LANL ESM Chapter 15  Attachment A  Commissioning Process Flow Chart

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Preliminary Design (60%)</th>
<th>Final Design (90%)</th>
<th>Construction</th>
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<tbody>
<tr>
<td><strong>Project Manager</strong></td>
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<td><strong>Subject Matter Experts (SMEs)</strong></td>
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<td><strong>LANL Commissioning Authority (LCA)</strong></td>
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<tr>
<td><strong>Project Commissioning Agent (CxA)</strong></td>
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<tr>
<td><strong>Deliverables</strong></td>
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</tbody>
</table>

- Design Review Comments
- Draft Estimate
- Draft Cx Plan

- Design Review Comments
- Issue Cx Plan for Approval

- Perform Submittal Reviews
- Issue approved Cx Plan
- Issue Cx Test Procedures

(Turnover: Complete punchlist walk-down and accept systems from Construction)

- Identify the Project Cx Agent (CxA)
- Document the Owner’s Project Cx Requirements
- Determine the Cx Graded Approach for the Project
- Draft Commissioning Estimate, and Commissioning Plan
- Perform Design Review
- Review Cx estimate and Cx Plan
- Review and Approve

- Issue Approved Cx Plan and Scope
- Incorporate Cx Schedules into Project Schedules
- Develop Component and System Test Procedures for each system
- Perform Design Review

- Review and Approve

- Issue Cx Test Procedures
- Review and Approve
- Review and Approve

- Review and Approve

- Review and Approve

- Review and Approve

- Review and Approve

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- Review and Approve

- Turnover: Complete punchlist walk-down and accept systems from Construction

- There will usually be overlap between the Const and Comm phases

Friday, March 22, 2019 1:20:02 PM
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Commissioning

Deliverables

- Complete System Test Procedures
- Cx Report

NOTES:
1 = Construction Management Procedure CMP 401 Process Component Test Procedure
2 = Project Management Procedure AP-350-406 Startup and Commissioning Process

Turnover To Operations

- Provide input and Lessons Learned Document

Subject Matter Experts (SMEs)

Project Commissioning Agent (CxA)

LANL Commissioning Authority (LCA)

Deliverables

- Complete System Test Procedures
- Cx Report

NOTES:
1 = Construction Management Procedure CMP 401 Process Component Test Procedure
2 = Project Management Procedure AP-350-406 Startup and Commissioning Process

Conduct Cx Component Tests

Note 1

Review and Approve Test Results

Conduct System Acceptance Tests

Note 2

Review and Approve Test Results

Prepare Test Summary Reports (TSR), Assemble packages for final Commissioning Report IAW Cx Plan

Perform Punch-List Walk-Down

Issue Final TSR for Approval (with Test Procedures)

Review and Approve

Review and Approve

Issue Final TSR for Approval (with Test Procedures)

Review and Approve

Review and Approve

Sign Off for Beneficial Occupancy

Sign Off for Beneficial Occupancy

Sign Off for Beneficial Occupancy

Sign Off for Beneficial Occupancy

Provide Support to Owner during Transition to Full Operations

Turnover Release Systems to Operations