

LLE Instruction 7700G

Overview

Agenda



- Motivation for change
- Overview of 7700
- Principal changes from Revision F to Revision G
- Closing Notes

Motivation for Update of INST 7700

- Improve laboratory resource allocation and utilization
 - Modified project approval and prioritization process
- Identify and engage long-term owners of end product throughout the project life cycle
 - Formation of the Experimental Support group under C. Sorce (diagnostics)
 - Provide continuity of expertise from project inception through end of life
- Establish an initial single point of contact for external user projects to enter the lab
- Free PI's from the burden of project cost and schedule responsibilities
- Formalize the process for projects requiring operational *in-situ* development
- Reduce ambiguity in the existing process



Overview of Instruction 7700

Overview of INST 7700(1)

- What
 - Establishes process and procedures for the flow of projects throughout the lab
- Applies to
 - New equipment projects
 - Significant modifications to existing equipment
 - Projects in OMEGA, OMEGA EP, MTW, and C&TF

Equipment

- Target diagnostics
- Beam generation and control
- Target handling and positioning
- Support structures
- Laser diagnostics
- Software impacting equipment and operations
- Omega Facility communication infrastructure

Significant

- Changes that affect.....
 - Operational characteristics, <u>or</u>
 - Structural integrity, or
 - Safety
- of previously qualified equipment
- Changes/projects involving more than one engineering discipline
- Assessed on a case-by-case basis



Overview of INST 7700(2)



- 1. Engineering Division Director approves, <u>and</u>
- 2. The proposed change follows the standard PDM design approval process, <u>and</u>
- 3. The change is implemented via LFORM work authorization procedures
- Is my project a minor change?
 - Determined on a case-by-case basis
 - Start with previous slide on "Significant Change"
 then ask Systems Engineering



Changes to 7700

The safety of personnel is of paramount importance and will be addressed at every phase of a project <u>without exception!</u>

- An up-to-date Safety Risk Assessment and Failure Mode and Effects Analysis is required for all projects, at all reviews regardless of project scope
- The vast majority of 7700 has remained essentially unchanged
 - Rewrite principally focused on clarification of existing process and incorporation of undocumented standard practices

7700G—What has changed?

- Process
 - Project Approval and Prioritization process Modified
 - Project Risk Assessment New
- Project Types
 - Development Project New
 - Preliminary Qualification Review New
- Roles and Responsibilities
 - Project Manager New
 - Project Assistant Deleted
 - Instrument Specialist Modified and Expanded



Process Changes

Project Approval Process



Internal Project prioritization process

- Only Priority-1 projects for which there are sufficient resources will be approved to start the design process
- Lower-priority projects will be ranked based on LLE mission, goals, and objectives and assigned resources as they become available
- Prioritization reviewed quarterly

<u>7700G</u>	<u>7700F</u>
Priority 1: Essential	Priority 1
required to meet needs, continue operations, ensure safety, or to support graduate student research	Must have to continue operations
Priority 2: Important	Priority 2
important to future needs or to improve operational efficiency	Required for research goals or critical sparing
Priority 3: Merited	Priority 3
ranked and pending resource availability	Desired capabilities or improvements

- External Projects are prioritized as part of annual scheduling planning process
 - Primary diagnostics are ranked as Priority 1

Project Risk Assessment(1)

- A tool to surface and manage project risks due to resources, technology, cost, and schedule issues
- Identifies roadblocks to project success allowing early management involvement to mitigate the risk

Project ID

- Updated at all project reviews
- Spreadsheet template tool is available
 - Guidelines for ranking are provided

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- Risk ranked
 - High
 - Medium
 - Low
- Impact ranked 1 to 4
 - -1 = No impact
 - 4 = Significant impact

	Project Risk Assessment										
			Risk & Impact					ıpa	ct		
ID	Risk Description	Land	1997	Schedule		Scheuure Technical		Resource		Status	Mitigation Plan
		R	I	R	Ι	R	Ι	R	Ι		
1											
2											
3											
4											
5											

Project Risk Assessment

To be completed* during project Concept and Requirements Development phase, and updated at each subsequent project review.

Completed by:

Project Manager/Date





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Project Risk Assessment Key:									
Risks are	described as having a High (H), Me	Risk Status							
High:>	> 80% chance of occurrence	Active: Actively being worked							
Mediu	m : $20\% < x < 80\%$ chance of occurr	Watch: Monitoring for action if required							
Low: <	20% chance of occurrence	Closed: Risk mitigated							
Impacts	are described in terms of consequence	e to project							
	Cost	Schedule	Technical	Resource					
1	No impact	No impact	No performance impact	No impact					
2	< 5% increase in cost	Minor slip in one or more project milestones	One or more secondary requirements will not be met	Impacts to cost, schedule or technical parameters					
3	5% < x < 15% cost increase	Key project milestone in jeopardy	Primary Science/Physics requirement will not be met	Impact to multiple project metrics (cost, schedule, technical)					
4	>15% increase in cost	Cannot meet first use schedule. Shot schedule at risk	Project in jeopardy	Critical need to complete project					

Note: "Closed" status missing from document.



Project Type Changes

Project Types

- 7700F currently defines two project types: Major and Minor
- 7700G adds a <u>Development</u> project type
 - Address the need for operational *in-situ* development projects to:
 - Demonstrate feasibility
 - Proof of principle
 - Complete facility upgrades requiring *in-situ* testing
 - Project receives a conditional qualification
 - Project must pass a CDR and a Preliminary Qualification Review (PQR) at a minimum
 - Requires clearly defined, quantifiable goals, and performance expectations
 - Granted a finite operational life scheduled consistent with laboratory objectives and priorities. **Open-ended deployment is <u>NOT</u> allowed!**
 - Project either terminates at the end of the conditional qualification period, or is resubmitted as a formal project for full qualification

Preliminary Qualification Review



- Development projects inherently involve a higher level of variability and uncertainty than fully qualified projects
 - a commensurate level diligence will be applied in approving these projects for deployment within operations

Items Required for a Preliminary Qualification Review					
#	Required Item	Content / Notes			
		Must contain clearly defined, quantifiable goal			
	A written Test Plan	and performance expectations.			
		Required system configuration and operating			
1		conditions			
		Shot types			
		Beam paths, terminations, and energies			
		Completed Shot Request Forms			
		Required personnel and responsibilities			
2	A written Test Procedure	Sufficent test detail for operations personal to			
		successfully execute the test			
3	Completed SRA and FMEA	Detail of safety mitigation strategies			
4	Safety Inspection				
5	Work Authorization Procedure (WAP)				
Review of changes from any prior					
6	evolution of the project through the				
	Development project cycle				



Roles and Responsibilities Changes



- Appointed by Division Directors as part of project approval process
- Overall project responsibility for project monitoring and execution:
 - Resource planning
 - Scope
 - Cost
 - Schedule
 - Risk
 - Closure
- Principal point of contact (POC) for the customer/end user throughout the project development process
- Project Assistant Deleted
 - No longer a formal role in the 7700 process, but not precluded
 - a PA will be assigned as a member of the project team where appropriate
- Instrument Specialist Redefined
 - Typically from the Experimental Support group
 - Responsible for equipment throughout its entire life cycle (cradle to grave)



Nominal Process Flow

7700G Nominal Process Flow



Major projects

- After prioritization and approval essentially proceed as before
- Mandatory Project Requirements Review (PRR), formality determined on a case-by-case basis
- Minor projects
 - After prioritization and approval proceed as before

Development projects

- After prioritization and approval
 - require a CDR/PRR
 - PDR and FDR determined on a case-by-case basis
 - <u>Mandatory</u> Preliminary Qualification Review (PQR) prior to *in-situ* testing, formality determined on a case-by-case basis
- Require quantifiable goals
- Granted finite in-situ life span
- Post testing the project must be formalized or terminated

Closing Notes

- Working some minor procedural issues with the Division Directors
- WEBEQC is being updated to reflect 7700G updates
 - Project Manager role
 - Development project type
 - PQR
 - EQC updates
 - Project Status Dashboard webpage
- "Slow roll" the 7700G process into the lab over the next 4 to 8 weeks rather than a hard cut over
 - Start implementing on new projects
 - Allow currently active projects to continue to track to 7700F
- Action Item Database functionality is being expanded
 - Data sorting/filtering functions
 - Report generation, auto population of Al's into design review meeting minutes
 - Automatic notification of action item assignment and status, similar to document approval notification process