

SHOWCASE PROJECT: INTUIT: QUINCY FACILITY ENERGY UPGRADES

SOLUTION OVERVIEW

Built in 2007 and officially commissioned in 2008, Intuit's 231,280 square foot Quincy, Washington facility houses an IT capacity of over 4 Megawatts. The building operates solely as a data center, but does feature support areas such as staff offices, a shipping and receiving center, electric distribution rooms, and a chilled water plant.

The Quincy facility was designed as a raised floor data center with 40,000 square feet of whitespace, but currently only 20,000 square feet has been built out with server racks. This space is split between two data halls with the server racks arranged in hot and cold aisles, and adjacent galleries for power and cooling located on either side. Cooling is performed using a central chiller plant that includes a water side economizer. The cool air is distributed through computer room air handlers (CRAHs) located in the galleries.

SECTOR TYPE

Data Center

LOCATION

Washington

PROJECT SIZE

4 Megawatts

FINANCIAL OVERVIEW

\$224,000

SOLUTIONS

The first savings measure implemented at the facility was to raise the server entering air temperatures to match ASHRAE TC9.9 Standards, which describe ideal operating conditions for mission critical facilities, data centers, technology spaces, and electronic equipment. While this did reduce the cooling load, it also created an issue with the ventilation system. The initial design counted on the hot air exiting from the back of the servers to reach the CRAH's by floating over a 10 foot wall which separated the data halls from the galleries. However once the entering air temperature was raised, the delta between the cold and hot air was not enough to prevent some of the hot air from re-entering the front of the servers.

To combat this new problem, the facilities team decided to build containment chimneys that would prevent the migration of hot air exiting at the back of the racks from short-cycling to the

front. Initially, a local sheet metal contractor was asked to build custom containment chimneys, but the team ultimately decided to purchase a self-install hot aisle containment system from Chatsworth Products. Once implemented, the containment measures successfully ensured that all of the hot server exhaust air made it back to the CRAH units for conditioning.

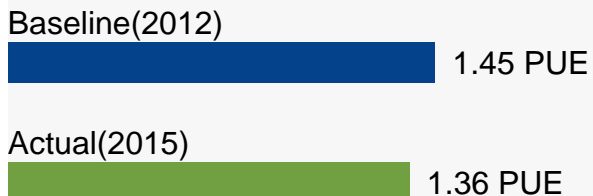
The final measure that the team has taken to reduce the energy intensity at the Quincy data center was to increase the secondary chilled water temperature set point. This action expands the hours that the cooling system operates solely on the water side economizer, thereby reducing the chiller runtime.

OTHER BENEFITS

Each of the three strategies to reduce energy intensity that were outlined above was implemented over the past three years. During that time, the power usage effectiveness (PUE) of the facility has improved from 1.52 (Jan, 2012) to 1.35 (Dec, 2015). The team estimates that Intuit has already saved \$130,600 in avoided utility costs, and expects to break even on the containment system costs sometime in the next two years. While this may not appear to be an attractive payback, it is impressive considering that the average cost per kilowatt hour of electricity in Quincy is only 2.5¢.

The high performing data center has been awarded ENERGY STAR Certification for the past three years (2013, 2014, 2015). The improvements have led to a current ENERGY STAR score of 97, which places the facility in the 97th percentile of data centers nationwide in terms of energy intensity.

Annual Energy Use



Energy Savings

21% Reduction in PUE-1

Annual Energy Cost



Cost Savings

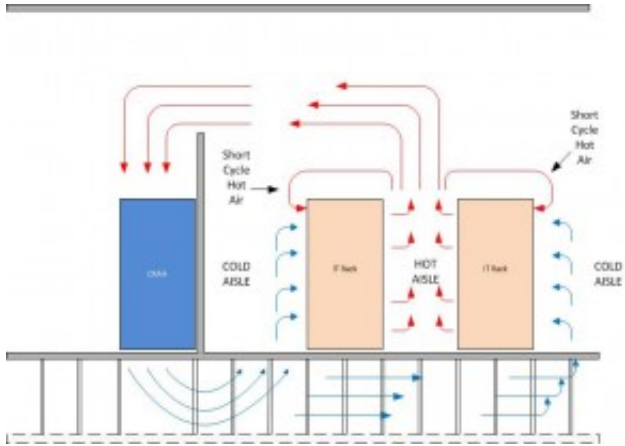
\$130,600 (3 Year Total)



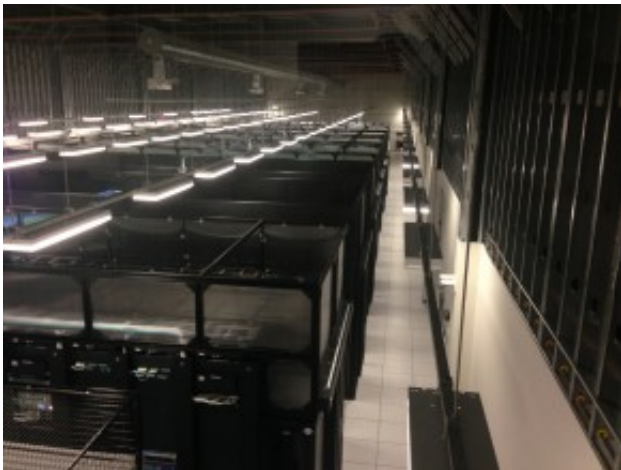
Intuit's Quincy, Washington Data Center



Data Hall Before Containment



Airflow Before Containment



Data Hall with Containment Chimneys



Close-up View of Containment System