

HOSPITAL RECOMMISSIONING BOILER ROOM FACILITY MANAGEMENT INTEGRATED PROJECT DELIVERY

This month's B2B will focus on an 800,000-square-foot existing in-patient health care facility committed to recommissioning its boiler room operation and maintenance management to maintain a highly performing, safe boiler plant environment. For this test the term recommissioning will be used because the installation was originally designed and built 30 years ago, and this is the start of a new quality control initiative under the phrase "recommissioning of the existing boiler plant" to be safe and clean with proper documentation. Please also refer to this month's Tomorrow's Environment, where a walking tour of the boiler plant is discussed.

This quality control initiative will be built around the project delivery method titled integrated project delivery (IPD) based on 2015 *ASHRAE Handbook — HVAC Applications*, chapter 58 (Integrated Building Design and Building Operation). This IPD team shall include the health care system owner, facility manager, health and safety officer, boiler plant manager, boiler plant O&M staff, and owner representative responsible for managing the recommissioning of the boiler plant in its entirety. The IPD team will also bring on an HVAC service contractor and a third-party commissioning and testing, adjusting, and balancing (CxTAB) consultant to demonstrate the boiler hot water heating system in its entirety.

The team will review chapter 8 (Healthcare Facilities), chapters 36-43 (Building Operation and Management), and chapter 59 (HVAC Security). In addition, the team will refer to the 2016 *ASHRAE Handbook — HVAC Systems and Equipment* for information pertaining to equipment that may be found in a boiler plant (e.g., chapter 32 on boilers). This information combined with the owner's own knowledge of operating a health care facility central boiler plant will assist the IPD team in understanding the intricacies of owning, operating, and managing this building.

With all these design guidelines from ASHRAE, the IPD team discussed specific building standards that need to be reviewed for this project as well as the project's scheduling/timeline. For the facility operation, with in-house staff and not an outsourced group, the staff will receive quality control training as it pertains to data collection, data analysis, and creation of "walk-around" survey checklists followed up by pertaining O&M, training, safety training, general housekeeping practices, preventive maintenance work order systems, and energy operating budgets.

In the Phase 3 Concept Development of the IPD project, the facility manager and a few of her O&M technicians will want to contribute information to the design team member's writing of the numerous survey checklists and include essential plant management, including service contracts, parts inventory, record drawings, and owner's manuals.

Following the conceptual phase, the IPD team will eliminate the traditional next phases and replace them with the data collection/survey phase, documented results phase, and functional performance test (FPT) phase (recommissioning of the boiler system sequence of

operation). In recommissioning FPT phases, the O&M staff will want to be proactive in following along with the IPD team's HVAC contractor and the third-party CxTAB balancer to document the hot water data (gpm and pump head) and receive a refresher course on the hot water system, set points, etc. **ES**

Once this system has received a rebalancing of the hot water heating system, including the cleaning out of all water strainers before the balancing, the HVAC contractor and the third-party consultant will begin the FPT system demonstration to the IPD team. During this system demonstration, the O&M staff will assist in making necessary adjustments to the controls and the building automation program based on out-of-sync controls and control system modifications based on historical data and lessons learned. All of this will be documented in the CxTAB final recommissioning report and become part of the quality control annual training that will also include review of O&M manuals and record drawings. The boiler plant BAS operation will begin collecting system performance by trending pertinent HVAC system components including the following:

- Outdoor air dry bulb and wet bulb temperature
- Room space pressure
- Primary hot water supply and return temperature
- Secondary hot water supply and return temperature
- Flue stack exhaust temperature
- Pressure differential across each boiler
- Pressure differential across each primary and secondary pump
- Alarms
- Off-site internet computer control interface

Taking the same approach as the design engineering team, the facility manager's personnel will use a series of computer-generated touchscreen project checklists that allows her staff to confirm that the following facility files have been collected. This process should start at the beginning of data collection/survey phase. During this same phase, the O&M staff and the CMMS system operator will review the equipment database populating this work order system. Part of this review will include touchscreen O&M checklists to confirm the following documents existing in the work order database:

- Equipment shop drawings
- O&M manuals, parts list, and lubricants
- Troubleshooting tips
- Remote monitoring instructions

The O&M staff should review the record drawings that are kept in the boiler plant management office to confirm record drawings reflect the current existing conditions e.g., plate and frame process heating system added to the boiler hot water heating system four years earlier. Touchscreen survey checklist will include:

- Location of automatic ventilation dampers
- System flow diagrams
- Equipment and control devices
- Access for servicing equipment

The training process, at the end of the recommissioning, will be the first annual boiler plant session based on the various survey checklists used and will include specific FPT results sequence by sequence e.g., system off, system at minimum load. The water rebalancing report will be completed and included in the final TAB report. The touchscreen training checklists should include:

- Equipment
- System
- Emergency plan
- Automatic controls
- Energy management



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