Start Construction

Contractor Training

O&M Data

Submittals

Site Observation

Systems Training

Systems Manuals

Equipment Startup

Final Report

PFC Verification

Develop Functional Test Procedures

Develop Pre-Functional Checklists

System Testing

Integrated Testing

Warranty Phase

Project Closeout

DD-1 Phase

SD-2 Phase

SD-1 Phase

Project Start

Final CD Phase

CD-1 Phase

DD-2 Phase

Bid Phase

Contractor Testing

[See Page A-3](#SD1)

[See Page A-](#SD1)4

[See Page A-](#DD1)6

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[See Page A-](#DD2)7

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Solicit IDIQ Commissioning Team

(NCA)

Develop Owner’s Project Requirements (NCA)

Pre-Design Conference

(NCA, A/E, CxA)

Solicit IDIQ A/E Design Team

(NCA)

IDIQ A/E Design Team Fee Negotiation

(NCA, A/E)

IDIQ Commissioning Team Fee Negotiation

(NCA, CxA)

Solicit IDIQ Peer Review Team

(NCA)

To SD-1 Phase

Project Start

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SD-1 Schematic Design Process

(A/E)

SD-1 Design Narrative

(A/E)

IDIQ Peer Review Fee Negotiation

(NCA, PR)

SD-1 Peer Design Review

(PR)

SD-1 Commissioning Design Review

(CxA)

Review Comments Entered into Dr. Checks

(CxA, PR)

SD-1 Design Review Meeting

(NCA, A/E, CxA, PR)

SD-1 Design Submission

(A/E)

Review NCA Design Requirements

(CxA)

Review Owner’s Project Requirements

(CxA)

Review NCA Design Requirements

(PR)

Begin SD-1 Phase

To SD-2 Phase

Respond to Review Comments

(A/E)

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Begin SD-2 Phase

Respond to Review Comments

(A/E)

SD-2 Design Process

(A/E)

SD-2 Design Submission

(A/E)

Cx SD-2 Design Review & Back Check

(CxA)

Peer Design Review & Back Check

(PR)

Respond to Review Comments

(A/E)

Review Comments Entered into Dr. Checks

(CxA, PR)

SD-2 Design Review Meeting

(NCA, A/E, CxA, PR)

To DD-1 Phase

SD-2 Design Narrative

(A/E)

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DD-1 Design Review Meeting

(NCA, A/E, CxA, PR)

DD-1 Design Submission

(A/E)

Begin DD-1 Phase

Outline Commissioning Plan

(CxA)

Respond to Review Comments

(A/E)

Outline Cx Specifications

(CxA)

Design Review & Back Check

(PR)

Update Design Narrative

(A/E)

Design Review & Back Check

(CxA)

Review Comments Entered into Dr. Checks

(CxA, PR)

To DD-2 Phase

Respond to Review Comments

(A/E)

DD-1 Design Process

(A/E)

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Review Comments Entered into Dr. Check.

(CxA, PR)

DD-2 Design Review Meeting

(A/E)

Begin DD-2 Phase

Draft Cx Plan

(CxA)

Respond to Review Comments

(A/E)

Update Design Narrative

(CxA)

DD-2 Design Process

(A/E)

Respond to Review Comments

(A/E)

Design Review and Back Check

(CxA)

Design Review and Back Check

(PR)

To CD-1 Phase

Draft Cx Specifications

(CxA)

DD-2 Design Submission

(A/E)

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Begin DD-1 Phase

CD-1 Design Review Meeting

(NCA, A/E, CxA, PR)

CD-1 Design Submission

(A/E)

Begin CD-1 Phase

Preliminary Commissioning Plan

(CxA)

CD-1 Design Process

(A/E)

Final Cx Specifications

(CxA)

Back Check Review Comments

(PR)

Back Check Review Comments

(CxA)

Review Comments Entered into Dr. Checks

(CxA, PR)

To Final CD Phase

Update Design Narrative

(CxA)

Respond to Review Comments

**(A/E)**

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Begin Final CD Design

Update Commissioning Plan

(CxA)

Final Design Process

(A/E)

Final Design Submission

(CxA)

Issue Certificate of Compliance

(PR)

Update Design Narrative

(CxA)

Back Check Review Comments

(CxA)

Back Check Review Comments

(PR)

Update Commissioning Specifications

(CxA)

To Bid Phase

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Release Bid Package(s)

(NCA)

Pre-Bid Conference

(NCA, A/E, CxA)

Prepare Addenda

(As needed)

(A/E)

Review & Respond to RFI

(A/E)

Review and Respond to RFI

(CxA)

Review & Respond to RFI

(NCA)

Start Bid Phase

Issue Addenda

(NCA)

To Construction

Issue Addenda

(NCA)

Award Contract

(NCA)

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Construction Contract Award

(NCA)

Pre-Construction Conference

(NCA, Contractor, A/E, CxA)

Update Construction Schedule

(Contractor)

Preliminary Construction Schedule

(Contractor)

Update Cx Plan

(CxA)

Submittals and Shop Drawings

(Contractor)

Start Construction Phase

Preliminary Cx Schedule

(CxA)

To Submittal Review

To Cx Site Observation

To O&M Data

To Contractor Training

Construction

(Contractor)

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Cx Site Observation

(CxA)

Construction Meeting

(NCA, A/E, CxA, Contractor)

Cx Meeting

(CxA)

Verify Equipment Installation

(CxA)

Start Cx Site Observation

To Equipment Startup

Review / Discuss Cx Issues Log

(NCA, A/E, CxA, Contractor)

Meeting Minutes

(CxA)

Field Report

(CxA)

Update Cx Issues Log

(CxA)

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Yes

No

Equipment Submittals

(Contractor)

Submittal Review

(NCA, A/E, CxA)

Submittal Comments

(A/E)

Submittal Comments

(CxA)

Submittal Comments

(NCA)

Start Submittal Review

To Functional Test Procedures

Approval

(NCA)

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Yes

No

O&M Data Submittals

(Contractor)

O&M Review

(NCA, A/E, CxA)

O&M Comments

(A/E)

O&M Comments

(CxA)

O&M Comments

(NCA)

Start O&M Data

To Systems Manuals

Approval

(NCA)

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Yes

No

Prepare Training Plans

(Contractor)

Training Plan Review

(NCA, CxA)

Training Plan Comments

(CxA)

Training Plan Comments

(NCA)

Start Contractor Training

To Systems Training

Approval

(NCA)

Training Evaluation & Feedback

(NCA, CxA)

Schedule and Present Training

(Contractor, NCA)

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No

Yes

Prepare / Submit Draft Equipment Startup Checklists

(Contractor)

Equipment Startup

(Contractor, CxA)

Start Equipment Startup

To Contractor Testing

Witness Startup?

(CxA)

Review Draft Checklists

(CxA)

Prepare Enhanced Equipment Startup Plan

(CxA)

Equipment Startup & Report

(Contractor)

Field Report & Issues Log

(CxA)

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Prepare Draft System Functional Performance Test Procedures (FPT)

(CxA)

Review and Comment

(Contractor)

Review and Comment

(NCA)

Review and Comment

(A/E)

Start Develop FPT

Issue Final FPT

(CxA)

To Develop SRC

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Yes

No

Prepare Draft Systems Manuals

(CxA)

Systems Manual Review

(NCA, A/E)

Systems Manual Comments

(A/E)

Systems Manual Comments

(NCA)

Start Systems Manuals

To Systems Training

Approval

(NCA)

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Prepare Systems Training Plans

(CxA)

Training Plan Review

(NCA, A/E)

Start Systems Training

Yes

No

Training Plan Comments

(A/E)

Training Plan Comments

(NCA)

To Final Report

Approval

(NCA)

Training Evaluation & Feedback

(NCA)

Schedule and Present Systems Training

(CxA, NCA)

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3

Yes

No

Yes

Yes

No

No

Verify System Installation

(Contractor)

Start Contractor Testing

OK?

OK?

Verify Test and Balance

(Contractor)

OK?

Verify Controls (Point-to-Point)

(Contractor)

2

1

Repair / Rework

(Contractor)

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Yes

Yes

No

No

Verify Component / Subsystem Performance

(Contractor)

To SRC Verification

OK?

OK?

Pre-Test System Functional Performance

(Contractor)

2

1

Complete System Readiness Checklist

(Contractor)

3

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Prepare Draft Pre-Functional Checklist (PFC)

(CxA, Contractor)

Review and Comment

(Contractor)

Review and Comment

(NCA)

Review and Comment

(A/E)

Start Develop Pre-Functional Checklist

To Contractor Testing

Issue Final PFC

(CxA)

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Yes

No

Yes

No

Field Verify Completed PFC

(CxA)

Revise / Resubmit

(Contractor)

Start PFC Verification

To System Testing

PFC Accurate

(CxA)

Sample More PFC?

(CxA)

Select 10% PFC

(CxA)

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Yes

No

Yes

Yes

No

No

Pre-Test System Verification

(CxA)

Start System Functional Testing

Pass?

(CxA)

Pass?

(CxA)

Verify Steady State Operation

(CxA)

Pass?

(CxA)

Verify System Start / Shutdown

(CxA)

5

4

6

System Repair / Rework

(Contractor)

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Yes

No

Yes

Yes

No

No

Verify System Reaction to Variables

(CxA)

Field Report & Issue Log

(CxA)

To Integrated Testing

Pass?

(CxA)

Pass?

(CxA)

Re-test?

(CxA)

Verify Emergency / Failure Operation

(CxA)

5

4

Field Report & Issue Log

(CxA)

6

System Repair / Rework

(Contractor)

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HVAC Controls Integrated Testing

(CxA)

Start Integrated Testing

Pass?

(CxA)

Yes

No

Pass?

(CxA)

Security System Integrated Testing

(CxA)

Pass?

(CxA)

Fire Alarm System Integrated Testing

(CxA)

Yes

Yes

No

No

9

System Repair / Rework

(Contractor)

8

7

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Yes

No

Yes

Yes

No

No

Failure Mode Integrated Testing

(CxA)

Field Report & Issue Log

(CxA)

Pass?

(CxA)

Pass?

(CxA)

Re-test?

(CxA)

Loss of Power Response Testing

(CxA)

8

7

Field Report & Issue Log

(CxA)

9

System Repair / Rework

(Contractor)

To Final Report

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Yes

No

Prepare Final Report

(CxA)

Final Report Review

(NCA, A/E)

Final Report Comments

(A/E)

Final Report Comments

(NCA)

Start Final Report

To Warranty Phase

Approval

(NCA)

Final Report Review Conference

(CxA, NCA)

Review / Update Issues Log

(CxA)

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Remotely Monitor Building Systems Operation

(CxA)

Seasonal Systems Functional Performance Testing

(NCA, Contractor, CxA)

Resolve Warranty Claims

(Contractor)

Warranty Checkup

(CxA, Contractor)

Review / Update Issues Log

(NCA, CxA)

Interview O&M Staff / Users

(NCA, CxA)

Project Closeout

Start Warranty Phase

Verify Corrective Actions

(CxA)

Investigate User Issues

(CxA)

Warranty Phase Review Meeting

(NCA, CxA, Contractor)

Prepare Final Report Amendment

(CxA)

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