CASE STUDY

EXISTING BUILDING COMMISSIONING

Recommissioning (RCx) of the Centre for Human and Animal Health Building (H-Block)

Project Summary

Building Name/Type: Public Health Agency of Canada – National Microbiology Laboratory of the Canadian Science Centre for Human and Animal Health (CSCHAH)

Location: 1015 Arlington Street, Winnipeg, MB

Project Year: 2019

Main Project Objective: Greenhouse gas (GHG) emissions reduction

Commissioning Scope: All systems in the H-Block are concerned. The new measures may take over a year to implement, however the delay will not exceed the two-year time limit. Some measures may require the help of a building automation system (BAS) technician, while other measures may only require the building operations staff.

Size of Commissioned Area: 92,536 sq. ft.

Total Commissioning Investment:

- RCx provider: 92,000$
- Measures implementation: 0$ (in-house)

Measured Results

ENERGY COST SAVINGS
$59,740 per year (8.8%)

SIMPLE PAYBACK
1.5 years

ENERGY SAVINGS
282,599 m^3 natural gas (17.8 %)
483,383 kWh electricity (6.2%)
12 441 GJ in total per year (14.12%)

GHG EMISSIONS SAVINGS
859 $eTCO_2$ per year

WHAT IS RCx?

Recommissioning (RCx), along with other terms such as retro-commissioning (Re-Cx) and ongoing commissioning (OCx), are part of a broader concept known as existing building commissioning (EBCx).

The RCx process represents a cost-effective investment to ensure that a building operates optimally and as intended based on its current use. RCx:

- Provides a better environment for occupants
- Reduces indoor air quality issues
- Reduces the number of occupant complaints
- Reduces contractor call-backs and warranty issues
- Reduces energy consumption and operational costs

Project Overview and Background

The CSCHAH H-block was built in 1997, in Winnipeg. It is one of the Public Health Agency of Canada – National Microbiology Laboratory buildings in Manitoba. The H-Block is divided into three parts: North, Center and South, connected with a main corridor. The five-storey building of 8,600 m^2 with above-ground parking and a common mechanical penthouse accommodates about 300 employees. The main corridor contains offices and non-lab function areas; the rest is the lab zone. The building's annual energy bill before RCx was undertaken was about $672,247, from August 2018 to July 2019. The building is 85% occupied according to 2019's RCx data.

Project Scope of Work

Completed in 2019, the RCx project reducted the energy bill by 8.8% and focused mainly on the following electromechanical systems:

- **Heating:** Steam heat exchangers, glycol primary pumps, hot water pumps, variable frequency drives, and hot water valves.
- **Cooling:** The building's central cooling plant is in the central power station (P-Block). It provides chilled water to the entire building.
- **Ventilation:** Make-up air handling units (100% outside air)
- **Exhaust systems:** General exhaust fans, laboratory fans
- **Control:** The ABB Building Automation System

The project covered all four phases of the RCx process, including Planning, Investigation, Implementation and Persistence.

Project Management

The building operations team is experienced in RCx since it is not the first time they undertake such a project. The work requires BAS programming modifications to program new trend logs and to modify some of the existing ones. The RCx provider provided a scope of work describing all stages of the RCx project from planification to persistence strategies. However, since in-house BAS operations staff have the expertise to perform programming and implementation, no contractor was needed during this phase. The RCx provider assisted by supplying a description of the individual energy conservation measures to be implemented, as well as the implementation methods and acceptance criteria used to determine correct performance. To modify system operations, the work was performed by operations staff following direction provided in the RCx provider's scope of work.

Challenges Encountered

- The fact that this is a high-security facility required careful planning and close coordination between the RCx provider and site management.
- The confidential nature of site operations prevented some documentation to be provided to the RCx provider.

Stages	Start Date	End Date	Duration
Planning	March 2019	June 2019	4 months
Investigation	July 2019	November 2019	5 months
Implementation	January 2020	May 2020	5 months
Persistence	January 2020	December 2020	1 year

Implemented Measures & Results

The implementation plan provided by the RCx provider contained 20 measures, but only 7 of them were selected by the building operators for this phase of project:

- Reset reheat water temperature based on outdoor air temperature.
- Reduce air change rates during unoccupied hours.
- Rebalance all fume hoods and biological cabinet sashes.
- Shut down steam supply to humidifiers and glycol during the summer.
- Revise stairwell vestibule temperature.
- Revise lighting control system schedule.
- Retrofit stairwell vestibule pot lights with LEDs.

Project Benefits

The RCx process allowed to reduce site energy costs.

Seeing as the project covered many potential initiatives, the building manager can use the list of recommendations and their status as review points during their Sustainable Development Initiative (SDI) meetings.

This study provided additional measures for future consideration that can help reduce and optimize more energy.

This RCx project helped to prioritize different measures that were undertaken because the provider's suggestions were on point.

Lessons Learned

- Time management is necessary from the beginning for future similar RCx projects.
- Limited availability of on-site internal staff must be acknowledged during the scheduling process.
- Integrating more ongoing commissioning measures on a daily/monthly/yearly basis on site is beneficial for long-term maintenance.
- Implementation of RCx measures can successfully be done in-house if experienced and technically knowledgeable resources are available. These resources should be involved during the investigation phase as much as possible.

PROJECT PARTNERS/TEAM:

Client (Building Owner/Manager): Public Health Agency of Canada – National Microbiology Laboratory (H-Block Building) of the Canadian Science Centre for Human and Animal Health.

Recommissioning Provider: WSP Canada Inc.
Technical Support: Natural Resources Canada – Greening Government Operations

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