

Building Performance

Managing change in the HVAC&R environment

John Penny M.AIRAH

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EXISTING BUILDINGS COMMISSIONING

“Is a systematic investigation and implementation process applied to existing buildings to improve and optimize operation, maintenance and management procedures.”

A new ally for the O&M team & building owners

**Optimizing building performance
reducing energy use
and improving indoor air quality
occupancy comfort
and productivity.**

Relevant Changes in the Overall Environment

- **Maintenance industry is on the cusp of a major upturn**
- **Rising energy prices**
- **Climate change action – energy efficiency**
- **Higher expectations from building occupants**
- **Demand for Green Professionals**

“Problems we face cannot be solved at the same level of awareness that created them”

- Albert Einstein.

Solving Problems

- **You don't solve problems by wallpapering over them.**



- **They are bound to surface in time.**

Richard Fairhead - Arup

How are we going to-date?

- **Simply installing retrofits will not solve the problem.**
 - Energy efficient equipment must be tested, calibrated, controlled, verified and maintained to ensure energy efficiency is actually achieved.
- **The industry currently only has a small class of:**
 - senior practitioners who are nearing retirement,
 - few with 10 or so years of experience,
 - and many young people entering the field.

Air conditioning is so forgiving against failures.



Chiller Upgrade Failure Examples

- **Throttled valve**
- **Chilled water bypass control**



The answer?

1. Combining retrofits with efficient operation and maintenance of building systems will meet long term goals for energy efficient buildings.

2. Changing how energy is managed rather than retrofiting will achieve the most cost effective energy efficiency gains.

Action #1 – Get house in order

- **It's not 1988 or even 1999**
- **Update O&M documentation**
- **Trending & event logging**
- **Use WWWW**
- **Utility metering data**
- **Number of Occupants**



Action #2: Indoor Air Quality Sampling

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on	Interval (Months)	Explanation
Check air quality.	6	Undertake 24 hour monitoring in a number of locations as determined by the air distribution system. Monitoring should include for carbon monoxide (CO), carbon dioxide (CO ₂), temperature and humidity at a minimum.
Report air quality	6	Provide a comprehensive report detailing the test results and including recommendations on any remedial works that may be required.
Certify air quality tests	6	Provide certificate stating that the testing has been undertaken and whether it complies with an acceptable standard.

Action#3 – Sensor & Device Calibrations

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Check calibration and condition of general control and monitoring sensors.	12	Ensure temperature sensors are effectively monitoring the controlled conditions, for example they are not influenced by other heat sources, thermal contact is effective
Check operation of control linkages on dampers and valves.	3	Check operation of control linkages by ensuring that the linkages are firmly attached and by observation of operation through the full length of travel.

Action#4 Join the Fight for Green Professionals

Green professionals are needed to be trained with in-dept technical and hands-on practical applications together with forensic tools and knowledge needed to identify and correct system integration and performance problems.

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