

SISTEMAS DE ÁGUA GELADA



PROGRAMA
BRASILEIRO DE
ELIMINAÇÃO DOS

HCFCs
Projeto para o Gerenciamento de Chillers

Projeto Demonstrativo para o Gerenciamento Integrado no Setor de Chillers

FIELD EXPERIENCES IN EXISTING BUILDING COMMISSIONING

Craig A, Hawkins, CxA, CCP – BCA
28/04/2016 – São Paulo

Execução



Implementação



Empoderando vidas.
Fortalecendo nações.

Realização

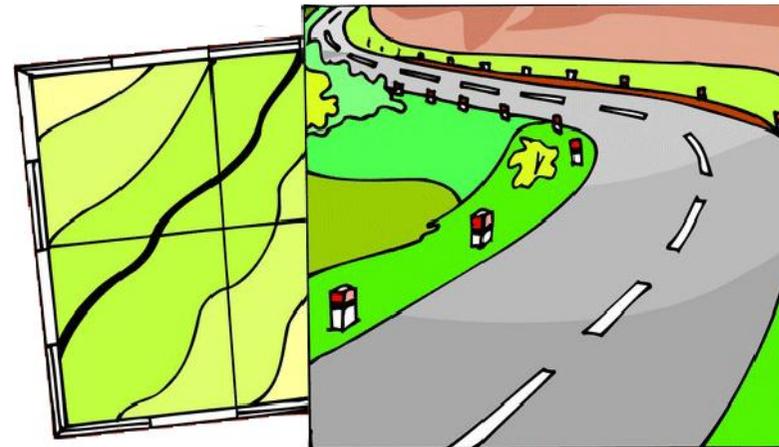
Ministério do
Meio Ambiente



Field EBCx – Session Overview



- Experience = Advice
- Expectations
- Discoveries
- Root Causes
- Challenges of EBCx



Experience = Advice



EBCx Rule #1:

Be Ready For Anything!!

Be Ready For Anything



Minimum OSA Setpoint??

Be Ready For Anything



Eliminating coil SP loss??

Be Ready For Anything



Who needs blade seals??

Be Ready For Anything



IAQ?? Lead paint/Asbestos

Be Ready For Anything



Black filter media??

Be Ready For Anything



Didn't anyone notice??

Be Ready For Anything



Want to borrow my belt??

EBCx Expectations



EBCx Rule #2:

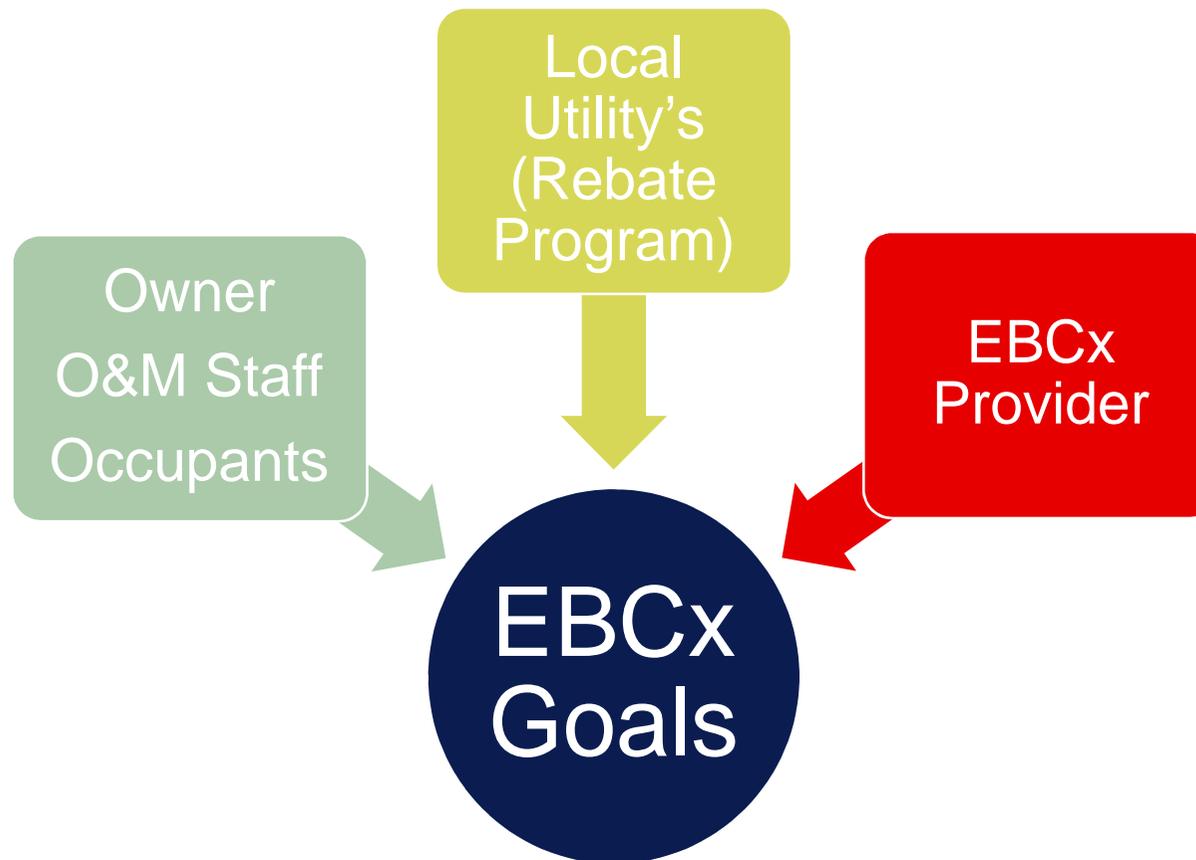
**Everyone wants to save
energy...**

(...I mean, everyone SAYS they want to
save energy)

EBCx Expectations



Everyone is fully supportive of EBCx



EBCx Expectations



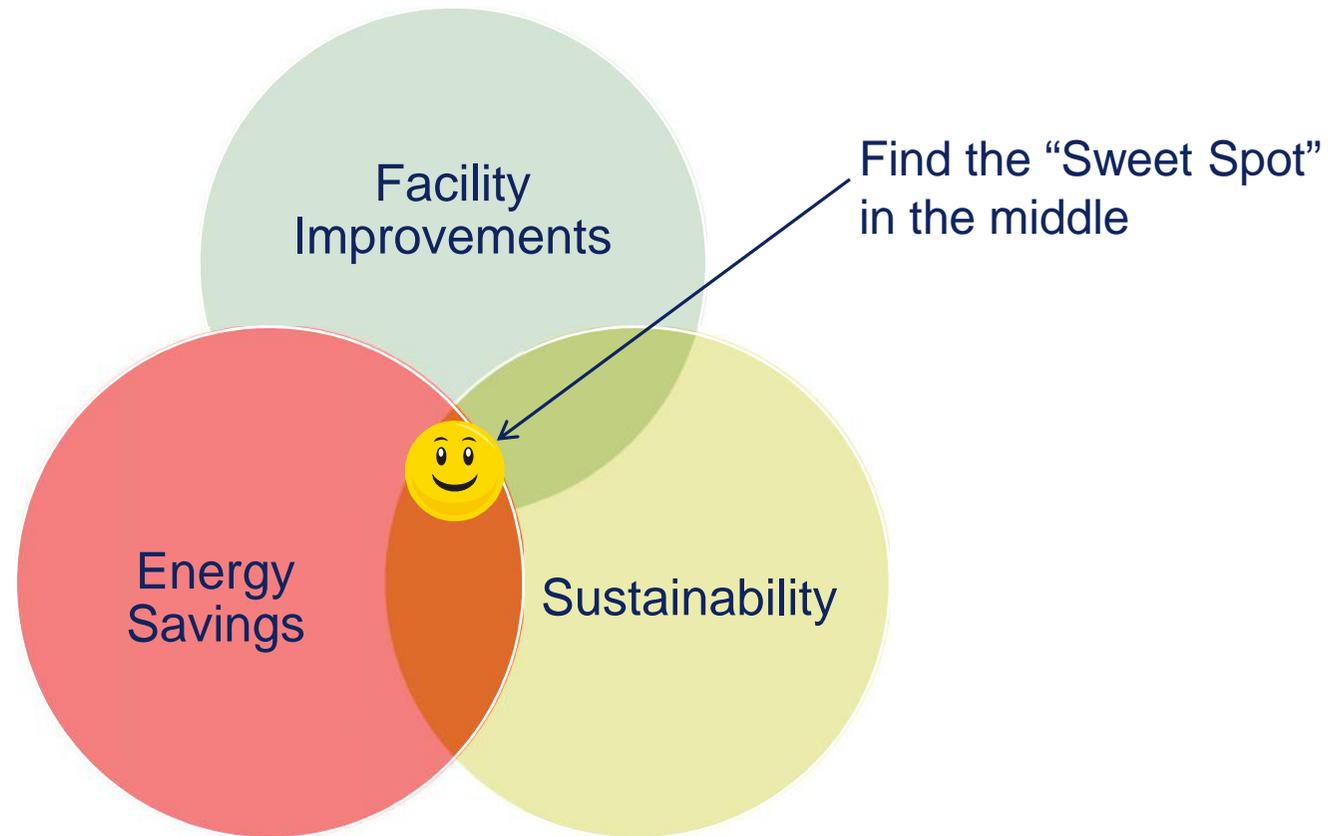
Everyone is on the same EBCx page, right?



EBCx Expectations



Finding common ground



EBCx Discoveries



EBCx Rule #3:

**Use all your senses when
investigating...**

(...well, maybe not the sense of taste)

EBCx Discoveries



Physical Review

- “Touch” each piece of MEP equipment
 - Use all your senses (except taste)
- Document current equipment conditions
 - Important to establish life-cycle condition
- Document current maintenance practices
 - Or lack thereof (in most cases)
- Document signs of “hidden” issues
 - Stained ceiling tiles



EBCx Discoveries



Facility Analysis

- Physical Review
 - O&M Review (Maintenance Logs / Procedures)
 - Diagnostic Monitoring / Trends Review
 - Functional Performance Testing
- **When conducting a facility assessment, the most important question to ask is... “WHY?”**
- Why is this piece of equipment in this condition?
 - Why is it operating (right now)?
 - Why is it not operating (right now)?
 - Why is it configured the way it is?
-**Never stop asking “WHY?”**



Root Causes



What happened that triggered EBCx?



© Jim Kazanjian

Root Causes



Common reasons that cause the need for EBCx:

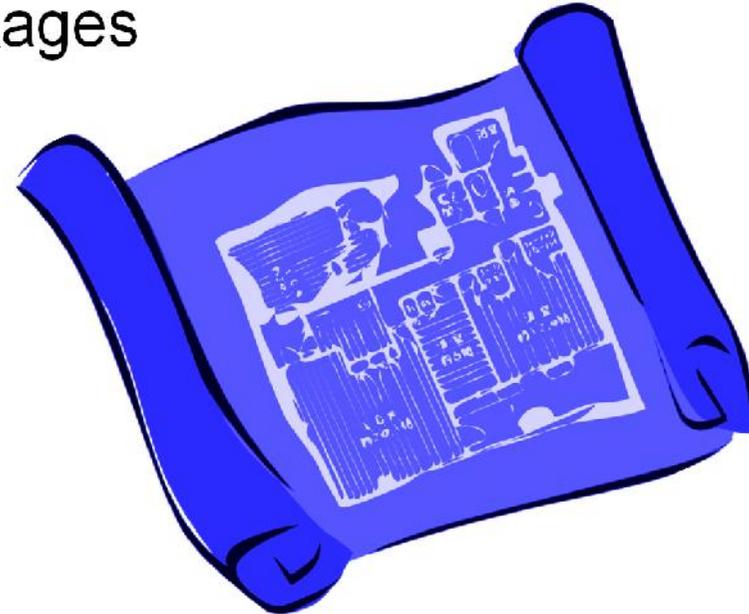
- Design
- Installation
- Sequence of Operation
- Maintenance

Root Causes



Common reasons that cause the need for EBCx:

- Design
 - Errors in original design
 - Design that does not follow an OPR
 - Incomplete design packages



Root Causes



Common reasons that cause the need for EBCx:

- Installation
 - Installation that does not match design
 - Unauthorized field changes



Root Causes



Common reasons that cause the need for EBCx:

- Sequence of Operation
 - Unfinished Sequences
 - Cut & Paste language “borrowed” from another project
 - Incomplete Sequences



Root Causes



Common reasons that cause the need for EBCx:

- Maintenance
 - Incorrect Maintenance
 - Ignored Maintenance
 - Band-Aid Maintenance
 - Poor O&M Staff Training



Challenges of EBCx



Common challenges of EBCx:

- Owner Expectations
- Acceptance from O&M Staff
- Lack of documentation
- Potential improvements versus budget limitations

What's The Issue Here?



Lubrication leaks:

Questions:

- Improper type of lube?
- Blown seals?
- Too much lube?

Answers:

- Yes
- Yes
- Yes

What's The Issue Here?



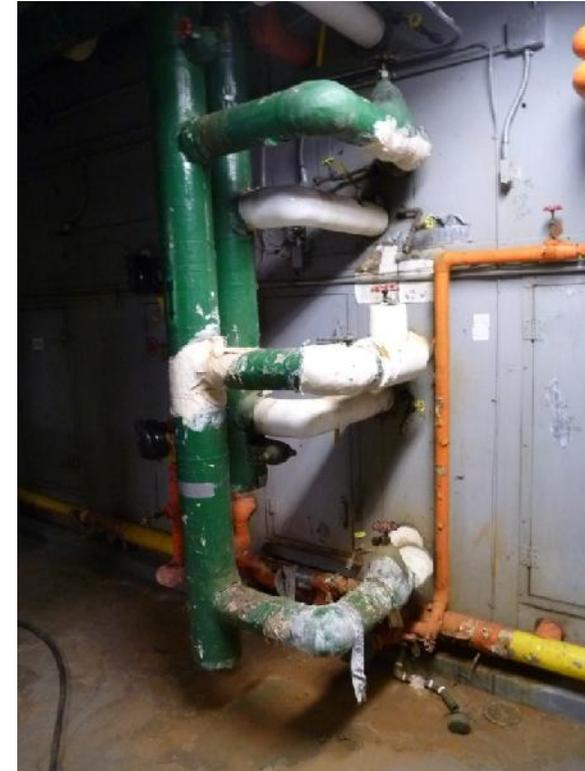
Maintenance Records:

- Strainer checked every 6 months
- Installation over 10 years old

Reality:

- Rusted bolts show no maintenance
- Insulation jacketing covering bolts, preventing maintenance

Be Ready For Anything



Be Ready For Anything



All metal fuses??

EBCx – Chilled Water System



Water Treatment??

SISTEMAS DE ÁGUA GELADA



PROGRAMA
BRASILEIRO DE
ELIMINAÇÃO DOS

HCFCs
Projeto para o Cumprimento de CILBERT

Apoio Institucional:



Execução



Implementação



Empoderando vidas.
Fortalecendo nações.

Realização

Ministério do
Meio Ambiente

