



ABSTRACT

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OPERATION PROGNOSTICS AND OPERATION DIAGNOSTICS – NEW TECHNOLOGIES FOR ENHANCED OPERATIONS AND CONTROLS

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The Methodologies of Operation Prognostics and Operation Diagnostics have been developed by the authors over the last 8 to 10 years. Today, these methodologies have been combined in an integrated approach for advanced building commissioning.

Within Operation Diagnostics, advanced visualization techniques are used to make information available, which is usually hidden in BAS trend data. Various diagrams and plot types are used to visualize the data in such a way that even large amounts of data can be comprehended and analyzed quickly. The correlation and dependencies between various operation values, as well as data frequency or other useful statistical information, is used to diagnose the operation of buildings and their systems. Due to the visual approach, even complex operation and control sequences can be analyzed, verified and optimized easily by comparing with ideal Operation Patterns.

Operation Prognostics uses expert knowledge from the design phase of systems and buildings to develop these Operation Patterns to describe the ideal dynamic behavior in a visual way. These Operation Patterns contain operation data under optimal conditions (e.g. derived from the energy model) to be compared with measured data from the BAS. Even faulty operation of systems can be modeled to obtain clues on how to interpret measured data, how to identify reasons for ineffective operation, and how to define clear measures to optimize it.

This presentation shows how Operation Prognostics and Operation Diagnostics have been applied to real world projects. Based on case studies, including LEED Platinum certified projects, the entire process will be explained, starting with the development and evaluation of control sequences during the design, the creation of Operation Patterns and the verification and optimization of the function and performance of systems and entire buildings.