'Design Requirements Manual (DRM) News to Use' is a monthly ORF publication featuring salient technical information that should be applied to the design of NIH biomedical research laboratories and animal facilities. NIH Project Officers, A/E's and other consultants to the NIH, who develop intramural, extramural and American Recovery and Reinvestment Act (ARRA) projects will benefit from 'News to Use'. Please address questions or comments to: ms252u@nih.gov

Commissioning Requirements

Commissioning is the process of making sure all building systems are working before occupants move in. This requires verification that all systems are: installed properly and perform according to design; cost effective; meet the users' needs; adequately documented and well understood by operators. NIH requires Commissioning (Cx) for most projects. The scope of Cx for a project shall be determined by the complexity of the project.

Cx entails coordinating the efforts of the various parties involved in the design, construction, use, and operation of a facility to achieve an optimal facility. NIH Cx focuses on the dynamic systems within the facility, such as the mechanical, electrical, plumbing, fire protection, and security systems.

Key Cx sequences during different project phases are listed below:

Programming Phase:
- Inclusion of Cx credentials related to Cx agent selection criteria, commissioning requirements in the project construction contracts and documentation of project requirements in a format that is transferable to the Cx documentation.
- Inclusion of Cx cost in the project budget.

Conceptual Design Phase:
- Commissioning authority (CA) develops initial Cx Plan.
- CA reviews the Basis of Design (BOD) and Room Data Sheets (RDS), and participates in the development of Facility Guide.

Schematic Phase:
- Identification of the Cx team and onset of participation in the Cx process.
- CA conducts the Cx kick off meeting, reviews schematic designs and design criteria, and produces preliminary versions of Cx specification sections.
- Establishes naming conventions to be used on project equipment identification.

Construction Documents Phase:
- A/E response to all design review comments including Cx comments, development of Systems Matrix in concert with the project specification
- Operators review and comment on Systems Matrix and other documents.
- CA develops detailed Cx requirements, Cx implementation plan and design phase version of the Facility Guide; review of other construction phase submittals, and development of a summary document that will track the Cx process.
- CA develops Cx precedent diagrams to reflect Cx tasks and how to most effectively sequence systems turn over to minimize the Cx impact on the schedule.
- A/E update of the BOD.

Construction Phase:
- Designation of a Cx Coordinator (CxC) by all major subcontractors and operators to represent them in the Cx process.

- Cx progress meeting conducted by CA.
- Incorporation of Cx tasks in detailed project schedule and presentation of an updated schedule at each Cx progress meeting by the contractor.
- CA reviews and comments on shop drawings and other submittals, inspections and attendance of meetings, and production of detailed project specific pre-functional and functional testing procedures.
- Supplementation of the pre-functional procedures developed by CA, contractor-provided training plan for review by CA and operators. CA and operators' review and approval of startup protocol.
- Submittals of Operations and Maintenance (O&M) portions of the Facility Guide and Temporary Conditioning Plan by the contractor for review by A/E, CA, and operators.
- Witnessing of close in inspections by operators, CA, and Project Officer.

Acceptance Phase:
- Establishment of trending and monitoring as applicable for systems by the contractors.
- Spot check start-ups and balancing by CA and the operators.
- Functional Operational Systems Test (FOST) directed/conducted by CA, in which most parties also participate to some degree, primarily for initial samples. Continued activity with FOST performing repetitive samples by CA and operators.
- FOST documentation by CA, recommendations of acceptance as applicable, and update of FOST status on Cx summary document.
- Development and performance of commissioned systems training by CA.
- Completion of record documentation and submittal for approval by the contractor and A/E.
- Remedies to issues that caused failure of FOSTs and CA retests by the contractor.

Endurance Test Phase:
During the endurance test phase, equipment is run continuously, monitored and trended. This phase is applicable to critical occupancies such as BSL-3, vivaria, data centers, and other areas as directed by the Project Officer. Cx sequence shall include:
- CA ensures monitoring is in place and functional throughout this period.
- Use of the space by occupants to confirm functionality.

Warranty Phase:
- Onset of warranty upon completion of the acceptance phase.
- Submittal of final Cx report by CA, and addition to Facility Guide important lessons learned, changes made, etc.
- Maintenance of log of warranty calls which tracks diagnosis and resolution by contractor.
- Performance of opposite season testing by CA.
- Documentation of issues and problems with the facility operation by the operators.