hours if it is determined that the remains are Native American. The NAHC shall then identify the person or persons it believes to be the most likely descendant of the deceased, who in turn shall make recommendations to LBNL for the appropriate means of treating or disposing of the human remains and any grave goods.

N. COST CONTROL – LINE ITEM & GPP/IGPP PROJECTS

The Project Manager shall update the Cost Workbook/Cost Sheet on a monthly basis at a minimum, incorporating the latest projections of LBNL staffing levels and subcontracts in a timely and complete fashion (see complete description in Section B4, Reporting).

O. CRITICAL DECISION-4 (CD-4): Approve Start of Operations or Project Completion

For Line Item or GPP/IGPP projects, Critical Decision-4 marks the achievement of the completion criteria defined in the Project Execution Plan and the approval of transition to operations.

The Project Manager, with assistance from the project team, shall assemble project documents for submittal to DOE for CD-4 approval. The LBNL Project Management Office reviews the CD-4 documents prior to submittal to DOE. Detailed requirements for this submittal are found in DOE Order 413.3A.

CONSTRUCTION CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Item	Date Complete	Remarks
A.	Pre-Start Meeting Held		
B.	Submittal Log Set Up		
C.	Request for Information Log Set Up		
D1.	Construction “Before” Photos Taken		
D.	Construction Inspector Daily Inspections Initiated		
E.	Subcontract Accounting Log Set Up		
F.	Change Order Log Set Up		
G.	Subcontract & Mods in PM Files		
H.	Purchase Order Status Summary Set Up		
I.	Acceptance Testing Log Set Up		
J.	Commissioning Plan Prepared		
K.	Claims Settled		
L.	Labor Standards Compliance Initiated		
N.	Cost Workbook/Cost Sheet Set Up		
O.	CD-4 Approval		

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PROJECT CLOSEOUT

Project closeout is a sequence of tasks performed at the end of construction. These tasks ready the project for final acceptance and involve close coordination between the Project Manager, Construction Subcontractor, Architecture/Engineering (A/E) firm, Inspector, and LBNL design team. The project team will gather as-built drawings, marked specifications, maintenance manuals, operations manuals, start-up and testing information, and equipment records for filing. The Project Manager is responsible for ensuring that all closeout items are completed.

A. START UP AND TESTING

LBNL design team members participate in the start-up and testing of equipment and systems. The start-up and testing procedures are as follows:

1. Construction Subcontractor submits start-up and testing procedures to the Project Manager.

2. Project Manager transmits procedures to the A/E firm or Commissioning agent for review and approval, and provides copy to Facilities Operations.

3. A/E firm or Commissioning agent reviews and approves procedures.

4. A/E firm or Commissioning agent transmits procedures to the Project Manager.

5. Project Manager distributes copies of procedures.

6. Facilities Operations participates in inspection and testing.

B. PUNCHLIST

When the subcontractor notifies the Project Manager in writing that the project is substantially complete and ready for a preliminary inspection, the Project Manager shall schedule a punchlist walkthrough. The punchlist walkthrough will be attended by the A/E of record, subcontractor, Inspector, Fire Marshal, EH&S team lead, Project Manager, and Construction Manager. The Project Administrator will compile comments from each of the walkthrough participants into the standard LBNL punchlist log. The Project Manager will transmit the punchlist log to the subcontractor, with a date for completion of the punchlist items. The Construction Manager is responsible to verify completion of the punchlist items, noting on the log when each item was accepted. The Project Manager may accept partial completion or non-completion of non-code-related items based on his/her judgment.

Upon satisfactory completion of all items in the punchlist, the subcontractor notifies the Project Manager in writing that the project is done and ready for final inspection. A final inspection is performed and, if the work is found acceptable to the Project Manager, the Project Manager shall notify Procurement to file a Notice of Completion. After receipt of a final release from the subcontractor, the final payment will be processed.

C. TRAINING OF FACILITIES OPERATIONS STAFF

The Project Manager will coordinate training on new equipment with the subcontractor and Facilities Operations per the requirements of the specifications. Sign-in sheets will be created for each training session and will be filed in the project files.

D. OPERATIONS AND MAINTENANCE MANUALS

Maintenance manuals and operations manuals provide instructions on care, operation, and maintenance of equipment and systems. The following is the sequence for obtaining maintenance manuals and operations manuals:

1. Project Manager obtains manuals from Construction Subcontractor.

2. Project Manager transmits manuals to A/E firm for review.

3. A/E firm reviews and approves manuals.

4. A/E firm transmits manuals and approval to Project Manager.

5. Project Manager distributes copies of manuals to Facilities Operations.

E. GUARANTEES/WARRANTIES TO FACILITIES OPERATIONS

The Project Administrator will create a list of all required guarantees/warranties per the project specifications. The list will then be tracked on the Project Submittal Log. Guarantees/warranties will be forwarded by the construction subcontractor to the Project Manager as described in the project specifications. The Project Manager will forward the guarantees/warranties with a transmittal to Facilities Operations, with a copy to the project file.

F. CONSTRUCTION COMPLETE SIGN-OFF

The Project Administrator shall draft a Project Construction Complete Review form and circulate for signatures. Sign-off confirms that work on the referenced subcontract has been completed in accordance with the construction documents and that it complies with applicable codes. The completed form will be filed in the project file, with a copy sent to Procurement.

G. BENEFICIAL OCCUPANCY

When the project is substantially complete, and prior to occupancy of the facility, the Project Manager will accept Beneficial Occupancy by sending a letter to the subcontractor confirming the date that LBNL will be occupying the facility. Issuance of this letter shall formally end the contract construction period for the calculation of liquidated damages, and shall transfer liability for safe operation of the facility to the LBNL operating entities. Before occupancy of the facility, a punchlist of existing deficiencies shall be prepared and transmitted to the subcontractor.

H. TURNOVER MEMO TO FACILITIES OPERATIONS

At Beneficial Occupancy of the facility, the Project Director shall send a Beneficial Occupancy (Project Turnover) letter to Facilities Operations and to the client, notifying

them that the facility has been accepted and that they are now responsible for the operation and safety of the facility. A copy will be sent to Procurement.

I. SUBCONTRACTOR NOTICE OF COMPLETION

The Project Manager will notify Procurement when all work, including punchlist work, is complete on the project. Procurement will file a Notice of Completion with the county.

J. AS-BUILT DRAWINGS FILED

As-built drawings show changes made during construction. An accurate record of changes is required and must include all changes made during construction that deviate from the intent of the original documents. This includes all Change Orders, Field Orders, RFI responses, bulletins, and clarifications. Inspector will review subcontractor mark-ups on the field set of drawings on a monthly basis, prior to approval of the subcontractor's progress payments. The following is a sequence for developing as-built drawings:

1. During construction, the Construction Subcontractor marks up prints of the drawings and shows changes made by Change Order, or any other manner.

2. At completion of construction, Construction Subcontractor transmits marked-up prints of drawings to the Project Manager.

3. Project Manager transmits drawings to the A/E firm.

4. A/E firm incorporates the marked-up data into the original drawings to produce as-built record drawings.

5. A/E firm transmits final drawings to Project Manager.

6. Project Manager forwards as-built record drawings to the Facilities Project Support Services for archiving per Section B7, Records Filing and Disposition.

7. Project Manager forwards wet-stamped construction drawings to the Facilities Project Support Services for archiving per Section B7, Records Filing and Disposition.

K. CLIENT QUESTIONNAIRE

The Project Administrator will send the Client Questionnaire to the client during the project closeout phase, to get feedback on the performance of the project team.

L. RECORDS DISPOSITION

At the completion of construction, the Project Manager will review the project records for disposition (refer to Section B7 for detailed procedures).

As part of the project closeout procedure, LBNL design team members complete Specifications Sheets for all new items of mechanical or electrical equipment installed in the project. These items include equipment that will require periodic inspection and preventative maintenance. Transmit all maintenance and operations documentation to Facilities Operations.

The mechanical and electrical design team members are responsible for placing into the equipment files pertinent data on equipment for the project (refer to Section B7 for detailed procedures).

M. FINAL RELEASE RECEIVED FROM SUBCONTRACTOR

Procurement will forward a final release to the subcontractor for signature. Procurement will forward a copy of the signed release to the Project Manager for inclusion in the project files.

N. LESSONS LEARNED MEETING

The Project Manager will schedule a Lessons Learned meeting for all projects of more than $100K to review the successes and failures of the project. The meeting will be attended by the project team, including the client and EH&S lead.

O. A/E EVALUATION

To be completed by the Project Manager reflecting input from the Lessons Learned meeting and forwarded to Procurement, with a copy to the Project Director.

P. SUBCONTRACTOR EVALUATION

To be completed by the Project Manager reflecting input from the Lessons Learned meeting and forwarded to Procurement, with a copy to the Project Director.

Q. FINANCIAL CLOSEOUT

The Project Manager, with the assistance of the Project Administrator and Resource Analyst, will review purchase orders to confirm that final payment has been made. Remaining lien amounts will be cleared. Work Orders for in-house work will be closed. Project IDs will be closed by the Resource Analyst.

R. WALKTHROUGH WITH DOE

The Project Director will schedule a walkthrough of the completed project with the Department of Energy (DOE) Federal Project Director from the Berkeley Site Office. The walkthrough will be attended by the Project Director and Project Manager. For Line Item Projects, DOE requires project completion documentation submittals (see DOE Order 413.3A).

S. CAPITALIZATION

The Resource Analyst will prepare a Facilities Division Construction Capitalization Recap Form (the second page of PACE Project Life Cycle Form) for review and approval by the Project Manager. The Project Manager is responsible for confirming that project costs have been properly distributed into the correct capitalization categories and that the amounts accurately reflect the actual project costs. Leasehold improvements shall be capitalized as shown in the Capitalization Decision Grid, this section. Capitalization forms shall be completed and submitted to General Accounting upon completion of a capital project.

CAPITALIZATION DECISION GRID

Initial Buildout at Lease Inception (Initial Property Record Unit)	Description	Capitalize as LHI [1]	Capitalize as Equipment [2]	Operating Expense
Pre - Title 1 activities	All activities taking place before the start of preliminary design, including siting and engineering studies, leasing and conceptual design.	No	No	Yes
Project Assurance	Oversight by Project Director and consultations with subject matter experts to assure contractual terms and conditions, and user requirements are met; protection of LBNL's interests	No	No	Yes
LBNL PM/CM	Manage scope, schedule and budget of construction work	Yes	No	No
Construction	HVAC, electrical; water, air, nitrogen, and vacuum systems; laboratory, office and other build-outs; painting, carpeting and lighting changes; laboratory casework, shelving systems and equipment tables, storage cabinets for bio-hazards and flamable items, fumehoods; warm room, cold room, other special rooms or permanent partitions; related seismic bracing	Yes	No	No
IT, Communications & Security	Hard-wiring for Facility-wide IT and communications systems; complete security system	Yes	No	No
Commissioning costs	Facility commissioning costs incurred to test, check, and adjust new systems before handing the facility over to ongoing operations personnel	Yes	No	No
Initial Occupancy - Other Personal Property, Moves Costs, Equipment Fit-Up, and Start-Up				
LBNL PM/CM and crafts	Coordinate and implement moves and seismic bracing/fit-up of equipment	No	No	Yes
Other Personal Property	The following items when **not permanently attached** to the building: refrigerators, deli cases, freezers, storage cabinets, shelving systems, furniture, cubicle partitions, research equipment tables and benches	No	For newly purchased equipment, Yes if => $50K	For newly purchased equipment, Yes if < $50K
Moves, equipment set-up and connection ("fit-up"), related seismic bracing		No	No	Yes
Start-up costs	Costs incurred during the transition period between the completion of construction and operation of the facility, such as the establishment of maintenance and EH&S plans and training of personnel	No	No	Yes
Subsequent Changes (After Initial Occupancy)				
Building Operations	Day-to-day work required to conduct business and research operations; i.e., building management, EH&S, custodial, building and office supplies	No	No	Yes
Repair	Restoration or replacement of a deteriorated item (that is part of the property record unit)	No	No	Yes
Maintenance	Recurring day-to-day work required to maintain and preserve an item (that is part of a property record unit) in a condition so that it can be used for its designated purpose; preventive, correction of wear and tear before major repairs are required.	No	No	Yes
Alterations	Remodeling such as changes to the floor area, making or closing openings, erecting or demolishing walls, re-routing utilities, etc.	No	No	Yes
Betterment	Improvements that result in better quality, higher capacity, extended life, add a new operational capability to a specific area (e.g. conversion), or work required for regulatory compliance (e.g. building code); determination requires judgement.	Follow Initial Buildout Guidelines Above		

[1] LHI capitalizations are subject to the $50K threshold based on total construction costs

[2] Equipment capitalizations are subject to the $50K threshold as determined per individual or group components guidelines

PROJECT CLOSEOUT CHECKLIST

Project ID: _____

Project Title: _____

Project Manager: _____

	Closeout Item	Date Complete	Remarks
A.	Start-up & Testing Complete (see acceptance testing log)		
B.	Punchlist		
C.	Training of Operations Staff		
D.	Operations & Maintenance Manuals		
E.	Guarantees/Warranties to Plant Operations		
F.	Construction Complete Sign-Off		
G.	Beneficial Occupancy		
H.	Turnover Memo to Plant Operations		
I.	Subcontractor Notice of Completion Filed		
J.	As-Built Drawings Filed		
K.	Client Questionnaire Sent Out		
L.	Records Disposition		
M.	Final Release Received From Subcontractor		
N.	Lessons Learned Meeting		
O.	A/E Evaluation		
P.	Subcontractor Evaluation		
Q.	Financial Closeout		
R.	Walkthrough with DOE		
S.	Capitalization (including leasehold improvements)		

SECTION B

DEPARTMENTAL POLICIES

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ROLES AND RESPONSIBILITIES

General project team roles and responsibilities for projects managed by the Facilities Division Capital Projects Department are covered in this section. Project team members and collaborators shall follow these guidelines.

Roles and responsibilities governing safety and the implementation of an Integrated Safety Management (ISM) system can be found in Section B5, Environment, Health and Safety.

Additional roles and responsibilities related to project reporting and financial practices can be found in Section B4, Reporting and Section B6, Financial Policies, respectively.

PROJECT INITIATORS

A. DEFINITION

A project initiator is a person who has the authority, or who has been given special authority, to start action on a project. For example, if LBNL Management assigns responsibility for a project to the Facilities Division, and the division accepts the project, then LBNL Management is the project initiator.

B. AUTHORITY

To enable them to fulfill their responsibilities, project initiators are normally delegated authority to:

1. Authorize use of project funds.

2. Set and change project objectives.

3. Assign and reassign project responsibilities to other persons, and require the prompt reporting of major project problems.

4. Cancel projects.

5. Accept or reject the results of a project, close projects, and remove projects from the official list of approved projects.

PROJECT SPONSORS

A. DEFINITION

A project sponsor is a person who has accepted responsibility for a project, and who has then assigned the project to another person who has accepted responsibility for achieving the objectives of that project.

1. A line of project responsibility starts with a project initiator, and the responsibility is normally reassigned from person to person until it reaches a Project Manager. If a person accepts responsibility for accomplishing a project, the person from whom s/he accepted the project is his/her project sponsor.

2. If a project initiator assigns a project directly to a designated Project Manager, the project initiator is also the project sponsor.

B. RESPONSIBILITY

All persons in a line of project responsibility, including the initiator and all sponsors as defined above, will be fully responsible for achieving the objectives of the assigned project. When a person assigns a project to another person, that action does not relieve the first person of full responsibility for achieving the project objectives.

C. SCOPE DOCUMENT

When a project sponsor accepts a project and then assigns the project to another person, it may be appropriate for the sponsor to augment the project scope document and provide the other person a more definitive project scope than s/he received from his/her sponsor.

D. REPORTING PROJECT PROBLEMS

Reports of significant project problems and action recommendations, both written and verbal, will be forwarded by Project Managers and project sponsors through the line of project responsibility to the project initiator (refer to Project Problem Reporting, Section B2).

PROJECT MANAGERS

A. RESPONSIBILITY

A Project Manager is a person who has accepted responsibility from a sponsor to achieve the objectives of a specific project and provides professional services consistent with the project management process.

B. DUTIES

Project Managers will fulfill their project responsibilities and accomplish their duties, such as:

1. Negotiate project objectives (scope, completion date, and budget) with the project sponsor, and accept responsibility for achieving those objectives if appropriate.

2. Contact appropriate functional organizations and obtain the names of the Task Managers to serve on the project team.

3. Organize and brief the project team, serving as the team leader, and working with the project Task Managers to produce task scope documents, task schedules, and task cost plans.

4. Develop a project plan.

5. Obtain task commitments from Task Managers.

6. Request that the project sponsor and the project user periodically review the project scope document, and see the work in progress, to ensure that the sponsor and user are in full agreement with the product being produced.

7. Ensure that the sponsor and user review and agree on changes in the project scope.

8. Take the lead role in resolving interface issues between two or more Task Managers. Ensure that no overlaps or gaps occur in task responsibilities. Direct unresolved interface/overlap issues to functional groups for resolution.

9. Ensure that tasks are accomplished so that the products (i.e., deliverables) of these tasks will properly integrate with each other, and will produce a final project product that meets the scope requirements and fully satisfies the users and other designated interests.

10. Work with Task Managers so as to promptly identify all significant task variances, determine the impact of these variances on the project objectives, and decide if a project problem exists.

11. Report promptly significant problems to the project sponsor (and others, if appropriate). A project problem is defined as a situation wherein it appears that a project objective cannot be achieved as agreed upon with the sponsor, or that the probability of achieving the objective has significantly decreased. Review project feasibility in the light of such problems.

12. Accomplish creative recovery planning to resolve project problems.

13. Revise the project plan when appropriate, to keep it current and valid, and provide copies to interested persons.

14. Present project status to the project sponsor and Project Director verbally or in writing, as appropriate.

15. Initiate design reviews, review plans and specifications for completeness.

16. Approve progress payment requests and subcontractor schedules, participate with Procurement in the negotiation of Change Orders with subcontractors, issue Change Orders, and approve subcontract modifications issued by Procurement.

17. Maintain the project files.

18. In the absence of an assigned Construction Manager, assume the Construction Manager's responsibilities and duties.

19. Participate in other assignments as required by the Project Director.

C. ACCOUNTABILITY

1. Project Managers will be held accountable by their functional supervisor for performing their Project Manager duties in support of their assigned functional responsibilities.

2. Project Managers will be held accountable by their project sponsors for achieving the project objectives for which they have accepted responsibility.

D. AUTHORITY

Project Managers' functional and project authorities are delegated to them by their functional supervisor and project sponsor, respectively.

Listed below are issues relating to project management over which Project Managers normally have authority. These are only examples, not a complete list. Project Managers should:

1. Accept project responsibility from sponsors and make commitments to meet project objectives.

2. Require that appropriate organizations designate qualified Task Managers, serve on the project team, accomplish assigned project tasks, and attend project team meetings.

3. Require that appropriate organizations help in the development and refinement of project scope documents and task scope documents.

4. Require that Task Managers provide scope of work, estimated costs, and schedules for assigned project tasks, both in-house and contractor. Manage the preparation of the project plan and determine when tasks need to be completed.

5. Negotiate task resource requirements, budgets, completion dates, and task scopes with Task Managers. Require that Task Managers either (a) reach agreement and commit to a task plan, or (b) tell the Project Manager what they feel is the best they can do given the availability of resources and their understanding of project priorities.

6. Require that Task Managers promptly report all significant task variances to the Project Manager, both in-house and contractor tasks, and assist in solving project problems.

7. Approve changes in task scopes, completion dates, and budget.

8. Require that Task Managers provide reconfirmation at any time regarding the status of task objectives.

E. PERSUASION

To achieve their objectives, Project Managers will be expected to use an appropriate combination of delegated authority and persuasion skills.

CONSTRUCTION MANAGER(S)

A. RESPONSIBILITY

1. The Construction Manager accepts responsibility from a Project Manager to achieve the goals and objectives of a specific project.

2. The Construction Manager has the responsibility to review construction subcontracts for constructability, completeness, operability and clarity; establish the standards of acceptability for subcontractors who are performing the work; interact with Procurement and others in providing services to the construction effort; and manage light construction labor-only subcontracts.

B. DUTIES

The Construction Manager shall administer construction subcontracts and:

1. Participate in design reviews, review plans and specifications for constructability, and develop construction methods and construction schedules.

2. Prepare field requests for clarification during bidding and prepare technical input to addenda, participate in field visits, conduct preconstruction meetings, process subcontractor submittals, maintain complete and accurate contractor records and files, including as-built drawings.

3. Review progress payment requests, schedule of values, and subcontractor schedules.

4. Report on and advise the Project Manager regarding the status, progress, and problems of subcontract activities, review problem solutions, schedule slippage, and recovery plans.

5. Prepare a daily log of all contractor activity, and provide the Project Manager with a copy at day's end.

6. Cooperate with LBNL assigned construction and site safety inspectors in the review of subcontractors' work.

7. Participate in other assignments as required by the Project Director.

C. ACCOUNTABILITY

1. Construction Managers will be held accountable by their functional manager for performing their construction management duties in support of their assigned functional responsibilities.

2. Construction Managers will be held accountable by their Project Manager for achieving the project objectives for which they have accepted responsibility.

D. AUTHORITY

The Construction Managers' functional and project authorities are delegated by their functional supervisor and the Project Manager, respectively.

E. PERSUASION

To achieve their objectives, Construction Managers will be expected to use an appropriate combination of delegated authority and persuasion skills.

CONSTRUCTION INSPECTOR(S)

A. RESPONSIBILITY

1. The Construction Inspector accepts responsibility from his/her functional supervisor to achieve the goals and objectives of a specific project.

2. The Construction Inspector has the responsibility for observing in detail all construction activities and site work operations. The inspector reports his/her observations to the Project Manager daily.

3. The Construction Inspector ensures the interpretation of plans and specifications are made by the Architect/Engineer of record.

B. DUTIES

1. The continuous study of design plans and specifications prior to and during construction.

2. Attends pre-bid site meetings and pre-start orientation meetings with subcontractors.

3. Maintains up-to-date files on all contractual data, including Change Orders, field memos, shop drawings, correspondence, etc.

4. Provides daily inspection of construction activities to ensure conformance with plans, specifications and code disciplines, including safety procedures.

5. Reviews and recommends approval of progress payments to the Project Manager.

6. Anticipates, observes, and reports conflicts affecting progress schedules to the Project Manager.

7. Inspects construction procedures and materials for compliance with approved submittals.

8. Prepares a daily log of all contractor activity, and provides the Project Manager with a copy at day's end.

9. Observes tests required by the contract documents, obtains specimens, and forwards to labs. Reports test procedures and results to Project Manager.

10. Verifies testing invoices and passes on for payment. Completes DOE "Monthly Contractor Count" reports and forwards to appropriate departments.

C. ACCOUNTABILITY

1. Construction Inspectors will be held accountable by their functional supervisor for performing their construction inspection duties in support of their assigned functional responsibilities.

2. Construction Inspectors will be held accountable by their Project Manager for achieving the project objectives for which they have accepted responsibility.

D. AUTHORITY

The Construction Inspectors' functional and project authorities are delegated by their functional supervisor and the Project Manager, respectively.

E. PERSUASION

To achieve their objectives, Construction Inspectors will be expected to use an appropriate combination of delegated authority and persuasion skills.

PROJECT TEAM

A. THE PROJECT TEAM

The project team will consist of (1) the Project Manager, (2) the Task Manager(s), (3) functional supervisors and workers who are directly responsible for accomplishing task work, (4) subcontractors' Project Managers, (5) the Project User, and (6) all other personnel working on the project.

B. PROJECT MANAGER

The Project Manager will do everything feasible to help his/her Task Managers accomplish their tasks as planned. The Project Manager is the team leader and must support his/her Task Managers in much the same way that a functional manager supports his/her immediate subordinates.

C. TASK MANAGERS

1. As soon as it appears that a functional department may be required to accomplish tasks in support of a project, the Project Manager will ask the manager of that organization to designate a Task Manager to serve on the project team.

2. Managers who provide Task Managers to work on projects will ensure that the persons designated are experienced personnel who (a) are qualified to perform the important duties of a Task Manager, and (b) have been delegated the authority necessary to speak for their organization on matters pertaining to the task to be accomplished.

PROJECT CONTROLS

A. DEFINITION

Project Controls staff are assigned to projects requiring EVMS tracking and reporting, and as resources are available. Otherwise, Project Managers fulfill some of these duties.

B. DUTIES

The support services to be provided include, but are not limited to, the following:

1. Produce project schedules and, where appropriate, make critical path and other project plan calculations based on information provided by Project Managers and Task Managers.

2. Maintain information defining project baseline and baseline change documents.

3. Produce project reports, charts, and other information.

4. Print and distribute original and revised project schedules and cost reports to appropriate personnel.

5. Prepare and print Responsibility Assignment Matrix (RAM) based on information provided by Project Managers.

6. Receive and display task plan variances (i.e., enter transactions).

7. Contact Task Managers to reconfirm the status of task plans.

8. Prepare project impact charts that display cost and schedule problems, for use by Project Managers.

9. Assist Project Managers to prepare project status reports and briefing documents.

10. If assigned, maintain the monthly Capital Projects List and Master Schedule, add and delete projects as directed, and distribute copies of the list.

C. RESPONSIBILITY

Project Controls staff will have functional responsibilities only. They will not have project responsibilities for achieving project objectives. They will not have staff responsibilities for reporting project status or problems directly to sponsors, project initiators, or other senior executives. Such reporting is the responsibility of Project Managers.

PROJECT ADMINISTRATORS

A. DEFINITION

Project Administrators provide project management support, financial analysis and tracking, and document control.

B. DUTIES

The support services provided include, but are not limited to, the following:

1. Plans and manages administrative support of assigned projects.

2. Sets up and maintains project files, including hard copy, electronic, and web data.

3. Coordinates project reviews and approvals, project meetings, and site visits.

4. Prepares purchase requisitions for acquisitions of design and construction subcontracts, consultant agreements, miscellaneous services, and equipment using LBNL's electronic procurement system.

5. Prepares and tracks subcontract change orders, Change Authorizations, and subcontract modifications.

6. Coordinates and tracks project communications, including meeting minutes, Requests for Information (RFIs), submittals, and safety documents.

7. Manages project closeout process, including archiving of project files.

FUNCTIONAL MANAGERS

A. RESPONSIBILITY

A functional manager is a person who has been assigned resources and who has accepted functional responsibility for achieving desired results or objectives in a specified functional area or discipline. Functional managers are responsible for (1) increasing the competency of the personnel and other resources assigned to their organizations, (2) using these personnel and other resources so as to provide maximum benefit to the Lawrence Berkeley National Laboratory, and (3) ensuring that adequate resources are maintained and available to support the present and near-term workload.

B. ACCOUNTABILITY

Functional managers will be held accountable by their supervisors for achieving the functional objectives for which they have accepted responsibility.

C. AUTHORITY

Listed below are issues relating to project management over which functional managers will normally have authority. These are examples only, not a complete list.

1. Selects the techniques and methods of "how" work will be done, as long as assigned task objectives are met (scope, schedule, and budget).

2. Provides training for assigned personnel to meet competency standards.

3. Assigns responsibilities to the personnel assigned to their organization.

4. Selects and assigns Task Managers.

5. Makes changes in task plans, as long as assigned task objectives are met (scope, schedule, and budget).

6. Proposes changes in assigned task objectives.

7. With concurrence of the Project Manager, makes decisions as to whether to use in-house resources or contractors to accomplish work on project tasks. The functional manager who decides to use a subcontractor or consultant will be responsible for their performance.

8. Requires Project Managers to work through Task Managers or other designated persons when making suggestions or assigning responsibilities to the functional manager's organization.

9. Maintains design standards documents.

10. Performs plan review and sign-off.

11. May participate in design reviews.

D. PERSUASION

To achieve their objectives, functional managers will be expected to use an appropriate combination of delegated authority and persuasion skills.

TASK MANAGERS

A. DEFINITION

1. Task Managers are members of functional organizations who have accepted responsibility for accomplishing project tasks for a Project Manager.

2. These persons continue to work for their regular functional supervisors while working on project tasks.

3. When a member of a functional organization is assigned the additional duty of serving as a project Task Manager, it is usually a temporary assignment that lasts until the project task is completed. This work is normally assigned as an additional duty to the person's more permanent assignments.

4. During these temporary assignments, Task Managers work on behalf of the Project Manager to accomplish tasks in a highly competent, timely, and cost-conscious manner, in the best interests of the project and Lawrence Berkeley National Laboratory.

B. RESPONSIBILITY

1. Task responsibility is almost identical to project responsibility.

2. Task responsibility is an obligation that a person has accepted to manage an assigned project task to achieve the following objectives:

   a. Scope: Produce a task deliverable that fully satisfies the user and other designated interests.

   b. Schedule: Complete the task within the agreed-upon schedule milestones.

   c. Cost: Complete the task within the agreed-upon task budget.

3. Functional managers will make every effort to respond fully to requests from a Project Manager to accomplish tasks on behalf of an approved project.

4. When a Task Manager and a Project Manager reach agreement on the plan for a project task (scope, schedule, and budget), the Task Manager will give the Project Manager a firm commitment to accomplish the task as agreed upon. A commitment means:

   a. That the Task Manager will make every reasonable effort to provide the resources required to accomplish the task.

   b. That the Task Manager will make every reasonable effort to have the task accomplished as planned and agreed upon (scope, completion date, and budget).

   c. That if it ever appears that the Task Manager may not be able to meet the commitments to the Project Manager to accomplish the task as agreed upon,

the Task Manager will promptly notify the Project Manager. This is a very important duty for all Task Managers. Failure to report a variance promptly to the Project Manager could have serious consequences for the project and the Lawrence Berkeley National Laboratory.

5. It must be understood by all personnel that a commitment is not a guarantee or an iron-clad promise.

6. All team members are expected to make a reasonable effort to provide a successful project.

C. DUTIES

Task Managers serve as the interface between the Project Manager and the various functional groups who will actually accomplish the task work. Project Managers will accomplish projects through the Task Managers assigned to their project team.

Task Managers will fulfill their task responsibilities and accomplish duties such as:

1. Negotiate realistic task scope objectives with Project Managers and accept responsibility for achieving those objectives. Ensure that the results to be produced are specified in the task scope document and that the users of the task results are clearly identified.

2. Obtain cost and schedule estimates for the task from appropriate sources and provide same to the Project Manager.

3. Negotiate a task plan with the Project Manager for achieving the task objectives. Ensure that the Project Manager includes in the project plan all inputs the Task Manager needs to accomplish his/her task.

4. Obtain commitments from functional supervisors to accomplish work so as to complete tasks as agreed upon with the Project Manager. Review the task worksheet when appropriate.

5. Discuss the task from time to time with (a) the persons who will be providing the task inputs, and (b) the users of the task outputs (task deliverables) so as to coordinate the effort and identify and resolve task problems.

6. Promptly report task variances to the Project Manager and others as may be appropriate. A task variance is defined as a situation in which it appears that a task objective cannot be achieved as agreed upon with the Project Manager.

7. Attend project team meetings. If a Task Manager is unable to attend a project team meeting, the Task Manager will inform the Project Manager and ensure that the alternate person is fully qualified to serve as a Task Manager. In addition, the alternate person should be delegated the authority necessary to accept task responsibilities and to speak for the organization on matters pertaining to the task.

8. Work with the Project Manager to resolve task variances.

D. ACCOUNTABILITY

1. Task Managers will be held accountable by their functional supervisor for achieving their task management duties in support of their assigned functional objectives.

2. Task Managers will be held accountable by their Project Manager for achieving the project objectives for which they have received responsibility.

E. AUTHORITY

The Task Manager's functional and project authorities are delegated by their functional supervisor and Project Manager, respectively.

F. PERSUASION

To achieve their objectives, Task Managers will be expected to use an appropriate combination of delegated authority and persuasion skills.

PROJECT USERS AND OTHER DESIGNATED INTERESTS

A. DEFINITION

1. When a Project Manager accepts responsibility for a project, it means that the Project Manager has agreed to produce a product or result that will fully satisfy the user and other designated interests. When work is finished on a project, the product of that project must be accepted by the users and the other designated interests before the initiator will consider the project to be complete and close out the project.

2. A project user represents the persons who will actually use the product of a project in their operations.

3. The other designated interests represent persons who have missions that interact with the product of a project. This includes missions involving safety, security, environmental, legal, maintainability of facilities and equipment, government regulations, licensing, laboratory policy, and other infrastructure requirements. Project products must be acceptable to persons having these missions.

B. ACCEPTING PROJECT RESULTS OR PRODUCTS

In order to fulfill their responsibilities, project users and other designated interests will have the authority to accept or reject the results of projects that interact with their missions. It is therefore essential that Project Managers remain in communication with these individuals so that any disagreements may be uncovered as early as possible and so that action can be taken to resolve them.

C. CONFLICTS

The Project Manager is responsible for resolving major scope conflicts between the users, the other designated interests, and the sponsor.

D. RESPONSIBILITIES

1. It will be the responsibility of the project initiator and the project sponsor to identify the users whom the Project Manager must satisfy in order to achieve the scope objective of a project.

2. It will be the responsibility of the Project Manager to ensure that all the other designated interests are identified and requested to participate in the project.

3. It will be the responsibility of the project sponsor to ensure that a project scope document is developed that properly defines the product or results that will satisfy the users and other designated interests.

4. If there are several users of the project product, the users will meet and select one person who will deal with the Project Manager and represent the needs of all the users for the life of the project. This users' representative will then be the "user" whom the Project Manager must satisfy.

E. AUTHORITY

Listed below are several issues over which the project users and other designated interests will normally have authority. These are examples only, not a complete list.

1. Participate in the scope definition of the desired project result or product.

2. Require that the Project Manager notify the user of all proposed scope changes. Require that the Project Manager notify the other designated interests of all proposed scope changes that might effect their mission requirements.

3. Recommend scope changes to the Project Manager and receive a timely response to the recommendation.

4. Inspect, review, and evaluate project products while work is in progress and when it is completed.

5. Notify the Project Manager if the user or other designated interest feels that the final product will not be acceptable to the user. In such cases, the user must support his/her position and suggest what action s/he feels should be taken by the Project Manager.

PROJECT MANAGEMENT POLICIES

A. Project Management policies will be implemented in the Facilities Division Capital Projects Department through the publication of Capital Projects Policy Directives or revisions to the Capital Projects Procedures Manual, approved by the Capital Projects Department Head, or his/her designee.

B. The policies laid out in these directives will be adhered to by all personnel in Facilities Capital Projects.

C. The Capital Projects Department Head is responsible for maintaining the Capital Projects Procedures Manual and issuing Capital Projects Policy Directives. This includes reviewing proposed directives and procedure revisions, obtaining staff concurrence, and issuing final approved policies and procedures.

D. After approval, new and revised policies and procedures will be distributed to all Capital Projects personnel.

E. Each Capital Projects policy or procedure will be reviewed periodically. If necessary, action will be taken to retire policies or procedures, or issue revisions to them.

F. Capital Projects Policy Directives

These policies are not intended to supersede Lawrence Berkeley National Laboratory (LBNL), University of California (UC), or Department of Energy (DOE) standing policies. If an apparent disagreement is identified, the Capital Projects Department Head should be advised, so that clarification can be made.

1. Notification of Construction Work: Prior to performing work in any building, the Project Manager or Construction Manager shall notify the appropriate building manager or facility manager so that any specific hazards or precautions relevant to the work and location can be identified.

2. Management Expectations: Work under Capital Projects' supervision is expected to be performed safely, on schedule, on budget, and within the approved scope. Safety is the paramount consideration, and senior managers should use their professional judgment as they prioritize the balance of expectations. It is also expected that they model good teamwork and client service as an example to other staff members.

3. Cost Estimates and Fees for Service: (a) all cost estimates for projects or efforts over $10,000; (b) all fees for services over $10,000; and (c) all funding requests over $10,000 must be reviewed and approved by the Capital Projects Department Head before being released to clients outside the department.

4. Document Control Reprographics: All printing or photocopying, for large- and small-format jobs, should be routed through LBNL's Government Printing Office liaison (RPM Section 5.04).

PROJECT MANAGEMENT PROCESS

Projects will be managed systematically within Capital Projects.

A. RESPONSIBILITY

1. The Capital Projects Department Head is responsible for the mission and scope of Facilities Capital Projects.

2. The Capital Projects Department Head will ensure that project management training is made available to Project Managers, Task Managers, and other personnel in the department who are involved in the project management process.

B. MISSION

The primary mission of Capital Projects is to accomplish projects in support of Lawrence Berkeley National Laboratory's national and programmatic research and development plans in the Energy, General, and Life Sciences. This group focuses on project management; the control of cost, scope, and schedule; client communications; and safety.

C. IMPLEMENTATION

Systematic project management will be implemented in Facilities Capital Projects by the publication of policy memoranda and by the publication of appropriate procedures manuals and other instructions.

D. GOALS

1. To accomplish projects in a well-planned, cost-effective, responsive, safe, and timely manner.

2. To maintain client communications and relationships.

3. To keep LBNL senior management, scientific, and support leadership informed of project activities in their areas of interest.

PROJECT DEFINITION

A. DEFINITION OF PROJECT

A project is a set of activities with a specific scope, schedule, and budget. These activities have been defined as a project by the project initiator and approved by the Facilities Division.

B. DEFINITION OF PROPOSED PROJECT

1. A proposed project is a work effort that has been approved by a manager who has the authority to commit funds for the review and evaluation of a project idea, prior to making a decision to proceed with the effort as an approved project. Proposed projects include those in the planning stage.

2. For large projects, a feasibility study, Conceptual Design Report, etc., may be necessary to evaluate the alternatives and recommend approval, disapproval, or deferral. If large enough, the feasibility study itself may be set up as an approved project, and the feasibility study manager designated as the Project Manager for the study. The final product of a feasibility study will be a recommendation to the appropriate approval authority to approve, disapprove, or defer the proposed project.

C. DEFINITION OF APPROVED PROJECT

1. An approved project is a work effort that has been approved by a manager with the authority to do so and that has been entered on the official list of approved projects.

2. A work effort is not considered an approved project until it appears on the official list of approved projects.

ASSIGNMENT OF RESPONSIBILITY

A. DEFINITION

Assignment of responsibility is a specific agreement between two persons for the purpose of achieving a desired result or objective.

B. Assignment of responsibility includes both (1) the person who assigns the responsibility, and (2) the person who agrees to accept the responsibility and produce the desired result. These can be any two people. The first person need not necessarily be the supervisor of the second person.

C. There are two legitimate ways of assigning responsibility:

1. Authority: The first person must have the authority to direct the second person to accept the responsibility and produce the desired result or product.

   Note: If the second person is aware of any reason why s/he should not accept the responsibility as directed, the second person has a duty to so advise the first person, and the first person has a duty to listen. In other words, if an adverse impact is likely to result from the order, the second person should so notify the first person.

2. Persuasion: The first person has the right to persuade the second person to accept the responsibility and produce the desired result or product.

D. When a responsibility carries over from person to person to person, it is defined as a line of responsibility. Each person in a line of responsibility will be held fully accountable for producing the desired result.

E. If a person concludes that s/he will not be able to fulfill a responsibility that s/he has accepted, s/he will promptly report this fact to the person who assigned him/her the responsibility.

PROJECT RESPONSIBILITY

A. DEFINITION

Project responsibility is an obligation that a manager has accepted to manage an assigned project to achieve the following objectives:

1. Scope:

   Produce a product or result that fully satisfies the user and other designated interests. Obtain project acceptance and accomplish project closeout.

2. Schedule:

   Complete the project by the agreed-upon completion date.

3. Cost:

   Complete the project within the agreed-upon approved budget.

B. If a person with project responsibility concludes that s/he may not be able to achieve one of the above objectives, s/he will promptly report this fact in writing to the person who assigned him/her the responsibility for that objective. In this event, both individuals will work together to develop a course of action to solve the problem.

C. When project responsibility is assigned from person to person to person, it is defined as a line of project responsibility.

1. A line of project responsibility always starts with the project initiator, then carries through to the Project Manager, and finally to the Task Managers.

2. Individuals in the line of project responsibility between the project initiator and the Project Manager are defined as project sponsors.

3. All individuals in a line of project responsibility are fully responsible for achieving the objectives of the project.

4. Typical project responsibilities are as shown in Sections B1 and B5.

FUNCTIONAL RESPONSIBILITY

A. DEFINITION

Functional responsibility is an obligation that a manager has accepted to manage assigned resources in a designated area for the purpose of achieving the following objectives:

1. Resource Competency

   a. Ensure that assigned personnel and other resources produce results in a highly competent, timely, and cost-conscious manner.

   b. Develop assigned resources to their highest possible level of competency.

   c. Develop standards that define desired levels of competency.

2. Resource Utilization

   a. Determine and recommend the optimum amount and mix of resources needed to produce the desired results.

   b. Assign tasks and duties to personnel and other resources so as to achieve maximum benefits for the Lawrence Berkeley National Laboratory.

3. Institutional Policies/Procedures

   a. Ensure that institutional policies and procedures are satisfied (e.g., security requirements; maintainability standards; legal considerations; safety standards; environmental constraints; life cycle and value engineering criteria; and policies, codes, and standards of the University of California, Department of Energy, and the State of California, etc.).

B. If a person with functional responsibility concludes that s/he is at risk of being unable to achieve any of the above objectives, s/he will promptly report this fact to the person who assigned him/her the responsibility for that objective. In this event, both individuals will work together to formulate a course of action to solve the problem.

C. When functional responsibility is assigned from person to person to person, it is called a line of functional responsibility.

DUAL RESPONSIBILITY

A. PROJECT SPONSORS AND FUNCTIONAL SUPERVISORS

1. Whenever someone assigns project responsibility to a second person, that person is defined as the project sponsor of the second person.

2. Whenever someone assigns functional responsibility to a second person, that person is defined as the functional supervisor of the second person.

B. DUAL RESPONSIBILITY

1. There will be cases when it will be appropriate for a person to accept functional responsibility from one person, and project responsibility from a different person. In such cases, it is considered that the person has been assigned dual responsibilities.

   a. This occurs, for example, when a Project Manager accepts responsibility for a project from a project sponsor who is not his functional supervisor.

   b. This also occurs when a Task Manager accepts responsibility for a task from a Project Manager who is not his/her functional supervisor.

2. Generally, it is not advisable to assign functional work to a Project Manager who is also performing numerous project management duties on several projects.

PROJECT COST RESPONSIBILITY

A. APPROVED PROJECT BUDGET

1. Approval for a project shall include the approval of a project budget.

2. For approved projects of uncertain or incomplete scope, a cost range rather than an absolute number may be designated. As the project proceeds and its scope becomes more clearly defined, the Project Manager and the sponsor should refine the accuracy of the cost estimate.

B. RESPONSIBILITY FOR PROJECT COST BUDGET

1. Project Managers will be responsible for accomplishing their projects without exceeding the approved budget they have accepted.

2. When a project has been organized into its major tasks, the Project Manager will negotiate a task budget with each Task Manager.

3. Task Managers will be responsible for accomplishing their tasks without exceeding the task budget to which they are committed.

4. Project plans will show the budget for each task. The sum of these task budgets, plus any non-task costs, will be the project cost estimate.

5. The project cost estimate plus the project cost contingency (for definition see Project Cost Plan, this section) will equal the project's Total Estimated Cost (TEC).

C. AUTHORITY TO CONTROL COSTS

1. Once a task cost target has been accepted by a Task Manager, the functional organizations involved will charge all costs incurred in accomplishing that task to the correct Project ID or Work Order established for that task.

2. If a Task Manager concludes that a task budget should be increased, the Task Manager will promptly notify the Project Manager and request the additional funding before proceeding. The Project Manager will review and evaluate the request and make the appropriate decision.

3. The Project Manager is the only person authorized to increase a task budget. Task Managers and functional managers do not have this authority.

ACCOUNTABILITY

A. Accountability is a direct consequence of assigning responsibility with the appropriate level of authority.

B. When responsibility to achieve a desired result has been assigned to an individual and accepted, the person assigning the responsibility will follow up from time to time to determine how well the other person is progressing toward achieving the desired result or objective.

C. The accountability process includes following up from time to time as appropriate, and responding as necessary to the information obtained.

D. As personnel become more experienced and competent and are delegated increased authority, they should generally require less follow-up.

DELEGATION OF AUTHORITY

A. DEFINITION OF AUTHORITY

1. Authority is defined as the right – pertaining to a specific issue – to give an order and to have it obeyed, or to make a decision and have it accepted.

2. Authority is delegated on an issue-by-issue basis. Therefore, a person will be authorized to give orders and make decisions on a number of specific issues; on other issues, the person will not be authorized to give orders or make decisions.

3. Increasing a person's authority means delegating authority to that person over a larger number of issues.

B. DELEGATION OF AUTHORITY

1. Personnel will be delegated authority commensurate with their knowledge, skills, abilities, assigned responsibilities, and experience, as well as task relevance. Authority to give orders and make decisions depends on issues pertinent to these responsibilities.

2. As individuals gain experience and ability, they are generally expected to assume more authority.

C. When managers delegate part of their authority to another person, they have relinquished that authority to the other person. The manager can always reassert that authority, but in the meantime, the authority is vested in the other person – and only that person should exercise it. It is normally undesirable for both a manager and his subordinate to exercise authority over the same issue at the same time.

CLIENT COMMUNICATIONS

A. DEFINITION

Client communications refers to the written or verbal exchange of information about the project and its progress between the Project Manager and the client (or project sponsor(s), if applicable). Communications start at project assignment and end after commissioning and normal operation (refer to Project Communications Guidelines, this section).

B. Project progress should be reported on a regular basis. Unless requested otherwise by the client, the Project Manager should review the project's status with the client on a monthly basis. Developments affecting scope, schedule and/or budget (i.e., baseline changes) should be communicated promptly (refer to Project Status and Problem Identification, this section).

C. Project cost estimates shall be furnished to the client by the Project Manager (refer to Cost Estimates, this section).

D. Project information should be accurate, timely, and succinct. Status reports should be communicated with factual statements; potential problems should be explained including a summary of the Project Manager's recovery plan where appropriate.

PROJECT COMMUNICATIONS GUIDELINES

When	What	To Whom	By Whom	How
Project Initiation	Scope definition, job duration, rough budget	Client and/or users	Project Planner or Project Manager	Meetings, written records
Project Approval	Method of performance, schedule, rough budget	Client and/or users	Project Manager	Meetings, written records
Project Start (Kick-off Meeting)	Project scope, project schedule, budget, method of performance, responsibilities	Client, users, Building Manager, project team	Project Manager	Meetings, written records
Monthly or more frequently	Progress reports, including project scope, schedule, budget	Client, users, Building Manager, project team	Project Manager	Meetings, meeting minutes
Prior to Construction (2 weeks prior)	Area affected, work hours, name of LBNL Construction Manager name of contact or lead	Client, users, Building Manager, project team, Maintenance technician	Project Manager, Construction Manager	Posting of impacted areas, meetings, meeting minutes
Weekly Construction Meetings	Project progress, including issues affecting schedule, budget, scope, responsibilities	Client, users, Building Manager, project team, Maintenance technician	Project Manager, Construction Manager	Meetings, meeting minutes, phone calls, e-mail, personal visits
Prior to project completion	Punchlist	Client, users, project team	Project Manager, Construction Manager	Written record
Project Completion	Final walkthrough	Client, users, Building Manager, Maintenance technician	Project Manager, Construction Manager	Written record
Initial Occupancy	Client Questionnaire	Client	Project Manager	Send client questionnaire to client
Post–Occupancy Interview (approximately one month after project completion)	Personal interview	Client/users	Project Manager	Written record

CONFLICT RESOLUTION

A. When conflicts arise, every effort should be made by the parties involved to resolve the conflict between themselves and reach agreement through good-faith negotiations. The agreements reached must be within the context of all responsibilities within Capital Projects.

B. If agreement cannot be reached, and if authority on the issue has been delegated to one of the persons involved, the disagreement or conflict will be readily resolved when the person who has the authority makes a decision that terminates the discussion. This decision-making shall be made at the lowest appropriate level.

C. In cases where neither party to a conflict has the authority to make a decision and thus terminate the discussion, or where resolution cannot be reached between the two parties, both persons will agree to refer the conflict to their respective supervisors for resolution. These supervisors will take prompt action to resolve the disagreement or refer the conflict to their respective supervisors for resolution.

PROJECT PRIORITIES

A. RESPONSIBILITIES

The Capital Projects Department Head is responsible for advising Project Managers and functional managers on the relative priorities of approved projects and other work endeavors.

B. RESOURCE ALLOCATION

Functional managers will allocate their resources to projects and other endeavors competing for the same resource by using the same priority guidance provided in Paragraph A, above.

C. DIVERSION OF RESOURCES

When a Task Manager, functional manager, or project support services are asked to support a new, high-priority project, and they cannot support the new project without diverting resources from existing projects to which they are committed, these functional managers may request that their respective group leader decide from which project(s) or other endeavors they should divert resources so as to support the new project. The group leader making the decision to divert committed resources will carefully review and evaluate any adverse long- or short-term impact of the decision.

D. PRIORITY OF WORK-IN-PROGRESS TASKS

When a definitive work effort (task or sub-task) has been started, and personnel are fully engaged in the work, the task will acquire increased priority by virtue of being in progress. A new task must have a very high priority to justify altering an ongoing task that is in progress and diverting the resources to the new task.

E. NOTIFICATION OF ADVERSE ACTION

Whenever resources are about to be diverted from one project to support a project of higher priority, the Task Manager will immediately confer with the other Project Manager(s) whose schedules may be adversely affected by this decision.

THE PROJECT PLAN

A. RESPONSIBILITY

Project Managers will develop and maintain a current project plan for each of their projects.

B. A typical project plan may consist of:

1. The current project scope document approved by the project sponsor. This document will clearly identify the project users and other designated interests (refer to Project Scope Document, this section).

2. The current project schedule and project cost plans for the project (refer to Project Schedule and Project Cost Plan, this section).

3. A list of the project team and assignments, or, for larger projects, a Responsibility Assignment Matrix (RAM).

4. The current Project Variance Report, for EVMS projects (refer to Section B4, Project Reports).

5. Project information, including:

   a. Project ID.

   b. The building number and name of the project.

   c. The name of the project sponsor, the name of the project user(s), the name of the Project Manager, the revision number and date of the plan, and the signature of the sponsor indicating approval of the plan.

   d. The project task list.

   e. The names and departments of the Task Managers.

6. Pertinent memoranda of understanding and key correspondence.

C. An operating version of the Project Variance Report should be prepared and maintained for use by the Project Manager, and for the guidance of Task Managers. If appropriate, a summary version of the plan may be developed for reporting status to the sponsor and initiator.

D. Task Managers will participate in the preparation of project plans.

E. Project plan documents should not be developed in any more detail than is necessary to permit cost-effective management of the project, or any regulatory requirements.

F. REVISIONS

1. An approved project plan may be revised at any time, but such revisions may be made only by persons with the authority to do so.

   a. Task Objectives

      i Changes in task scopes, task schedule, and task budgets will be approved only by the responsible Project Manager.

      ii A baseline change log will be maintained by the Project Manager to record all significant changes in task objectives.

   b. Project Objectives

      i Changes in the project scope, project schedule, and project budgets will be approved only by the project sponsor.

      ii When needed, a project change log will be maintained by the Project Manager to record all significant changes in the project objectives. For Line Item Projects, this is known as a Baseline Change Proposal log.

2. When a recovery plan is approved, the project plan changes resulting from the recovery plan, if any, will be promptly incorporated into the project plan. The modified plan will be assigned a new revision number, and copies will be distributed to all interested persons. If the revised project plan includes changes in the project objectives, the Project Manager will ask the sponsor to sign the revised version of the plan before it is distributed.

3. Change Logs

   a. Project Managers will ensure that all significant changes in task objectives and project objectives are promptly recorded in the appropriate change log.

   b. At the conclusion of a project, the change logs will provide complete traceability as to how the project evolved from its original project objectives and task objectives to the objectives finally achieved.

4. Variance Reports

   Project Managers will notify the project sponsor and Project Director in writing of significant changes in scope, schedule, or project cost plan.

PROJECT SCOPE DOCUMENT

A. RESPONSIBILITY

When a project sponsor requests a Project Manager to evaluate or accomplish a proposed project, it is the responsibility of the project sponsor to provide the Project Manager with an initial scope document that (1) reasonably defines the product the Project Manager is to produce, and (2) clearly identifies the users or user representative who must be satisfied with the project product.

B. In cases where the project sponsor cannot provide a reasonable scope document, the sponsor may ask the Project Manager to develop a scope document for him/her. In these cases, the Project Manager is authorized to obtain a scope document as follows:

1. The Project Manager will determine which organization, or group of organizations, should write the scope document on behalf of the project sponsor. The Project Manager will then assign the scope writing responsibilities to that organization or group of organizations. Preventing scope errors and omissions is the responsibility of the scope writers.

2. If appropriate, the Project Manager will request the project sponsor to provide personnel to participate with the other contributing groups in writing the project scope document.

3. The Project Manager will submit the initial scope document to the project sponsor, the users, and other designated interests. The Project Manager must ensure that all designated interests have been identified. If the project sponsor, the users, and other interests cannot reach agreement on the project scope document, it is the responsibility of the project sponsor to resolve the differences; it is not the responsibility of the Project Manager.

C. Preparing a project scope document is an important responsibility that often requires significant expenditure of work-hours by qualified persons. In such cases, the Project Manager will include the writing of the initial scope document as a key task in the project plan with a schedule, a task cost plan, and a responsible Task Manager. The cost of writing the scope document will be included in the project budget and paid for with project funds. In cases of high uncertainty, tasks involving the later refinement of the scope document may be included in the project plan.

D. REFINEMENTS

1. In almost all cases, the initial project scope document will have to be expanded and made more specific at various times during the life of a project.

2. Responsibility

Refining a project scope document is a functional responsibility that often requires significant expenditure of work-hours by qualified persons.

a. In such cases, expanding and refining the scope document should be included as a key task in the project plan, with a schedule, a task cost plan, and a responsible Task Manager.

b. The cost of refining the scope document will be included in the project budget and paid for with project funds.

c. Preventing scope errors and omissions is the responsibility of the individuals refining the scope documents and their supervisors.

3. Revised scope documents will be reviewed by the Project Manager. If the revised scope document is acceptable to the Project Manager, he will submit the document to the project sponsor, the users, and other designated interests, and request their acceptance.

4. If the project sponsor, users, and other interests cannot agree on a revised scope document, it will be the responsibility of the project sponsor to resolve the differences with the assistance of the Project Manager; however, it is not the responsibility of the Project Manager.

5. Basis for Task Scope Documents

   The Project Manager will use the evolving project scope document as the basis for the task scope documents that s/he is responsible for providing to his/her Task Managers (refer to Task Scope Document, this section). A change in a project scope document may require revising some or all of the task scope documents.

PROJECT WORK BREAKDOWN STRUCTURE (WBS)

A. A project Work Breakdown Structure (WBS) is a grouping of project work elements that organizes and defines the total scope of the project. The WBS is a multi-level framework that organizes and graphically displays elements representing work to be accomplished in logical relationships. Each descending level represents an increasingly detailed definition of a project component. It is the structure and code that integrates and relates all project work (technical, schedule, and cost) and is used throughout the life cycle of a project to identify and track specific work scopes.

B. All Facilities Capital Projects projects of more than $100K shall have a Work Breakdown Structure. The Capital Projects WBS Standard Format (this section) will be used as a basis for the project WBS. The Standard Format WBS will allow cross-project reporting to management, and tracking of program budgets. Higher-level elements (Level 1 and Level 2) of the Standard Format WBS will be maintained; lower-level elements may be added, modified or removed at the Project Manager's discretion as needed to manage the project. The WBS will be established in sufficient detail so that each Control Account has a unique WBS element.

C. The WBS will be defined in the Project Execution Plan. An understanding of the planned project scope, schedule, and cost and the planned methods of project execution are required before preparation of the WBS.

D. Project Managers are responsible for the establishment of a WBS for their assigned projects, with input from the Control Account Managers (CAM) and other members of the project team.

E. Where the title of a WBS element does not provide an adequate description of the work involved, the project shall develop a WBS dictionary. The WBS dictionary is a set of specific definitions that describe the scope of each work element identified in the WBS. It defines each element to at least the Control Account level in terms of the content of the work to be performed. If a WBS dictionary is not used on a project where Earned Value Management (EVMS) reporting is required, the project must demonstrate to the satisfaction of the LBNL Project Management Office that the Scope of Work (SOW) and the WBS are fully reconciled.

WBS STANDARD FORMAT

Work Breakdown Structure – PROJECT TITLE
Project Supervisor – PROJECT MANAGER

Fxyz00	PROJECT TITLE			Control Acct Mgr (CAM)*
	Fxyz10	In-House A/E		
		Fxyz11	Architects	Architect
		Fxyz12	Civil / Structural	Structural Engineer
		Fxyz13	Mechanical	Mechanical Engineer
		Fxyz14	Electrical	Electrical Engineer
		Fxyz15	Cost Estimating	Cost Estimator
	Fxyz20	Consultants		
		Fxyz21	Consultant 1	Project Manager
		Fxyz22	Consultant 2	Project Manager
	Fxyz30	Inspection		
		Fxyz31	Q/A	Inspector
		Fxyz32	Safety	Inspector
		Fxyz33	Testing Labs/Consultants	Inspector
		Fxyz34	Contract Services	Inspector
	Fxyz40	Outside A&E		
		Fxyz41	Preliminary Design/Title 1	Project Manager
		Fxyz42	Final Design/Title 2	Project Manager
		Fxyz43	Construction Design/Title 3	Project Manager
	Fxyz50	Construction		
		Fxyz51	Construction Subcontract 1	Project Manager
		Fxyz52	Construction Subcontract 2	Project Manager
		Fxyz53	Construction Subcontract 3	Project Manager
		Fxyz55	In-House Construction	
			Wxxxxx Work Order 1	Project Manager
			Wxxxxx Work Order 2	Project Manager
			Wxxxxx Work Order 3	Project Manager
	Fxyz60	Standard Equipment		Project Manager
	Fxyz70	Other Costs		
	Fxyz80	In-House Project Management		
		Fxyz81	Project Manager	Project Manager
		Fxyz82	Construction Manager	Project Manager
		Fxyz83	Project Administrator	Project Manager
		Fxyz84	Supplies & Expenses	Project Manager
	Fxyz90	Unassigned		Project Manager

Legend:
x = project type code
y = project year code (e.g., 5 for 2005)
z = project number code

* Project Manager has overall responsibility for project budget.

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PROJECT ORGANIZATIONAL BREAKDOWN STRUCTURE (OBS)

A. A project Organizational Breakdown Structure (OBS) is a depiction of the project organization arranged to indicate the line-reporting relationships within the project context.

B. The OBS is a project organization framework for identification of accountability, responsibility, management, and approvals of all authorized work scope. It is a direct representation and description of the hierarchy and organizations that will provide resources to plan and perform work identified in the Work Breakdown Structure (WBS). The OBS helps management focus on establishing the most efficient organization, by taking into consideration availability and capability of management and technical staff including subcontractors, to achieve project objectives.

C. LBNL will prepare an OBS for all projects requiring EVMS (Earned Value Management System) reporting. The OBS for each project will be defined in the Project Execution Plan.

D. The Project Manager has responsibility for preparing the OBS.

CONTROL ACCOUNTS, WORK PACKAGES AND PLANNING PACKAGES

A. This procedure applies to all LBNL projects requiring Earned Value Management System (EVMS) reporting.

B. A Control Account is a management control point at which budgets (resource plans) and actual costs are accumulated and compared to earned value for management control purposes. A Control Account is a natural management point for planning and control, since it represents the work assigned to one responsible organizational element on one project Work Breakdown Structure (WBS) element.

Project IDs are established within LBNL's Financial Management System such that cost collection is performed at the Control Account level, with Control Accounts rolling up into Summary Level Accounts, which in turn roll up to an overall Project Summary account. No charges are directly charged or recorded at any Summary Level Account. At LBNL all accounts are commonly referred to as Project IDs, and individual chargeable accounts are often referred to as descendents or children of the summary Project IDs. There is not necessarily a one-to-one correspondence between Project IDs and Control Accounts. Multiple Project IDs, representing individual Work Packages, may feed into the summary Project ID, which is the Control Account. While multiple Project IDs may roll up into a summary Control Account Project ID, a Project ID is never divided among multiple Control Accounts. In all cases, the Control Account has a unique Project ID number that matches its WBS activity identifier.

C. Work packages are a subdivision of a Control Account and consist of discrete, apportioned, or level-of-effort tasks that have been planned and budgeted in detail. The budget for each is segregated into elements of cost. Work packages constitute the basic building blocks used in planning, measuring accomplishment, and controlling project work. A work package has the following characteristics:

1. Represents units of work at levels where work is performed.

2. Is clearly distinguishable from all other work packages by a descriptive title.

3. Is assignable to a single organizational element responsible for performing the work.

4. Has scheduled start and completion dates and, as applicable, interim milestones – all of which represent physical accomplishment.

5. Has a budget or an assigned value expressed in terms of dollars. Indirect costs are allocated based on the applicable base per the LBNL financial practices disclosure.

6. Uses a single earned value (EV) method.

7. Has a limited duration within a reasonably short time span.

8. Can be integrated with project schedules.

9. Reflects the way in which work is planned and has meaningful products or, is a management-oriented subdivision of a higher-level element of work.

10. Uses objective indicators/milestones as much as possible to minimize in-process work evaluation and provides accurate assessment of progress.

11. Contains time-phased budgets that are used for planning, reporting, and control. When learning curves are used, time-phased budgets and schedules reflect this learning.

12. Level of Effort should only be used on a work package where no definable deliverable or work products exist as a consequence of the work package.

D. Planning packages are created to describe work within a Control Account that will occur in the future. Planning packages must have a work scope, schedule, and time-phased budget. Planning packages are normally larger (in scope, schedule, and budget) than individual detailed work packages, but planning packages must still relate to a specific work scope. Individual planning packages do not require the detail found in work packages. When planning packages are converted into work packages, they are defined in greater detail and a Control Account Plan/Work Authorization (CAP/WA) is issued.

E. Control Account planning consists of those efforts needed to establish time-phased budgets for each Control Account identified for project execution. The Control Account Managers have the primary responsibility for developing and managing the Control Account budgets. The project provides Control Account Managers with budget guidance and a common planning capability to perform resource costing, indirect rate applications, and other calculations.

Control Accounts are generally budgeted in dollars. The Project Manager and the Control Account Manager come to agree on the work scope to be accomplished, and the accompanying budget and schedule necessary to support the required effort. Once these budgets have been developed, the work is authorized through a CAP/WA. The total budget with respect to any given grouping of work is called Budget at Completion (BAC).

Each project is responsible for defining the specific software applications and planning procedures that will apply. However, the LBNL Project Management Office may recommend specific packages or configurations for uniformity and ease of integration across LBNL. Although records can be kept at lower levels of detail, the lowest required level of detail for maintaining the PV and the BAC is by resource within the planning package or work package subsets of the Control Account.

Control Account budgets may be further subdivided into one or more work packages and planning packages in the project schedule. The Control Account Manager selects the EV measurement technique, the method for measuring the work performed. Only a single technique may be used on an individual work package. Planning packages have no associated earned value technique, as they always represent future work for which detailed planning and estimation has not been completed. Control Account budgets in the EVMS are governed by the following guidelines:

1. The sum of budgets for work packages and planning packages equals the Control Account BAC value.

2. The Control Account Manager must be able to provide the basis for the budgets of all detail-planned work packages and planning packages.

3. The start and completion dates for all tasks, including planning packages, are to fall within the scheduled start and completion dates of the Control Account.

4. Retroactive changes to budgets for completed efforts are prohibited except for the explicit correction of errors.

5. Re-planning future portions of open and unopened work packages and planning packages requires formal change approval, consistent with the Project Execution Plan change management requirements.

F. Assigned Control Account Managers (who may also be the Project Manager), supported by the Project Manager and other members of the project team, have responsibility for developing and managing work packages and planning packages within their assigned Control Account.

PROJECT SCHEDULE

A. Project Managers will prepare and maintain a project schedule for their assigned projects.

B. The project schedule will be displayed on the project plan and will consist of:

1. The project task list.

2. The scheduled start date and completion date for each task.

3. The project completion date (completion date milestone).

4. The name and department of each Task Manager responsible for accomplishing tasks.

C. When appropriate, the project schedule, or sub-schedules, may also show:

1. Important deliverables (task products).

2. Key events and major decision points.

3. Interfaces, links, critical path, and float.

D. Project schedules should not be developed in any more detail than is necessary for cost-effective planning and management of the project.

E. For all capital projects requiring EVMS reporting, LBNL will develop, utilize, and keep current three categories of schedules. The schedules will be used as tools to facilitate and achieve project goals and schedule commitments and will generally reflect the following:

1. Baseline Schedule

The Baseline Schedule is the key control and contractual schedule for the entire project, start to finish, that includes all major control milestones, and major activities included in conceptual design, detailed design, procurement, subcontracting, construction, start-up, and commissioning.

The Baseline Schedule is the basis for project schedule performance. The Project Manager, supported by the Integrated Project Team (IPT) and others, is responsible for developing the Baseline Schedule and subsequently executing the project in accordance with the agreed-to milestones reflected in the Baseline Schedule.

The Baseline Schedule is maintained under configuration management and may not be revised without proper authorization. Any milestone changes will be made in conformance with the baseline change process described in the Project Execution Plan. The Baseline Schedule will be updated as necessary.

2. Current Schedule

The Current Schedule is used to manage all project activities and is developed by logically networking the project activities. It reflects the logical, optimal sequence of

project execution and allows for the determination of different critical paths and what-if scenarios. The network approach provides the ability to relate the project time-phased activities in their logical sequence using predecessor-successor relationships and timing.

The Current Schedule also enables the determination of critical paths and an evaluation of the effects of the current schedule performance status on activities and milestones scheduled to be accomplished in the future. The Current Schedule includes detailed input from all Control Account Managers providing the ability to relate activities and milestones between different levels of schedules. The Current Schedule must be consistent with key deliverables, control and contractual milestones as reflected in the Baseline Schedule and the Project Execution Plan.

The Current Schedule employs the approved Baseline Schedule to relate progress. The Current Schedule reflects the actual status of the project at a current point in time and shows the work performed and the milestone accomplishments. The Current Schedule is updated monthly, or as determined by the Project Manager, and is used by the Project Team as a key control and analysis tool to manage the work and identify areas needing corrective action.

3. Supplemental Schedules

Supplemental schedules are prepared at the discretion of the Project Manager or other key team member to facilitate and control a certain aspect or time frame of the project. These can be computerized or manually generated documents. Examples can include: weekly or monthly rolling or look-ahead schedules, conceptual study schedules, drawing production schedules, concrete pour schedules, various subcontractor schedules, craft schedules, cable installation schedules, critical piping installation schedules, start-up schedules, and Beneficial Occupancy schedules.

PROJECT COST PLAN

A. Project Managers will prepare and maintain a Project Cost Plan for their assigned projects.

B. The Project Cost Plan will be displayed on the project plan and consist of:

1. The project task list. This list will be consistent with the Project Schedule task list as defined in Project Schedule, this section.

2. The budget for each task or appropriate groups of tasks.

3. The project Total Estimated Cost (TEC). This will be the sum of the project cost estimate plus any costs not attributable to tasks, and project contingency.

4. The name and department of each Task Manager responsible for accomplishing tasks.

C. When appropriate, the Project Cost Plan, or subplans, may also show:

1. The cost of large material purchases.

2. The cost of large equipment and facility rents or purchases.

D. Project cost plans should not be developed in any more detail than is necessary for cost-effective planning and management of the project.

E. Project Cost Contingency

1. Definition

Project cost contingencies are made available to Project Managers to cover unforeseen, unexpected, or unusual costs that are difficult or impossible to define or plan. Since the Project Manager is authorized to use the cost contingency as s/he sees fit, s/he can use the funds to resolve project problems quickly with negligible administrative delay. For Line Item Projects, the use of contingency is governed by the Baseline Change Control Threshold table in the Project Execution Plan.

2. Authority to Use the Cost Contingency

a. Project Managers are authorized to transfer funds from the project cost contingency to a project task. Task Managers do not have this authority.

b. If a Task Manager has a need for additional funding that s/he feels should come from the project cost contingency, the Task Manager will recommend this action to the Project Manager. The Project Manager will review the situation and make the decision.

c. The cost contingency should not be used to finance scope changes desired by the sponsor. Scope changes will be approved at the appropriate level, and a decision will be made after a review of the project finances to determine how

much the project budget needs to be increased to cover the cost of the sponsor's scope change.

d. Any cost revisions that exceed thresholds established in the Project Execution Plan shall be approved through the Baseline Change Control (BCP) process.

TASKS

A. LIST OF PROJECT TASKS

A project tasks list will be developed for each approved project by the Project Manager and the project team. The list of tasks should be selected that will provide an optimum structure for planning and managing the project and for reporting status to the sponsor and other managers.

B. DEFINITIONS

1. Task

A task is a subset of a project. It is a functional work effort that produces a specific product or result. A task is defined by its scope, schedule, budget, responsible Task Manager, task products (deliverables), and the user of the task products. A task can be likened to a mini-project.

2. Major Task (Level I Task)

A major task is one of the primary structural elements of a project. A project is therefore a set of major tasks. Major tasks may also be defined as Level I tasks.

3. Subtasks (Level II Tasks)

When a major task (Level I task) is broken down into smaller subtasks, these tasks may be described as Level II tasks. When a Level II task is broken down into smaller tasks, these tasks may be described as Level III tasks, and so on.

4. Project Task List

A project task list is the set of major tasks and appropriate subtasks displayed on the project cost and task plan documents.

TASK SCOPE DOCUMENT

A. RESPONSIBILITY

1. When a Project Manager requests a Task Manager to accomplish a task on behalf of his project, it is the responsibility of the Project Manager to ensure that a scope document is prepared that reasonably defines the task product or result to be produced.

2. In most cases, responsibility for writing a task scope document will be assigned to the Task Manager for that task.

B. Task Managers are authorized to request appropriate functional organizations to assist in preparing the necessary task scope documents. This can include the sponsor's organization, the users' organizations, the Task Manager's own organization, corporate staff, and outside contractors. Requests for assistance should be coordinated with the Project Manager.

C. Project Managers should not write task scope documents, unless the Project Manager is the only person technically qualified to write the document, and this work will not adversely affect the management of the project.

D. If a Project Manager encounters difficulties in obtaining the support necessary to produce a required task scope document, s/he will promptly notify the project sponsor, who will then assist him/her with the problem.

TASK PLAN

A. RESPONSIBILITY

Task Managers will prepare and maintain a task plan for each project task for which they are responsible.

B. A task plan will consist of the following:

1. The current task scope document (refer to Task Scope Document, this section).

2. The task cost worksheet (refer to Task Cost Worksheet, this section).

3. The task schedule, including milestone dates. In cases of high uncertainty, the completion date will be shown as bracketed.

4. The current budget for the task. In cases of high uncertainty, the budget will be shown as bracketed.

TASK COST WORKSHEET

A. RESPONSIBILITY

Task Managers will be responsible for maintaining a task scope document and a task worksheet for each of their tasks. A task worksheet will normally include:

1. Information on how the task schedule (duration) was derived.

2. Information on how the task budget was derived. For example:

Category	Units	Number	X	Rate ($/unit)	=	Cost ($)
Sr Engineer	Mhrs	100		40.00/mhr		4,000.00
Technologist	Mhrs	60		30.00/mhr		1,800.00
Field Expenses	Trips	5		600.00/trip		3,000.00
Task Budget						8,800.00

B. If someone other than a Task Manager prepares a task worksheet, the Task Manager will obtain a copy of the worksheet and will study how the task schedule and budget were derived.

1. If a Task Manager disagrees with a task worksheet, the Task Manager will challenge the data and will negotiate a revised worksheet if appropriate.

2. If a Task Manager agrees with a task worksheet, s/he will prepare a summary task plan for the task (start date, completion date, and cost target) and submit it to the Project Manager.

C. In cases where there is great uncertainty regarding the scope of a task, the Task Manager may not be able to prepare a worksheet. In this case, the Task Manager is authorized to provide a stochastic determination of the cost in lieu of a worksheet as the source of the task span time and cost budget.

1. If the Project Manager selects a specific duration and budget for the task for use on the project cost and task schedule plan, the bracketed information provided by the Task Manager should be clearly shown on the plan. In these cases, the probability (risk analysis) of meeting the specific task duration and budget should be recorded in the project history file.

COST ESTIMATES

A. COMMON PROBLEMS

Cost problems are generally the result of one or more of the following conditions:

1. Unrealistic or low baseline budgets, cost estimates, and construction bids.

2. Uncontrolled and/or unnoticed increases in scope of work.

3. Unforeseen technical difficulties.

4. Schedule delays that require overtime or other added cost for recovery.

5. Inadequate cost budgeting, reporting, control practices, and procedures.

B. RESPONSIBILITIES

Project Manager: Identifies and manages project objectives (i.e., scope, completion date, and budget); develops and maintains cost and schedule estimates for the project.

Task Manager: Identifies and manages an assigned project task to achieve task objectives; develops and maintains cost and schedule estimates for the task.

Project Director: Ensures that Project Managers develop and maintain project plans, cost and schedule estimates, and follows baseline change control process.

Project initiator (or project sponsors, when applicable): Requests that Facilities Capital Projects provides cost and schedule estimates for LBNL projects.

C. COMPLETED ESTIMATES

When a cost estimate has been completed, it will be provided to the project initiator/sponsor in writing and signed by the Project Manager of Facilities Capital Projects (refer also to Paragraph D, Reviews, below).

1. Cost estimates will clearly indicate the degree of uncertainty in the estimate (e.g., Class A, B, C, or D – refer to Paragraph F, below) and list the important assumptions. In cases where the project initiator/sponsor is unable to provide a well-defined project scope document, it may be appropriate to provide the project initiator/sponsor with cost and schedule duration ranges.

2. When the project initiator/sponsor requires a cost estimate and project schedule immediately (within a day or so), and there is insufficient time to evaluate the task and prepare a proper response, a letter will be provided to the project initiator/sponsor by the date requested, and clearly state (in addition to Paragraph C1, above) that the cost estimate was prepared quickly, indicating the amount of effort expended (number of work-hours).

D. REVIEWS

Cost estimates must be reviewed by the Project Director before the information is shared with the project initiator/sponsor.

E. REFINING ESTIMATES

If a project initiator/sponsor requests a higher-quality cost estimate, the project initiator/sponsor may be asked to:

1. Furnish more details and description of the project;

2. Provide additional funding to support estimating and study work; and/or

3. Agree to a reasonable due date for completing the estimate.

F. LEVELS OF ACCURACY

1. Class A – Final Construction Estimate. Accuracy (%) = 10(±5).

   a. Construction estimates from subcontractor

2. Class B – Final Design Estimate. Accuracy (%) = 15(±5).

   a. Final engineering complete

   b. Drawings complete

   c. Specifications complete

   d. Material and labor from final drawing take-offs

3. Class C – Conceptual Design Estimate. Accuracy (%) = 20(±10).

   a. Detailed scope definition by client

   b. Client approval of scope

   c. Site investigation (determine tie-in requirements for major equipment)

   d. Preliminary engineering drawings

   e. Material and labor from preliminary drawing take-offs

4. Class D – Scoping and Planning Estimate. Accuracy (%) = 30(±10).

   a. Project definition by client

   b. Site visit and on-site scope review with client

   c. Major equipment identified and reviewed

   d. Experience and historical cost data for similar work

e. No design documents

PROJECT STATUS AND PROBLEM IDENTIFICATION

A. RESPONSIBILITY

Project Managers must ensure that they are continuously aware of the status of their projects, in order to identify task variances, evaluate the impact of these variances on future elements of the project, and determine if the impact represents a significant problem for the project. Possible issues include scope, schedule, and cost problems.

B. STATUS OF PROJECTS

The status of project scope completion will be reviewed frequently, at weekly meetings with engineering and/or construction subcontractors as appropriate. At a minimum, project schedules and cost reports will be generated monthly, as required by the overall Capital Projects reporting process for the Monthly Capital Projects list and Master Schedule.

C. IDENTIFYING AND DISPLAYING TASK VARIANCES (SCOPE, SCHEDULE, COST)

1. Task variances will be identified primarily by the responsible Task Managers, who will promptly report these variances to the Project Manager and, if appropriate, to their functional supervisors.

2. Task variances may also be identified by Project Managers visiting work sites, reviewing documents, talking to Task Managers and other project team members, discussing the project with interested functional managers and staff personnel, and talking with functional workers, contractors, and vendors.

3. Project Managers will maintain a log that accurately shows for all tasks, at all times, unresolved task scope variances.

4. Project Managers will maintain a current copy of the Project Variance Report that accurately describes the issue(s):

   a. Unresolved cost target variances.

   b. Unresolved task schedule variances.

   c. Design deviations.

   d. Refer to Section B4, Project Reports.

D. PROJECT SCOPE PROBLEMS

A project scope problem is defined as a situation in which the collective impact of unresolved task scope variances and other difficulties appear likely to fall short of the project requirements of the project users and other designated interests.

E. PROJECT SCHEDULE PROBLEMS

1. A project schedule problem is defined as a situation in which the collective impact of the unresolved task schedule variances is likely to delay the project completion date,

postpone a major project milestone, or compromise delivery of a critical element in the project to a user.

2. When appropriate, Project Managers will prepare more detailed information for projects that have several significant task schedule variances.

F. PROJECT COST PROBLEMS

1. A project cost problem is defined as the sum of the current unresolved cost variances.

2. The forecast cost of a project is the sum of (a) the project budget, and (b) the sum of the current unresolved cost variances.

G. PROJECT STATUS AWARENESS

Project Managers must ensure that they are aware at all times of all significant scope, schedule, and cost problems confronting their projects.

VARIANCE REPORTING

A. TASK MANAGERS

1. Task Managers who have made a commitment to a Project Manager to accomplish a project task will continuously review the task plan, both before, during, and after work starts, to ensure:

   a. That the task objectives are still valid, realistic, and can be met.

   b. That the task scope adequately defines the task deliverables and that these will satisfy the task users.

   c. That the resources required to meet the task objectives are forecast to be available on the dates required.

2. If a Task Manager concludes that a current or future task cannot be accomplished as agreed upon in his/her commitment to the Project Manager, the Task Manager will promptly notify the Project Manager of this fact, and will work with the Project Manager to develop a good recovery plan.

3. No one in the Facilities Division will knowingly withhold information from Project Managers on significant task variances. Such withholding of information on task variances compromises the best interests both of the project and of Lawrence Berkeley National Laboratory, and will be considered a violation of division policy.

B. PROJECT MANAGERS

1. A Project Manager who has made a commitment to provide a Task Manager with a deliverable needed for a task will monitor at a minimum monthly the status of the activity.

2. If the Project Manager concludes that he cannot provide the deliverable as planned, the Project Manager will promptly notify the Task Manager and will work with him/her to develop a suitable course of action. This early notification will give the Task Manager sufficient time to reschedule tasks and reallocate resources from the delayed task to other tasks.

COMPLETED TASK ANALYSIS

A. RESPONSIBILITIES

1. Functional managers are responsible for the performance of Task Managers in their organizations.

2. The supervisors of Task Managers are responsible for ensuring that their Task Managers complete assigned project tasks in a competent, timely, and cost-conscious manner. This includes making sure that the Task Managers in their divisions promptly notify Project Managers of significant scope, schedule, and cost variances.

B. TASK CRITIQUE

1. At the completion of each major task, the Project Manager and the Task Manager will look at the results (the actual completion date of the task, the final actual cost of the task, and the extent of the users' satisfaction with the Task Product), and will compare these results with the last approved plan for that task.

2. The variances, if any, between the actual results and the latest approved task plan will be noted and discussed by the Project Manager and the Task Manager.

3. If there is a large variance, the Task Manager will notify his/her functional supervisor.

4. If an actual Task Variance is likely to have a major adverse impact on a project objective, this will be promptly reported to the sponsor and other managers as appropriate. As appropriate, the Project Manager will submit recommendations to the sponsor to prevent any recurrence of the problem that caused the variance.

ACTUAL PROJECT COSTS

A. PROJECT CODE OF ACCOUNTS

When a Project Plan has been approved, and the cost and task plan documents have been approved and signed, the Project Manager will request the project support services organization to arrange to have the actual costs of tasks collected in accordance with an agreed-upon code of accounts.

B. FINAL TASK COSTS

Costs incurred by Facilities Capital Projects organizations on behalf of a project will be charged against the project task on which the money was spent. When a project task has been completed and the task deliverables accepted, the Project Manager will notify the project support services organization. This organization will arrange to have the final actual cost of that task calculated and provided to the Project Manager and the Task Manager.

C. ATTRIBUTION OF COSTS

All personnel responsible for charging costs to tasks will do so as accurately as possible. The misattribution of costs is unethical and is a serious violation of LBNL policy.

D. FINAL PROJECT COSTS

When a project is completed, the final actual cost of the total project will be reviewed and verified by the Project Manager. This total project cost is the sum of the final actual costs of the project tasks, plus any authorized project costs not attributable to project tasks. The Project Manager will report this final total cost of the project to the project sponsor, and to his/her line manager if this is a different person. The sponsor will notify the initiator of the final actual cost of the project.

KEY PROJECT MEMBER CHANGE: TURNOVER PROCESS

A. DEFINITION OF KEY PROJECT MEMBER CHANGE

A change in the Project Manager or Construction Manager may be made at any time during the execution of the project. This change places a new person, with or without prior knowledge of the project, into the position of Project Manager or Construction Manager.

B. TURNOVER PROCESS

Prior to the new person taking full responsibility, a turnover process shall occur. The extent of the turnover process will depend upon the size and complexity of the project, but shall at a minimum include the following:

- Hand off of all project documents including a discussion of both electronic and hard copy files
- Current assessment of project risks
- Summary of outstanding issues and priorities

A meeting shall be conducted with key project team members to review these documents as they are turned over to the new team member.

PROJECT RESTART PLAN

A. OBJECTIVE

A restart plan shall be developed for all projects that are paused for longer than two months. The objective of this plan includes assuring that team members and stakeholders are updated on project status and are aware of their roles and responsibilities.

B. CONTENT

The content of the restart plan will depend upon the size and complexity of the project but shall at a minimum include a meeting with the Integrated Project Team. The written plan (or agenda of the IPT meeting) shall include:

- General description of scope clarifying any scope changes that may have occurred during the hold period
- Summary of unresolved issues and project priorities
- Acquisition Strategy
- Identification of project team members

If a key project team member (Project Manager or Construction Manager) has changed during the hold period, refer to the Key Project Member Change: Turnover Process (this section).

PROJECT PROBLEM REPORTING

A. DEFINITION OF PROJECT PROBLEM

A project problem is defined as a situation in which it appears that (1) a project objective (scope, schedule, or budget) cannot be achieved, or (2) the probability of achieving a project objective has significantly decreased.

B. PROMPT REPORTING

If a Project Manager identifies a problem that is of sufficient gravity to bring to the attention of the sponsor, the problem shall be promptly brought to the attention of the project sponsor and Project Director, and not be withheld until a recommended solution can be developed. Problems shall be resolved in a timely manner.

1. If a Project Manager identifies a new problem but is convinced that the problem can be readily solved in a day or so, it is common sense to solve the problem quickly without involving the sponsor. However, if after a day or so, a solution has not been found, the Project Manager must notify the sponsor and Project Director that the problem exists.

2. If a Project Manager identifies a new problem, and it is likely that the sponsor or initiator will hear about the problem from other sources in the next day or so, it is acceptable for the Project Manager to immediately notify the sponsor and Project Director that the problem exists.

C. To enable Project Managers to report significant problems promptly, as outlined above, all personnel must be candid regarding problems and task variances, and must report these variances to Project Managers promptly, as specified in Variance Reporting, this section.

1. To fully support this policy, an attitude of “shoot the messenger” on the part of managers will be considered unacceptable.

2. In addition, reasonable mistakes will be accepted as the normal consequence of delegating authority and taking risks in support of the mission and objectives of Facilities Capital Projects. Concealing mistakes, however, will be treated as a violation of Capital Projects policy.

D. Project sponsors must ensure that project initiators are promptly informed of all significant project problems.

PROJECT RECOVERY PLANNING

A. PROJECT PROBLEM

A project problem is defined as a situation in which it appears that (1) a project objective (scope, schedule, or budget) cannot be achieved, or (2) the probability of achieving a project objective has significantly decreased.

B. RESPONSIBILITY FOR RESOLVING PROBLEMS

1. Task Managers

   Task Managers are responsible for resolving task variances. If a task variance cannot be solved, the variance will be promptly reported to the Project Manager.

2. Project Managers

   Project Managers will be responsible for resolving project problems. If a project problem cannot be solved, the problem will be promptly reported to the project sponsor and Project Director.

C. REVISING PROJECT OBJECTIVES

1. If it is determined that a project problem is threatening the viability of a project, the Project Manager will consider various changes in the project objectives (cost, schedule, scope) to develop a creative recovery plan that will reduce or eliminate the difficulty. For example, if a project is experiencing a significant cost increase, it may be possible to save money by reducing the project scope to bring the project within viable cost limits.

2. If a feasible recovery plan is not possible, and the problems being experienced are jeopardizing the entire project, the project initiator may consider terminating the project.

D. In summary, responsible managers will continuously take prompt action to develop and implement innovative and realistic recovery plans to eliminate or mitigate task variances and to resolve project problems.

PROJECT COMPLETION

A. A project is not complete until the project sponsors and initiator have officially accepted the project result or product (deliverables).

B. When a Project Manager finishes work on a project, and the users and other designated interests advise the Project Manager that the project products are acceptable, the Project Manager will so notify the sponsors.

C. The project sponsors are responsible for:

1. Personally reviewing and evaluating the results of the project, including the project history file.

2. Confirming the acceptance of the project products by the users and the other designated interests.

3. Ensuring that there are no outstanding issues, problems or incomplete tasks that would require keeping the project active. This particularly applies to (a) as-built drawings, (b) databases, (c) files, (d) revised drawings, and (e) other closeout items. If any of these closeout items are not complete, the sponsor is not authorized to close the project. The project will remain on the Capital Projects list until all items are complete.

4. Advising the project initiator that the project is complete and that all closeout items have been accomplished in accordance with Capital Projects standards and contract documents.

5. Obtaining the approval of the project initiator to close the project and remove the project from the List of Approved Projects.

D. Last-Minute Disagreements

Any last-minute disagreements between the project sponsor, the users, and the other designated interests as to the interpretation of the project scope document, or the configuration of the final product, will be resolved by the project sponsor – with the assistance of the Project Manager.

1. This is a responsibility of the project sponsor.

2. When the disagreements have been resolved, the project sponsor is responsible for advising the Project Manager of the results of the negotiations between the sponsor and the users, and for specifying any actions to be taken by the Project Manager to complete the project.

PROJECT SUCCESS

A. SUCCESSFUL PROJECT

A project is successful when (1) the objectives of the project have been achieved to the complete satisfaction of the users, all designated interests, the sponsor, and the initiator, and (2) all closeout activities, including as-built drawings, have been completed and the initiator officially accepts the project results or products and closes the project.

B. There will be cases, which should be rare, in which the initiator, the sponsor, a senior manager, or one or more of the users, are dissatisfied with the project results or product but the Project Manager's functional supervisors have concluded that the Project Manager was successful in managing the project.

C. SUCCESSFUL PROJECT MANAGER

1. A successful Project Manager is a person who fulfills his/her assigned project responsibilities to the satisfaction of his/her line manager by competently performing the numerous duties outlined for Project Managers (refer to Project Managers, Section B1).

2. It is therefore possible for a Project Manager to encounter serious difficulties that are beyond his/her control or influence (e.g., acts of nature, significant price increases, incompetent vendors), and thus be unsuccessful in achieving a project objective for which s/he had accepted responsibility; yet still be considered a successful Project Manager, on the condition that s/he:

   a. Competently performed the numerous duties necessary to achieve the objective as outlined for Project Managers (refer to Project Managers, Section B1).

   b. Identified the project difficulties early.

   c. Promptly reported these difficulties to the sponsor and other persons as appropriate.

   d. Took prompt, creative actions to resolve the difficulties or minimize the adverse effect of the difficulties.

PROJECT HISTORY

A. Project Managers will ensure that an accurate history of their projects is maintained.

B. Project history files will include, but not be limited to, the following:

1. The original project objectives specified by the project sponsor.
2. The project objectives accepted by the Project Manager and the original project plan.
3. Copies of all numbered revisions of the project variance report.
4. Major revisions in the project plan.
5. Project status reports and special reports.
6. Change logs.
7. Subcontractor and vendor documentation, contract files, and correspondence.
8. A record of the actual completion dates and actual final costs of the major project tasks.
9. A copy of the final project plan and other closeout items.
10. Project completion letter from the project sponsor.
11. Project closeout documentation.
12. All documentation required for legal purposes and for responding to subcontractor and vendor claims.
13. All other documentation required by Lawrence Berkeley National Laboratory policies, procedures, and instructions.

REQUIRED DOCUMENTS

A. Listed below are the policies that require the preparation of documents. These documents will be produced in a competent, timely, and cost-conscious manner.

B. If anyone concludes that one of these documents is not cost-effective, or is not in the best interest of the project or Lawrence Berkeley National Laboratory, that person should promptly report his/her conclusions to his/her immediate supervisor.

1. Management will review all recommendations to change or delete required documents and will provide a response to each recommendation.

2. A major objective of the Capital Projects group is to eliminate paperwork that is not truly cost-effective and essential to the mission of the Lawrence Berkeley National Laboratory.

C. Although preparation of the specified documents is mandatory, the level of detail is left to the discretion of the responsible managers. These documents should not be prepared in any more detail than is necessary to achieve their basic purpose. The following policies require the preparation of documents:

Required Documents	Responsibility
Project Assignments or RAM	PM
Project Plan (Cost Plan and Schedule)	PM
Task Scope Document	TM
Task Cost Worksheet	TM
Project Reports	PM
As-Built Drawings	PM
Project Completion (Maintenance/Operations Manuals)	PM

PM = Project Manager
TM = Task Manager

DESIGN POLICIES

A. INTRODUCTION

1. Purpose

To provide guidance in the design of projects for the Lawrence Berkeley National Laboratory (LBNL), as well as to:

a. Set forth policies and procedures for design management.

b. Outline the Quality Control Program.

c. Orient new employees to required procedures.

d. Provide a reference source and guidelines for existing employees.

2. Utility Planning

Structures and buildings are supported by utilities, which must be available when the buildings are ready to be occupied and used. An important function of design is utility planning, to make certain that the utilities are available when needed.

3. Maintenance Support

Facilities Operations and Maintenance must be provided with appropriate project record documents, such as equipment maintenance instructions, operation manuals, and as-built drawings. In turn, Facilities Operations may offer information on any defects or deficiencies in buildings.

4. Support of Building Official for LBNL Jurisdiction

The University is its own building official. At LBNL, the Facilities Division Director is the building official. The in-house design disciplines provide the LBNL building official with support from licensed professionals.

5. Special Assignments

Special assignments are frequently given to the in-house design disciplines by the LBNL management, or by the Capital Projects Department Head. Special assignments include assistance to auditors, or special studies related to Facilities design and code issues.

6. Policies and Procedures

Policies and procedures are set forth by DOE, the University, and LBNL. LBNL policies include policies on design and quality assurance.

7. Quality Assurance Program

Facilties' Quality Assurance Program tracks adherence to policies and procedures (refer to Facilities' quality assurance document RD3.8, Checking of Architecture and Engineering Documents).

8. Design Criteria

The final design must meet:

a. All applicable codes

b. UC rules and regulations

c. DOE regulations and orders

d. Industry standards

e. Fire protection improved risk levels

f. Safety: LBNL PUB-3000

g. Seismic safety: LBNL PUB-3000, Chapter 23

h. LBNL Construction Details and Design Guidelines

B. DESIGN MANAGEMENT PRINCIPLES AND PROCEDURES

1. Section Summary

Office Practices: Design must be properly managed to ensure a quality product.

Management is the organization and control of a group to achieve a goal or objective. Controls are listed in this section and include policies, quality control, quality assurance, and special procedures. Control items help to ensure proper design, review, implementation, and documentation of projects in a timely manner.

2. Policies

Policies allow controls to be established. LBNL policies regarding design are found in this section or the LBNL Construction Details and Design Guidelines documents, and include:

a. Facilities Operations Department Design Review Procedures for Capital and Small Projects.

b. Seismic Safety, LBNL Lateral Force Design Criteria, RD3.22.

c. Health and Safety, LBNL Health and Safety Manual, PUB-3000.

d. Checking of Architecture and Engineering Documents, RD3.8.

e. Basic Operating Policies for Design of Facilities, RD3.2 (this section).

f. Drawing Management (Handling of Drawings), RD3.9.

g. Building Energy-Efficiency Design, RD3.19.

h. Policy for the Conduct and Documentation of Facility Design Reviews, RD3.24 (this section).

i. Policy Regarding Site Planning, RD3.26 (Facilities Division, Interim Policy Number 4).

3. Office Procedures

a. Procurement Transactions

Procurement transactions require various authorization forms (refer to Section B6 and the Procurement Division Standard Practices).

b. Projects on UC Berkeley Campus

UC Berkeley's Department of Capital Projects must review construction Bid Documents for LBNL projects on the Berkeley campus.

C. DESIGN REQUIREMENTS

1. Section Summary

Design requirements include criteria for design, calculations, requirements for checking, drafting practices, construction document development, conduct and documentation of reviews and approvals, and requirements for design changes.

2. Application

These design requirements apply to LBNL projects whether designed by LBNL personnel or by an A/E firm.

3. Design Criteria

Local, state, and federal codes, standards, and regulations.

4. Drawings

Normally the drawings are prepared by an outside A/E firm. Preliminary drawings are a part of preliminary design. Drawings are a part of final design.

a. Handling

Procedures for handling drawings are set forth in RD3.9, Handling of Drawings.

b. Review and Approval

For required reviews and approvals of drawings, refer to RD3.24, Policy for the Conduct and Documentation of Facility Design Reviews (this section).

5. Specifications

a. Standard Abbreviations

Refer to Standard LBNL Abbreviations, Equipment/Facility Types, RD7.4.

b. Review and Approval

For required reviews and approvals of specifications, refer to RD3.24, Policy for the Conduct and Documentation of Facility Design Reviews (this section).

6. Calculations

a. Calculations may be made manually or on the computer.

b. Checking Calculations is an item in the Quality Control Program. Subcontracted A/E firms shall have a calculation checking procedure.

c. Manual

A/E firms may use their own standard calculation sheets.

d. Documentation

Place on each calculation sheet the project title, project number, the name of the person making the calculation, and the date. If performed on a computer, place the same entries on the first page of the printout. If possible, place the entries on each page. In either method, note revisions by name, revision number, and date.

7. Design Reviews and Approvals

Reviews and approvals are part of the Quality Assurance Program (refer to Facilities Operations Department Design Review Procedures for Capital and Small Projects). The reviews may include both internal reviews by the LBNL assigned in-house disciplines and Capital Projects, and external reviews by agencies or firms outside LBNL. UC-mandated buildings must go through independent structural engineering peer review.

a. Documentation

Document Internal Reviews by using the Project Plan Review form. The completed Project Plan Review form shall be filed in the permanent Project File.

8. Design Changes

a. Initiated by Project Manager

All design changes are initiated by and are the responsibility of the Project Manager. For each change, review the scope, schedule and budget impact.

9. Capital Projects Directives

a. Construction/Demolition Work with Authorized Drawings/Specifications

Under the California Business and Professions Code, all Construction Work and related demolition work shall be documented on required drawings and specifications, and signed by the required professional (licensed Architect and/or Engineer). No construction shall be authorized without complete, approved, and signed drawings and specifications.

b. Design Review for Construction in Spaces Used for Chemical Inventory

For new construction and modification of existing spaces where chemicals are used, handled, or stored, the design review shall include an analysis of the current fire control area(s). The impact of the modification and final use of the new construction or modified space shall be evaluated against the building code exempt quantities of the current and anticipated chemical inventories.

c. Emergency Lights and Installation Procedures for Illuminated Exit Signs

The Facilities and Environment, Health, and Safety Divisions are required to control the installation of emergency lights and illuminated exit signs. Facilities' lighting group is tasked with maintaining the devices, and the purchase of new or replacement fixtures must receive prior approval from the LBNL Fire Marshal and the Facilities Lighting Supervisor.

The Fire Marshal will review and identify whether the device is required by code and whether it can be appropriately installed in the planned location. The Lighting Supervisor will ensure that the device is appropriate per specifications and that relevant information is entered into the Maximo database for maintenance and tracking purposes.

d. Concrete Anchors

The 2007 California Building Code (CBC), which took effect January 1, 2008, requires that concrete anchors used in seismic applications meet rigorous testing requirements. To date, only two anchors are known to have passed the ICC (International Code Council) testing requirements, the Hilti TZ anchor and the Simpson Strong-Bolt Wedge anchor.

DESIGN PROGRESS REVIEW AND PLAN REVIEW
(FOR LINE ITEM AND GP PROJECTS)

	Review performed by	Processed by Project Manager	Design Progress Review Prelim Design (30%)	Plan Review* Final Design (100%)
1.	Project Manager	X	X	X
2.	Subject Matter Experts	X	X	X
3.	Environment, Health, and Safety Coordinator	X	X	X
4.	Fire Marshal	X	X	X
5.	Operations and Maintenance	X	X	X
6.	Client/User	X	X	X

*Completion of Design Review shall be documented on the Project Plan Review form.

RD3.2 BASIC OPERATING POLICIES FOR DESIGN OF FACILITIES

- All employees in responsible charge of design must be licensed in California (including engineering management and leaders of engineering and architectural sections).
- All structural design involving life safety reviewed by independent structural engineer.
- All projects reviewed and approved by the LBNL Fire Marshall and the Environmental Health and Safety Department.
- All projects reviewed by the Plant Operations Department for feedback on operations and maintenance design considerations.
- Structural design criteria not covered by code reviewed by the LBNL Seismic Safety Committee.
- LBNL building official Class A member of ICBO, publishers of the uniform building code.
- Sign off sheet to certify that project design and construction reviews and approvals by key members of the LBNL staff have taken place.

RD3.3 FIRE PROTECTION ENGINEERING RESPONSIBILITIES

LAWRENCE BERKELEY LABORATORY
PLANT ENGINEERING DEPARTMENT
Mailstop B90G Ext 5261 FAX 4101

TO: Fred Angliss
Dick Gleason
Joe Hansen
Doug Lockhart
Martin Luk

FROM: Bert Schleifer

SUBJECT: FIRE PROTECTION ENGINEERING RESPONSIBILITIES

The attached matrix defines responsibilities for accomplishing fire protection engineering (FPE) tasks, for the Fire Department and the Plant Engineering Department. The matrix was reviewed and approved by both department heads.

The primary contact for FPE tasks with the Fire Department will be the Fire Marshal. Plant Engineering has design responsibility for all fire protection engineering requirements defined in the UBC, UFC and NFPA 101 Fire Safety Code. The Fire Department has been charged with the enforcement of these requirements. Specific details of the Plant Engineering interfaces with the Fire Department are defined in the enclosed Fire Protection Engineering Responsibilities Matrix.

Enclosure: Fire Protection Engineering Responsibilities Matrix
Dated 3/6/92

c (w/encl): R. Camper
C. Hernandez
R. Rhoades
R. Scudero

RESPONSIBILITIES MATRIX

FIRE PROTECTION ENGINEERING RESPONSIBILITIES	AUTHORITIES					FUNCTIONS*									
SUBJECT	DOE 5781.7	DOE 6430.1A	NFPA (FM)	UFC	UBC UMC	CONSULT	INTERPRET	PLANNING	SPECIFY	DESIGN REVIEW	COMPLIANCE REVIEW	CONSTRUCTION INSPECT	ACCEPTANCE	REG INSPECT SURVEY	PERMITS
Occupancy class, height and area			101		5	F	P	P	P	P	F	P		F	
Construction, fire resistance	X	X	101		5		P	P	P	P	F	P		F	
Access				10	33	F	FP	FP	FP	P	F	FP		F	
Premises identification				10	5	FP	F	FP	F	P	F	F		F	
Exit facilities	X		101		33	F	P	FP	P	P	F	P		F	
Stairway identification				12	33	P	F	FP	F	P	F	F		FP	
Handicapped provisions		X			33	F	P	P	P	P	P	P		P	
Sprinkler & standpipe systems	X	X	13,14	10	38	F	P	P	P	P	F	F	F	F	
Sprinkler & standpipe valves & connections			13,14	10	38	F	F	FP	F	P	F	F	F	F	
Special extinguishing systems	X	X	VAR	10	38	F	P	FP	P	P	F	F	F	PF	
Fire detection & alarm systems	X	X	VAR	14	9	F	P	FP	P	P	F	F	F	F	
Fire alarm zones				14		F	F	FP	F	P	F	P	F	F	
Electrical system		X	70				P	P	P	P	P	P		P	
Heating, ventilating & air conditioning		X	90A		UMC	F	P	P	P	P	P	P	P	P	
Smoke control	X		92A		18	FP	FP	FP	FP	P	F	FP	FP	P	
Hydrants		X	[3]	10		F	F	FP	F	P	F	FP	F	F	
Portable fire extinguishers		X	10	10		F	F	FP	F	P	F	F		F	
Electrical data processing facilities		X	75			F	P	P	P	P	P	P		P	
Cryogenic facilities		X		75	9	P	F	FP	FP	P	F	FP	P	FP	F
Radioactive facilities		X	801	80	9	F	FP	FP	P	P	F	FP		FP	F
Heating appliances			86	11	UMC	F	P	P	P	P	P	P		P	
Semiconductor fabrication facilities			[7]	51	9	F	FP	FP	FP	P	F	FP	FP	FP	F
Compressed gases			[7]	74	9	P	F	FP	F	P	F	F	FP	F	F
Flammable & combustible liquids			30	79	9	FP	FP	FP	FP	P	F	FP	F	F	F
Hazardous materials			VAR	80	9	FP	FP	FP	FP	P	F	FP	FP	F	F
Liquified petroleum gases			58	82	UMC	FP	FP	FP	FP	P	F	FP		FP	F
Fire rated assemblies						PF	P	P	P	P	F	F	F	F	

F = Fire Department; P = Facilities Department

Authorities: X = Covered in DOE orders; NFPA - Standard No.; FM - Data Sheet Prefix No,; UFC - Article No.; UBC - Chapter No.; UMC - Chapter No.

* When both Departments are designated, the first initial shall be the Department which takes the leading role.

RD3.24 FACILITIES PLAN REVIEWS

SUBJECT:				
POLICY FOR THE CONDUCT AND	Approved:			
DOCUMENTATION OF FACILITY	Rev:	2	By:	BHS
PLAN REVIEWS				

A. Policy

1. All design and construction documents (drawings, specifications and design calculations) shall be given a Plan Review[1] for code compliance, environment, health and fire safety, constructability, operability, maintainability and reliability.
2. Plan Reviews shall be documented on form RD4.2a or c (Project Plan Review). This document shall be retained with the project records.
3. Design documents for new facilities and facility modifications shall be checked and approved as required by RD3.8 (Checking of Architecture and Engineering Documents) for compliance with Project Design Requirements, the LBNL Health and Safety Manual PUB 3000, and LBNL's Seismic Safety Lateral Force Design Criteria RD3.22. Each drawing issued for construction shall have an approved and signed title block, and each design calculation shall have an approved and signed calculation cover sheet. Checking and approval shall be documented by signature of the checker and approver in the drawing title block and on the calculation cover sheet.

B. Responsibility for review of documents produced by LBNL

1. The Facilities Project Manager (PM) is responsible for ensuring that the design package is complete and that all design documents have been checked and approved by the originating design section. In addition the PM ensures that Plan Reviews have been conducted by (a) the Facilities Department design Section Chiefs and the Operations and Maintenance group (b) the EH&S Division (c) the Fire Department, and (d) the client/user organization. The PM is responsible for submitting the design documents to the above organizations for Plan Review. Upon completion of Plan Review the PM ensures that all design documents bear the seal of a licensed architect or registered engineer as required by RD 3.25 (Policy for Stamping and Signing Construction Documents).
2. The Facilities A&E Design Section Chiefs are delegated the Building Official responsibilities for their respective disciplines. The Section Chiefs will conduct Plan Reviews for compliance with the applicable codes and regulations.
3. The Facilities Operations and Maintenance group (O&M) is responsible for conducting Plan Reviews ensuring constructability and maintainability for items affecting operation and maintenance.
4. The Environment, Health and Safety Division performs Plan Reviews for construction safety, industrial safety and compliance with environmental regulations, as required by the LBNL Health and Safety Manual, PUB 3000.

5. The Fire Department performs Plan Reviews for compliance with applicable fire codes, and in accordance with LBNL Fire Safety and Protection Policy.
6. The client/user organization performs Plan Reviews for compliance with programmatic intent, functionality and operating requirements, as established in the approved Project Design Requirements.

C. Responsibility for review of documents produced by subcontracted A&E firms

1. The Facilities Project Manager (PM) is responsible for ensuring that the design package is complete and that all design documents have been checked and approved by the originating A&E firm. In addition the PM ensures that Plan Reviews have been conducted by (a) the Facilities Department design Section Chiefs and the Operations and Maintenance group (b) the EH&S Division (c) the Fire Department, and (d) the client/user organization. The PM is responsible for submitting the design documents to the above organizations for Plan Review. Upon completion of Plan Review the PM ensures that all design documents bear the seal of a licensed architect or registered engineer as required by RD 3.25 (Policy for Stamping and Signing of Construction Documents)
2. The A&E firm is responsible for ensuring that the design documents comply with applicable codes, regulations and the standard of care of the industry. The Facilities A&E group Design Section Chiefs are delegated the Building Official responsibilities for their respective disciplines. The Section Chiefs, or their designated representatives, will conduct Plan Reviews for compliance with applicable codes and regulations.
3. The Facilities Operations and Maintenance group (O&M) is responsible for conducting Plan Reviews ensuring constructability and maintainability for items affecting operation and maintenance.
4. The Environment, Health and Safety Division performs Plan Reviews for construction safety, industrial safety and compliance with environmental regulations, as required by the LBNL Health and Safety Manual, PUB 3000.
5. The Fire Department performs Plan Reviews for compliance with applicable fire codes, in accordance with LBNL Fire Safety and Protection Policy.
6. The client/user organization performs Plan Reviews for compliance with programmatic intent, functionality and operating requirements, as established in the approved Project Design Requirements.

D. Procedure

1. At the start of each project, the PM obtains the names of the individuals responsible for Plan Review and lists them on form RD4.2a or c (Project Plan Review). As members of the Plan Review team, these individuals participate in the project kickoff meeting and provide the necessary technical input to the design development from their organization.
2. The PM includes dates and durations for all required Plan Reviews on the project schedule, allowing a reasonable period of time for the review process.
3. Design documents are checked and approved by the originating design office in accordance with RD3.8 (Checking of Architectural and Engineering Documents). The designated Plan Reviewers shall review the plans per the requirements of the Plan Review Manual, Building Codes, Health and Safety Manual, Fire Codes, and applicable rules and regulations. They also must ensure that the O&M comments for constructability, maintainability, operability and

reliability are obtained from O&M and incorporated in the drawings and specifications. For subcontracted plans and specifications the lead technical discipline (Technical Coordinator) gathers all review comments from the organizations listed under (C.) above and ensures that all comments are coordinated and consolidated in a master review set of drawings and specifications. The master review set is transmitted by the PM to the A&E firm for comment resolution. For LBNL produced plans and specifications the lead technical discipline (Technical Coordinator) gathers all review comments from the organizations listed under (B.) above and ensures that all comments are resolved and incorporated in the plans by the LBNL technical disciplines.

5. Upon satisfactory resolution and incorporation of comments in the plans and specifications, Plan Reviews are documented by obtaining the signature of the reviewer on the Project Plan Review form RD4.2a or c (Project Plan Review).

6. The completed and signed form RD4.2a or c (Project Plan Review) is filed in the project file. The sealed and signed construction documents (drawings and specifications) are retained in accordance with Section 10 of this Manual "Records Filing and Disposition."

[1] See "Plan Review Manual" (ICBO, 1994) for definitions, legal implications and limitations of Plan Reviews.

PROJECT REPORTS

A. OBJECTIVE

Project reports provide written documentation as necessary showing the scope, schedule, and cost of the project, as of the date of the report. As a result, major unresolved problems can be identified.

B. MONTHLY AND QUARTERLY STATUS REPORTS

1. The Project Manager is responsible for the accuracy of project reports. The Office of the Chief Financial Officer is responsible for assurance review of the financial information. Project reports will be prepared with support from the project team and issued on a monthly or quarterly basis. The cost of preparing project reports will be charged to the project.

2. Project status reports will follow the agreed upon content, format, and timing of the Capital Projects suite of reports unless agreed otherwise by the Capital Projects Department Manager. Additional reports required by the client, LBNL management, or government agencies will be prepared and submitted as required. Such reports will be consistent with the information presented in the standard status reports.

3. Project Managers will notify the Project Director, project sponsors, project initiators, or other interested managers that a problem exists as part of the day-to-day management of the project. As a result, the responsible senior managers will have been notified of major problems before they receive a report displaying unresolved variances and problems. A project status report will not be used to notify these managers that a major project problem exists for the first time.

4. The information presented in the status reports should be succinct enough to highlight the project status, summarize project issues, and identify project risks. Detailed project information should be described in supporting documents.

5. For projects performed at leased facilities, all construction costs shall be tracked and reported separately from lease costs. In order to provide proper accounting and capitalization, construction costs should use a Facilities Project I.D. that is not parented to the lease expense account. Construction costs paid for by third parties (such as a landlord tenant improvement allowance) shall be reported if it will provide a more accurate representation of the project and such information is meaningful to users of the report. Reports should clearly state if third party costs are included so that the information is not misleading.

C. REPORTING REQUIREMENTS

Each capital project managed through the Facilities Division will use best project management practices and principles. When applicable, this will include complying with DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets, and LBNL's Earned Value Management System (EVMS) Procedures to track and report project performance.

Due to the various types, sizes, complexities, and funding sources of each project, not all projects managed by Capital Projects are required to comply with DOE Order 413.3A. A modified EVMS approach may be implemented in such cases.

The monthly reports shall clearly communicate the following data:

1. Scope, schedule, and budget performance (non-EVMS projects)

2. EVMS data and performance (if required)

3. Current milestone status

4. Current issues and risk areas, including proposed corrective actions

5. Baseline changes

6. Status date of the project information and accounting close date for financial data

The table below represents the current set of reports developed in support of Capital Projects. Various project reports are developed during the month to communicate the technical, cost, and schedule performance of each project, and may include:

Report Title	**Description and Content**	**Developed by**	**Timetable**
Project Cost Sheet	An Excel spreadsheet that tracks time-phased budget funding and actuals by WBS/Project ID.	Project Administrator/ Project Manager	Second Monday of each month
Detail Schedule	Developed in P3e by WBS. Contains schedule performance against planned versus actual schedule.	Project Controls	First week of each month
EVMS Reports	Specific requirements defined under DOE Order 413.3A to include at a minimum a Cost Performance Report.	Project Controls	Completed and finalized by third Thursday of each month
Capital Projects List	List of active Capital Projects, showing Total Estimated Cost, costs, funding, performance stop light, and noteworthy information.	Resource Analyst	Second Friday of each month
GPP Financial Status Report	List of GPP/IGPP projects, showing Total Estimated Cost, costs, funding, project phase, and noteworthy information.	Resource Analyst/ Project Manager	Before second Friday of each month

Report Title	Description and Content	Developed by	Timetable
Overhead Budget Status Report	Status of Capital Projects overhead budgets vs. actuals, liens, and remaining funding.	Resource Analyst	By 15th of each month
DOE Monthly Status Reports	Summarizes monthly scope, schedule, and cost performance for Line Item Projects.	Project Manager	Before third Thursday of each month
DOE Quarterly Status Reports	Summarizes quarterly scope, schedule, and cost performance for Line Item Projects.	Project Manager	Before third Thursday of each quarter (Jan., April, July, Oct.)
Facilities Division Spend Plan	This document shows the Facilities Division Spend Plan and Forecast.	Resource Analyst	A minimum of four times per year
Risk Registry	An Excel spreadsheet that captures project risks, probabilities, and impacts. Basis for Monte Carlo risk simulations.	Project Administrator	Monthly
Capital Projects Update	High-level project status presentation to Operations group.	Project Manager	First Monday of each month

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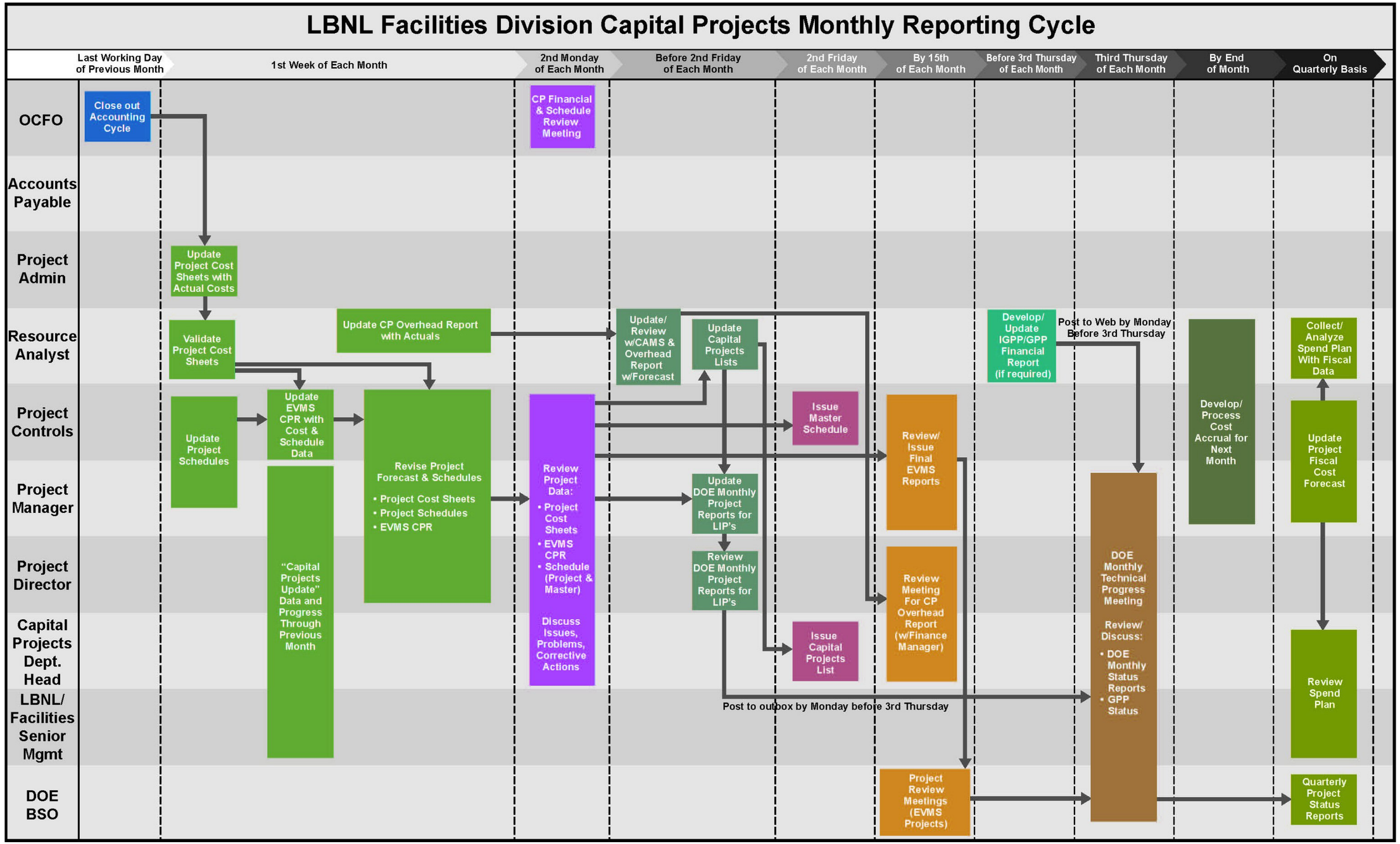
LBNL Facilities Division Capital Projects Monthly Reporting Cycle
Last Working Day of Previous Month
1st Week of Each Month
2nd Monday of Each Month
Before 2nd Friday of Each Month
2nd Friday of Each Month
By 15th of Each Month
Before 3rd Thursday of Each Month
Third Thursday of Each Month
By End of Month
On Quarterly Basis
OCFO
Accounts Payable
Project Admin
Resource Analyst
Project Controls
Project Manager
Project Director
Capital Projects Dept. Head
LBNL/ Facilities Senior Mgmt
DOE BSO
Close out Accounting Cycle
CP Financial & Schedule Review Meeting
Update Project Cost Sheets with Actual Costs
Validate Project Cost Sheets
Update CP Overhead Report with Actuals
Update/ Review w/CAMS & Overhead Report w/Forecast
Update Capital Projects Lists
Develop/ Update IGPP/GPP Financial Report (if required)
Post to Web by Monday Before 3rd Thursday
Collect/ Analyze Spend Plan With Fiscal Data
Update Project Schedules
Update EVMS CPR with Cost & Schedule Data
Revise Project Forecast & Schedules
• Project Cost Sheets
• Project Schedules
• EVMS CPR
Review Project Data:
• Project Cost Sheets
• EVMS CPR
• Schedule (Project & Master)
Discuss Issues, Problems, Corrective Actions
Issue Master Schedule
Review/ Issue Final EVMS Reports
Develop/ Process Cost Accrual for Next Month
Update Project Fiscal Cost Forecast
"Capital Projects Update" Data and Progress Through Previous Month
Update DOE Monthly Project Reports for LIP's
Review DOE Monthly Project Reports for LIP's
Review Meeting For CP Overhead Report (w/Finance Manager)
DOE Monthly Technical Progress Meeting
Review/ Discuss:
• DOE Monthly Status Reports
• GPP Status
Issue Capital Projects List
Review Spend Plan
Post to outbox by Monday before 3rd Thursday
Project Review Meetings (EVMS Projects)
Quarterly Project Status Reports

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ENVIRONMENT, HEALTH, AND SAFETY

This section summarizes and highlights Environment, Health, and Safety (EH&S) procedures that relate to the activities of Facilities Capital Projects. All Capital Projects employees must comply with the requirements of the LBNL Health and Safety Manual, PUB-3000. Capital Projects work shall be carried out in accordance with the Facilities Division Integrated Safety Management Plan and all applicable federal, state, and local regulations. Work will be performed in a manner that protects the environment and the safety and health of subcontractor employees, LBNL employees, and the general public.

The Facilities ISM Plan is part of a coordinated focus on safety that flows down from the DOE contract through LBNL to the vendors and construction subcontractors performing work at LBNL. This integral relationship is illustrated in Figure 1. Safety requirements are detailed in many hierarchical documents, including the Facilities ISM Plan and the Capital Projects Procedures Manual.

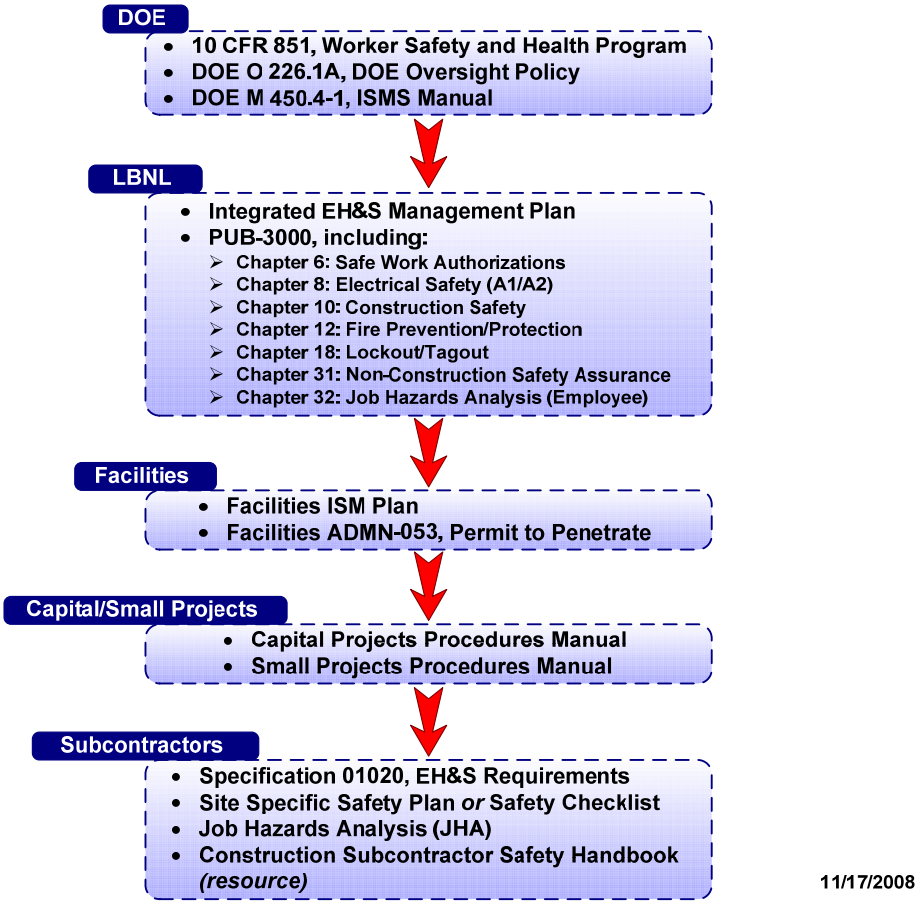

Figure 1: Safety Flow Down

GENERAL EMPLOYEE RESPONSIBILITIES

Capital Projects employees must comply with the requirements of the LBNL Health and Safety Manual, PUB-3000. Individual responsibilities for all employees are as follows:

- Must complete the LBNL employee Job Hazards Analysis (JHA) and fulfill all identified training requirements within a month of being hired.
- Must complete General Employee Radiation Training (EH&S-0405 GERT).
- Must be familiar with the sections of PUB-3000 that relate to the work they are performing at LBNL.
- Must be knowledgeable of LBNL's "Stop Unsafe Work Policy" whenever they encounter or become aware of a situation that poses an imminent danger.
- Must not perform or direct the performance of any work in the presence of any existing or previously unrecognized hazards inherently dangerous to themselves, their co-workers, the public, or the environment. If employees, contractors, and casual and participating visitors encounter such a situation, they must bring it to the attention of their supervisor or LBNL EH&S coordinator immediately. Work will not commence until the hazard(s) is/are resolved through elimination or control (either administrative or engineering controls).
- Owners of hazard control equipment, personal protective equipment (PPE), and hazard monitoring equipment must ensure that the equipment is in good order and working within operational parameters. Any equipment failing to satisfy operational requirements must be taken out of commission and repaired or replaced.
- Must proceed with work only after ensuring that appropriate ES&H procedures have been implemented.
- Must perform all work safely, and be aware of potentially hazardous operations and conditions.
- Must minimize the volume and toxicity of LBNL-generated waste, and maintain chemical inventories at as low a level as reasonably achievable.

Refer to PUB-3000, Chapter 24, for additional responsibilities for managers and supervisors.

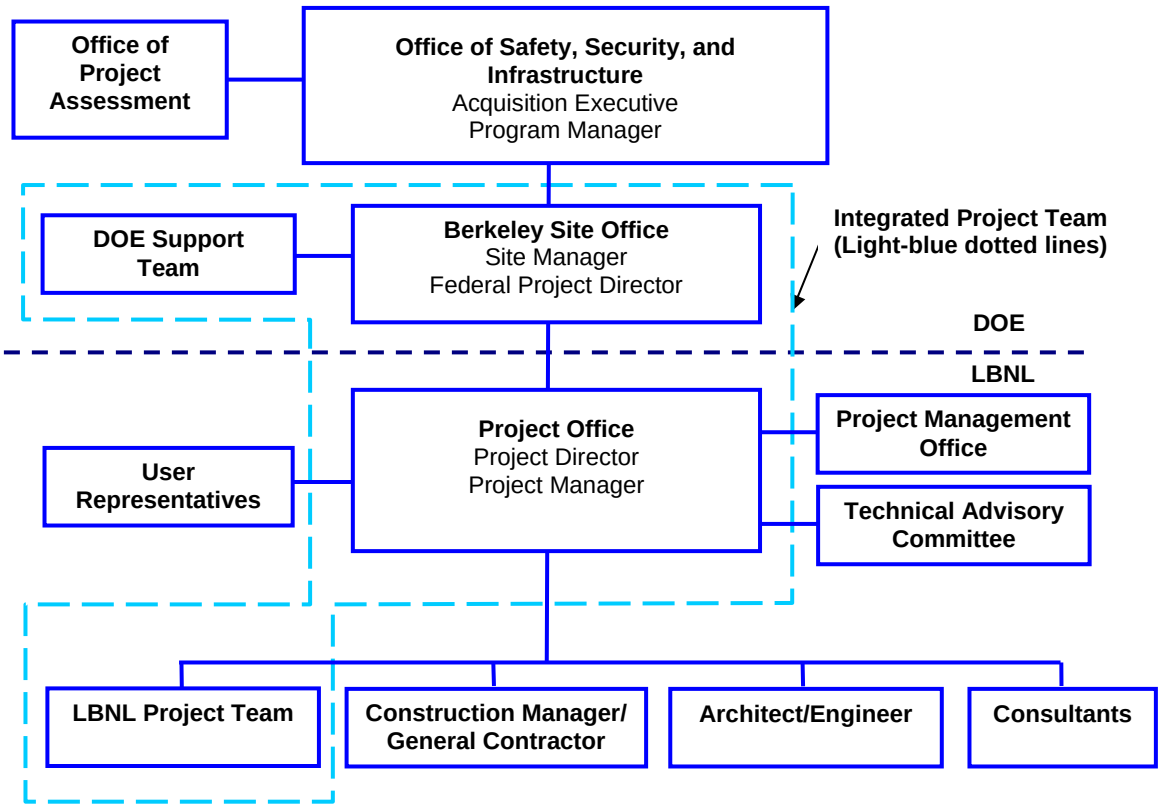

Figure 2: Organization Chart

PROJECT TEAM MEMBER RESPONSIBILITIES

A. PROJECT DIRECTOR

The Project Director (PD) is responsible for all "contractor requirements" provided in Department of Energy Order 413.3A, including adherence to:

- established technical, cost, and schedule baselines
- utilization of an Earned Value Management System
- development of a risk mitigation plan
- utilization of a configuration management process
- implementation of an Integrated Safety Management (ISM) system

The LBNL Director, through the Associate Laboratory Director for Operations, delegates to the Project Director full responsibility and accountability to design and execute projects in a manner that will not compromise the safety and health of workers, the public, or the environment. The Project Director will be supported in this effort by the Project Manager, Project Office Staff, and various Subject Matter Experts. The Project Director reports to the Capital Projects Department Head.

The Project Director will be responsible for identifying all potential ES&H hazards and associated mitigation procedures. The Project Director has full responsibility to ensure the safe completion of the project and to implement continuous improvement of the project safety plans through implementation of ISM principles.

The Project Director will be responsible for control of scope, budget, and schedule throughout the life of the project, from conceptual design through start-up. The Project Director will chair regular meetings with the Project Manager and the Project Team that will help ensure that the project is successfully being executed in accordance with the cost, schedule, and technical baseline.

The LBNL Project Director interacts directly with the Berkeley Site Office Federal Project Director (FPD). The LBNL Project Director has overall responsibility for the management of the safe execution of the project.

The Project Director:

- leads LBNL's project team
- ensures that project environment, safety, and health accountability is integrated throughout project-related efforts and is integrated by all project personnel, from the Integrated Project Team (IPT) to subcontractor workers
- supports the Federal Project Director in implementing DOE's project management process
- has primary responsibility for community relations

B. PROJECT MANAGER

The Project Manager (PM) reports to the Project Director. The Project Manager has responsibility for managing day-to-day construction-related activities consistent with DOE orders, as well as applicable federal, state, and local laws and LBNL policies. The Project Manager has direct oversight of the architect and engineering consultants, the contractor, additional consultants, the Project Administrator, the LBNL Construction Manager, the quality inspector, and the LBNL project team.

The Project Manager:

- ensures that LBNL's Integrated Safety Management policies are followed
- approves the subcontractor's safety plan
- is directly responsible for design and execution of a project in a manner that will not compromise the safety and health of workers, the public, or the environment
- is directly responsible for the safe and successful execution of the project scope of work
- ensures that National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) mitigation monitoring measures are enforced; reports on mitigation measure implementation
- provides the number of complete sets of design and construction documents requested by the EH&S Team Leader at each review stage
- is responsible for the distribution of the design documentation (drawings, specifications, calculations, etc.) at the completion of each design phase to the EH&S Team Leader for review and sign-off. An adequate period must be allocated for review of design documentation.
- ensures that a project specific Soil Management Plan is approved by the EH&S team for all projects that disturb LBNL soil, and that all work performed follows that plan
- manages project risks and resolves technical issues raised by contractors
- controls the cost, schedule, and scope of the design and construction-related activities
- is responsible for coordinating design input from all the team members and incorporating the information into the design
- implements effective quality assurance procedures
- conducts daily site walks
- drafts monthly reports submitted by the Federal Project Director
- manages the work of the architect and engineering consultants
- identifies and ensures timely resolution of critical issues within LBNL's control that impact project performance

C. LBNL CONSTRUCTION MANAGER

The LBNL Construction Manager is the primary interface with the construction subcontractors' Field Superintendent and with LBNL craft supervisors. The LBNL Construction Manager reports to the Project Manager and:

- is overall responsible for safe execution of the work including all work performed by subcontractors, in-house crafts, vendors, and other LBNL divisions
- monitors overall worksite status, ensures safe performance of work by contractors, and ensures physical controls are in place (including security fence and hazardous materials storage areas)
- monitors construction activity in accordance with Integrated Safety Management practices
- monitors contractors' and site craft achievement of work according to technical specifications
- supports contractors when they need information and resolves issues that threaten work progress
- manages traffic and logistics on site and adjacent
- manages the soil handling process in accordance with an approved Soil Management Plan
- is the primary interface with all LBNL craft and EH&S personnel, coordinating utility shutdowns, dig permits, burn permits, Job Hazards Analysis process, etc.
- in conjunction with the Construction Safety Engineer, performs worksite safety inspections
- prepares a daily construction progress report for each day s/he is on the job, noting all construction activity, field conditions, and number of subcontractor personnel by trade. Progress photos should be included as needed.

D. EH&S FACILITIES PROJECTS COORDINATOR

- identifies the EH&S Team Leader
- assigns technical professionals to specific projects and tracks their participation
- assists the EH&S Team Leader in resolving conflicting EH&S issues when requested by the Team Leader
- distributes EH&S/Facilities Guidelines for Renovation and Construction Projects (see below) outlining safety procedures and responsibilities for project team

E. EH&S TEAM LEADER

The EH&S Lead oversees and supervises the EH&S team (including subcontractors). The EH&S Team Leader:

- coordinates and supervises the activities of all the EH&S team members
- advises team members of project activities (meetings, reviews, events, etc.)
- distributes design and construction documents for review to the EH&S team members
- coordinates EH&S review comments, resolves conflicts, and returns a consolidated set of comments at each review milestone to the Project Manager
- coordinates the sign-offs for the EH&S team members at project review milestones, ensuring that EH&S issues have been resolved
- provides support and advice to the Project Manager to ensure EH&S integration into all project activities at an appropriate level
- provides advice and support to the Project Manager and Construction Manager on the continuous improvement of safety throughout the project
- provides an interface with the subcontractor safety manager and staff to ensure that safety requirements are understood and that LBNL and the subcontractor perform as an effective team to support the safe conduct of work
- inspects the worksite as needed and gathers and integrates data from other EH&S staff to provide the Construction Manager with prompt and effective information and status on safety compliance on the project
- reviews and ensures that the Construction Safety Engineer approves the subcontractor hazard assessments and safety plans

F. CONSTRUCTION SAFETY ENGINEER

The Construction Safety Engineer is a key project team member. S/he provides oversight and support for safety at the jobsite and interacts with the Construction Manager and subcontractor. The Construction Safety Engineer's responsibilities include:

- reviews subcontractor safety plans and Job Hazards Analyses
- reviews subcontractor safety implementation documents: permits, such as excavation, LOTO, air quality, asbestos, National Emissions Standards for Hazardous Air Pollutants, (NESHAPS), etc., and sampling results
- performs worksite safety inspections in conjunction with the Construction Manager and reports positive and negative findings/issues to the Project Manager
- documents positive and negative inspection findings and provides trending reports to the Project and Construction Managers each week. Provides recommendations as appropriate. Summarizes trending reports monthly, or as needed.
- tracks open safety issues and verifies resolution. Performs effectiveness reviews of serious noncompliances to ensure that corrective actions have addressed the root cause of the noncompliance.

- periodically observes subcontractor tailgate and other safety meetings. Provides input on topics of interest.

- participates in all project review meetings and provides timely and constructive input on the safety performance of the subcontractor.

- develops and delivers any project-specific safety training to LBNL project personnel. This will include Lessons Learned from project errors and incidents and corrective training when project staff demonstrate a lack of effective knowledge on specific areas of safety compliance.

- develops any project-specific safety procedures as directed by the Project or Construction Manager.

G. EH&S TEAM MEMBERS/SUBJECT MATTER EXPERTS

EH&S team members participate in the same manner as all design team members, to review information, identify EH&S issues, sign off at formal review periods, and assist with issue resolution.

At any point in the process, if any team member identifies any EH&S issues that need to be reviewed by additional technical staff, s/he shall make recommendations to the EH&S Team Leader.

PLANNING PHASE ACTIVITIES

Pre-project planning is an interactive process that identifies user needs and evaluates the function, form, and site requirements of the proposed facility. Requests for new capital projects are often handled as studies, resulting in preliminary scope definition and preliminary cost estimates. A strategic assessment of potential environmental impacts, hazards analysis, government regulations, economic, and technology changes is important during this phase. Hence, the EH&S Facilities Projects Coordinator shall assign an EH&S Team Lead to aid the Project Team in the environmental and hazards assessment. During this planning phase the Project Team:

- determines the appropriate Hazards Analysis process, including a Safety Analysis Document, Hazards Analysis Report, or other tailored approach

- performs a preliminary NEPA/CEQA determination

- identifies testing that should be performed to analyze any contamination, lead, or asbestos considerations

- performs a site characterization study for brownfield sites (a brownfield site is defined as any site with prior development)

DESIGN PHASE ACTIVITIES

The EH&S Facilities Projects Coordinator will assign support team members and Team Leaders for all Capital Projects work. The Orange Folder for team assignments will be routed to the EH&S Facilities Project Coordinator, who will assign team members appropriate for each project. The Project Manager is responsible for including the EH&S team in the project design process and providing responses to their concerns and comments. Guidelines for EH&S team members are prepared by the EH&S Facilities Project Coordinator as part of the team assignment e-mail. The Interface Policy between EH&S and Facilities: Project Support (see below) describes the participation and review responsibilities of the EH&S team.

Chemical inventories should be obtained from the client and forwarded to the EH&S Team Lead, the design professional, and Fire Marshal for determination of controls needing inclusion in the project scope.

The Project Manager and EH&S Team Lead will initiate the agreed upon hazards analysis documents, i.e. a Hazards Analysis Report, or other tailored approach. This analysis will consider and incorporate the Site Characterization Study.

The Project Manager will initiate a hazardous materials survey of the project area to identify materials that may be disturbed by the construction work. The Project Manager will discuss with the EH&S team the requirements for hazardous materials abatement during construction. The Hazards Analysis document and contract documents shall include these requirements. The Hazards Analysis Report/document shall also include the requirement for a site specific Soil Management Plan.

The Project Manager will initiate a site specific Soil Management Plan for all projects within the boundaries of LBNL which involve land disturbance, i.e. affect LBNL soil. The Soil Management Plan shall be consistent with PUB-3000 Chapter 11, Soil Management Plan. The plan shall include the size of area anticipated to be disturbed, soil testing and analysis to be completed, restrictions on handling and/or hauling of material, and approved disposal site. The plan will be approved by the Project Manager, the EH&S Team Lead, and the environmental SME, and included in the contract documents.

Specifications, Division 1 Section 013529 (formerly 01020) Environment, Safety, and Health General Requirements should be included in all project specifications documents. This specification should be reviewed by the Project Managers and EH&S team members assigned to the project, and tailored to the project if necessary. Requirements for the subcontractor to provide an on-site health and safety representative may need to be quantified (full-time, weekly visits, etc.), depending on the size and type of project.

The EH&S team lead will sign the final design Project Plan Review form to confirm that the design includes EH&S requirements.

BID AND AWARD

For projects that will be publicly advertised, consideration should be given to pre-qualifying subcontractors, using their past construction safety record as a qualification criterion.

Construction subcontract bidding that uses best value source selection, with safety as one of the selection criteria, is encouraged.

The requisition preparer will specify on the electronic purchase requisition whether or not a safety plan or Pre-job Safety Checklist is required. Procurement, after award of the subcontract, will send the Pre-job Safety Checklist to the subcontractor, who will fill it out and forward it to the Project Manager. The Project Manager will ensure that the Pre-job Safety Checklist is reviewed and approved in accordance with PUB-3000, Chapter 10, before recommending that Procurement issue a Notice to Proceed. The Project Manager is responsible for ensuring that work does not start on site without an approved Pre-job Safety Checklist or approved site-specific safety plan.

In the event a non-construction hands-on project is being managed, follow PUB-3000, Chapter 31 requirements (Non-Construction Safety Assurance for Vendors, Subcontractors, and Guests at LBNL Facilities).

CONSTRUCTION SAFETY

A. SAFETY DOCUMENTS

Project Managers are responsible for obtaining the following safety documentation from the construction subcontractor:

- Site-Specific Safety Plan
- Construction Safety Checklists
- Job Hazards Analysis (also known as Activity Hazard Analysis)

The subcontractor will prepare and submit to the Project Manager a Job Hazards Analysis (also known as an Activity Hazard Analysis) for each construction activity listed in the project specifications. This should be reviewed by the Construction Safety Engineer and approved by the Project Manager before work can start on that activity.

No construction activity is allowed on site until the safety plan or safety checklist has been approved.

B. SAFETY DOCUMENT REVIEW

Outside Construction Subcontractors:

1. The Project Manager receives the safety documents from the subcontractor and gives them preliminary review, then forwards them, along with plans, specifications, and other project-pertinent information, to the Construction Safety Engineer.

2. The Construction Safety Engineer reviews and signs the documents and returns them to the Project Manager.

3. The Project Manager approves and signs the documents, and transmits them to the subcontractor. The Project Manager may delegate responsibility for this review and approval to the Construction Manager. Subcontracts for low-risk projects may use the Construction Safety Checklist in lieu of a full safety plan.

4. The Construction Manager shall review Job Hazards Analyses with the construction workers.

5. All construction workers sign the JHA to acknowledge that they have reviewed it.

6. The approved safety documents will be maintained in the project files and on the jobsite.

In-house Construction Support:

7. The Capital Projects Construction Manager shall hold a pre-start meeting with the Scheduled Work Center Supervisor, EH&S representative, and leads from the crafts, to discuss safety hazards, schedule, logistics, and work coordination. (Also refer to Section A6, Bid and Award).

C. SAFETY CONTROLS AND OVERSIGHT

Safety controls and oversight are required to be implemented on all projects, including, at a minimum:

- **Pre-start Meeting:** A pre-start meeting will be held for all projects. The Construction Pre-start Meeting Agenda lists construction safety topics to be discussed at this meeting. The Construction Manager shall attend all pre-start and work kick-off meetings.

- **Safety Orientation:** The Project Manager and Construction Manager will ensure that subcontractors provide worksite safety orientation to their employees prior to performing work on site.

- **Tool Box Safety Training:**, The Project Manager and Construction Manager will ensure that tool box safety training is conducted at least weekly.

- **Plan of the Day:** Subcontractors shall identify high-risk activities and discuss the measures they are taking to address them with the Construction Manager and the workers performing the work. This Plan of the Day, or Pre-Task Hazard Analysis, will be appropriately documented, depending on the size of the project and the type of work being performed.

- **OAC Meeting:** The Project Manager will schedule a weekly Owner, Architect, Contractor (OAC) meeting for each project. The OAC meeting will include Safety as a standing agenda item, including: discussion on the submittal and approval status of safety documentation, status of safety related permits (e.g. LOTTO, penetration permit, etc.), a review of the safety observations on the work in progress, the hazards and controls associated with upcoming work activities, and confirmation that safety staffing is adequate and responsibilities are clearly understood.

- **Daily Report:** The Construction Manager will prepare a daily construction progress report for each day s/he is on the job, noting all construction activity.

- **Inspection Report:** The Construction Inspector will issue construction inspection reports for each day s/he is on the job, noting observations from jobsite visits.

- **Safety Walkaround:** Line management up to the Capital Projects Department Head will convene a weekly Safety Walkaround with the project team, including safety representatives, to review the scope of work and how risks are being addressed.

- **Periodic Safety Inspection:** The Construction Safety Engineer will periodically visit construction jobsites to ensure that the subcontractor is performing the work in conformance with safety regulations and the approved safety plan.

- **Stop Work Order:** For serious or repeat violations, the Construction Safety Engineer may issue a verbal stop work order followed by a Safety Deficiency Notice, requiring, within 24 hours, a written correction plan that identifies steps to be taken to correct the hazard and prevent further occurrences of the same type.

D. PERMITS

A listing of common permits follows:

1. AIR EMISSIONS PERMITS AND NOTIFICATIONS: All projects that involve demolition of a structure or involve removal of regulated asbestos-containing materials require notification or permits from the Bay Area Air Quality Management District (BAAQMD). The Project Manager shall coordinate with EH&S team to ensure proper notification is made.

2. DIG PERMITS: A Permit to Penetrate or Excavate Surface of LBNL Property must be obtained prior to any work at LBNL that will require penetration or excavation of any ground surface, concrete wall, column, or slab deeper than 1½ inches, including the use of stakes or poles. The Project Manager or Construction Manager will request the permit from the LBNL Utilities Coordinator, and after surveys are completed and signatures obtained, the permit will be posted at the jobsite. Construction activities shall adhere to any conditions of the permit.

3. LOTO Permits: A signed LOTO permit is required when subcontractors will be performing LOTO on a project per LBNL PUB-3000 Chapter 18. The Project Manager or Construction Manager will initiate LOTO permits by submitting a Subcontractor LOTO Workbook to EH&S Construction Safety. Work will not commence until the permit is issued. Construction activities shall adhere to any conditions of the permit.

4. ELECTRICAL PERMITS: An Energized Electrical Work Permit is required when working with exposed electrical hazards per LBNL PUB-3000 Chapter 8. This permit is required for all live testing/troubleshooting, manipulative live work, or non-electrical work that happens to be within 3.5 feet of exposed live electrical parts. The Project Manager or Construction Manager will initiate energized electrical work permits by submitting a Subcontractor Electrical Safety Workbook to EH&S Construction Safety. Work will not commence until the permit is issued. Construction activities shall adhere to any conditions of the permit.

5. FIRE SAFETY (BURN) PERMITS: All operations with open flames that cause sparks, or are near gas lines or combustible storage containers, require a Fire Safety Permit for Hot Work or Hazardous Operations issued by the Fire Department (ext. 6015). The Project Manager or Construction Manager will request the permit from the Fire Department. Activities requiring a permit include electric arc and gas welding and flame-cutting, other open flame operations, tar kettles, powder-activated tools, and excavations. Work will not commence until the permit is issued. Construction activities shall adhere to any conditions of the permit.

In order to keep track of permits during construction, a color-coded map of LBNL shall be kept in the Facilities Division Office and updated by Construction Managers to show current penetration permits. Original wet-signed permits are posted on the jobsite. When the project is completed or the Penetration Permit is no longer active, the original will be kept in the project files.

E. REPORTING

ACCIDENTS: The Project Manager is to promptly inform line management of any accidents, injuries, or occupational illnesses that occur on the project for determination of reporting requirements. Significant construction safety events may require DOE Occurrence Reports (see PUB-3000, Chapter 15, for requirements). In case of serious accidents, the worksite must remain undisturbed until the proper LBNL authorities have been notified and the accident site has been released for work by the EH&S Division.

F. JOBSITE POSTINGS

When jobsite activities require them, the Construction Manager is responsible for posting at each jobsite current approved copies of documentation (see Construction Subcontractor Safety Handbook), including:

1. Safety Checklist

2. Job Hazards Analysis

3. Fire Safety (Burn) Permit

4. Permit to Penetrate or Excavate Surface of LBNL Property

5. Appendix A1, Appendix A2, or Appendix B Permits

6. Radiation Work Permit

If a project is using a subcontractor safety plan, it should be on site in the job trailer or job box, so that it is available for inspection. Job information boards listing LBNL project team contact information, subcontractor contact information, permits currently in effect, and other safety information should be posted at the main jobsite entry.

G. PERSONAL PROTECTIVE EQUIPMENT (PPE)

1. PPE GENERAL REQUIREMENTS

In keeping with the division's commitment to achieving a no-injury workplace, supervisors are responsible for ensuring that employees are trained in the proper selection, use, and limitations of PPE.

Supervisors are responsible for making available all needed PPE to employees.

Employees are responsible for using, maintaining in good condition, and reporting the need for additional PPE to their supervisor.

Questions regarding PPE may be addressed to an employee's supervisor or to the Facilities Safety Coordinator.

Capital Projects personnel entering an active construction site are required to follow all jobsite postings and to wear, at a minimum:

- Hard hat: regardless of whether the worksite is posted as a "hard hat area" or not.

- Safety shoes (protective footwear): Employees who work primarily at construction sites, such as inspectors and superintendents, are required to wear safety-toe shoes (refer to Safety Shoes, below). Occasional visitors to the jobsite may wear supportive, sturdy sole shoes instead of safety-toe shoes, but must not enter areas where active construction is in progress. The use of open, soft, or high-heeled shoes is not permitted at construction sites.

- Safety glasses: Eye protection must be worn when entering construction areas. Safety eyewear or "visitor safety glasses" shall be worn over prescription eye glasses. Side shields may be worn in lieu of safety eyewear as long as lenses on the prescription glasses are impact-resistant. LBNL employees can receive an eye examination and obtain prescription safety glasses free of charge through Health Services (ext. 6266).

- Hearing protection: Ear plugs or ear muffs must be worn when entering high-noise-level areas. Pre-shaped foam ear plugs are recommended for this purpose. They are small, easy to carry, and provide protection against most construction noises.

- Reflective vests: Reflective vests must be worn when working around heavy construction vehicles or mechanized equipment, when working outdoors in areas of limited visibility, or on or around roadways.

- Appropriate clothing: Loose-fitting garments or jewelry that can be caught in moving machinery or any part of the work under construction should not be worn. This is particularly important when entering mechanical or other equipment rooms. Shorts and tank tops are not appropriate attire for construction areas. Long pants should be worn.

References:

CFR 29, 1926, Subpart E, Personal Protective and Life-Saving Equipment
PUB-3000, Chapter 3, Health Services
PUB-3000, Chapter 10, Construction Safety
PUB-3000, Chapter 19, Personal Protective Equipment

2. SAFETY SHOES

Facilities Division employees are required to wear safety shoes. Supervisors are responsible for implementing this policy and ensuring that employees fulfill their responsibility.

LBNL encourages the wearing of safety shoes by making them available to all employees at cost and delivered by the manufacturer's Shoe Mobile. For certain types of work, wearing safety shoes is required by LBNL Policy or by federal regulations (29 CFR 1910.136), as specified in American National Safety Standard Z41.1. Examples are work that exposes employees to foot injuries from hot, corrosive, or poisonous substances; work in shops, in equipment handling, or in construction jobs where there is a danger of falling objects; or work in abnormally wet locations.

a. Employees' Responsibilities

If the employee's current classification (duties/responsibilities) requires that s/he wear safety shoes to perform his/her primary job duties (crafts, custodians, truck drivers, material handlers, etc.):

Employees shall arrive at the start of their shift with their safety shoes on.

If in the event an employee is found not wearing safety shoes during an assigned shift or when in a location where they are required, the employee shall be told to stop work, get his/her safety shoes, and put them on. If an employee needs to go off site to obtain safety shoes, the time off site shall be considered time away from the Laboratory and shall result in loss of pay.

For employees who are required to wear safety shoes on limited or specific occasions, such as project managers when they go to active construction sites, employees must have their safety shoes available on site.

b. Accountability

Violations of this safety shoe procedure will be noted in the annual performance review/evaluation. Failure to comply with this internal safety shoe procedure may also lead to disciplinary action, up to and including termination.

c. Procedure for Obtaining Safety Shoes:

LBNL shall subsidize safety shoe purchases up to the current authorized amount of $120 one time per year. If the shoe cost exceeds the authorized amount of $120, the employee shall pay the difference to the vendor (cash, check, or credit card). LBNL also allows for a payroll deduction for the amount exceeding the authorized LBNL allowance ($120).

A Safety Shoe Request Form (available from the Work Request Center) must be submitted to an employee's supervisor for issuance of safety shoes. The supervisor shall be responsible for clarifying the shoe type, justification for issuance, and approval for the request (signature) prior to the shoes being purchased.

The supervisor shall validate that the employee has not been issued a pair of safety shoes during the last year. Note: The date on which the Safety Shoe Request Form is approved by the supervisor is taken as the start of the tracking year for safety shoe allowances.

At the time of purchase, the vendor will take appropriate copies of the Safety Shoe Request Form and give the employee two copies (employee and supervisor/approver). The employee must immediately return the Approver copy to the supervisor to validate that the appropriate type of shoe was purchased. The supervisor will then return the form to the Work Request Center. Employees may retain or discard their copy.

If within one year from the date of purchase the safety shoes show significant wear and tear or are defective and could compromise the safety of the employee, the supervisor should verify the need to replace the safety shoes and submit a safety shoe issuance form, with a written justification for replacement.

SAFETY HANDOVER TO OPERATIONS

Prior to taking beneficial occupancy of the project, the project team shall complete the Project Turnover (Beneficial Occupancy) letter. This document formally transfers the responsibility for safety to the operating entities. The responsibility for safety will be transferred to:

A. the client for program operations and scientific-related items, and

B. to Facilities Operations for building systems maintenance-related items.

SAFETY TRAINING

It is LBNL policy, and required by federal law, that all staff, participating guests, visitors, and others who perform work at, or for, Berkeley Lab receive the training necessary to protect their health, and to perform work in a safe and environmentally sound manner. This training must include information regarding job hazards, possible health effects, and required work practices and procedures.

Line managers are responsible for analyzing the work of all those under their direction and for ensuring that the proper training for safe conduct of the work is identified and completed. Until an individual has been properly trained, s/he will work under the direct supervision of someone who is already trained. Employees are required to maintain general and job-specific training so that they can work safely, under Integrated Safety Management guidelines. Workers should follow their Job Hazard Analysis to identify potential hazards and train accordingly (see PUB-3000, Chapter 24).

LESSONS LEARNED

Providing feedback under ISM principles allows for continuous improvement, as hazards are analyzed, information on the adequacy of controls is gathered, and line and independent oversight is conducted in order to develop and implement safety measures in the workplace.

At the completion of a project at a minimum, the Project Manager will call a meeting of the Integrated Project Team to review its performance and look for opportunities to improve upon the process in future work. Safety is a crucial component of any Lessons Learned meeting.

The Project Director, Project Manager, other line managers, and individual workers are expected to provide feedback as appropriate. Procedures, practices, tools or equipment that can be adjusted or improved should be identified and discussed. All procedures, practices and controls should be updated and communicated.

EH&S/FACILITIES GUIDELINES FOR RENOVATION & CONSTRUCTION PROJECTS

Project Kick-off

- Facilities assigns team (Project Manager, architect, mechanical, electrical, structural, Construction Manager, and inspector)
- EH&S assigns Team Lead and EH&S Subject Matter Experts as needed
- Project Team determines method of documenting the Hazards Analysis process; a Safety Analysis Document, Hazards Analysis Report or other tailored approach.
- Facilities conducts opening meeting with client and EH&S
  - Discusses Scope of Work, renovation process, duties, potential contamination issues, responsibilities, and how project design, demolition, construction, and inspection will proceed
  - Organizes walk-through of space, conducted with all parties
  - Client describes activities, equipment needs and anticipated chemical or other hazardous material or equipment usage
    - Industrial Hygienist can provide current inventory beforehand – client needs to update
    - Chemical usage has impact on controls
    - Fire Marshal analyzes impact of projected chemical / hazardous material usage on fire control areas if existing structure is involved with project
  - Industrial Hygienist explains the role of EH&S and informs client
    - Preliminary idea of controls needed based on client input
    - Area needs to be cleaned before renovation begins
    - Safety equipment should be upgraded (hoods, eyewash/showers, and storage)
  - EH&S Subject Matter Experts discuss other environment, health, and safety issues as necessary.
- The Project Manager and EH&S Team Lead determine whether a project specific Soil Management Plan and/or a Site Characterization Study are required.
- The Project Manager and EH&S Team Lead determine whether a project specific Storm Water Pollution Prevention Plan are required.

Develop Design Drawings and Specs

- Facilities develops design drawings, schedule & budget
  - Current standards, codes, and specifications
  - Facilities Specs (e.g., fume hood spec)
  - Use “standard details”
- Client, Industrial Hygienists and other EH&S personnel review and provide written comments to Facilities
- Facilities addresses and resolves each comment
  - Incorporate comments directly into drawings and specs. Includes asbestos, lead and mercury controls.
  - Show revision number and/or date on updated drawings
- Equipment schedule and budget reflects design review comments made

- Parties review final design package, concur, and sign off

Area Preparation

- Client cleans laboratory: waste, sharps, excess chemicals, equipment, debris and residues
- Space owner requisitions Waste Management to handle/remove excess chemicals/wastes
- Industrial Hygienists and Radiological Control Technicians perform final inspection
- Facilities conducts/contracts out necessary abatement before area demolition

Demolition and Construction – Space Released to Facilities

- Transportation moves equipment, unopened chemicals and furnishings from LBNL
- Waste Management moves opened chemicals
- Demolition and construction begin
- Demolition activities follow Approved Deactivation Plans and Site Characterization Study
- Installation of equipment and furnishings
- Facilities monitors progress of renovation and installation of equipment through regular inspections (to ensure proper installation in accordance with code)

Punch List Walkthrough

- Facilities organizes “Punch List” walk through *(renovation must be near completion)*
- All parties (including EH&S) participate at same time
- Facilities responds to and corrects each issue identified

Commissioning

- Test and certify: Hoods, biological safety cabinets, gas cabinets, eyewashes/showers, pressurization
- Project sign-off

Lawrence Berkeley National Laboratory

INTERFACE POLICY BETWEEN EH&S AND FACILITIES: PROJECT SUPPORT

Revised January, 2009

Signatures:

Jennifer S. Ridgeway
Jennifer Ridgeway
Facilities Division Director

1/9/09
Date

Howard Hatayama
EH&S Division Director

1/9/09
Date

A. Capital Projects

1. FACILITIES ASSIGNMENT OF THE PROJECT TEAM:

The Facilities Project Manager (PM) is responsible for the project. The Project Manager works with the Client to confirm the project scope and budget. The Project Manager and the EH&S Facilities Projects Coordinator assemble a project team. The Project Manager is responsible for the project throughout all phases:

Conceptual Design

Preliminary Design

Final Design

Construction

2. EH&S SUPPORT OF THE PROJECT TEAM:

The Facilities Project Manager sends the Project Folder to the EH&S Facilities Projects Coordinator for assignment of EH&S safety professionals to participate in the project team. The Facilities Projects Coordinator reviews the project scope and identifies appropriate EH&S Team Leader and team members to be part of the project team. Selection of team members (e.g., environmental services, industrial hygiene, radiation assessment, waste management, occupational safety, construction safety) is made on the basis of hazards anticipated after reviewing the scope of work and any other preliminary information. Membership may be modified as the project evolves if new hazards are identified. The EH&S Facilities Projects Coordinator assigns an EH&S Team Leader for each project based on a number of strategic factors (client, project location, unique hazards, etc). Specific identification within each EH&S group is made according to the EH&S group leaders' particular guidelines.

3. FUNCTIONS OF THE PROJECT TEAM (with respect to EH&S issues):

(a). Conceptual Design Phase:

EH&S team members participate in the project development process to identify EH&S issues. Team member activities are coordinated by the EH&S Team Leader. If any EH&S issues appear that need additional EH&S technical resources, the EH&S

Team Leader notifies the EH&S Facilities Projects Coordinator, who assesses the need and adds additional technical resources to the project team as required. If a formal Conceptual Design Report (CDR) is required, the Project Manager coordinates the gathering of information and incorporates it into the report. Essential EH&S design criteria are identified at this stage. Sign-off by the EH&S Team Leader validates that EH&S elements have been incorporated into the conceptual design.

(b). <u>Preliminary Design and Final Design:</u>

EH&S team members participate in the design process. They identify the EH&S design criteria and provide technical subject matter expertise to the design team. The EH&S team is consulted throughout the design phases to ensure that EH&S issues are comprehensively identified and resolved. Team member activities are coordinated by the EH&S Team Leader. If any EH&S issues appear that need additional EH&S technical resources, the EH&S Team Leader will notify the EH&S Facilities Projects Coordinator. The Facilities Projects Coordinator will assess the need and add the additional technical resources to the Project Team, as required. At the completion of each design phase, the Project Manager distributes copies of all design documentation (drawings, specifications, calculations, etc.) to the EH&S Team Leader for formal review. Formal review comments are submitted to the Project Manager on the specified project review comments form for response and or action by the design team. Sign-off after final design by the EH&S Team Leader validates that EH&S issues have been resolved.

(c). <u>Construction:</u>

During the construction phase, EH&S team members monitor construction activities that pertain to their area of EH&S expertise, to ensure that it conforms to EH&S design specifications. Team member activities are coordinated by the EH&S Team Leader. If any EH&S issues appear that need modifications or additional EH&S technical resources, the EH&S Team Leader notifies the EH&S Facilities Projects Coordinator and the Project Manager. The EH&S Facilities Projects Coordinator will assess the need and add the additional technical resources to the project team as required. The Project Manager will initiate corrective actions for conditions identified by the EH&S team during construction that require attention. At the completion of construction, sign-off by the EH&S Team Leader validates that EH&S issues have been resolved.

4. TEAM MEMBER RESPONSIBILITIES:

(a). Project Manager

Coordination of Information: The Project Manager is responsible for obtaining design input from all the team members and incorporating the information into the design.

Sign-off: The Project Manager is responsible for the distribution of design documentation (drawings, specifications, calculations, etc.) to the EH&S Team Leader for sign-off at the completion of each project phase.

Provides the number of complete sets of design and construction documents requested by the EH&S Team Leader at each review stage.

(b). EH&S Team Leader

Coordinates activities of EH&S team members:

Advises team members on project activities (meetings, etc.), deliverables, time-charging practices

Distributes design and construction documents for review to EH&S team members

Coordinates EH&S review comments, resolves conflicts and returns a consolidated set of comments at each review milestone to the Project Manager.

Coordinates the sign-off for EH&S team members at project review milestones, ensuring that EH&S issues have been resolved.

(c). EH&S Team Member

EH&S project team members participate in the same manner as all design team members: providing technical subject matter support, reviewing information, identifying EH&S issues, signing off at formal review periods and helping to resolve issues.

Additional hazards: At any point in the process, if any team member identifies any EH&S issues that need to be reviewed by additional technical staff, s/he makes recommendations to the EH&S Team Leader.

(d). EH&S Facilities Projects Coordinator

Assigns the EH&S Team Leader.

Assigns technical professionals to specific projects and tracks their participation.

Monitors project support efforts for all assigned teams.

Assists the EH&S Team Leader in resolving conflicting EH&S issues.

B. SMALL PROJECTS

1. ASSIGNMENT OF THE PROJECT TEAM AND IDENTIFICATION OF EH&S TEAM SUPPORT

Projects are initiated with Project Folders in the same manner as Line Item/General Plant Project/Institutional General Plant Projects (LI/GPP/IGPP). The EH&S Facilities Projects Coordinator identifies appropriate EH&S safety professionals to work with the design team during the project planning, design, and construction phases.

2. ROLES AND RESPONSIBILITIES

(a). EH&S Facilities Projects Coordinator:

(1). Identifies EH&S safety professionals as team members on Facilities projects.

(2). Attends Capital Projects and Small Projects meetings for the purpose of facilitating EH&S coordination and resolving EH&S issues.

(b). EH&S Team Lead:

(1). Participates with the Facilities design team in preliminary design, final design, and construction phases of projects.

(2). Evaluates project to identify EH&S issues, with the Project Manager and Construction Manager assesses the hazards presented, identifies EH&S design criteria.

(3). Reviews the completed project and signs off when EH&S criteria have been satisfied.

(c). Facilities Project Manager:

(1). Ensures that all projects have been reviewed with the EH&S Facilities Projects Coordinator to determine EH&S support needs prior to starting design and construction.

(2). Ensures that the assigned EH&S team members participate in the design before the final design sign-off and review construction completion before final construction sign-off.

(3). When applicable, provides the EH&S Facilities Team Lead complete sets of final design documents (drawings, specifications, and calculations) ready for final sign-off (final design and construction completion stage).

C. LBNL FIRE DEPARTMENT REVIEW OF FACILITIES PROJECTS

Following LBNL's Fire Prevention and Protection policy (see PUB-3000, Chapter 12), all LIP, GPP/IGPP, and Small Projects processed by the Facilities Division will be reviewed by the Fire Marshal or designee. Project documents will be submitted directly by the Facilities Project Manager to the Fire Marshal Office for review and approval.

D. EH&S CHARGING PRACTICES

EH&S activities are normally funded by Lawrence Berkeley National Laboratory's overhead General and Administrative (G&A) budget. Department of Energy (DOE) Line Item construction projects (LIP) or projects covered by DOE Order 413.3A require additional Environment, Health, and Safety Division support, in accordance with the Protocol for EH&S Support Cost, dated February 26, 2008. EH&S Team Lead and team members will in general account for their time as follows:

1. For all non-Contract 31 construction projects, EH&S will direct charge its effort to the individual project.

2. For DOE Line Item construction, i.e., projects with a Total Estimated Cost (TEC) of greater than $5 million, EH&S will direct charge its effort to the individual project. These projects will include EH&S time in the development of the project budget.

3. Projects with a TEC of less than $5 million are funded from LBNL's G&A (overhead) expenses. EH&S and Facilities will periodically meet to review the level of EH&S support on projects. During the annual budget formulation, EH&S will forecast the level of funding needed to support projects with a TEC of less than $5 million. The EH&S staff will consult the EH&S Facilities

Projects Coordinator to obtain the internal EH&S cost accounting code against which time is to be charged.

For further information on EH&S resource allocation, see the Facilities Integrated Safety Management (ISM) plan.

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FINANCIAL POLICIES

A. PROJECT CONTROLS

The LBNL Project Manager is responsible for creating a project plan consistent with the project objectives, gaining approval on the project plan, and managing the project within the project plan. A key element of the project plan is the creation and management of the project budget.

1. Cost Estimates

Cost estimates will be prepared for all projects during the budget formation stage, when the estimate will be used as the basis for creation of the project budget, and during design preparation stages, when the estimate will be used to track projected costs against the project budget.

2. Cost Budgeting

The Project Manager has overall responsibility for accuracy of information in the cost plan. At project initiation, the Project Manager fills out cost plan information in the Original Budget Column and Approved Budget Column, and distributes the budget by month. On a monthly basis, the Project Manager will review budget, actual costs, and other financial information to verify accuracy, and note any variances.

The Project Manager is supported by the Project Controls staff and the Project Administrator.

3. Cost Reporting

The Project Manager has overall responsibility for updating the cost reports on a monthly basis at a minimum, incorporating the latest projections of LBNL staffing levels, subcontracts and other costs in a timely and complete fashion (see complete description in Section B4, Reporting). With the support of the Project Controls staff and the Project Administrator, the Project Manager shall:

a. Status and comment on project progress.

b. Provide an accurate and timely forecast of costs-to-go (or, if easier, a forecast of total expected project costs) once a month.

c. Identify risks and evaluate contingency.

d. Alert the Capital Projects Department Head and Division Finance Manager of any risks of cost overruns immediately, so that risks can be mitigated and additional funding identified if risks cannot be mitigated.

e. Prepare a revised Construction Directive Authorization (CDA) for GPP/IGPP projects if forecast costs change by 10 percent or more of authorized TEC.

f. Close out all projects in a timely manner.

The Facilities Finance Group shall:

a. Communicate regularly during the month with each Project Manager, to understand risks and opportunities.

b. Monitor GPP/IGPP Budget and Reporting (B&R) funds balances in hand.

c. Assist Project Manager in preparing a revised CDA if necessary.

d. Prepare and submit requests for revised authorizations to the Berkeley Site Office when necessary.

e. Provide assurance review for financial information included in project status reports.

Checklist Items:

a. Verify that the remaining balance is adequate to complete the project.

b. Initiate corrective action as required if the estimated cost to complete exceeds the funds available.

Typical documents are:

- Cost Workbook
- Cost Performance Report (EVMS)
- DOE Monthly and Quarterly Reports
- Financial Status Report (for UC projects)
- Financial Summary (GPP/IGPP/Small Projects)
- Monthly updates for the Chief Operating Officer
- Capital Projects List

4. Signature Authority

Project Managers and other selected staff are delegated signature authority up to a designated dollar amount. It is the responsibility of the individual to know the amount of his/her signature authority. Signature authority limits the amount of obligations (such as purchase requisitions) that can be approved. It does not limit the approval amount for invoices against previously approved obligations.

All cost estimates for projects or efforts of more than $10K, all fees for services over $10K, and all funding requests over $10K are to be reviewed and approved by the Capital Projects Department Head.

B. PROCUREMENT

The LBNL Project Manager is responsible for managing procurements on his/her assigned projects through the LBNL Procurement Division.

1. Purchase Requisition Approval

a. Initiate Purchase Requisition.

A purchase requisition is entered by a Project Administrator or other authorized person who has training on the eProcurement system. Care must be taken with the following entries:

Requestor: Enter the name of the person who is responsible for the Project ID to be charged. This is the Project Manager for project work, or the Control Account Manager for overhead-funded work.

Approver: The Project Manager or another authorized signer who has sufficient signature authority to cover the amount of the requisition.

Certifier: The Certifier is the person responsible for the Project ID to be charged and who will approve the invoice for this purchase. This is the Project Manager for project work and the Control Account Manager for overhead-funded work. The Certifier's name is entered into eProcurement by the Procurement Subcontract Administrator.

Project ID: Review Project ID with Requestor to confirm that the cost will be charged to the correct account.

Category: Review Procurement Category List on pull-down menu, select appropriate category, and confirm selection with requestor. Some categories are restricted and may require additional approvals.

Description: Enter a complete description of the purchase, including an expected start date and completion date. The words entered will be transferred and tracked on the Purchase Order. The description is limited to 254 characters. Use the Additional Information text box if additional space is needed for the description. The Notes to Buyer text box may also be used.

b. Requisition is approved electronically on eProcurement by the Project Manager. When a requisition exceeds the Project Manager's signature authority, the Project Requisition Approval Form should be used. The form is to be filled out by the Project Administrator, signed by the Project Manager, then routed to the Project Director for approval. Requisitions exceeding the Project Director's signature authority will be routed to the Capital Projects Department Head, for approval. The authorized signer must have sufficient signature authority to cover the amount of the requisition. The approver must be certain that the requisition is consistent with the authorized scope of work and that the Project ID has sufficient funds to cover the requisition amount. Purchase Orders must be issued by Procurement before the vendor proceeds with work. Work must not proceed on any construction projects until Procurement issues a Notice to Proceed.

c. For Architecture/Engineering (A/E) consultant subcontracts, a Task Request for A/E Services form is filled out, routed for signature by the Project Manager, and then forwarded to the assigned Subcontract Administrator in Procurement. The Task Request may be attached to the Requisition by the Project Administrator and electronically sent to the Subcontract Administrator.

d. For construction subcontracts of more than $100K, a Subcontract Award Memo is prepared by the Project Manager, signed by the Capital Projects Department Head, and forwarded to Procurement.

2. Change Order to a Purchase Order

a. A purchase requisition for the Change Order is entered by the Project Administrator or other authorized person who has training in eProcurement.

b. Requisition is approved electronically on eProcurement by the Project Manager, or other authorized signer, who must have sufficient signature authority to cover the amount of the requisition.

c. For Change Orders to A/E consultant subcontracts, a Task Request for A/E Services form is filled out, routed by the Project Manager for signature, and then forwarded to the assigned Subcontract Administrator in Procurement.

d. For Change Orders to a construction subcontract, a Construction Subcontract Change Authorization form is prepared by the Project Manager and forwarded to the Procurement Subcontract Administrator. The subcontractor's change request and the LBNL independent estimate are attached to this form.

3. Invoices and Payment Applications

The original invoice is sent by the vendor to Accounts Payable, with copies to the certifier and Subcontract Administrator. The designated certifier is typically the Project Manager. Contract employees cannot be designated as a certifier.

4. Invoice Approval (invoice less than $100K ***and*** subcontract less than $1 million)

a. The certifier shall verify that invoiced work is complete, sufficient funds are available to cover the invoice, and, for any construction work of more than $2,000, that the Subcontract Administrator has received certified payrolls.

b. For invoices exceeding the Project Manager's signature authority, the Invoice Approval Form shall be filled out by the Project Administrator, signed by the Project Manager, then routed to the Project Director for signature. Invoices exceeding the Project Director's signature authority shall be routed to the Capital Projects Department Head, for signature. Copies of the invoice, subcontract accounting log, and other backup as needed shall be attached to the form.

c. The certifier shall certify the invoice online in eProcurement Field Certification. A link is provided in the e-mail certification notice. Certifier shall verify that the invoice amount and Project ID to be charged are correct in eProcurement. If necessary, the Project ID can be corrected online prior to certification. For special distribution or retention requirements, the certifier shall send an e-mail

to Accounts Payable detailing the request and including Project IDs and amounts.

d. Hard copies of the invoice and e-mail certification approval are kept in the project file.

5. Invoice Approval (invoice greater than $100K ***or*** subcontract greater than $1 million)

a. Follow the steps under paragraph 4, above, with the following modifications.

b. All invoices under this category shall be accompanied by an Invoice Approval Form signed by the Capital Projects Department Head.

c. Invoices greater than $100K must be approved by the certifier, and also by an authorized signer who has signature authority equal to or greater than the amount of the invoice. Invoices greater than $100K cannot be certified online. The certifier shall forward the e-mail certification notice to the authorized signer (using "Reply All" and copying the Subcontract Administrator and Project Administrator), who will approve with "Reply All." Invoices greater than $1 million may have additional approval requirements; check with the authorized signer for guidance.

d. The certifier shall include in the e-mail approval:

- the Project ID(s) to be charged with corresponding amount(s),
- any retention amount(s) to be withheld,
- the Purchase Order (PO) line number(s) to be charged against, if needed.s

6. Invoice for Final Payment

The vendor will submit a separate invoice for retention to Accounts Payable. Invoice shall be certified by the certifier and authorized signer and then approved by the Procurement Subcontract Administrator. Approval signifies that all work has been completed and that there are no outstanding claims.

7. Construction Subcontract Progress Payments

Construction subcontract progress payments are to be reviewed by the Construction Manager to confirm that the invoice accurately reflects construction progress prior to payment. The Construction Manager wet-signs the schedule of values and returns it to the Project Manager. A copy of the invoice with the wet-signed schedule of values becomes part of the record in the project management files, along with any e-mail/online certifications and the signed Invoice Approval Form, where applicable.

8. Invoice and Subcontract Accounting Log

An Invoice and Subcontract Accounting Log will be maintained by the Project Administrator, detailing the Purchase Order amount, all Change Orders to the Purchase Order, and all invoices received.

9. Unauthorized Procurements

Procurements made without following LBNL Procurement policies may be considered unauthorized procurements. If a procurement is identified as unauthorized, the Division must provide an explanation and request for ratification, using the Unauthorized Commitment form (see LBNL Procurement Standard Practices Manual 1.3).

10. Sole Source Procurements

Requests for sole source procurements on purchase requisitions over $100K may be made using the Berkeley Lab Justification for Sole Source Procurement form. The form must be approved by the Design & Construction Department Head and Facilities Division Director prior to submittal to Procurement (see Procurement Standard Practice 6.2).

C. ADMINISTRATIVE EXPENSES

1. Travel Expense Report

Capital Projects staff may submit a Travel Expense Report for expenses incurred on LBNL business, in accordance with LBNL policy. The form is to be prepared by the employee and forwarded to the Capital Projects Department Head, for approval.

2. Request for Issuance of Check

A Request for Issuance of Check form may be used for expenses incurred in accordance with LBNL policy. The form is to be prepared by the employee, and forwarded to the Capital Projects Department Head for approval.

D. OVERHEAD BUDGET

The Capital Projects Department Head, is responsible for management of the Capital Projects Overhead Budget.

1. Creation of Budget

The Capital Projects Department Head is responsible for creating a proposed budget for the coming fiscal year and submitting it to the Facilities Director and Chief Operating Officer for approval. The proposed budget is usually prepared in June, with approval made prior to the start of the fiscal year.

2. Control Account Managers

The Capital Projects Department Head will assign Control Account Managers to sections of the Overhead Budget and will establish budget amounts for each of these sections. The Control Account Managers will be responsible for managing their portion of the budget within the established amount.

3. Project Initiation Forms

The Project Initiation Form is (PIF) used to submit a detailed request for Project IDs to be set up as part of the Overhead Budget. The PIF should be submitted to the Control Account Manager for review, forwarded to the Capital Projects Department

Head for approval, then routed to the Resource Analyst for set-up of a Project ID (refer to Section A1, Project Initiation).

4. Monthly Status Report

Monthly reports are generated by the Resource Analyst for review by the Control Account Manager and Capital Projects Department Head. This review will include identification of any potential budget changes (refer to Section B4, Reporting).

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RECORDS FILING AND DISPOSITION

A. SUMMARY

This section describes the documents that constitute project records, their filing location during the active phase of the project, and the requirements for the inactive phase of the project. Records include communications, contracts, construction documents, calculations, and design review and approval documents. Active phase includes conceptual design, design, construction, and project closeout. Inactive phase includes dispositioning and archiving.

The legal requirements and responsibilities for gathering, managing, and archiving project records are defined in the LBNL's Regulations and Procedures Manual (RPM) Policy 1.17.

B. PROJECT RECORDS

The primary location of project records during both active and inactive phases of the project is shown in the Records Filing and Disposition Table, this section.

Project records include:

1. Communications
    a. Correspondence
    b. Memos (including hard copies of e-mail messages)
    c. Meeting minutes
    d. Telephone logs
    e. Facsimile transmittals
    f. Reports
2. Subcontracts
    a. Subcontract agreement with A/E firm
    b. Subcontract with construction firm
    c. Modifications and Change Orders to a & b above
3. Construction Documents
    a. Drawings
    b. Specifications
    c. Revisions to a & b above

4. Calculations

5. Other Record Documents (as required by the Specifications)

   a. Warranties (Operations and Maintenance, O&M)

   b. As-built drawings (O&M)

   c. Maintenance manuals (O&M)

   d. Operations manuals (O&M)

   e. Start-up and testing procedures

   f. Shop drawings

   g. Samples

   h. Submittals

6. Review and Approval Documents

   a. Department of Energy (DOE) approval documents

   b. Project Plan Review forms for Preliminary Design and Final Design

   c. Project Construction Complete Review form

   d. Third-party reviews and recommendations

C. FILING OF PROJECT RECORDS (Active Phase of Project)

This section discusses the files maintained by Facilities and Procurement during the active phase of the project. The Facilities Project Manager and the Procurement Subcontract Administrator are responsible for the proper filing of project records they generate or receive during the active phase.

1. Project Records Maintained by Facilities

   a. Central project files (maintained by Capital Projects)

   b. Central drawing file

   c. Project Manager working files

2. Files Maintained in Procurement

   a. Project subcontract files (originals)

D. PREPARING PROJECT RECORDS FOR DISPOSITION AND ARCHIVING

The Project Manager is responsible for gathering and transferring project records to the Archives and Records Office within three years of project closeout.

E. RECORDS DISPOSITION (Inactive Phase of Project)

The disposition of project records is governed by LBNL policy and DOE Orders. DOE requirements are defined in the DOE Order 243.1, Records Management Program.

RECORDS FILING AND DISPOSITION TABLE

LOCATION OF PROJECT RECORDS DURING ACTIVE AND INACTIVE PHASES OF THE PROJECT

	ACTIVE PHASE			INACTIVE PHASE				
	FACILITIES		PROCUREMENT	FACILITIES			ARCHIVES	
PROJECT RECORD	PM CENTRAL FILE	PROJECT DRAWING FILE	SUBCONTRACT FILE	FACILITIES OPERATIONS FILES	SERVER FILE	MICROFILM FILE	BOX FILE	MICROFILM FILE
COMMUNICATIONS								
Correspondence	R						R	
Transmittals	R						R	
Meeting Minutes	R						R	
Reports	R						R	
Memos	R						R	
Telephone Logs	R						R	
A/E SUBCONTRACTS								
Communications	C		R				R	
Subcontract/Modifications	C		R				R	
Requests for Payment/Authorizations	C		R				R	
CONSTRUCTION SUBCONTRACT								
Communications	C		R				R	
Subcontract/Change Orders	C		R				R	
Requests for Payment/Authorizations	C		R				R	
CONSTRUCTION DOCUMENTS								
DRAWINGS								
Progress Drawings		R						
Bid Set		R					R	
Construction Set		R					R	
As-Built Set					R	C	R	C
SPECIFICATIONS								
Bid Set	R						R	
Conformed Set	R						R	
CALCULATIONS	C				R		R	C
OTHER RECORD DOCUMENTS								
Warranties	R			R			C	
Start Up and Testing Procedures	R			R			C	
Operation and Maintenance Manuals	R			R			C	
Shop Drawings	R						R	
Samples	R						R	
Submittals	R						R	
Inspection Reports	R						R	
REVIEW AND APPROVAL DOCUMENTS								
Project Plan Review	R		C				R	
Project Construction Complete Review	R		C				R	
Third Party Reviews/Recommendations	R						R	

Legend:
PM = Project Management, R = Responsible Department/Group, C = Copy

ARCHIVES AND RECORDS

A. GENERAL

Lawrence Berkeley National Laboratory (LBNL) and the University of California recognize the importance of appropriate treatment of records. Every LBNL employee has responsibilities for LBNL records. Records management is a line function at LBNL, and the LBNL Archives and Records Office assists line management in meeting its records management responsibilities.

Records management provides a rational basis for making decisions about recorded information, including what should be saved and what should be discarded. These decisions are necessary to support the legal, fiscal, administrative, and other research needs of LBNL, the University, the federal government, state of California, and general public. The ultimate goal of records management is to identify and maintain records that adequately and properly document the organization, functions, policies, decisions, procedures, and essential transactions of projects and research.

Additional information about records-keeping requirements can be obtained by calling the LBNL Archives and Records Office at (510) 486-5525.

B. LEGAL REQUIREMENTS

All records generated at LBNL under terms of its contract with DOE are considered institutional. As such, all LBNL records are owned by the United States government, with the exception of the University's fiscal and administrative records.

University administration and fiscal records are owned by the University of California and are therefore subject to the California Public Records Act and the Information Practices Act. All other LBNL records are federal records. Four primary laws relate to federal records management: the Federal Records Act of 1950, as amended; the Freedom of Information Act; the Privacy Act; and the Paperwork Reduction Act of 1980.

The LBNL records management program is mandatory.

C. RESPONSIBILITIES

1. The Archives and Records Office must:

   a. Establish standards, procedures, and guidelines for the LBNL archives and records management program.

   b. Assist LBNL divisions in developing programs for effective records management, files maintenance, records disposition, and vital records protection.

   c. Collect and disseminate information on records management, technological developments, and other records management-related activities.

   d. Train records liaison officers and LBNL employees about their records responsibilities.

e. Inventory and appraise records and submit LBNL-specific records retention schedules to the National Archives and Records Administration.

f. Assign records retentions according to authorized retention schedules.

g. Ensure that semi-active records are appraised for their legal, fiscal, administrative, research, and historical value, and are properly accessioned, stored, and retrieved as needed.

h. Obtain departmental written authorization to dispose of temporary records.

i. Ensure that permanent, historically valuable records are appropriately accessible to researchers.

j. Conduct surveys of the records management practices of divisions, departments, and research groups to ensure accountability and improve records care.

k. Assist all Principal Investigators with designated quality assurance records.

l. Assist LBNL divisions in LBNL disaster preparation and recovery if records are involved.

m. Identify, store, and display historic LBNL artifacts.

n. Assist LBNL in adhering to the National Historic Preservation Act.

2. Each LBNL division/department must:

a. Designate records liaison officers responsible for overall coordination of records programs, add the records liaison officer duties to the individual's job description and his/her annual job evaluation, and ensure that the records liaison officer is trained by the Archives and Records Office.

b. Cooperate with the LBNL Archives and Records Office in applying standards and procedures to improve the management of records.

c. Establish effective management controls over the creation, maintenance, and use of records.

d. Create and preserve records that adequately and properly document the organization, functions, policies, decisions, procedures, and essential transactions of the divisions, departments, and research groups.

e. Destroy records according to retention schedules approved by the National Archives and Records Administration.

f. Submit records inventories to the LBNL Archives and Records Office.

g. Transfer semi-active records from office space to the LBNL Archives and Records Office.

h. Establish safeguards against the unauthorized removal or destruction of records and notify the LBNL Archives and Records Office if their removal or destruction occurs or appears imminent.

i. Provide safeguards in all records management activities for the protection of individual privacy in accordance with federal and state laws and regulations.

j. Identify, develop, and maintain a vital records protection program.

k. Ensure that document retention schedule/destruction practices are suspended when litigation, governmental investigation, or an audit are pending.

D. PROGRAM COMPONENTS AND SERVICES

1. Training and Workshops

The Archives and Records Office offers training and workshops on records management, including records disposition, vital records protection, files management, electronic records retention scheduling, and disaster preparedness.

2. Records Inventory

All LBNL divisions, departments, and research groups are responsible for completing and keeping current inventories for their records, and should share the information electronically with the Archives and Records Office.

3. Records Scheduling

Records must be maintained according to the retention schedules approved by the National Archives and Records Administration. The schedule is the legal instrument by which records are evaluated and decisions are made about their storage, preservation, availability, or transfer to the National Archives and Records Administration. The Archives and Records Office is responsible for developing retention schedules that accurately reflect the nature and content of LBNL's records.

After the schedule is prepared, it is sent to DOE and the National Archives for review and approval. It is critical to note that records may not be destroyed unless they are covered by an approved schedule.

4. Program Survey

To establish accountability and to assess LBNL's records management practices, the Archives and Records Office will survey each division, department, project, and research group's area using National Archives and Records Administration guidelines and requirements. Reports of the records surveys will be given to the records liaison officer and appropriate line management. Line management and the records liaison officer are responsible for correcting the deficiencies within a reasonable amount of time.

5. Information in Electronic and Optical Form

Scientific and technical records may consist of laboratory notebooks, raw observational or experimental data, text files, software, or modeling and design

systems recorded on electronic or optical media. According to the law and National Archives and Records Administration regulations, records may consist of any media, including microfilm, magnetic tape, floppy and hard disks, and optical cards and disks. Information on these media must be covered by an approved records schedule and handled according to the terms of the schedule.

Federal law and regulations require LBNL to schedule electronic and optical record retention by information system (including inputs, outputs, documentation, and magnetic or optical media). Unscheduled records or records scheduled for permanent retention in hard copy may not be destroyed without National Archives approval. Before a division, department, project, or research group creates electronic or optical data systems, the records liaison officer should contact the Archives and Records Office about disposition requirements.

6. Vital Records

Vital records should be inventoried and identified. Scientific groups and departments must take appropriate measures to protect vital records.

7. Disaster Recovery

If records are damaged by fire, water, or other natural or man-made hazards, the LBNL Archivist and Records Manager should be contacted to assess the damage, determine whether in-house methods can be used to recover the information, or find additional records disaster recovery expertise.

8. Disposition of Personal Papers and Official Records

The contract between the University of California and DOE specifies that all records, except the University's fiscal and administrative records, are federal records. Individuals do not own LBNL records and do not have the authority to dispose of them or transfer records to another institution. If individuals maintain personal files at LBNL, they must not mix LBNL records with their personal records. Individuals may make convenience copies of appropriate LBNL records for their personal files in reasonable quantities.

9. Privacy and Access Laws

LBNL records, except for the University's fiscal and administrative records, are subject to the procedures outlined in the Freedom of Information Act and the Privacy Act. University fiscal and administrative records are subject to the California Public Records Act and the Information Practices Act. For assistance and clarification about these laws, call the Archives and Records Office.

10. Access to LBNL Records

LBNL records that are permanent, historically valuable, and non-current are open to research, subject to Freedom of Information and Privacy Act provisions. Researchers are encouraged to call the Archives and Records Office to make arrangements to use these records.

11. Quality Assurance

The LBNL Operating and Quality Management Plan (PUB-3111) addresses quality assurance records. The records liaison officer must carry out records responsibilities according to procedures established by quality assurance guidelines, LBNL policy and procedure, and federal laws and regulations. The Archives and Records Office will assist divisions, Principal Investigators, departments, projects, and research groups in understanding and meeting their quality assurance records obligations.

12. Central Records Holding Area

The LBNL Archives and Records Office operates LBNL's central records holding area. All offices are required to retire semi-active records series to the Archives and Records Office. The central records holding area facility standards are set forth in RPM 1.17, Archives and Records Management.

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FORMS

Current forms in use by Capital Projects are contained herein. Electronic versions of these forms are also located on the Capital Projects file server:

G:\Capital Projects\Procedures, Standards & Forms\Forms

A. CAPITAL PROJECTS DEPARTMENT FORMS

- Activity Hazard Analysis
- A/E Project Routing Form
- Agenda Bidwalk
- Agenda Pre-start
- Appendix A1 – Project Work by LBNL
- Appendix A2 – Project Work by Contractor
- Award of Subcontract
- Baseline Change Proposal (BCP)-Master
- Beneficial Occupancy – Sample Letter
- Bid and Award Checklist
- Capitalization Recap Form
- Change Order Log
- Client Questionnaire – A/E
- Closeout Checklist
- Conceptual Design Checklist
- Construction Checklist
- Construction Subcontract Change Authorization
- Contractor Parking Request
- Design Comment Form
- Dig Permit Application
- Engineering Note
- Equipment Datasheet
- Equipment Folder Contents
- Facilities Safety Walk Around
- Fax Form (Capital Projects)
- Field Order
- File Directory
- File Drawer Label Template

- Final Acceptance – Procurement
- Final Design Checklist
- Invoice Approval Form
- Job Hazard Analysis (see Activity Hazard Analysis)
- Letterhead (Capital Projects)
- Local Travel Expense Report Form
- Meeting Action Items
- Meeting Minutes
- Memo (Capital Projects)
- NTP Joint Operating Committee (JOC)
- On-site Meeting Form
- Participating Guest Form
- Performance Evaluation – A/E
- Performance Evaluation – Construction
- Permit to Penetrate Application Form (see Dig Permit Application)
- Preliminary Design Checklist
- Project Budget Estimate Cover
- Project Completion Letter
- Project Construction Complete Review
- Project Initiation & Change Form (PIF)
- Project Initiation Checklist
- Project Plan Review
- Proposed Change Order
- Punchlist Log
- Requisition Approval Form
- Requisition Worksheet ePro
- Requests for Information (RFI) Log
- Safety Checklist
- Signin Sheet
- Subcontract Accounting Log
- Submittal Log
- Tail Gate Meeting Form
- Task Request for A/E Services
- Team Directory
- Tool Box Meeting Form
- Transmittal Template

- Vacation Form
- Value Engineering Form
- Visitor Sign-in Sheet – Site Access
- WBS Standard Format
- Work Order Checklist
- Work Order Structure

B. OTHER LBNL FORMS

Other LBNL forms used by the Capital Projects Department, but belonging to other groups within LBNL, can be found by going directly to the source. Links to various forms can be found on several websites, but the originator should always be consulted for the most current version of the forms. In most cases, instructions for form usage can be found on the originator's website. Some of the most common forms used by Capital Projects are listed below.

1. Procurement

Procurement forms can be found on the Procurement Forms Cabinet website (www.lbl.gov/Workplace/CFO/pro/forms.html) or by following the link from the main Procurement website (http://procurement.lbl.gov/).

Forms that can be found at this location include:

- Sole Source Form
- Detailed Advance Acquisition Plan
- Request for Consultant/Personal Services Agreement

2. Chief Financial Officer

Financial forms can be found on the Forms page of the Office of the Chief Financial Officer (CFO) website (http://fsdwprod.lbl.gov/cfo/cfoFormFullList.asp) or by following the link from the main Office of the CFO website at (http://www.lbl.gov/Workplace/CFO/).

Forms that can be found at this location include:

a. Disbursements (Accounts Payable)

- Create/Update Vendor Form
- Vendor Wire Request Form

b. General Accounting

- Plant and Capital Equipment (PACE) Life Cycle Form

c. Financial Policy and Training

- Off-Site Training Request Form
- Request for Issuance of Check Form

3. Conference Services

Conference Services forms can be found on the Forms page of the Conference Services website (http://www.lbl.gov/Workplace/CFO/conferences/index.html).

Forms that can be found at this location include:

- Laboratory-Hosted Meeting Request (food only)
- Laboratory-Hosted Meeting Request (including food, lodging, meeting space, etc.)

4. Site Access

Site access and parking forms can be found on the Site Access website (http://www.lbl.gov/Workplace/site-access/access/).

Forms that can be found at this location include:

- Site Access Meeting and Conference Guidance and Procedures

5. Facilities

a. Key Request

Key Request forms can be found on the Facilities Lock Shop website (www.lbl.gov/Workplace/site-access/access/GGM_form.rtf).

b. Vehicle Request

Online Vehicle Request forms can be found on the Site Services website (http://fac.lbl.gov/Facilities/SiteSvcs/forms/reservation2.htm).

c. Scheduled Work Request

Online Work Request forms can be found on the Scheduled Work Request website (https://workrequest.lbl.gov/jsp/workreq_login.jsp).

C. FORMS PROCEDURES

New forms will be saved in the Forms directory of the Capital Projects file server. Notification to Capital Projects will be made immediately, as follows:

- E-mail notice to Capital Projects e-mail distribution.
- Discussion at monthly Capital Projects Full Staff or Project Managers/Construction Managers meetings, as necessary.
- A brown-bag training session may be scheduled to review the new form and procedure for use.
- All notifications will include the implementation date for the new form and procedure, which will be two weeks from the approval date. Additionally, any forms or procedures that will be superseded by the new form and procedure will be identified.

GLOSSARY

Acceptance Testing. The performance of all testing necessary to demonstrate that the completed effort operates in accordance with the defined requirements, plans, and specifications, including reliability, maintainability, and availability.

Acquisition Executive. The individual designated by the Secretary of Energy to integrate and unify the management system for a program portfolio of projects, and to implement prescribed policies and practices.

Acquisition Plan. The acquisition plan provides the procurement and contracting detail for elements of a system, program, or project. The acquisition plan is execution oriented, provides the framework for conducting and accomplishing the procurements, and includes actions from solicitation preparation through contract award administration.

Acquisition Program or Project. Acquisition programs and projects are acquisitions of capital assets equal to or greater than $5 million, regardless of the funding source, that deliver a product, or capability, with a specified beginning and end, a stated cost, and expected performance objectives. They are directed, funded efforts whose purpose is to provide a useful, material capability in response to a validated mission or business need. An acquisition program may be facility construction, infrastructure repairs or modifications, system, production capability, remediated land, closed site, disposal effort, software development, information technology, space system, research capability, or other asset. Acquisition programs, as they relate to projects, are generally made up of multiple projects, related by a common mission, in which each project remains a useful segment and able to perform its intended function.

Acquisition Strategy. An acquisition strategy is a high-level business and technical management approach designed to achieve project objectives within specified resource constraints. It is the framework for planning, organizing, staffing, controlling, and leading a project. It provides a master schedule for activities essential for project success and for formulating functional strategies and plans.

Active Phase. The time period of a project from the start of conceptual design to the end of the construction phase.

Actual Cost of Work Performed (ACWP). Total costs incurred (direct and indirect) in accomplishing an identified element or scope of work during a given time period. See also EARNED VALUE.

ACWP. Abbreviation for the Actual Cost of Work Performed.

A/E. Abbreviation for Architect/Engineer.

Approved Budget. A specific amount of funds dedicated towards a project(s) that has been authorized by the Department of Energy (DOE).

Authority. Authority is the right, pertaining to a specific issue, to give an order and have it obeyed, or to make a decision and have it accepted.

B&R. Abbreviation for Budget and Reporting Classification.

BA/BO. Abbreviation for Budget Authority (Authorization)/Budget Obligation.

BAC. Abbreviation for Budget At Completion.

BCWP. Abbreviation for the Budgeted Cost of Work Performed.

BCWS. Abbreviation for the Budgeted Cost of Work Scheduled.

Beneficial Occupancy. The process by which a facility or portions thereof is released for use by others, prior to final acceptance. Non-integral or subsidiary items and correction of design inadequacies subsequently brought to light may be completed after the Beneficial Occupancy date.

Budget and Reporting Classification (B&R). Defines the budget coding structure that parallels DOE activities and programs. This structure is used for executing the budget, reporting actual obligations, costs, and revenues, and controlling and measuring actual versus budgeted performance. The Budget and Reporting Classification is an alphanumeric designator assigned by the DOE to all funding sources. It is a Work Breakdown Structure (WBS) and facilitates identification of funding/costs for specific research areas (or small projects) on a Lawrence Berkeley National Laboratory (LBNL) or DOE nationwide basis.

Budget at Completion (BAC). The total authorized budget for accomplishing the scope of work. It is equal to the sum of all allocated budgets plus any undistributed budget. (Management Reserve is not included.) The Budget at Completion will form the Performance Baseline.

Budget Authority (Authorization)/Budget Obligation (BA/BO) Schedule. A schedule showing the distribution of project obligations and costs over time by WBS. Also shows the funding profile and funding requirements for the project.

Budgeted Cost of Work Performed (BCWP). A measurement of the work completed (in Earned Value Management terminology). BCWP is the value of work performed, or "earned," when compared to the original plan, that is, the Budgeted Cost of Work Scheduled. The BCWP is called the Earned Value. See also EARNED VALUE.

Budgeted Cost of Work Scheduled (BCWS). The sum of the budgets for all work (work packages, planning packages, etc.) scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period. Also called the Performance Measurement Baseline. See also EARNED VALUE.

Budgeting. The process of translating resource requirements into a funding profile.

Burden. Costs that cannot be attributed or assigned to a system as direct cost. An alternative term for overhead.

Burn Rate. The monthly rate at which a contractor's funds are expended during the period of the contract.

Capability. A measure of the system's ability to achieve mission objectives, given the system condition during the mission.

Capital Assets. Land, structures, equipment, systems, and information technology (e.g., hardware, software, and applications) that are used by the federal government and have an estimated useful life of two years or more. Capital assets include environmental restoration (decontamination and decommissioning) of land to make useful leasehold improvements and land rights, and assets whose ownership is shared by the federal government with other entities. This does not apply to capital assets acquired by state and local governments or other entities through DOE grants.

CD. Abbreviation for Critical Decision.

CEQA. Abbreviation for the California Environmental Quality Act.

Change Order. A bilateral, or sometimes unilateral, order, signed by the government contracting officer, directing the contractor to make a change that the Changes clause authorizes, usually with, but sometimes without, the contractor's consent.

Change Proposal. The instrument prepared to provide a complete description of a proposed change and its resulting impact on project objectives.

Chart of Accounts. Any numbering system used to monitor project costs by category (e.g., labor, supplies, materials). The project chart of accounts is usually based upon the corporate chart of accounts of the primary performing organization, and is directly linked to the project's WBS.

Commissioning. Commissioning is a systematic process for achieving, verifying, and documenting that the performance of the facility or system and its various components meets the design intent and the functional and operational needs of the owners, users, and occupants.

Commitment. A reservation of funds, prior to creation of an obligation. A commitment is based upon a valid request for procurement that authorizes the creation of an obligation.

Competition. An acquisition strategy whereby more than one contractor is sought to bid on a service or function; the winner is selected on the basis of criteria established by the activity for which the work is to be performed.

Competitive Proposals. A procedure used in negotiated procurement that concludes with awarding a contract to the offerer whose offer is most advantageous to the government.

Conceptual Design. The formative stage in the design of a facility, prepared for the purpose of developing and quantifying (1) the physical construction requirements of the project, (2) a cost estimate of sufficient quality to be used for budgetary purposes, and (3) a schedule of key design and construction activities.

Configuration. The functional and/or physical characteristics of hardware, firmware, and/or software, or any of their discrete portions, as set forth in technical documentation and achieved in a product. Configuration items may vary widely in complexity, size, and type, from a facility, electronic, or control system to a test meter or process vessel. Any item required for logistic support and designated for separate procurement is a configuration item.

Configuration Control Board. A multidiscipline functional body of representatives designated and chartered by the appropriate management level to ensure the proper definition, coordination, evaluation, and disposition of all proposed changes.

Configuration Management. To control changes to, and to record and report changes to data sets, reports, and documents.

Construction. Any combination of engineering, procurement, erection, installation, assembly, or fabrication activities involved to create a new facility or to alter, add to, or rehabilitate an existing facility. Construction also includes the alteration and repair of buildings, structures, or other real property. (Formerly referred to as "Title III.")

Construction Completion. The date on which Beneficial Occupancy is taken by LBNL on the work performed by the subcontractor.

Construction Documents. All of the written and graphic documents prepared or assembled by the design professional for communicating the project design and contract administration. Construction documents include both the bidding and contract documents.

Construction Management. Services that encompass a wide range of professional services relating to the management of a project during the pre-design, design, and/or construction phases. The types of services provided include development of project strategy, design review relating to cost and time consequences, value management, budgeting, cost estimating, scheduling, monitoring of cost and schedule trends, procurement, observation to ensure that workmanship and materials comply with plans and specifications, contract administration, labor relations, construction methodology and coordination, and other management efforts related to the acquisition of construction.

Construction Manager. A person responsible for managing field construction activities and coordinating in-house craft labor.

Construction Project Data Sheet. A document containing all project data and justification, including the construction scope, budget, and schedule. The data sheet is submitted to DOE once a year to request funding in future fiscal year budgets.

Construction Start. The date on which construction starts is either the agreed Notice to Proceed date or the date construction activities physically start.

Construction Team. Members of the construction team consist of University personnel, the design professional, and the contractor.

Contingency. Contingency is the portion of the project budget that is available for uncertainty within the project scope but outside the scope of the contract. The contingency is an amount budgeted to cover costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties.

Contract. A contract is a mutually binding agreement that obligates the seller to provide the specified product and obligates the buyer to pay for it.

Contract Closeout. Completion and settlement of the contract, including resolution of all outstanding items.

Construction Documents. Documents containing the legally enforceable requirements that become part of the construction contract when the Agreement is signed. Contract documents consist of the Agreement, General Conditions, Supplementary Conditions, Exhibits, Specifications, List of Drawings, Drawings, Addenda, Certificates of Insurance, Payment Bond, Performance Bond, List of Subcontractors, List of Changes in Subcontractors Due to Alternates, Notice to

Proceed, various contract modifications, Notice of Completion, and all other documents identified in the Agreement.

Contractor. An individual, partnership, company, corporation, or association having a contract with a contracting agency for the design, development, maintenance, modification, or supply of configuration items and services under the terms of a contract.

Control Account. A management control point at which budgets (resource plans) and actual costs are accumulated and compared to earned value for management control purposes. A control account is a natural management point for planning and control, since it represents the work assigned to one responsible organizational element on one WBS element.

Cost Estimate. A documented statement of costs estimated to be incurred to complete the project or a defined portion of a project.

Cost Performance Index (CPI). The Budgeted Cost of Work Performed (BCWP) divided by the Actual Cost of Work Performed (ACWP). See also EARNED VALUE.

Cost Variance (CV). The algebraic difference between earned value and actual cost (Cost Variance = Earned Value - Actual Cost). A positive value indicates a favorable position, and a negative value indicates an unfavorable condition. See also EARNED VALUE.

Costs to Date. Costs incurred to date, including all charges for goods and services received and other assets required, regardless of whether payment for the charges has been made. This includes all completed work and work in process chargeable to the contract. Accrued costs include invoices for: (1) completed work; (2) materials delivered to LBNL; (3) services rendered; (4) costs billed under cost reimbursement, or time and material subcontracts; and (5) progress payments to subcontractors that have been paid or approved for current payment in the ordinary course of business.

CPI. Abbreviation for Cost Performance Index.

CPM. Abbreviation for Critical Path Method.

Critical Decision (CD). A formal determination made by the DOE at a specific point in a project life cycle that allows the project to proceed. Critical Decisions occur in the course of a project. For example, prior to commencement of conceptual design (CD-1), commencement of execution (CD-3), and prior to turnover (CD-4).

Critical Decision-0 (CD-0). Approval of Mission Need.

Critical Decision-1 (CD-1). Approval of Preliminary Baseline Range.

Critical Decision-2 (CD-2). Approval of Performance Baseline.

Critical Decision-3 (CD-3). Approval for Start of Construction.

Critical Decision-4 (CD-4). Approval for Start of Operations or Project Closeout.

Critical Path. In a project network diagram, the series of logically linked activities that determine the earliest completion date for the project. The critical path may change from time to time as activities are completed ahead of or behind schedule. Although normally calculated for the entire project, the critical path can also be determined for a milestone or subproject. The

critical path is usually defined as those activities with float less than or equal to a specified value, often zero.

Critical Path Method (CPM). A network analysis technique used to predict project duration by analyzing which sequence of activities (which path) has the least amount of scheduling flexibility (the least amount of float). Early dates are calculated by means of a forward pass using a specified start date. Late dates are calculated by means of a backward pass starting from a specified completion date to result in zero total float for each activity.

Current Budget. Budget reflecting currently authorized funds.

CV. Abbreviation for Cost Variance.

Delegation. This term is used when one person gives another person authority over a given issue. In this case, authority has been "delegated" by the first person to the second person. People "delegate" authority and "assign" responsibility.

Deliverable. A report or product of one or more tasks that satisfies one or more objectives and must be delivered to satisfy contractual requirements.

Delivery Method. A term used to describe the process by which a capital improvement project proceeds from concept, through design and construction, to occupancy. Delivery methods include the following:

- Conventional (design-bid-build);
- Construction Management/General Contractor (CM/GC);
- Multiple Prime Trade;
- Design-build;
- Turnkey;
- Lease-back;
- Other (these include joint ventures, leasing, tenant improvements, and purchase of developer-owned projects).

Design Approval. The date on which sign-off on the project plan review is completed.

Design Criteria. Those technical data and other project information identified during the project initiation and definition (conceptual design, and/or preliminary design phases). They define the project scope, construction features and requirements, and design parameters; applicable design codes, standards, and regulations; applicable health, safety, fire protection, safeguards, security, energy conservation, and quality assurance requirements; and other requirements. The project design criteria are normally consolidated into a document that provides the technical base for any further design performed after the criteria are developed.

Design Development. A University of California (UC) and industry term describing a project design phase in which all design decisions need to be completed. The design professional further develops the schematic design and architectural detailing and ensures that basic technical issues are resolved and are capable of technical description. Plan arrangements, specific space accommodations, equipment and furnishings, building design, materials and colors, and complete

definitions of systems serving the project are developed. Design development activities occur during the end of the preliminary design phase and the start of final design.

Design Professional. Licensed architects, landscape architects, and engineers (civil, structural, mechanical, and electrical).

Detailed Project Program (DPP). A document required on UC projects describing a project in detail; an explanation of how and why a project is being developed that provides the designers with a facility's standard architectural and engineering criteria, and shows how the project meets the University's and facility's goals. The Detailed Project Program may be prepared by a planning department, by a design professional, or by another consultant.

Deviation. A deviation occurs when the current estimate of a performance, technical, scope, schedule, or cost parameter does not fall within the threshold values of the Performance Baseline for that parameter. It is handled as a deviation, not through the normal change control system.

Direct Costs. Any costs that can be specifically identified with a particular project or activity, including labor, materials, salaries, travel, equipment, and supplies directly benefiting the project or activity.

Directed Change. A change imposed on a project or projects that affects the project's baseline. Example of directed changes include, but are not limited to (1) changes to approved budgets or funding, and (2) changes resulting from DOE policy directives and regulatory or statutory requirements.

Disposition. A general term for those activities that follow completion of program mission, including, but not limited to, stabilization, deactivation, decontamination, decommissioning, dismantlement, and/or reuse of physical assets. Used as a general term for those project types that follow the completion of a mission.

Disposition. An action taken to remove project records from the active files.

DOE. Abbreviation for the Department of Energy.

DOE Authorization Date. The date that DOE signs a written directive allowing use of project funds or the commencement of project activities.

DOHS. Abbreviation for the California Department of Health and Safety.

DPP. Abbreviation for Detailed Project Program.

Drawings. The architectural and engineering drawings that consist of the master tracings acceptable for reproducing. The drawings provide information about various aspects of the construction of the building or facility, including architectural, ornamental, structural, mechanical, electrical, heating, ventilating, and air-conditioning details, as well as site and landscaping plans.

Duration. The number of work periods (not including holidays or other non-working periods) required to complete an activity or other project element. Usually expressed as workdays or workweeks. Sometimes incorrectly equated with elapsed time.

EAC. Abbreviation for Estimate At Completion.

Earned Value (EV). (1) A method for measuring project performance comparing the value of work performed (Budgeted Cost of Work Performed) with the value of work scheduled (Budgeted Cost of Work Scheduled) and the cost of performing the work (Actual Cost of Work Performed) for the reporting period and/or cumulative to date. See also ACTUAL COST OF WORK PERFORMED, BUDGETED COST OF WORK PERFORMED, BUDGETED COST OF WORK SCHEDULED, COST PERFORMANCE INDEX, COST VARIANCE, SCHEDULE PERFORMANCE INDEX, and SCHEDULE VARIANCE. (2) The budgeted cost of work performed for an activity or group of activities.

EIR. Abbreviation for Environmental Impact Report.

Environmental Impact Report (EIR). A facility-prepared report that documents in detail the probable environmental impact of a proposed project. The EIR process includes publication and public review of a draft report. The final EIR incorporates responses to all comments received during the review period and also proposes measures designed to mitigate significant environmental impacts and a program for monitoring mitigation measures.

Estimate At Completion (EAC). The current estimated cost for the entire scope of authorized work.

Estimate To Complete (ETC). Estimate of costs to complete all work from a point in time to the end of the project.

Estimated Cost. An anticipated cost for applied work scope.

ETC. Abbreviation for Estimate To Complete.

EV. Abbreviation for Earned Value.

Facilities. Buildings and other structures; their functional systems and equipment, including site development features such as landscaping, roads, walks, and parking areas; outside lighting and communications systems; central utility plants; utilities supply and distribution systems; and other physical plant features.

Final Design. Completion of the design effort and production of all the approved design documentation necessary to permit procurement. Includes construction, testing, checkout, and turnover to proceed. Final design occurs between Critical Decision-2 and -3. (Formerly referred to as “Title II” design.)

Fiscal Year (FY). The federal government budget period starting October 1 and ending September 30.

Fixed-Price Contract. Fixed-price contracts provide for a firm price or, under appropriate circumstances, may provide for an adjustable price for the supplies or services that are being procured. In providing for an adjustable price, the contract may fix a ceiling price, target price (including target cost), or minimum price. Unless otherwise provided in the contract, any such ceiling, target, or minimum price is subject to adjustment only if required by the operation of any contract clause that provides for equitable adjustment, escalation, or other revision of the contract price upon the occurrence of an event or a contingency. Also referred to as Firm Fixed-Price Contract.

FY. Abbreviation for Fiscal Year.

General Plant Projects (GPP). Capital infrastructure improvements at site that cost less than $5 million. Funded directly by DOE. (Planned phase-out by end of fiscal year 2009. See also IGPP.)

GPP. Abbreviation for General Plant Projects.

GSF. Abbreviation for Gross Square Feet.

In-House Construction. Delivery method that uses LBNL forces to perform craft work.

Independent Cost Estimate. A documented cost estimate that has the express purpose of serving as an analytical tool to validate, cross-check, or analyze estimates developed by proponents of a project.

Independent Cost Review (ICR). An independent cost review may be performed by an independent internal or external organization to validate the cost estimate.

Indirect Cost. A cost that is a percentage of a direct cost, such as overhead, project mobilization, or bonds.

Initial Operating Capability (IOC). The point at which a project is sufficiently complete and its performance has been demonstrated to meet the technical threshold criteria in the Performance Baseline, without reaching full, steady-state operations.

Inspection. The detailed examination of a unit, facility, or area to determine overall compliance with Contract Drawings and Specifications.

Inspector. The person assigned inspection responsibilities on a project and who will verify that work is completed in accordance with the contract drawings and specifications.

Institutional General Plant Projects (IGPP). Capital infrastructure improvements at site that cost less than $5 million. Funded through institutional burdens. (Replaces GPP.)

IGPP. Abbreviation for Institutional General Plant Projects.

Integrated Project Team (IPT). An Integrated Project Team is a cross-functional group of individuals organized for the specific purpose of delivering a project to an external or internal customer.

Integrated Safety Management (ISM). The application of the Integrated Safety Management System (ISMS) to a project or activity. The fundamental premise of ISM is that accidents are preventable through early and close attention to safety, design, and operation, and with substantial stakeholder involvement in teams that plan and execute the project, based on appropriate standards.

Integrated Safety Management System (ISMS). An overall management system designed to ensure that environmental protection, worker and public safety is appropriately addressed in the planning, design, and performance of any task.

IOC. Abbreviation for Initial Operating Capability.

IPT. Abbreviation for Integrated Project Team.

ISM. Abbreviation for Integrated Safety Management.

ISMS. Abbreviation for Integrated Safety Management System.

Job Description. A concise description of the major job duties and responsibilities of the employee for the time period of the current review. The job description is prepared by the employee's supervisor.

LBNL Design Team. In-house architects, civil/structural engineers, mechanical engineers, and electrical engineers assigned to a project team.

Level of Effort (LOE). Effort of a general or supportive nature, usually without a deliverable end product. An activity (e.g., vendor or customer liaison) that does not readily lend itself to measurement of discrete accomplishment. It is generally characterized by a uniform rate of activity over a specific period of time. Value is earned at the rate that the effort is being expended.

Lien. A forward commitment or anticipated expense not yet invoiced or paid.

Life-Cycle Costs. All costs except the cost of personnel occupying a facility, incurred from the time that a space requirement is defined until that facility passes out of LBNL hands.

Line Item Projects. Projects that are specifically reviewed and approved by Congress with a total estimated cost of greater than $5 million.

LOE. Abbreviation for Level of Effort.

Long-Lead Procurement. Equipment or material that must be procured well in advance of the need for the materials, because of long delivery times.

Maintenance Index Indicator. A measure of how much money LBNL is spending on maintenance.

Major System. A project with a Total Project Cost of greater than or equal to $750 million, or designated by the DOE Deputy Secretary.

Management. Organizing and controlling a group to achieve a product.

Management Reserve. An amount of the total allocated budget withheld for management control purposes by LBNL. Management Reserve is not part of the Performance Measurement Baseline.

Master Schedule. A summary-level schedule that identifies the major activities and key milestones. See also MILESTONE SCHEDULE.

MII. Abbreviation for Maintenance Index Indicator.

Milestone. A schedule event marking the due date for accomplishment of a specified effort (work scope) or objective. A milestone may mark the start, an interim step, or the end of one or more activities.

Milestone Schedule. A summary-level schedule that identifies the major milestones. See also MASTER SCHEDULE.

Mission Need. A performance gap between current performance and required. Statements of Mission Need are prepared and submitted to DOE in order to obtain Critical Decision-0.

Monte Carlo Analysis. The Monte Carlo method provides approximate solutions to a variety of mathematical problems by performing statistical sampling experiments on a computer. The method applies to problems with no probabilistic content as well as to those with inherent probabilistic structure. The Monte Carlo method is used in risk analysis and other areas requiring quantification.

NEPA. Abbreviation for the National Environmental Policy Act.

Network Schedule. A schedule format in which the activities and milestones are represented, along with the interdependencies between activities. It expresses the logic (how the program will be accomplished) and the timeframes (when). Network schedules are the basis for critical path analysis, a method for identification and assessment of schedule priorities and impacts.

NOC. Abbreviation for Notice of Completion.

Non-Major System. Any project with a Total Project Cost of less than $750 million.

Notice of Completion (NOC). Document filed with the county by Procurement stating that a subcontractor's work on a project is finished.

Notice to Proceed (NTP). The agreed-upon date between the LBNL and the subcontractor for starting construction.

NSF. Abbreviation for Net Square Feet.

NTP. Abbreviation for Notice to Proceed.

OBS. Abbreviation for Organizational Breakdown Structure.

OPC. Abbreviation for Other Project Costs.

Organizational Breakdown Structure (OBS). A depiction of the project organization arranged to indicate the line-reporting relationships within the project context.

Original Budget. The budget established when funds are initially authorized.

Other Project Costs (OPC). Costs, not included in the Total Estimated Cost of the project, for engineering, design, development, start-up, and operations, that are essential for project execution and are operating expense funds. Other project costs are included in the Total Project Cost.

PDS. Abbreviation for Project Data Sheet.

PED. Abbreviation for Project Engineering and Design.

PEP. Abbreviation for Project Execution Plan.

Performance Baseline. The collected key performance, scope, cost, and schedule parameters, which are defined for all projects. The Performance Baseline defines the threshold and boundary conditions for a project. Also referred to as Performance Measurement Baseline (PMB).

Performance Measurement Baseline (PMB). See Performance Baseline.

PID. Abbreviation for Project Identification Number.

Planned Value (PV). The sum of the budgets for all work (work packages, planning packages, etc.) scheduled to be accomplished (including in-process work packages), plus the amount of level of effort and apportioned effort scheduled to be accomplished within a given time period. Also called the Performance Measurement Baseline.

Planning Package. A logical aggregate of work, usually future efforts that can be identified and budgeted, that is not yet planned in detail at the work package or task level.

PMB. Abbreviation for Performance Measurement Baseline.

PPG. Abbreviation for Project Planning Guide.

Preliminary Design. Project phase that initiates the process of converting concepts into a design appropriate for procurement or construction. Results include a more refined definition of the project requirements, cost estimates, performance schedules, method of project performance, safety environmental impact analysis, preliminary drawings, and outline specifications. Formerly referred to as "Title I" design.

Program. An organized set of activities directed toward a common purpose or goal undertaken or proposed in support of an assigned mission area.

Program Office. The DOE Headquarters organizational element responsible for managing a program.

Programming. The process for defining project needs. Programming includes cataloging the spaces and equipment needed, defining functional relationships, and identifying building systems requirements.

Project. A unique major effort within a program that has firmly scheduled beginning, intermediate, and ending date milestones; prescribed performance requirements, prescribed costs; and close management, planning, and control.

Project Administrator. A person responsible for providing administrative support to a project manager.

Project Data Sheet (PDS). A generic term defining the document that contains summary project data and the justification required to include the entire project effort as a part of the Capital Projects budget. PDSs are submitted to request Project Engineering and Design (PED) funds, and construction funds. Specific instructions on the format and content of Project Data Sheets are contained in the annual budget call, and DOE Order 5100.3, Field Budget Process.

Project Director. A person who has accepted responsibility for achieving the objectives of a project.

Project Engineering and Design (PED). Design funds established for use on preliminary design activities.

Project Execution Plan (PEP). The plan for the execution of the project, which establishes roles and responsibilities and defines how the project will be executed. Every project implementing Earned Value Management will have a unique Project Execution Plan.

Project Identification Number (PID). A unique number assigned in the Financial Management System to a Work Breakdown Structure element for the purpose of tracking costs.

Project Initiator. A person who has the authority to start action on a project. A project initiator is fully responsible for meeting the objectives set for the project s/he has initiated.

Project Manager. A person assigned responsibility by the project initiator to achieve the project objectives.

Project Planning Guide (PPG). A narrative and statistical University of California document that systematically justifies and describes a proposed capital improvement project. The Project Planning Guide establishes the scope and purpose of the project in relation to the facility's academic plan.

Project Problem. Task variances may or may not have an adverse impact on the objectives set for a project. A one-month slippage on a current task that has six months of slack will probably not have an adverse impact on the project completion date. However, if a task variance or a set of task variances will have an adverse impact on the objectives set for a project, the project manager has a project problem.

Project Program. A document setting forth project requirements, constraints, and design objectives, including space requirements and relationships, needed flexibility and expandability, special equipment and systems, and site requirements.

Project Records. Documents generated during a project, including communications, contracts, construction documents, calculations, and design review and approval documents.

Project Sponsor. If a project initiator assigns responsibility for a project to a second person (through either authority or persuasion), and that person reassigns the project to a third person, the second person is a project sponsor. A project sponsor is fully responsible for meeting the objectives set for the project for which he has accepted responsibility.

Project Team. A group of persons working to achieve the end result of the project. The Project Team normally includes the following project participants:

- The Project Manager.
- The Task Managers.
- The functional supervisors and all workers who are directly responsible for accomplishing task work. These people normally receive task assignments from the Project Manager and Task Managers.
- Subcontractor Project Managers.
- The project user and representatives of other designated interests (e.g., safety, health, environmental, security, legal considerations, etc.).

Project User. A person who will actually use the end results or products of a project. A Project Manager must satisfy the project user in order to meet the scope objective of his project. Project

users are normally authorized to accept the results or products of a project, or to reject the results or products of a project if they do not meet the user's requirements. In some cases, someone else may be authorized to override the user's decision regarding the acceptance or rejection of the project results or products.

PV. Abbreviation for Planned Value.

Quality Assurance. All of the planned and systematic actions necessary to provide adequate confidence that a facility, structure, system, or component will perform satisfactorily in service.

RAM. Abbreviation for Responsibility Assignment Matrix.

Real Property. Land and/or improvements including interests therein, except public domain land.

Record Documents. Copies of the drawings, specifications, and all other contract documents that reflect the changes that have occurred since these documents were issued to bidders.

Remaining Duration. The time needed to complete an activity.

Resource Leveling. Any form of network analysis in which scheduling decisions (start and finish dates) are driven by resource management concerns (e.g., limited resource availability or difficult-to-manage changes in resource levels).

Responsibility. A special agreement between two people for the purpose of achieving a desired result.

Responsibility Assignment Matrix (RAM). A structure that relates the project organization structure to the Work Breakdown Structure to help ensure that each element of the project's scope of work is assigned to a responsible individual.

Risk. A measure of the potential inability to achieve overall project objectives within defined cost, schedule, and technical constraints. It has two components, (1) the probability/likelihood of failing to achieve a particular outcome, and (2) the consequences/impacts of failing to achieve that outcome.

Risk Management. The act or practice of controlling risk. An organized process that reduces risk, prevents a risk from happening, or mitigates the impact if it does occur.

Schedule. A plan that defines when specified work is to be done to accomplish project objectives on time.

Schedule Control. Controlling changes to the project schedule and preparing workaround plans to mitigate the impact of adverse results/delays by others.

Schedule Performance Index (SPI). The Budgeted Cost of Work Performed divided by the Budgeted Cost of Work Scheduled. See also EARNED VALUE.

Schedule Variance (SV). A metric for the schedule performance on a program. It is the algebraic difference between earned value and the budget (Schedule Variance = Earned Value - Budget). A positive value is a favorable condition, while a negative value is favorable. The SV is calculated in dollars or work units and is intended to complement network analysis, not supersede or replace it. See also EARNED VALUE.

Schematic Design. A University of California and industry term describing the first phase of a project's design process; preparation, by the design professional, of drawings and other documents illustrating the scale and relationship of project components. Schematic design activities occur during the Preliminary Design phase.

Scope of Work (SOW). The document that defines the work scope requirements for the project. It is a basic element of control used in the processes of work assignment (scope) and establishment of project schedules and budgets.

Shall. Denotes a requirement.

Should. Denotes a recommendation.

SOW. Abbreviation for Scope of Work.

Specifications. Detailed requirements for the project that identify materials and workmanship requirements, and explain the materials and equipment items depicted on the drawings.

SPI. Abbreviation for Schedule Performance Index.

Substantial Completion. That stage in the progress of the work when the University's representative determines that the work is complete and in accordance with the contract documents, except for completion of minor items that do not prevent the University from occupying and fully utilizing the work for its intended purpose.

SV. Abbreviation for Schedule Variance.

System. A collection of interdependent equipment and procedures assembled and integrated to perform a well-defined purpose. An assembly of procedures, processes, methods, routines, or techniques united by some form of regulated interaction to form an organized whole.

Task Manager. When a Project Manager breaks a project down into a set of tasks and assigns responsibility for accomplishing a task to a second person, the second person is a Task Manager. A Task Manager is fully responsible for meeting the objectives set for the task for which s/he has accepted responsibility.

Task Variance. If at any time the Task Manager concludes (1) that s/he cannot produce a product that will satisfy the task user (scope), or (2) that s/he cannot complete the task by the agreed-to date (schedule), or (3) that s/he cannot complete the task within the agreed-to cost target (budget), the Task Manager has a "task variance."

TEC. Abbreviation for Total Estimated Cost.

Title I. See Preliminary Design.

Title II. See Final Design.

Title III. See Construction.

Total Estimated Cost (TEC). The Total Estimated Cost of a project is the specific cost of the project. It includes the cost of land and land rights; engineering, design, and inspection costs; direct and indirect construction costs; and the cost of initial equipment necessary to place the plant or installation in operation.

Total Project Cost (TPC). The Total Project Cost consists of all the costs included in the Total Estimated Cost of a construction project plus the preconstruction costs, such as conceptual design and research and development, as well as the costs associated with the preoperational phase, such as training and startup costs.

TPC. Abbreviation for Total Project Cost.

Undistributed Budget. Budget associated with specific work scope or contract changes that have not been assigned to a control account or summary-level planning package.

User. The entity that will ultimately operate or otherwise use the system being developed.

Validation. The process of evaluating project planning, development, baselines, and proposed funding prior to inclusion of new project or system acquisition in the DOE budget.

Value Management (VM). Value management is organized effort directed at analyzing the functions of systems, equipment, facilities, services, and supplies for the purpose of achieving the essential functions at the lowest life-cycle cost consistent with required performance, quality, reliability, and safety.

Variance. A deviation between planned and actual.

VM. Abbreviation for Value Management.

WBS. Abbreviation for Work Breakdown Structure.

Work Breakdown Structure (WBS). A product-oriented grouping of project elements that organizes and defines the total scope of the project. The Work Breakdown Structure is a multi-level framework that organizes and graphically displays elements representing work to be accomplished in logical relationships. Each descending level represents an increasingly detailed definition of a project component. Project components may be products or services. It is the structure and code that integrates and relates all project work (technical, schedule, and cost) and is used throughout the life cycle of a project to identify and track specific work scopes.

Work Breakdown Structure Dictionary. A listing of Work Breakdown Structure elements with a short description of the work scope content in each element.

Work Package. A task or set of tasks performed within a control account.

Workaround. A response to a specific negative schedule event. Distinguished from a contingency plan in that a workaround is not planned in advance of the occurrence of the risk event.