



Getting It Right From the Start

Design Phase Commissioning

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Defining Commissioning



- Commissioning Process is a quality-focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated and maintained to meet the Owner's Project Requirements.



Commissioning Process

- Phases
 - Pre-design
 - Design
 - Construction
 - Occupancy and Operations



Design Industry Terminology

- **Pre-Design Phase**
vs **Program Phase**

- **Owner's Project Requirements**
vs **Design Intent**



OWNER EMPHASIS

- **Setting the Project Tone**
 - **Budget and Schedules**
 - **People** - Form the Commissioning Team
 - **Requirements** - Owner's Project Requirements
 - **Process** - Commissioning Plan
 - **Documentation** - Systems Manuals
 - **Operations** - Training Requirements



Commissioning Team

- Owner (or Representative)
- Commissioning Authority
- Pre-design and Programming Professionals
- Design Professionals
- Construction/Project Managers



Owner's Project Requirements

- Information Gathering
- OPR Workshop
 - Commissioning Authority
 - Owner/Representatives
 - User Groups
 - Maintenance
 - Design Professionals
 - Construction

Owner' Project Requirements



- Budgets
- Schedules
- Owner Directives
- Limitations
- Codes and Standards
- Use Requirements
- Occupancy Reqmts
- Equipment and Systems
- Energy Efficiency
- Community
- Sustainability
- Constructibility
- Environmental
- Communications
- Indoor Environment
- Acoustical
- Vibration
- Seismic
- Accessibility
- Security
- Health and Hygiene
- Aesthetics
- Adaptibility
- Quality and Tolerances



Owner's Project Requirements- Continued

- Benchmarking
- Operation and Maintenance Criteria
- Systems Integration
- Documentation
- Training Requirements
- Warranty Requirements

Owner's Project Requirements Workshop

FACILITY: _____

LOCATION: _____

1. OBJECTIVES FOR THE FACILITY: *USE, FUNCTION, IMAGE, FLEXIBILITY, ETC*

2. INDOOR ENVIRONMENT REQUIREMENTS: *IN GENERAL DEFINE COMFORT, HVAC REQUIREMENTS, AIR QUALITY, LIGHTING, NOISE, VIBRATION, POLLUTANT*

GENERATORS/EXHAUST, ETC.

3. SUSTAINABILITY OBJECTIVES: *MATERIALS, LIFE CYCLE ISSUES, CONSERVATION OF RESOURCES, ETC.*

4. MAINTAINABILITY AND EQUIPMENT ACCESS; *MATERIALS AND LOCATION REQUIREMENTS*

5. EFFICIENCY OBJECTIVES: *ELECTRIC ENERGY, NATURAL GAS, WATER, EQUIPMENT EFFICIENCIES, GENERAL BENCHMARK REQMTS.*

6. PROJECT DOCUMENTATION: *CONSTRUCTION DOCUMENTS, COMMISSIONING, OPERATIONS, SYSTEMS MANUALS, TESTING, TRAINING, FORMATS & MEDIA, ETC.*

7. TRAINING: *SCOPE, DURATION, FORMAT, VIDEO RECORDINGS, ETC.*

8. SPECIAL STANDARDS AND CODES: *NON-CONSTRUCTION CODE REQUIREMENTS*

9. PROBLEMS FOR PREVIOUS PROJECTS: *ISSUES TO AVOID*

10. DEFINE A SUCCESSFUL PROJECT:



Project Documentation Flow

Owner's Project Requirements



Basis of Design



Construction Documents



Constructed Facility



Documentation



Training and Operations



Commissioning Plan

- Roles and Responsibilities
- Communication Channels
- Process Activities for all Phases
- Milestones and Approvals
- Meetings and Reports
- Design and Construction Verification Process
- Checklist Development and Use
- Documentation and Reports



Issues Log and Procedures

- Procedures
- Communications
- Resolution Activities
- Commissioning Progress Reports
- Final Reports



Systems Manuals

- Content Requirements
 - Expanded from O&M Requirements
 - Combination of OPR/BOD, Design, Submittals, O&M Documents, Training and Commissioning
- Format
- Responsibility



Training Plan

- Scope of Training
- Skill Sets Involved
- Form and Format
- Contractor Training Plans
- Location and Duration
- Recording
- Training Records



Basis of Design

- Define design approach for each OPR requirement.
- Plan for incorporation of non-design OPR requirements.



Design Review- Commissioning Process

- Trades Coordination
 - Are the architectural plans, mechanical, electrical and plumbing plans showing the same items in the same locations?
 - Will the equipment fit in the spaces shown?
- Expert Review
 - Does the design meet the Owner's Project Requirements?
 - Will the systems work?

Design Document Review

Examples



- Do air flows and water flows add up for device sizing?
- Does the equipment sizing meet the normal “rules of thumb”?
- Are test access devices provided and in the correct location?
- Do the systems coordinate between plan sheets, various other trades, and the specifications?

Questions

