

Advanced Computation #0017



Building Gross Area: 45,346 sq.ft.

Retrocommissioning Oct. 2015– Jan-2016

Team Visit Period:

Principal Building Use: Offices, Computer Rooms, Data Center

Building & Occupant Overview

The original building just had the west half built in 1971 and was called "Astronomy Building" at that time. The East half was built in 2000. This building was the primary data center on campus until Petascale became operational approximately 5 years ago. The computer load at this building has been reduced significantly since then and the utility cost has reduced from \$1.5 million per year down to \$600K. The building is connected to the chilled water loop. There are chillers in the building that are capable of cooling the building in lieu of the chilled water loop. We are recommending that these chillers be retired as they have not operated in years. Most Liebert units in the building are in the process of being retired with the exception of maybe one or two units (in the server staging area) which will be served by campus chilled water. The VAV system in the third floor replaced some of the Liebert units that were removed. The constant volume system in the west penthouse serves rest of the west building. There is a steam to hot water heat exchanger in the building for the AHU 1 reheat systems. These systems are on the DDC systems.

The data center is served by four 52,500cfm air handling units and does not have any economizer capability. There is an outside air unit (AHU1) to provide ventilation. There is a steam to hot water heat exchanger in the building for the AHU1 reheats.

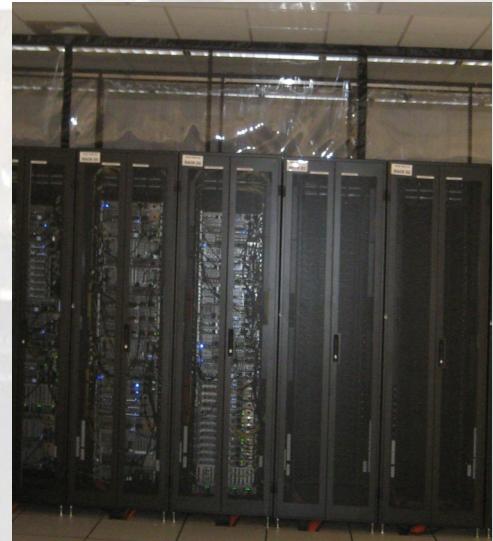
Retro-commissioning Specifics & Results

All four air handling units serving the data center were running full speed. The computer load reduced significantly after PetaScale became operational and four units are not necessary to condition the space. The units were reprogrammed to run only two them at a time at minimum speed (25% fan speed). There is also a rotation schedule in place so that all units get an appropriate same amount of run time.

To improve other areas of the building there were repairs made on AHU 8, including VFD's, damper controls, the mixing chamber, and economizer cycle was put back into operation. A faulty humidity sensor was also fixed. The set points for the mechanical room air handling unit (AHU2) was modified (Heating - 60F, Cooling - 85F) and the hours of operation have considerably reduced. On the third floor occupancy schedules were added and the Liebert units were retired.

Found sewer surcharging problems and added a back water valve. East end of mechanical room was flooding several times a year previously.

Note: The computer load in the space has been increasing in the past year. This has increased the electrical load on the building recently.



Project Highlights

- Shut down two of the four large air handling units for data center
- Scheduled air handling units and AHU1 to shut off during unoccupied periods
- Added occupancy sensors to third floor.
- Finished control repairs to AHU 8 including VFDs and damper controls.
- Removed abandoned steam coil and humidifier.
- Helped department with Liebert retirement project.
- Cleaned coils, repaired canvas leaks, and fixed radiation pumps.