

Comfortable Performance

Retro-Commissioning Building Operations

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Building owner's challenges

- Tenant comfort
- Operating cost
- Equipment Condition and Life Cycle
- Environmental impact

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- **Tenant comfort**
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NRCan - RCx Definition:

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Comfort + Building Performance = Comfortable Performance

Building Operators

- Successful Building Operator requires:
 1. Knowledge
 2. Time
 3. Tools
- RCx will
 - develop tools
 - improve knowledge

Knowledge

- Problem troubleshooting
- New controls strategies
- Equipment schedule optimization
- Comfort improvements

Tools

- Actuator and system testing
- Sensor Calibration
- Use of Building Automation trends
- Use of data-loggers

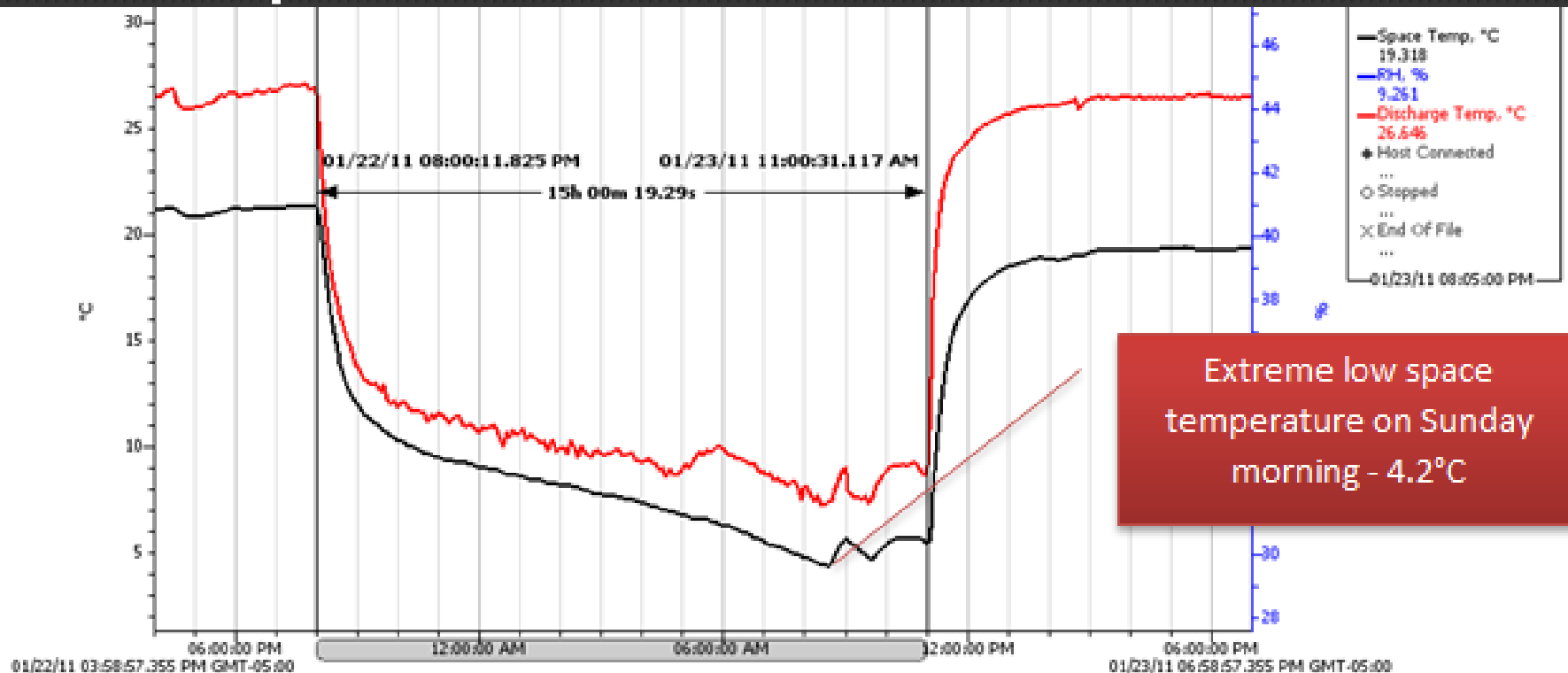
BAS Contractor

- BAS Service Contractor = Operations Staff
responsible for “Comfortable Performance”

Example 1

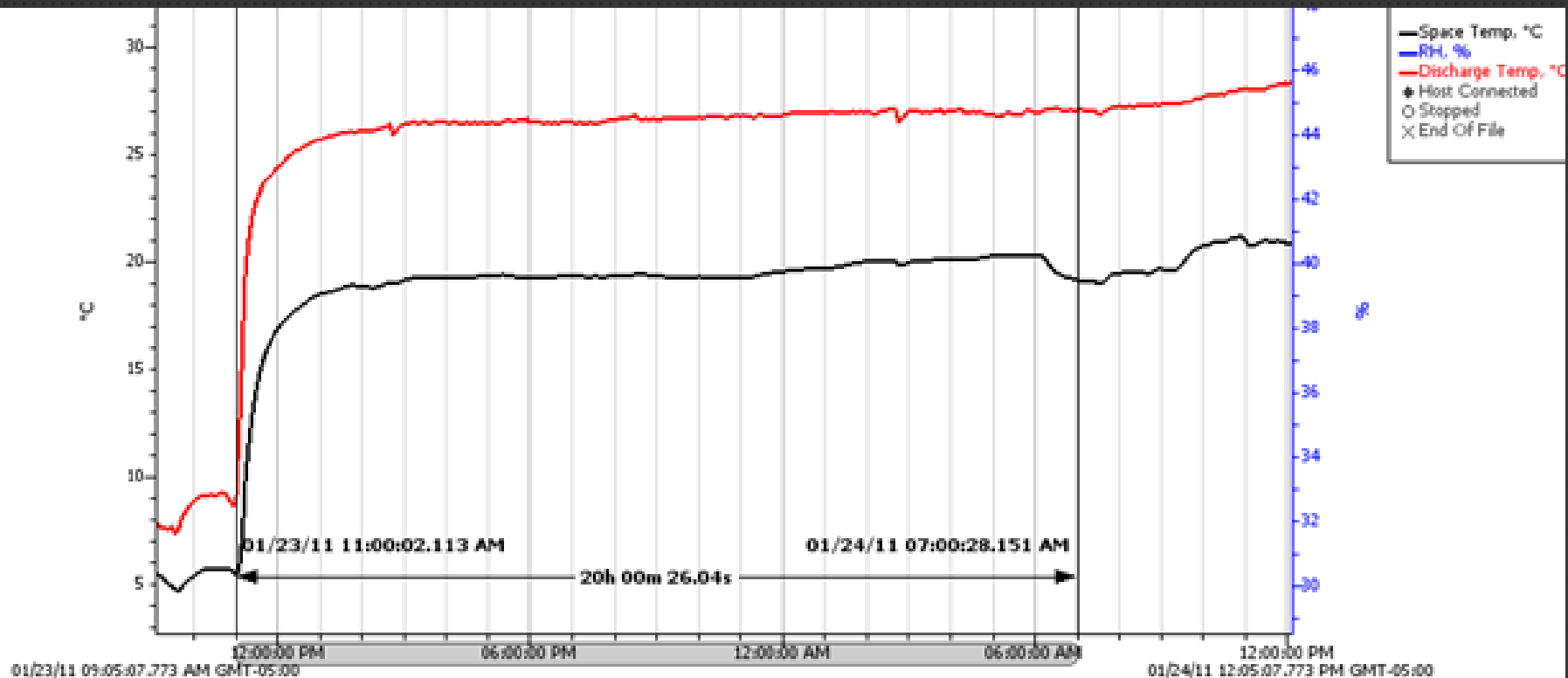
- Problem
 - Monday morning “too cold” complaints
- Solution
 - Heating system start-up on Sunday at 2:00pm

Example 1



Over the 15 hours of shutdown the space temperature dropped continuously, from a high of 20.6°C to an extreme low of 4.2°C.

Example 1



Continuous system operation for 20 hours prior 07:00 AM Monday morning.

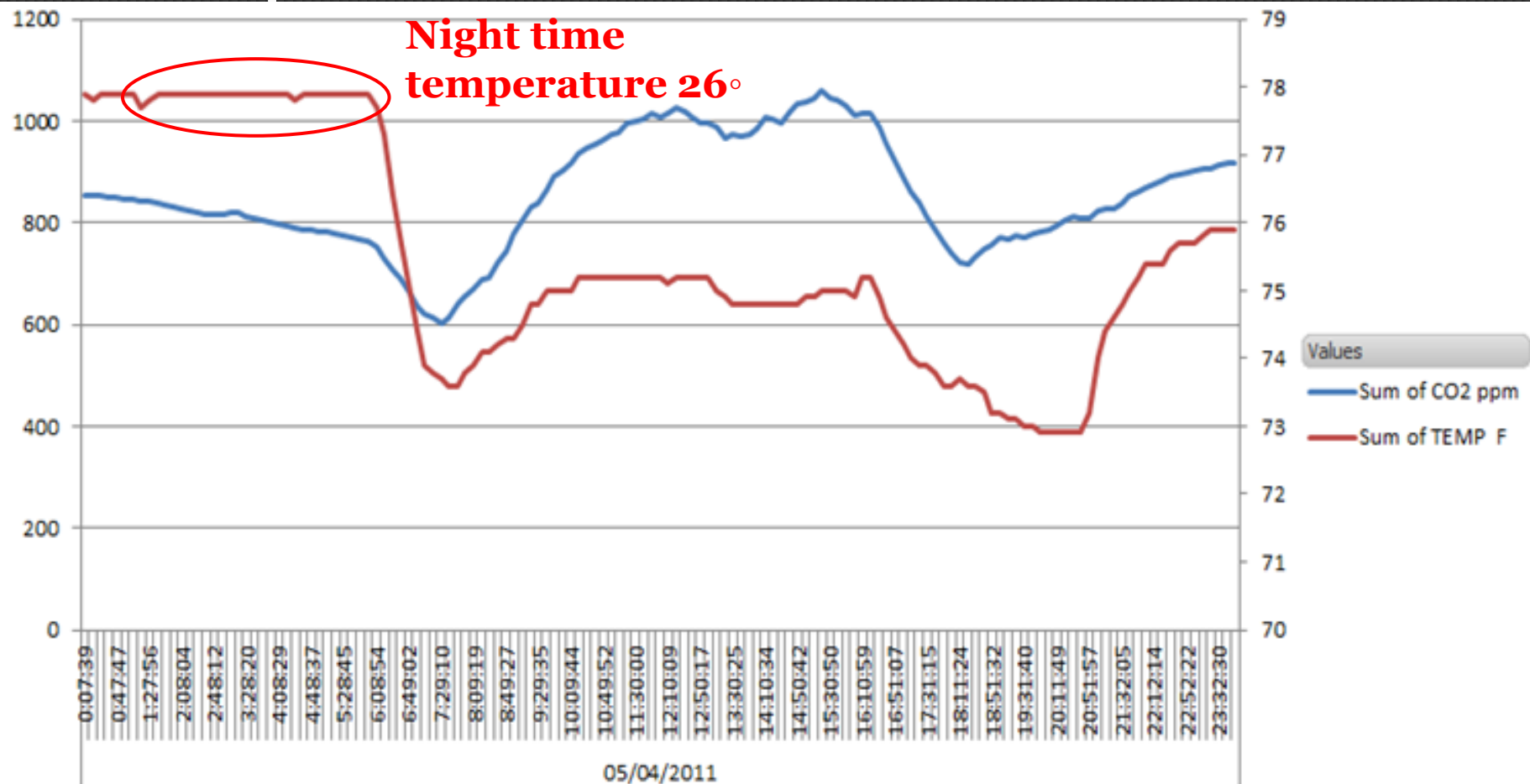
Example 1

- Problem
 - Monday morning “too cold” complaints
- Solution
 - Heating system start-up on Sunday at 2:00pm
- RCx Investigation
 - Tenant MAU running 24x7 with no heat (space temperature dropped to 5°C)
- Solution
 - Advise tenant and repair defective unit
 - Implement Optimum Start / Stop

Example 2

- Problem
 - Constant indoor air quality complaints
- Solution
 - Increased fresh air volume

Example 2



Example 2

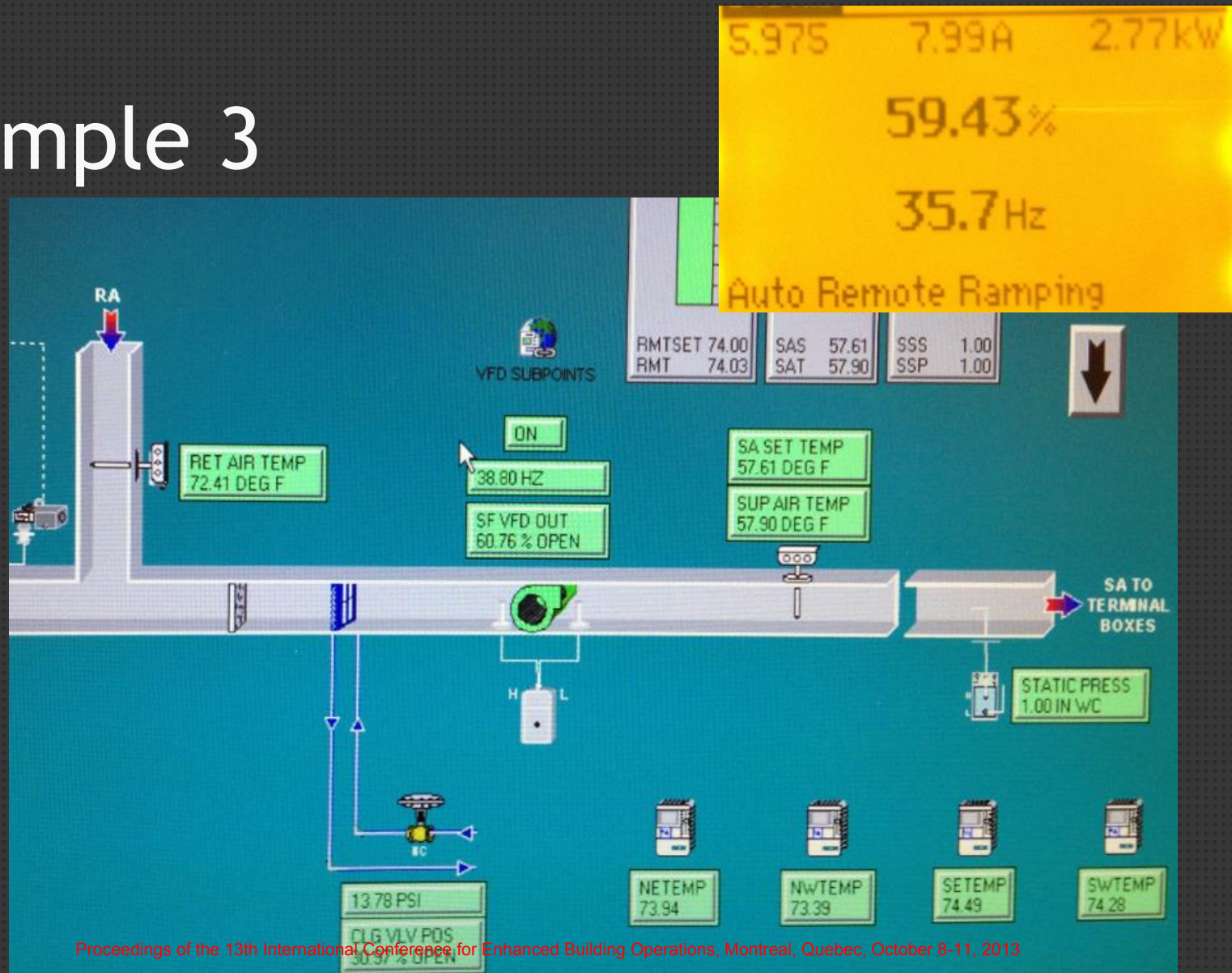
- Problem
 - Constant indoor air quality complaints
- Solution
 - Increased fresh air volume

- RCx Investigation
 - Overnight over-heating the space to 26°C
- Solution
 - Repair faulty heating valves

Example 3

- Problem
 - Indoor air quality failure and too hot complaints
- Solution
 - Increased MAU fresh air volume

Example 3



Example 3

- Problem
 - Indoor air quality failure and too hot complaints
- Solution
 - Increased MAU fresh air volume
- RCx Investigation
 - VFD running at low speed, Static Pressure sensor faulty
- Solution
 - Replace faulty sensor and rebalance fresh air

Comfortable Performance

- Operator training plan:
 - Investigation of comfort problems
 - Energy efficient control strategies
 - Sequence of operation
 - Equipment testing
 - Sensor Calibration

Comfortable Performance

- BAS Service Contracts
 - Preserve comfort and improve performance
 - Building and system specific
 - Open for amendments as required
 - Detailed scope of work, task description and frequency
 - Requirement for Continuous Improvement

Comfortable Performance

- Focus on building operator
 - Knowledge
 - Tools
 - Time
- BAS contractor involvement

Thank you!

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