



Investing in re-commissioning at Cross Cancer Institute pays big dividends

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The Cross Cancer Institute in Edmonton, Alberta is the comprehensive cancer centre for northern Alberta and a lead centre for the province-wide prevention, research and treatment program, providing advanced medical and supportive cancer care, patient and professional education.

The team at Mackenzie Hospital had a challenging problem on their hands. Their Cross Cancer Institute (CCI) facility was experiencing air delivery and cooling issues during shoulder and summer seasons in the lower levels (Level 0, 1 and 2) of the building.

Adding to their concern was the fact the main air handler array serving the facility had no redundancy built in, meaning an air system could not be shut down for maintenance, or any other reason, without impacting air flow to CCI and thus causing an adverse effect on clinical programs and patient comfort and safety.

After numerous attempts failed to rectify the problems, including increasing existing fan flows to maximum capabilities, a request was

made for a capital expenditure to fund the purchase and installation of a new air handler, estimated to cost approximately \$500,000: this in addition to extensive down time and disruption to research and treatment activities at CCI.

It was clear that with health care dollars being as scarce as they are and in such high demand elsewhere in the system, a project of this nature could take years to be approved. In the interim, user space would continue to get worse from a ventilation perspective and occupant dissatisfaction would remain. The decision was finally made to put the facility through a re-commissioning process focusing on the air handlers and the delivery of air to the lower floors in CCI.



Re-commissioning pays big dividends



Re-commissioning activities related to air handling units at the Cross Cancer Institute resulted in annual energy savings of over \$240,000 and greatly improved indoor environmental quality.

Re-commissioning is a continuous re-optimization process for existing buildings focusing on improving or optimizing system performance while at the same time identifying operational improvements; maximizing energy efficiency, comfort and savings.

Focus was on the air handler array, a group of seven air handlers serving duct shafts to the five story, 43,366 M² facility. Of major concern were the array pressure drops, the duct riser's pressure profile and the operation of the terminal units on each floor.

Re-commissioning, which typically focuses on low- and no-cost actions/items to achieve efficiencies, was done using in-house technical forces to keep costs to a minimum. The implementation process entailed:

- Review of original design intent
- Review current operational requirements
- Perform baseline testing of the air system, risers and occupied floors considering air flow and pressure drop looking for improvement opportunities
- Document all changes and make adjustments as necessary to the digitally-controlled building management system
- Continue with ongoing assessment and monitoring

Areas of concern requiring attention during re-commissioning:

- High pressure drops across existing filter banks
- Switching v-belt drives to more efficient cog drives
- High pressure drops in fittings and take-offs on high and medium velocity ductwork
- Incorrect testing, adjusting and balancing (TAB) calibrations
- Inaccessible and dirty flow measuring stations
- Change in user occupancy loads resulting in increased or decreased requirements



This publication possible thanks to financial support from the Ontario Trillium Foundation. The Ontario Trillium Foundation is an agency of the Government of Ontario. La Fondation Trillium de l'Ontario est un organisme du gouvernement de l'Ontario.

The CCI redevelopment project of 20 plus years ago left the building with insufficient air and a lack of redundancy to shut one of the air handlers down for maintenance without negatively impacting clinical and support service space.

Summary of benefits for the re-commissioning initiative:

Direct:

- Yearly energy savings currently in the order of \$240,000 greatly lowering operating costs
- Improved system performance addressing problems of proper air delivery
- Avoidance of a \$500,000 capital cost expenditure permitting retention of funds for much needed patient care programs

Indirect:

- Improved indoor environmental quality [IEQ] for patients/staff
- Elimination of need for new air handler saving capital health care dollars
- Increased equipment life due to greatly reduced operating speeds
- Recovered system redundancy reducing the impact of required maintenance shut downs to clinical spaces

The re-commissioning process provides significant potential in health care facilities to achieve both energy and dollar savings, and improved system performance. Whether referred to as 'commissioning,' as in new construction, 're-commissioning/retro-commissioning' or simply 'setting systems up to run at optimum operational levels,' it can provide significant savings in all types of buildings including health care.

As a result of this project, the Mackenzie Hospital team garnered significant cost savings and reductions in emissions, reinforcing the potential to save scarce health care dollars by continually focusing on operational improvements.

Savings associated with re-commissioning project at the Cross Cancer Institute:

- The realized savings based on reduced electrical and heating costs is in excess of \$240,000.00 annually
- Carbon emissions have been reduced by 1,437 tonnes, methane emissions by 0.431 tonnes, and NO₂ emissions by 12.933 tonnes

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