LLEINST 7700L
1 November 2024

LLE

PROJECT MANAGEMENT PROCESS

MANUAL

LLE INSTRUCTION 7700L

SUBJECT: LLE Project Management Process Manual

1. **Purpose:** To promulgate Revision L for the LLE Project Management Process Manual.

2. **Promulgation:** Revision L to the LLE Project Management Process Manual is hereby promulgated.

3. Approval:

Christopher Deeney
Director, Laboratory for Laser Energetics

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Part I: Introduction to the Project Management Process

1. Purpose

This procedure documents the process and requirements for the implementation of projects within the Laboratory for Laser Energetics (LLE). The intent of this procedure is to ensure safe, on-time project implementations that meet budget, technical goals, and reliability targets.

2. Scope

This process applies to all approved equipment or system projects conducted at LLE, including all spaces that encompass the Omega Laser Facility, MTW Laser Facility, and all research/side laboratories and projects proposed by outside organizations. All LLE 7700 projects will be tailored appropriately based on work content. Other non-project work is managed through Engineering Service Requests. In cases where there is a lack of clarity, the determination of whether an effort rises to the level of a project shall be made by the Engineering Division Director and the accountable Division Director.

3. Safety

Personnel and equipment safety is of paramount importance at LLE. All projects must comply with the LLE Safety Standards (found in LLE Safety Zone website). The Safety Risk Assessment (SRA) is actively maintained by the project manager and the safety officers throughout the project life cycle. The SRA is reviewed at each project review and tracks mitigation plans and documents sign off of inspections prior to installation and operations release.

* *Student advisors are responsible for ensuring that students comply with all requirements of this procedure when working on projects. If the student advisor is not an LLE employee, the LLE group leader most closely connected with the student's work shall share this responsibility.*

4. Key Project Stakeholders

Key project stakeholders are responsible for supporting the project management process per the 7700 procedure and for performing the functions stated below. Detailed roles and responsibilities are identified in the project plan and explained in the training materials. The CAIRO (consulted, accountable, informed, responsible, and omitted) resource management method is used for further task responsibility clarification.

Division Director (DD): Authorizes the initial Project Budget and Resources Request (PBRR) submission; and reviews, approves, and prioritizes proposed projects and funding, as appropriate and consistent with LLE's established mission, objectives, and goals.

Project Portfolio Manager (PPM): Administers project management process; tracks project management metrics; works with the Administrative Support Team (AST) on project budget funding releases and forecasting; resolves bottlenecks and conflicting priorities; and trains project management teams.

Principal Investigator (PI)/ Customer/End User: Initiates the PBRR; provides top-level project requirements; provides scientific/technical expertise to project team and attends the Working Group Meeting (WGM) when possible; and provides feedback after handoff.

Group Leader (GL): Provides feedback for scoping review; schedules resources to appropriately support project timeline; assigns qualified group members, as needed, to serve as project team members; and provides technical support to the Project Manager (PM), PI, Instrument Specialist (IS), and project teams.

Project Manager (PM): Leads Project Team Members via ongoing WGMs; and establishes and maintains the project schedule, budget, scope, and risks to ensure the quality of project reviews, successful project implementation, and timely closure of assigned projects. A PM is assigned to approved projects prior to the Scoping Review by an appropriate GL.

Project Team Member(s) (PTM): Part of the project team and includes members from all disciplines required to achieve the goals and objectives of the project, e.g., Engineering, Operations, Experimental, Safety, Facilities, etc., and is assigned to the project team prior to Project Kickoff by the appropriate GL.

Chief Safety Officer (CSO) and Safety Officer(s) (SO): Ensure all projects comply to all LLE safety requirements. The CSO and functionally focused SO's are engaged upfront at Project Kickoff and serve as PTM, as required, throughout project life cycle; provide input on the SRA and the adequacy of mitigation efforts; conduct safety inspections of equipment and sign off on the SRA at appropriate phases of the project installation and operations release; and participate in project reviews, as required.

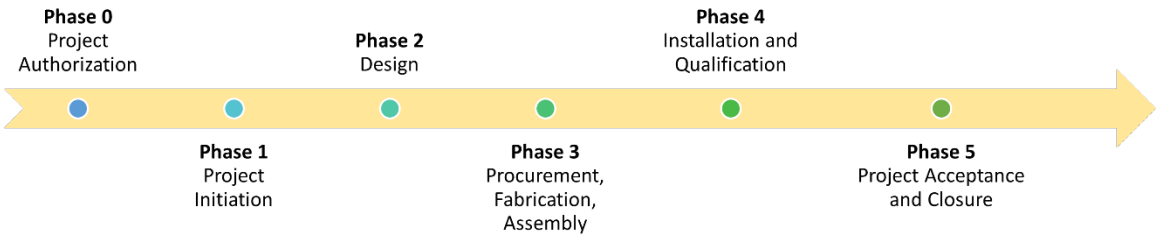
Administrative Support Team (AST): Activates the project account for purchases after authorization from the PPM; works with the PPM on project asset strategy, budget funding releases, and forecasting; and assigns property tags at the completion of projects, as required.

Instrument Specialist (IS): Develops, releases, and maintains equipment calibration, installation, alignment, maintenance plans/procedures, and spare parts/consumables; develops and publishes appropriate fit and function, installation, and qualification plans; supervises qualification activities; and participates in training Operations personnel on the installation, setup, and operation of equipment within the Omega Facility.

Instrument Technician (IT): Trained by the IS to perform a specialized work (for example, alignment, maintenance) on a system that is outside of standard operations, but still documented in the operating procedure or another formal reference document (e.g., Work Authorization Procedure (WAP), Maintenance procedure).

Subject Matter Expert (SME): Consults PTMs and attends peer reviews as needed to provide knowledge, expertise, and experience to the team on subject matter and systems.

Part II: Project Management Process



1. Project Management Process Overview

The project process is broken down into six distinct sequential work elements:

Phase 0 Project Authorization: Pre-Work

Phase 1 Project Initiation: Kickoff, Requirements

Phase 2 Design: Concept, Preliminary, Final Design Activity

Phase 3 Procurement, Fabrication, and Assembly

Phase 4 Installation and Qualification

Phase 5 Project Acceptance and Closure

- Each phase has key tasks and milestone dates that are tracked and updated by the PM. This establishes the project plan and can be found in the Project Workbook. These milestone dates drive the timing and priorities for LLE's resources.
- Project plans are dependent upon the work scope and can be tailored according to the complexity and resource demand of a project. A generic project plan template is provided in the Project Workbook as an initial starting point. Project tailoring guidelines are addressed in Training Module M-PM-M-008.

2. Project Process Phase Details and Reviews

Phase 0: Project Authorization

Objective: Documents project scope, resource level of effort, and project authorization.

Phase	WBS	Task	Resp
Phase 0: Project Authorization	n/a	**Approve PBRR Submission with PI/GL**	DD
		Submit PBRR	PI/GL
		Perform Initial PBRR Review at DDPR	PPM
		Perform Project Scoping Review and Financial Breakdown	PPM
		Perform Project Authorization Review at DDPR	PPM

Key Task Notes

Perform Departmental Review: All LLE projects requiring engineering resources and administrative controls will be initiated by submitting a PBRR. The PBRR must be approved by the appropriate DD prior to submission.

Project Budget and Resource Request: The PBRR is submitted by the PI or GL via MS Forms and can be viewed in the PBRR Submission Log SharePoint site.

Initial PBRR Review: New projects are introduced, reviewed, and filtered to determine whether the project will proceed to scoping review.

Scoping Review: The PPM schedules an upfront review with involvement from all affected groups to obtain accurate details on scope, resource level of effort, and financial estimates. The Scoping Review occurs periodically throughout the year as new PBRRs are submitted.

Project Authorization Review: After the Scoping Review, project spending and resource demand schedules are compiled by the PPM. Data are reviewed by DDs, and project authorization and priorities are established at the monthly Division Directors' Priorities Review (DDPR).

Project Authorization: Approved projects must follow this procedure. The PPM will open the projects and establish Task IDs. An updated listing of approved projects, Task IDs, and their priority shall be maintained by the PPM and posted on the Project Management Tracking System. Project status and priorities are reviewed monthly at the DDPR, as needed, due to scope changes or additional funding requests.

Other Projects: If other projects (such as External User, Externally Developed Diagnostics, Grants, Joint Ventures, or LLE Designs/Fabricated Equipment supplied for external use) require LLE resources beyond the associated division's level of effort, a PBRR must be submitted by the appropriate LLE PI or IS. The project will then proceed through the Phase 0: Project Authorization process. If a project is authorized, a PM will be assigned and the project will follow this procedure, as any internal approved project.

* *To ensure resource availability, the PI/IS must obtain DDPR authorization for a project prior to any grant applications, joint-venture agreements, external contracts, or shot time commitments.*
* *Unmodified external diagnostics that remain in the custody of the LLE facility after use do not require new projects or recertification prior to each new use. External-user diagnostics that leave the LLE facility must be recertified upon their return prior to use at LLE. Details of recertification can be located at Part II: LLE 7700 Project Management Process: Diagnostic Recertification.*

Phase 1: Project Initiation

Objective: Assemble the Project Team and develop project requirements.

Phase	WBS	Task	Resp
Phase 1: Project Initiation	**1.1.1**	**Perform Project Kickoff and Site Tour**	PM
	1.1.2	Compile Requirements Document	PM/PI
	1.1.3	**Perform Requirements Peer Review**	PM
	1.1.4	Put Requirements Document Under Change Control	PM

Key Task Notes:

Kickoff: After a project team has been assembled, the PM will hold a project kickoff meeting. The Kickoff Meeting agenda and checklist are located in the Project Workbook. All PTMs from all affected functions must be included. WGM time, cadence, and location must be established. PBRR, Project Goals and Motivation, Initial Project Plan tasks, CAIRO responsibilities, and timing are reviewed and agreed upon with PTMs. A site tour should be performed for team members to view the location of the project and confirm any assumptions.

Requirements Document: A requirements document must be compiled with the cross-functional PTMs to ensure all requirements have been considered and documented from all external and internal customers. A generic requirements template is provided in the Project Workbook.

Requirements Peer Review: Once the requirements document has been compiled, a peer review should be performed with a larger encompassing team, including GLs, SMEs, and DDs as appropriate. The intent of the requirements peer review is to gather any historical perspective and lessons-learned experience, clarify project deliverables, and ensure agreement prior to design activity. After the peer review, requirements documents shall be placed under change control and updated throughout project life cycle as needed.

Phase 2: Design

Objective: Produce final design documents that meet project requirements and allow the project to move forward to procurement.

The Design Phase typically has three distinct work elements: Concept Development and Design, Preliminary Design, and Final Design. These work elements each have a project review: CDR, PDR, and FDR, respectively. Each Project Review Checklist can be found in the Project Workbook. A Project Status Review (PSR) may be conducted at any point to provide updates on the project.

The Design Phase may include Mechanical, Electrical, IT, OMAN, Target Fab, Optical, and Operations design elements. It is important to include all of the affected functions up front in the Design Phase to ensure project quality depending upon the project work scope.

Development testing is an important part of the design process and may be conducted at any point between the requirements review and the Final Design Review. Testing is typically done on a component, subsystem, or subprocess being considered for use in the final system and may be performed in side labs or in the larger facilities. Development testing may require a WAP if any of the following conditions are met:

- The test has identified safety risks (regardless of the location at LLE).
- The test occurs in the larger facilities.
- The test is higher risk (e.g., performed in a facility vacuum space, requires rigging of equipment, requires connection to a facility network, etc.). This scenario requires a review in a WGM with relevant stakeholders.

Phase 2.1: Concept Development and Design

Objective: Brainstorm, evaluate, and optimize a concept that will satisfy the project objectives and requirements compiled in Phase 1. Initiate risk assessments [Project Risk Summary (PRS), Failure Modes and Effects Analysis (FMEA), and SRA].

Phase	WBS	Task	Resp
Phase 2.1: Concept Development and Design	2.1.1	Perform Brainstorming/Concept Generation	PM/PTM
	2.1.2	Perform Concept Analysis and Evaluation	PM/PTM
	2.1.3	Initiate Technical Discussion with Potential Suppliers	PM
	2.1.4	Perform Concept Selection	PM/PTM
	2.1.5	**Perform CDR**	PM

Key Task Notes:

Concept Generation: Concept generation is a creative, iterative brainstorming activity, using input from all cross-functional team members to compile various options/concepts that should meet the project requirements.

Concept Analysis and Evaluation: Quantifiable criteria should be used to rank potential concepts' abilities to meet the project requirements including performance, safety, timing, and cost. High-level development testing, layouts, and engineering analysis may be pursued to obtain data for accurate evaluation.

Concept Selection: The Project Team is to select a Design Concept using the Analysis and Evaluation results; the concept should include a preliminary Concept of Operations. A Concept of Operations contains the significant details and logistics regarding the assembly, initial installation, operational changeovers, and personnel usage for the project equipment/system.

CDR: The CDR seeks approval to move forward with the team's proposed concept and to release funds for long lead-time items (over 16 weeks). The meeting agenda and checklist are available in the Project Workbook. A brief review of the Concept Selection process and justification for the proposed concept should be included. Detailed drawings are not required at this stage. After the CDR, funds may be authorized to procure low-risk, long lead-time items to maintain the project schedule, or to provide "seed" capital for an R&D project. Supplier discussions should begin before the CDR to obtain credible cost estimates and timing. Approval is documented in the CDR meeting minutes.

Phase 2.2: Preliminary Design

Objective: Produce initial detailed drawings/designs for selected concept.

Depending upon the size and scope of the project, a PDR may not be required. This determination is typically made at the initial scoping review and re-evaluated at the conclusion of the CDR.

Phase	WBS	Task	Resp
Phase 2.2: Preliminary Design	2.2.1	Procure Long Lead-Time Items	PM/PTM
	2.2.2	Detail Initial Concept Design/Drawings	ENG
	2.2.3	Perform Initial Design Analysis and FMEA	PM/PTM
	2.2.4	**Perform PDR**	PM

Key Task Notes:

Preliminary Design: Detail designs, update risk analysis, update budget projection, perform development testing, and analysis/evaluations on the selected concept.

PDR: The PDR seeks approval to proceed with the team's proposed preliminary design and communicates any newly identified project risks or roadblocks. The meeting agenda and checklist are available in the Project Workbook, and approval is documented in the PDR meeting minutes.

Phase 2.3: Final Design

Objective: Finalize detailed designs.

Phase	WBS	Task	Resp
Phase 2.3: Final Design	2.3.1	Perform Drawing Review with Potential Suppliers	ENG
	2.3.2	Finalize Design Analysis and Update FMEA	PM/PTM
	2.3.3	Finalize BOM and Drawing Package	ENG
	2.3.4	Perform Final Design Peer Review (SME Review)	PM
	2.3.5	**Perform FDR**	PM
	2.3.6	Release Final Drawing Package and Requirements Document	PM/ENG

Key Task Notes:

Final Design: Update risk assessments (PRS, FMEA, SRA), complete development testing and engineering analysis. Finalize design verification and engineering inspection plans.

Final Design Peer Review: A Final Design Peer Review must be performed prior to FDR with cross-functional SMEs and GLs as appropriate. This applies to any ME, ECE, IT, OMAN, Optical, Operations, and Target Fab designs that are impacted.

FDR: The FDR seeks approval to proceed with the procurement, fabrication, and assembly of the final design, while escalating any newly identified risks or roadblocks. The meeting agenda and checklist are available in the Project Workbook, and approval is documented in the FDR meeting minutes.

* *Detailed drawings and design specifications that are generally required for a project are identified in the Document Library in the Project Workbook. These drawings and specifications must be released as a controlled document before any procurement activity can occur.*
* *After conclusion of the Design Phase, PSRs can still be requested or scheduled as needed to close any remaining open issues.*

Phase 3: Procurement, Fabrication, Assembly

Objective: Procure, fabricate, and off-line assemble the final design.

Design verification is an important part of this phase and may be conducted at any point between receipt of components and the Installation Readiness Review (IRR). Design verification is typically done on a subassembly or assembly of the final design without impacting any facilities outside the project. Verification may be performed in a side lab or an assembly lab. Design verification is intended to confirm that the engineering design requirements are met. This may include leak checking subassemblies, confirming motor travel and actuations, and the like. If potential safety concerns may occur during the verification process, a WGM with stakeholders and safety team members is required.

Phase	WBS	Task	Resp
Phase 3: Procurement, Fabrication, Assembly	3.1.1	Release Remaining Funds	PPM
	3.1.2	Select Suppliers	ENG/PURCH
	3.1.3	Order Materials/Off-The-Shelf Components (COTS)	ENG
	3.1.4	Fabricate Components	ENG
	3.1.5	Monitor Procurement Status	PM
	3.2.1	Receive Components/Quality Inspection	ENG
	3.3.1	Assemble Components	ENG
	3.3.2	Compile Operations Documents Drafts	IS/XOPS
	3.3.3	Perform Engineering Inspection/Design Verification/Safety Check	ENG/PM/IS/SO
	3.4.1	**Perform IRR**	**PM**

Key Task Notes:

Release Funds: After FDR approval, the PPM will release remaining project funds.

Component Procurement and Fabrication: The team should proceed with procurement and fabrication once the controlled design documents are released in Teamcenter. The engineer and PM shall actively collaborate with Purchasing and monitor procurement progress. Any discrepancies in the plan or components must be evaluated for risk and addressed by the PM and engineer. Fabrication and assembly shall only continue once the discrepancy is resolved and properly documented.

Assembly: Off-line assembly activities are to be performed by qualified personnel only, using released assembly drawings from Teamcenter. Qualified personnel are defined as those individuals assigned by the GL with the appropriate safety and functional training required to complete the required assembly.

Engineering Inspection/Design Verification/Safety Check: After off-line assembly is complete, an Engineering Inspection shall be conducted. This includes verifying critical design aspects and functionality to the fullest extent possible. Details of the Engineering Inspection are found in *Part III: Project Management Process Logistics and Execution: Other Reviews*. A successful SRA pre-operational check must also be performed on-site with the CSO and other affected SOs prior to the IRR. Any concerns/issues must be documented by the PM and added to the action item list found in the Project Workbook.

IRR: Seeks approval to install final design at designated site (operations floor or side lab). It ensures that all safety and operational scheduling issues are resolved before installation. It also communicates and escalates any newly found project risks or roadblocks. The meeting agenda/checklist is located in the Project Workbook. Approval is documented in IRR meeting minutes.

Phase 4: Installation/Qualification

Objective: Verify that the project meets its specified performance, operational, and safety requirements prior to hand off for routine operational use. This phase may include installation, qualification, equipment validation, and personnel training. Initial Operations Documents and equipment qualification plan are to be written in this phase and released prior to Initial Qualification Review (IQR).

Qualification of the final design is an important part of this phase and may be conducted after the IQR. Qualification is typically done on the top-level assembly of the final design and may be performed on the facility or in the project's final location, whichever is applicable. Qualification is intended to confirm that principal science requirements are met and to allow for a period of initial uses with the new equipment to identify any changes or updates that may be needed before the equipment is completely handed off to the operator and facility.

Phase	WBS	Task	Resp
Phase 4: Installation and Qualification	4.1.1	Install Permanent Design in Facility	ENG
	4.2.1	Release Initial Operations Documents	ENG/XOPS/EXP
	4.3.1	**Perform IQR**	PM
	4.4.1	Perform Initial Shot Day Uses with Expert Resources	ENG/XOPS/EXP
	4.4.2	Improve and Revise Operations Documents	ENG/XOPS/EXP
	4.5.1	Perform and Document Training	ENG/XOPS/EXP

Key Task Notes:

IQR: After design installation, qualification thorough use of the equipment is required prior to formal hand off to Operations. Permission to run the qualification activity is obtained through an IQR. The IQR checklist can be found in the Project Workbook. Upon successful completion of the IQR, first uses will be authorized and conducted by the IS and design team resources through deliberate operations during the Initial Qualification Period (IQP). The IQP is restricted in duration by one of the following criteria, whichever occurs first: (1) the equipment is used during six distinct weeks or (2) the equipment has undergone qualification for a maximum duration of six months from first use.

The purpose of the IQP is to bring the system to the appropriate level of maturity and train the operators to use the system safely and successfully, with minimal IS involvement required. Each use during the IQP requires an identified IS/IT leading the operation of the system. All projects to which this applies e.g., new diagnostic systems in the Omega Facility, must have IQR approval at least two weeks prior to the first validation shot day use. Changes to the hardware and operating procedure are expected during the IQP. These changes shall be communicated through a WAP, which must include a copy of or reference to the latest draft of the operating procedure. If the changes are deemed to be significant by the Operations or Engineering Division Director, there shall be a new IQR to review the changes.

Initial Shot Day Uses: Qualification and operational optimization is performed during the designated qualification period. After qualification has been performed, operations documents and training instructions are updated and released for Operations acceptance.

Intent of the IQP: *The level of maturity of a system at the time of the IQR shall meet or exceed the level of maturity required for Operational Readiness Review (ORR) in previous revisions of INST 7700.* Historically many projects have achieved closure and hardware was released to operations prior to its initial use. This created challenges securing resources for remediation of issues identified during early operations as well as operators being trained to procedures that had not been well vetted by the SMEs through use and experience. The IQP allows project teams and ISs to deliver more-mature, better-documented systems to operations through a collaborative engagement with feedback during the IQP. At the conclusion of the IQP, the Operations Acceptance Review (OAR) serves as a gate review to document the IQP was completed successfully.

Phase 5: Acceptance and Closure

Objective: Confirm project hand off to Operations. Close project.

Phase	WBS	Task	Resp
Phase 5: Project Acceptance and Closure	**5.1.1**	**Perform OAR and Hand Off to Operations**	PM
	5.2.1	Close Project Account	PPM
	5.3.1	Close Project in PM Tracking System (WebEQC)	PPM

Key Task Notes:

OAR: Once the operations documentation is updated and training completed, an OAR can be performed. The financial, functional, and operational performance of the project must be reviewed against the original requirements and objectives. Any lessons learned during Phase 4 must be presented. The OAR seeks approval to transfer and hand off the project design and equipment to operations for permanent use. It ensures no identified safety or operations issues remain prior to final hand off to Operations. The meeting agenda and checklist are located in the Project Workbook. Approval is documented in OAR meeting minutes.

Key items needed for OAR:

- All design work [ex., Design Change Orders (DCOs)] must be completed and released.
- All component/equipment/system fabrication, assembly, and inspection action items must be completed.
- All system integration, implementation, safety, and operational concerns must be resolved.
- The Document Library must contain the critical Teamcenter numbers, and all applicable documentation must be released.
- All additional working files must be archived in the Project Files folder.
- Final equipment/system must be tagged per LLE INST 8520 Property Management as applicable.

An electronic Operations Acceptance Review (eOAR) is the preferred option, and should be used instead of an in-person OAR for projects where there is general agreement from the PPM and appropriate Division Directors that the IQP has been completed successfully. If there are open questions regarding the readiness for OAR, an in-person OAR shall be presented to allow discussion and a determination of the path forward to be made by the appropriate DDs. The PM must distribute presentation materials to all approvers and stakeholders, and document all approvals in meeting minutes. The PM must release the minutes, presentation materials, Project Workbook, and written email approvals in Teamcenter.

3. Diagnostic Recertification

Diagnostic Recertification must be performed when external diagnostics leave the LLE and return for use. The recertification process will include the following reviews and inspections determined by the Diagnostic Development and Integration (DDI) Group Leader in coordination with the Laser Facility Director and Safety:

- Prior to the "two-week PI brief," and preferably at the time of the Experimental Proposal Submission to the Facility Advisory and Scheduling Committee, the external PI must disclose all changes, modifications, and upgrades to the diagnostic hardware, software, and concept of operations since the last fielding at LLE. If the impact of the disclosed changes cannot be addressed in time, the diagnostic will not be able to be fielded so communication as soon as the changes are known is advised. If undisclosed changes are discovered at or after the two-week PI brief, the diagnostic is unlikely to be fielded.
- A physical inspection of the external diagnostic must be performed by the LLE IS (if one exists) or DDI Group Leader for changes since the last use at LLE. The latest approved operating procedure should be referenced during the inspection. In the event there are unanticipated discrepancies found, the inspector shall notify the respective Omega Facility Manager and discuss the path forward.
- Whenever pressure vessels have been removed from LLE, an LLE safety inspection of the external diagnostic by the CSO, SOs, and/or designee must be conducted.
- A review of the Shot Request Form and auditor, and mechanical and beam interference checks shall be performed.

The DDI Group Leader will summarize the findings from the recertification process in an entry on the Diagnostic Status Page before restoring the diagnostic to available status. If any unresolved concerns arise during the inspections, the diagnostic will not be permitted for use. In rare cases where significant modifications have been made without approval, the diagnostic equipment shall be disqualified and will require a new project for requalification, e.g., increasing the external envelope on a ten-inch manipulator-deployed diagnostic.

Part III: Project Management Process Logistics and Execution

1. Tool Overview

Project Management Tracking System (WebEQC)

The LLE WebEQC is a tracking system for all past and present LLE projects. It contains the project status, key milestones, PTMs, project document library, and other significant project-related information. The database may be accessed via the link in the *7700 Appendix* in the Table of Contents. WebEQC Navigation is addressed in Training Module M-PM-M-007.

It is the PM's responsibility to keep this database up to date. The PM is responsible for completing the project database and having it verified by the PPM before the project is closed.

Project Workbook: Trackers, Review Checklists, and Risk Assessments

The Project Workbook is a Microsoft Excel file that contains worksheets with all the project checklists, trackers, and risk assessments needed for a project. The template is housed in Teamcenter M-PM-M-002.

This workbook is a tool for the PM and Project Team to use to ensure items are not forgotten or considered too late in the project to take appropriate, effective action. The workbook should be used as a living document that is reviewed and updated at the WGM. Checklist items designated as "not applicable" (n/a) require a justification for this determination in the comment fields and approval at the project reviews.

The workbook is maintained by the PM and stored in their Project Files folder. It should be actively updated at the WGM throughout the project's life cycle. Worksheets can be easily copied into a Microsoft PowerPoint file for the project review presentations.

Project Workbook content is shown below. Instructions and guidelines are addressed in Training Module M-PM-M-004.

Trackers:

Project Plan	Resource Tracker	Document Library	Action Items	Project Requirements	Eng. Insp.

Project Review Check Lists:

Scoping Review	Kickoff	CDR	PDR	FDR	IRR	IQR	OAR	PSR

Risk Assessments:

SRA	PRS	FMEA

Project Review Presentation

A generic project review template is available to assist project teams in preparing their review presentation and to provide a consistent format for all LLE project reviews. The template is housed in Teamcenter M-PM-M-009. Training is addressed in Training Module M-PM-M-004.

For external projects, the LLE PM assists the external PI with compiling their presentation material using the LLE Presentation Review template. The external PI must provide an electronic copy of their presentation in its original, non-PDF format for LLE to archive with the project.

2. Storage

Project Working Document Folder Structure

To facilitate project team collaboration, PM's will maintain a project folder on *\\lle-lsmb-up\Project_Files.* The project folder and structure will be set up by PPM upon approval of project.

The PM and PTMs can store all relevant project documentation in this shared project folder. It is the PM's responsibility to ensure all relevant project documentation is updated and maintained. Links to the project folder can be found in the Project Management Tracking System (WebEQC).

Document Library: Controlled Documents

The following documents, as applicable to the project, must be released in Teamcenter according to the project plan and project review deadline from the table below. There may occasionally be instances where further revisions are re-released in Teamcenter at subsequent project reviews.

DOCUMENT LIBRARY							
DOCUMENTS TO BE APPROVED AND RELEASED				RELEASE DEADLINE			
Controlled Documents to be Released	Responsible Function	Teamcenter Item Number	Teamcenter Item Name	CDR PDR FDR	IRR	IQR	OAR
Project Review Presentations, Project Review Meeting Minutes, Project Workbook	PM			X	X	X	X
Mechanical Top Level Assembly/Assemblies	Engineering			X			X
Electrical/Controls Cable Diagrams and Drawings	Engineering			X			X
P&ID Drawings	Engineering			X			X
Analyses	Engineering			X			X
Firmware Code and Firmware Description	Engineering			X			X
External Safety Notes	Engineering			X			X
Beam Interference Check	Engineering			X			X
Test Plans/Fixtures	Engineering/PI/IS			X	X	X	X
Diagnostic User Guide	DDI						X
Operations (Install, Alignment, Calibration, Operating) Procedures	DDI w/ XOPS				X		X
Maintenance Procedures	DDI w/ XOPS/ENG						X

3. Training

Training Modules: Training modules are available on Teamcenter for reference. The PPM will perform live training when needed.

- M-PM-M-003: Training - Project Review Document Release Process
- M-PM-M-004: Training - 7700 and Project Workbook
- M-PM-M-005: Training - Financial Tracking
- M-PM-M-006: Training - Project Plans and Schedules

- M-PM-M-007: Training - WebEQC Navigation
- M-PM-M-008: Training - Project Tailoring Guidelines

Key Execution Guidelines

Meeting Minutes: Meeting minutes document and communicate the WGM and Project Review discussions and decisions. Meeting minutes must be kept by the PM for all project team working group meetings and all project reviews. The PM is responsible for ensuring that meeting minutes are published to all team members, attendees, and stakeholders in a timely manner (less than one week).

- **WGM:** After distribution to team members, a copy of the meeting minutes must be kept in the Project Files folder. The PM may use their preferred method of capturing WGMs. The meeting minutes must at least include who was present at the meeting and any key discussion points.
- **Project Review:** After distribution to the Project Review team, the meeting minutes, Project Workbook, and presentation materials must be released into Teamcenter as controlled documents covering the review's discussions and decisions. A standard Microsoft Word meeting minutes template and example are housed in Teamcenter M-PM-M-010.

Project Reviews: Scheduling, Content, and Preparation

The PM contacts the PPM to schedule project reviews based on the progress of the project plan. The PPM will schedule the review in WebEQC and send out invites to appropriate approvers and team members as a calendar event in Microsoft Outlook. Design reviews are generally held on Wednesdays between 0900 and 1200 hours. Reviews may be scheduled at other times to support the needs of the project and the availability of required attendees.

Project Review presentation materials will be compiled by the PM, using the generic PowerPoint template, review trackers, review checklist, and risk assessments found in the Project Workbook. Included in the presentation material is the Project Risk Summary (PRS). This summarizes any key risks from the SRA or FMEA that may impact the launch of the project, including technical, financial, schedule, safety, and resource risks. Highlighting these risks helps the project team receive the additional support that may be needed from management.

Project Review presentation material must be pre-reviewed with the project team and the PPM prior to the Project Review. The final invitations to the review will be sent by the PPM one week before the review. After the invite has been sent, the review will not be canceled. The PM must distribute all review materials to the meeting invitees a minimum of one full working day prior to the meeting.

Project Reviews: Approvals and Control

Project reviews are the primary mechanism for maintaining oversight of a project, updating interested parties on project status, and evaluating the readiness of a project to advance to its next phase. The following approvers are required to attend the appropriate project reviews.

Approvals are documented in the review's meeting minutes, which must be distributed by the PM within one week of the Project Review.

Project Subject or Primary Location / Required Project Review Approvers	Omega 60 Facility	Omega EP Facility	Omega C&TF	MTW Laser Facility	R&D (Side Lab)	Information Technology	Facility Infrastructure
Omega Laser Facility Director	X	X	X			*	*
Engineering Division Director	X	X	X	X	X	X	X
Administrative Division Director						X	*
LMT Division Director	*	*		X	*		
Experimental Division Director	*	*	*	*	*		
PULSE Division Director	*	*		*	*		
Theory Division Director	*	*				*	
Chief Safety Officer	X	X	X	X	X	X	X

** Approver if Division is owner/primary stakeholder*

- All DDs are welcome to attend and approve any of the project reviews.
- In the event review approvers are unable to attend a review, they must delegate their approval responsibility to an appropriate individual who can attend, evaluate, and approve/reject the review on their behalf. Project review delegated approvals are noted in the meeting minutes.
- The meeting minutes for formal project review must list all required DD approvers and indicate their decision (approve/reject/conditional approval). Other required approvers are documented in the attendee list.
- If a conditional approval or rejection is decided, the rationale and corrective actions must be stated in the meeting minutes. The PM will take appropriate corrective actions and repeat the review when the actions have been addressed.
- The LLE Radiation Safety Officer (RSO) is a mandatory team member for any equipment/system project involving radiological materials *anywhere* within the LLE facility. The RSO is a mandatory approver for *all project reviews* related to equipment/systems involving the use/handling of radiological materials.

Other Reviews

The following review types typically do not require DD approvals. However, DDs can be invited as SMEs, as deemed appropriate. Meeting minutes should be distributed as a typical WGM and placed in the project folder. Attendance and actions from these meetings should be included in a summary slide presented in the formal review that follows.

Requirement Reviews and Peer Reviews

Requirement and peer reviews are strongly encouraged for all projects. These reviews should be structured as deep-dive working group sessions, engaging SMEs who are not directly involved with the project. The sessions should include interactive content, such as simulations, analyses, live 3D CAD model reviews, and development test data. The PPM can assist in scheduling these reviews.

Project Status Reviews

A PSR may be scheduled at any time by the PM or at the request of an LLE Division Director. Motivation for holding a PSR may be as follows: a major project milestone; a significant change in scope, cost, or approach; cancelation of the project; or at the request of LLE management. The agenda checklist is located in the Project Workbook. The PPM can assist in scheduling these reviews.

Failure Modes and Effects Analysis Reviews

An FMEA is a system design tool used to identify potential failure modes of a system and the effect of those failures on the system, operations, and personnel. An FMEA captures the key system design controls and establishes the qualification plans needed to mitigate system, operational, and personnel risks. FMEA reviews should be performed at weekly WGMs with SMEs and stakeholders as needed. The PM schedules these reviews.

On-Site Reviews

- **Engineering Inspection:** The purpose of the Engineering Inspection is to ensure the design has been assembled and functions according to the engineer's design intent before final installation. The inspection is conducted on-site by the PM and responsible engineering team with the actual equipment. Engineers verify critical design aspects and functionality to the fullest extent possible. The PM is responsible for scheduling these reviews.
- **Safety Risk Assessment:** The SRA is a mandatory safety checklist, which is reviewed at every Project Review. It identifies all potential personnel and equipment safety hazards associated with the project. The hazard level and mitigation plans are tracked and signed off by the appropriate safety officer. On-site inspections must occur prior to IRR and IQR review approval. The checklist and signatures are housed and maintained in the Project Workbook and the Project Management Tracking System. The PM schedules these reviews.

Any further questions or concerns should be directed to the LLE PPM for assistance.