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Retrocommissioning: Further Discussion Roundtable

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Description of Roundtable Discussion
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Synopsis

Retrocommissioning most often focuses on energy systems in facilities to reduce costs and fix problems. This roundtable will include a brief initial presentation on purpose and definitions, with the majority of time spent on discussing issues related to the nature of retrocommissioning, key factors affecting whether retrocommissioning is used or not, methods being used, and what national-level activities are needed.

About the Author

Mr. MacDonald has significant experience in assessing the energy savings potential of efficiency measures in commercial and residential buildings and has performed extensive work on energy and demand impacts of energy technologies. He has developed energy audit and analysis procedures for industrial, commercial, and single–family buildings. His work has included development of methods for conservation program verification and evaluation, and he has participated in national standards development related to efficiency of existing buildings and building energy use measurement. He also has performed analysis of sectoral energy use data for many years. Currently, Mr. MacDonald is a staff member of the Buildings Technology Center at the U.S. Dept. of Energy's Oak Ridge National Laboratory.

Introduction

Most buildings have never gone through any type of commissioning or quality assurance process. Retrocommissioning is applied to existing buildings that have not received any previous commissioning, so it is a systematic way of identifying and correcting building system problems and optimizing system performance in existing buildings. The goals of retrocommissioning typically include increased comfort and productivity for occupants and operators, as well as cost savings.

At Oak Ridge National Laboratory, significant research is being devoted to the development of technologies that improve the energy efficiency and environmental compatibility of residential and commercial buildings. One of the most important means of increasing energy efficiency in commercial buildings is through efficient operation. The retrocommissioning process most often focuses on dynamic energy-using systems

with the goal of reducing energy waste, obtaining energy cost savings for the owner, and identifying and fixing existing problems. Reducing energy waste increases energy efficiency, and improving energy efficiency is a primary effort of the Department of Energy (DOE) for buildings.

DOE Efforts on Retrocommissioning Guides

For the Rebuild America program, DOE this year released a guide on "Building Commissioning" for two situations: retrocommissioning, or commissioning existing buildings and systems; and commissioning of a retrofit project. (DOE's Rebuild America is a national program targeted at assisting community partnerships achieve energy efficiency improvements in commercial, large multifamily, and publicly assisted housing.) This guide is limited in scope, and is targeted at helping building owners and retrofit project managers understand and successfully oversee the commissioning process. It helps them understand the commissioning process, what the costs and benefits are, how to capture these benefits, and what to look for in a commissioning agent.

A supporting guide that contains detail on how to implement and optimize the specific tasks in the retrocommissioning process has been developed and is near publication. The supporting guide also provides many examples of the types of documentation that should be developed as part of a commissioning effort. This supporting information will jump-start the user and help to ensure a successful project. Some of the material presented here is extracted from this guide.

How does the Retrocommissioning Process Differ from the Commissioning Process?

There are some major differences between retrocommissioning and commissioning for new construction or new installations. There are also many similarities. For the most part, the purpose of new-building or new-installation commissioning is to *provide assurance* that the design intent and owner operating requirements are met. On the other hand, retrocommissioning focuses on *improving* comfort and *optimizing* equipment function in existing buildings.

Table 1 provides a summary comparison of the processes for commissioning new construction and retrocommissioning. The Table includes the phases for each process along with some of the primary tasks performed during each phase. Many of the tasks performed are much the same for both. However, two major differences are immediately noticeable when looking at Table 1. For retrocommissioning, no design phase activities are involved and building documentation is not always readily available, meaning the commissioning provider and building staff must recreate or update much if not all of it.

Table 1: Retrocommissioning Process vs New-Construction Commissioning Process

Retrocommissioning (Existing Equip.)	New-Construction Commissioning
1. Planning Phase ⇒ Develop commissioning objectives ⇒ Hire Commissioning Provider ⇒ Review available documentation ⇒ Develop retrocommissioning plan	**1. Conception or Pre Design Phase** ⇒ Develop commissioning objectives ⇒ Hire Commissioning Provider ⇒ Develop design phase commissioning requirements ⇒ Choose the design team
Retrocommissioning has no Design Phase Activities.	**2. Design Phase** ⇒ Commissioning review of design intent ⇒ Write Commissioning specifications for bid documents ⇒ Job awarded to Contractor ⇒ Develop commissioning plan
2. Investigation Phase ⇒ Perform site assessment ⇒ Obtain or develop missing documentation ⇒ Develop and execute diagnostic monitoring and test plans ⇒ Develop and execute functional test plans ⇒ Analyze results ⇒ Develop Master List of Deficiencies and Improvements ⇒ Recommend most cost-effective improvements for implementation	**3. Construction / Installation Phase** ⇒ Gather and review documentation ⇒ Hold commissioning scoping meeting and finalize plan ⇒ Develop pre-test checklists ⇒ Startup of equipment / perform pre-test checklists to assure readiness for functional testing during acceptance
3. Implementation Phase ⇒ Implement repairs and improvements ⇒ Retest and remonitor for results ⇒ Fine tune improvements if needed ⇒ Revise estimated energy savings calculations	**4. Acceptance Phase** ⇒ Execute functional tests and diagnostics ⇒ Fix deficiencies ⇒ Retest and monitor as needed ⇒ Verify operator training ⇒ Review O&M manuals ⇒ Building / retrofit accepted by owner
4. Project Hand-Off and Integration Phase ⇒ Prepare and submit final report ⇒ Perform deferred tests (if needed) ⇒ Develop Recommissioning Plan / Schedule	**5. Post-acceptance Phase** ⇒ Prepare and submit final report ⇒ Perform deferred tests (if needed) ⇒ Develop recommissioning Plan / Schedule

The Roundtable Session

The roundtable will start with a short description of purpose and definitions. Most of the time will be spent in discussion, which will, as time allows, be directed at the following issues:

- What do you perceive retrocommissioning to be?
- Experience and rules-of-thumb on benefits and costs of retrocommissioning
- How much retrocommissioning is being done now?
- Key motivations of owners or managers who choose to retrocommission
- Selling and promotion, who needs to be convinced?
- Screening of buildings, what is needed to start and have success?
- Key results that raise the desire for more retrocommissioning
- Moving from single buildings to organization-wide efforts
- How does retrocommissioning fit into this conference?
- What other national-level efforts are needed?