BAS Operational Effectiveness

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What do we mean by “Operational Effectiveness”

• BAS contributing to its full potential to building operations
• Human operators allow, enable and enhance BAS functions

Why this topic?

• Is this “central brain” well utilized to make our buildings smart?
  • Is the BAS optimized to do what it is capable of?
  • Valuable repository of control routines and digitized data – accessed & used?
  • How fit into a socio-technical context of building operations?
• Literature dating back to mid-1980’s. Holy Grail? Or are we at the cusp of some new IT-informed capabilities?
How we got involved

• Continuing Ed Operator training – BOC, BRT – and interest in how BAS are used….or aren’t.
  • BRT use of trend log data converted to visualization via ECAM. Students to support building operators in this process.

• Auto-Collect BAS data with analytics from 3rd party vendor
  • Not allowed by university…..

• Now developing system-process from ground-up. Ugh! But important learning
Currently evolving paradigm: 2 sides (?)

- Machine side
  - Advanced control routines, often using external data
  - Data extraction and databases, internal or external

- Human side
  - Operators remain in control of key system functions
  - Does the operator know what the machine intends?
  - Can the operator work with data?

- Concept of CONJOINT SYSTEMS
  - Computer scientist Donald Norman
Paradigm

Extract –
Process –
Feedback

Start-up Furor
- SkyFoundry
- Building IQ
- Optimum Energy
- KGS Clockworks
- JCI PanOptics

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Operational Issues on the Machine Side

Persistent Old Issues
• Legacy systems
  • Inter-operability
  • Data capabilities
• Up-grade/replace decision
• Assessment
• Sensor calibration

Emergent New Issues
• Cyber-security
• How to “suck out the data”
• Database Feudalism
  • proliferation without shared standard
  • Re-creating the inter-operability situation

• More complex “optimizing” control routines – challenges for the human operators
Issues on the Human Side

• Limited understanding of how operators use BAS
  • Heuristics. Hesitations with major equipment. Inconsistencies.
  • Anecdotal data about manual over-rides

• Adapt to data-driven environment, new control actions
  • Operator-sensible framework. BRT?
  • Training in use of data – reading graphics, understanding advanced control strategies-modes-actions
  • Acceptance of supervisory control role with automated routines.

• What to pay attention to?
  • Avoiding TMI – guiding focus
  • KPI for Continuous Improvement process
Conclusion

• Brave New World of Building Big Data, much of which will be streaming from BAS. Our new paradigm.

• Furor & competition over “new apps” but industry is not taking adequate steps to assure common platform for data-sharing

• If what the building is doing does not make sense to the Operator, s/he will by-pass it. So need to make it transparent to an educated operator.
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