

## **Executive Summary**

City Hospital campus development included three (3) million square feet of occupiable spaces such as research, clinical office, and support service spaces. These spaces often require high ventilation rate to minimize the risk of contamination. In recognition of substantial amount of energy required to condition such significant volume of space, the mechanical system must be design as energy efficient as practical.

The existing mechanical systems of City Hospital are designed with careful attention toward occupant health and thermal comfort, energy conservation, reliability, and expandability. The existing mechanical system is considered excellent design for large intuition such as City Hospital campus.

The primary goal of the proposed mechanical system modification is to further reduce energy consumption and annual utility cost. It is also important to maintain occupant health and thermal comfort, system reliability in certain foreseeable events, and the ability to expand as the campus grows. The modification will consequently reduce emissions as well. Furthermore, the alternate solution should have a reasonable payback period to justify its application.

## ***Mechanical Modification***

The mechanical redesign will compare the energy and cost reducing capability of cogeneration with an all electric centrifugal chiller plant. Due to the large volume and phasing complexity of City Hospital campus development, capacity and staging of the modified system will be iterated several times to fine the most financially viable situation.

## ***Economic***

Electric utility deregulation has significantly changed the electricity market. These will affect cogeneration strategies, since consumers may be able to buy less expensive electricity, sell excess power to other consumers. Reevaluate electric utility deregulation can help energy users understand the regulatory and economic impacts of the evolving market better, and determine whether deregulation actually benefits.

## ***Electrical System***

The proposed mechanical redesign will make a significant change to the electrical load. Analysis of electrical system and local code will determine whether a system resize is necessary, and the possibility of eliminating certain components.