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Commissioning The Gift that Keeps Giving

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Building Facilities Management and the Value of Commissioning

- Brief History –Current State
- What's Driving Complexity?
- “Gift” That Keeps Giving



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Historical Facilities Management

“Keep the lights on and the costs low”

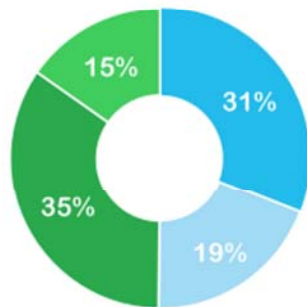
Key Performance Metrics

- Utilities bills
- Repairs and Maintenance costs
- Service calls/customer sat

Building Management Approach



Please select the statement that best describes your current approach to maintaining building systems.



- Very reactive, fix equipment when it breaks
- Largely reactive break/fix, some regular preventive maintenance
- Proactive, conduct regular preventive maintenance on equipment
- Full utilization of predictive maintenance tools to assess and target equipment maintenance efforts along with regular preventive maintenance

Facility Managers are still split between taking a proactive versus reactive approach to building maintenance.

This is especially exemplified amongst Facility Managers responsible for larger buildings as they are nearly twice as likely to categorize themselves to have a reactive management style



63%

>500,000 SF



40%

<500,000 SF

Takes a very reactive or largely reactive approach



What's Changing?



➤ Green Building Initiatives

Buildings are a major source of energy consumption

- 32% of global final energy use
- 30-40% of Greenhouse Gas emissions
- 75% of existing buildings are energy INEFFICIENT!

➤ Industry 4.0

➤ IoT- Internet of Things

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Global Green Building Initiatives



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The (EPBD)2016 'Clean Energy for All Europeans' Goals

- Make new buildings as energy efficient as possible by 2050
- Boost renovations
- Introduce smarter ways of monitoring energy performance and air quality conditions
- Boost electrical recharging and parking infrastructure for electro-mobility.

United States

- USGBC –LEED
- DOE/GSA
- IECC 2015
- State & Local Code

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Global Green Building Initiatives



- Drive regulations and code changes impacting new construction
- FOLLOWED BY REPORTING OF RESULTS AND MONITORING OF OPERATIONS
- Require Building Commissioning

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What is Commissioning?

Building Commissioning is the Owner's Quality Process.



The UK-based Chartered Institution of Building Services Engineers (CIBSE) defines Cx as:

The advancement of an installation from the state of static completion to full working order to the specified requirements. It includes the setting to work of an installation, the regulation of the system and the fine tuning of the system.

ASHRAE defines Cx as:

A quality-focused **process** for enhancing the delivery of a project. The process focuses upon **verifying and documenting** that the facility and all of its systems and assemblies are planned, designed, **installed, tested**, operated, and maintained to meet **Owner's Requirements**.

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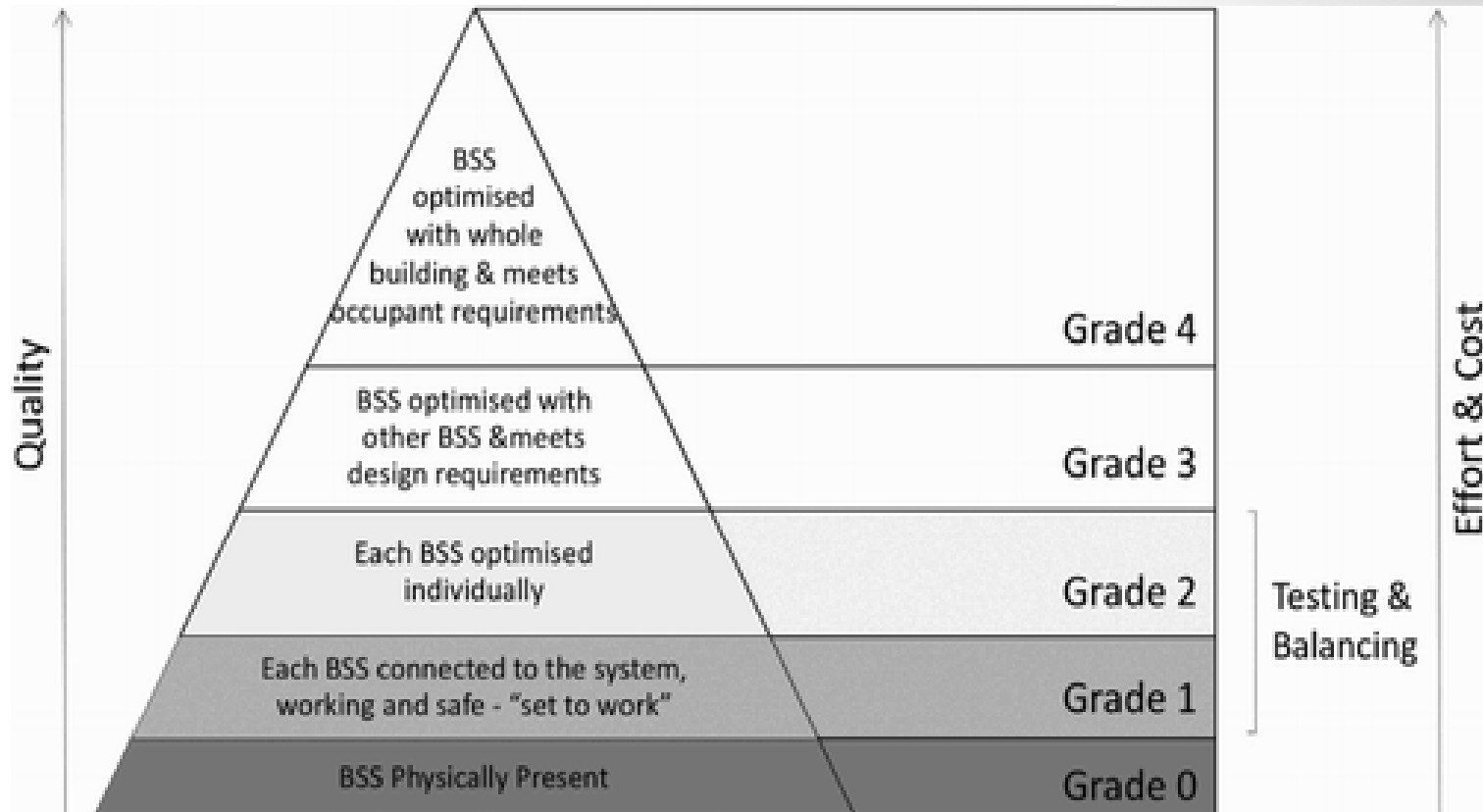
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Cx Provides Building Systems Knowledge



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Meeting Facilities Management Needs



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DESIGN

- Include M&O Requirements in OPR
- Measurement & Reporting Needs

CONSTRUCTION

- Review Submittals
- Verify Installation/Operations

WARRANTY/ TURNOVER

- Systems Training
- O&M Manuals
- SYSTEMS Manuals
- Re-Commissioning

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Meeting Facilities Management Needs



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COMMISSIONING

- New Buildings
- Verification
- Documentation
- Training
- O&Ms
- OPR

Re- COMMISSIONING

- Recurring Process
- “Tune-up”
- Continuous Cx

RETRO COMMISSIONING

- Existing Buildings
- Identify & resolve problems
- Low hanging fruit
- Improve O&M

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Why Retro Cx?

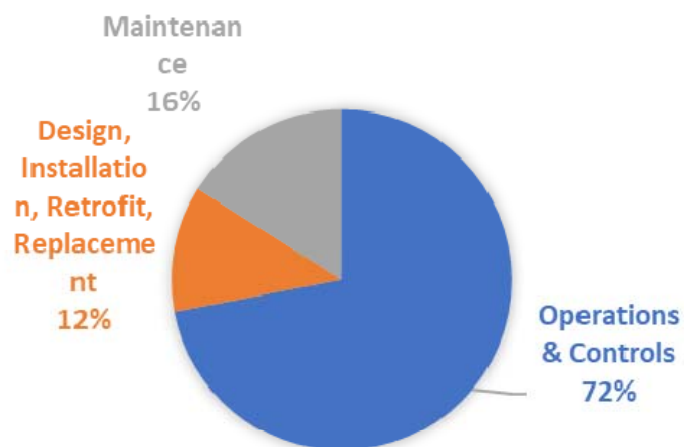
- Never had TAB
- Changes in building occupancy or usage
- Systems drift
- General systems degradation
- Energy savings opportunities



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FREQUENCY OF MEASURES IMPLEMENTED IN RETRO CX



- Costs of retro -Cx range from \$0.13 to \$2.00 per square foot,
- Payback ranges from 0.2 to 2.1 years
- Overall energy savings can reach ~ 15%

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Summary



- Reactive Facilities Management will not enable us to meet our Green Building Initiatives
- Voluntary Compliance is shifting to regulations, codes, measurement & verifications, & penalties!
- Cx of New Buildings required
- Retro Cx will help bridge the gap

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³CASTELLAZZI, Luca, ZANGHERI, Paolo, PACI, Daniele (2016) Synthesis Report on the assessment of Member States' building renovation strategies, EU SCIENCE HUB
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