

Applying Systems Engineering to Transit Facilities: Advancing Beyond "Building Commissioning"

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Abstract. The demand for increased energy efficiency and sustainable facility designs is significantly increasing the complexity of buildings. With the evolution of higher yielding energy efficient performance for heating, ventilation, and air conditioning (HVAC) systems, integration of new sustainable energy technologies and other sustainable green building systems, there is a growing need to ensure that proper systems techniques are implemented across the lifecycle of new transit facility projects. Today there continues to be advances in building automation, energy management and fire alarm/control systems for the monitoring and control of the facility subsystems and systems, which correspondingly adds to the complexity for defining the subsystems interfaces, the required level of integration, and how these interfaces and systems are verified during the construction phase of the project. As a result of this advancing complexity for many facility systems the Building industry developed the _Commissioning process_. This paper describes the evolution of the Commissioning process currently used to deploy facility systems, with a focus on the process application and its deficiencies when compared to a systems engineering approach. Case studies will be provided from New York City Transit's (NYCT) tailored implementation experience and efforts to attain more successful results by further tailoring this Commissioning process to apply systems engineering principles and activities.