Public Safety Building Data Center Needs Assessment

Redundant Cooling Project

Background

The Public Safety Building (PSB) is located at 2100 Martin Luther King Jr Way, Berkeley, CA 94704. The City of Berkeley implemented major improvements during 2014 to the PSB Data Center, which included the installation of new electrical and mechanical equipment. The primary goal of this improvement project was to create a more robust and dependable Data Center. This critical operation warranted high quality systems and equipment with provisions for redundancy.

The PSB Data Center was upgraded by the installation of a new rooftop mounted cooling system. The cooling system was necessary to offset the heat generated from the computers within the data center. Without having a cooling system, the generated heat would lead to the failure of the computers. This was an important improvement over the old air conditioning system. The PSB Data Center Cooling system was originally designed with a duplicate redundant cooling system. However, the construction cost to install the redundant cooling system was not within the available budget, and it was subsequently removed from the project.

Introduction

The goal of this project was to assess the reliability of the PSB Data Center and develop a scope that includes increasing the reliability of the PSB cooling system by adding a redundant system. The concept of redundancy for such a critical system ensures the continued operation of the Data Center despite a potential equipment failure.

A determination of what equipment and systems must be redundant is based on potential for failure and acceptable risk. Currently, the PSB cooling system is not a fully redundant system, although it does have certain redundant features installed. For example, only one circulation pump is strictly needed. However, it does have two circulation pumps, which operate alternately, such that if one fails the other will operate.

In order to create a redundant cooling system for the PSB Data Center, the planned approach is to install a “mirror image” of the existing rooftop system. This system would include an air handler, chiller, pumps and piping, ductwork, dampers and controls to interconnect with the existing system. The ductwork through the roof and into the Data Center would not be altered as it is shared between the two cooling systems.

The new cooling system equipment will require electrical power, which would be served from the existing roof mounted power distribution panel. This panel provides space for the future circuit breakers to serve the redundant air handler, chiller, and pumps. There will be control interlocks to ensure only one system is capable of operating at a time. Should the system or any component fail, the redundant system will be enabled to operate.

FUNDING SOURCE

In 2016, Berkeley voters approved *Measure T1*, which authorized the City to sell $100 million of general obligation bonds to repair, renovate, replace, or reconstruct the City's aging infrastructure and facilities, including important City facilities and buildings. In 2017, as part of the City's Measure T1 Bond program, the Public Safety Building received funding of $5,000 for the scoping of a redundant cooling system.

PROJECT TEAM

In July of 2019, the City of Berkeley selected Noll & Tam Architecture to provide professional consulting services to assist in completion of this project. Noll & Tam's team included Stanton Engineering as its subject matter expert on cooling systems.

FUTURE COSTS AND FUNDING STRATEGY

The total estimated project cost for these improvements is $550,000. Funding for the remaining project will come from the capital improvement fund.