

News to Use

Design Requirements Manual

The formulae $\frac{\partial U_i}{\partial x_j} + \frac{\partial}{\partial x_j}(\rho U_i) = -\frac{\partial \sigma}{\partial x_j} + \frac{\partial}{\partial x_j}(\mu \frac{\partial U_i}{\partial x_j}) + s_i(\rho - \rho_0)$ for building $\frac{\partial}{\partial x_j}(\rho U_i) = -\frac{\partial \sigma}{\partial x_j} + \frac{\partial}{\partial x_j}(\mu \frac{\partial U_i}{\partial x_j} - \rho U_i^2) + s_i(\rho - \rho_0)$ state of the art $\frac{\partial}{\partial x_j}(\rho U_i) = \frac{\partial}{\partial x_j}(\lambda \frac{\partial}{\partial x_j} - \rho U_i^2)$ biomedical research facilities.

'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: shawm@mail.nih.gov

Managing the Commissioning Process (Part II)

Part 1 of this article looked at important commissioning milestones to be tracked in the master project schedule including the Pre-Functional Checklists (PFCs), the first testing document prepared by the Commissioning Agent (CxA). The second document, the Functional Performance Tests (FPTs), is critically connected to the completion of the controls submittal. The controls submittal is a complex document and a reflection of the contractor's understanding of the owner's intent. Delays in the completion and approval of the controls submission can result in late development of the FPTs, which can result in delays at the end of the project and unsatisfactory environmental and operational conditions. A strategy that many project managers are finding successful is having design charrettes when the control contractor is starting the development of their submittals. As a combined effort of the contractor, the designer and the CxA this can be an excellent method of making sure the original design intent is carried through construction.

The next important commissioning milestones are the completion of the actual functional tests. The dates for the tests must be imbedded in the contractor's schedule, so the contractor is required to consider commissioning as a process through the length of the project and not just a two week testing event at the end of the project. This also provides a method to tie payments for monthly requisitions to commissioning task completion, so that owners do not overpay early in the project and helps ensure that there is money left in the pay requisition to leverage the contractor into taking necessary action to make corrections. Having the complete commissioning process captured in the master project schedule will help ensure that issues are found and addressed early so issues will not drag past testing and into project turnover. It also provides the project manager and owner the financial leverage necessary to take action to resolve issues while there is still enough financial assets in the project to provide them the necessary control.

Enforcement of the Statement of Preparedness.

The Statement of Preparedness is a document signed by the contractor and verified by the CxA that all preparatory work necessary to perform the FPTs is complete. The effective implementation and execution of the Statement of Preparedness during the construction phase can significantly increase efficiency during functional performance testing. Included in the Statement is the completion TAB work, point to point checks completed by the control contractor, completion of the PFCs and the contractor's first run through of the FPTs. The Statement should be included in the specifications as part of the contract to provide the project manager the tool to confirm work is being done on time and as

required. Having this as component of the master schedule requires the general contractor to track all the sub-tasks necessary to maintain the commissioning process. This will ultimately require the contractor to implement their own QA/QC plan, rather than deferring back to the owner's CxA to perform this function at the end of the project, costing time, money and quality.

Maintenance and Facilities Involvement in the Commissioning Process.

It is imperative that facility personnel be involved in decision making from the very beginning of the project. When developing the Owner's Project Requirements (OPR) they should be included as part of the commissioning team and in writing the Basis of Design (BOD). They need to be keenly aware of the types of systems being proposed and confirm they have the people and knowledge base to maintain those systems. If necessary, their early involvement will confirm that this is the time to obtain the training necessary; hire people with the knowledge base to maintain the facility; or contract this work out in the future. Many owners and project managers work under the misconception that all necessary training to maintain the facility will be provided at the end of the project by the contractors. This is not the case; the training at the end of the project is to build on the maintenance personnel's knowledge base with specific information particular to this specific project. There have been many projects where owners have not provided their facility personnel the hours and days necessary to be involved throughout the design, construction and turnover phases of the project in a misguided approach to saving money, this is a false economy. Turning over expensive and complicated equipment to personnel who are not properly trained in its maintenance and operation can be very costly in loss of equipment lifespan and higher energy costs due to inefficient operation. Every project manager should insist maintenance personnel be involved from the onset of the project

Conclusion

A properly managed and integrated commissioning process will greatly increase the odds of the success of a project. A well-managed and implemented process requires everyone involved in the project, from design through construction and turn over to recognize commissioning is integral, not supplemental to the process. It will provide measurable milestones and consistent documentation to confirm that the project is healthy with respect to commissioning and achieving successful completion. Most important it will have the entire team looking at commissioning as it is defined by ASHRAE as a process that runs throughout the project and not a two week quality control event at the end of the project.

Reference: www.ashrae.org

Further details on this month's topic are available on the DRM website

<http://orf.od.nih.gov/PoliciesAndGuidelines/BiomedicalandAnimalResearchFacilitiesDesignPoliciesandGuidelines/Pages/DesignRequirementsManualPDF.aspx>

DRM Chapter 1 Section 7 Commissioning