

Case Study: Pneumatic Tube System Optimization through Simulation

Health Care System (HCS)

- Improved Decision Making by Modeling Complex Process

The Challenges

Most of the over 5,000 hospitals in the United States have installed a pneumatic tube system as a way to more quickly, effectively and efficiently deliver small items to many locations. When initially installed, these systems are designed for the existing conditions. However, conditions in the hospital environment change often, especially with the expansion and/or relocation of facilities. There are few tools available to the operations staff to easily determine problems and test possible solutions without impacting actual service. HCS had undergone such an expansion, with undesirable impacts to the tube system performance which is typically quantified by the time it takes tubes to reach destinations. Therefore, HCS wanted a way to examine possible reconfiguration scenarios prior to installation to optimize the system performance post-installation, at which point there is no turning back.

Efficiency Engineers' Solution

Working with HCS's Tube System Manager, Efficiency Engineers put together a flexible yet powerful simulation model built with SIMUL8 to be used by healthcare facility engineers. The goal was to create a model with a friendly, intuitive user interface which would not require extensive simulation experience. The model is entirely data-based, and tube systems of various sizes and configurations can be modeled by only changing the data that the model runs on. Onsite technicians are now able to easily change parameters in the model, run test scenarios, and verify outcomes prior to making physical or policy changes to their systems.

Results

Using the simulation model, the time required to load a system configuration scenario and analyze the results can be as short as mere minutes. The Tube System Manager at HCS is actively using the model to evaluate configurations as they prepare for a major expansion to their pneumatic tube system. The effect of this is saving time and money and dramatically increasing the effectiveness of this expensive resource.

Pneumatic Tube System Model

