

Engineering Design Services National Aquarium in Baltimore

Under a turn-key energy savings project implemented by Constellation, an Exelon Company, Global Facility Solutions provided engineering design services for the National Aquarium in Baltimore, MD. GFS created Mechanical/Electrical/Plumbing engineering designs for the renovation and upgrade of the central chiller and boiler plants serving both the Pier 3 Aquarium and Pier 4 Pavilion facilities.

BACKGROUND

The National Aquarium in Baltimore encompasses three buildings on two piers of the city's Inner Harbor. Much of the Aquarium's HVAC system was original to each building, dating back to the 1980s. As the equipment approached the end of its service life, it did not meet modern efficiency standards.

The HVAC cooling system employed two centrifugal chillers. Three sectional cast-iron boilers generated heating water for general space heating. The boiler plant also generated heating water that was used for domestic hot water and to control the temperature in the aquarium exhibits' life support systems. As such, redundancy and reliability in the boiler plant were essential for day-to-day operations.



Five new 3,000 MBH KN Series Hydrotherm boilers were installed to generate hot water for the Aquarium's buildings and exhibits.



PROJECT PLAN

Two 200-ton centrifugal chillers would be replaced with six 70-ton multistack variable speed compressor chiller modules. The design of the cooling plant included the installation of a free-cooling heat exchanger to operate during winter months. For the boiler plant design, five 3,000 MBH KN Series Hydrotherm boilers took the place of three Weil-McLain cast-iron hot water boilers. New variable speed distribution pumps and DDC controls for the newly installed systems rounded out the central plant upgrade.

SCOPE OF WORK

- » Create MEP engineering designs
- » Provide construction administration services
- » Commission new systems
- » Verify system performance

IMPLEMENTATION

GFS provided engineering design and construction administration services for the renovation project. The construction design documents were created as part of a large-scale guaranteed energy savings project for the Aquarium conducted by Constellation, an Exelon Company. GFS also was contracted to produce permit drawings, analyze energy savings and supply engineering services for the chiller and boiler upgrade under a turn-key contract with Constellation. During project construction, GFS's role included construction administration services, commissioning new systems and verification of system performance. Upon completion of the upgrade, the new central plants became operational in April 2015.

PROJECT SAVINGS FOR CHILLERS, BOILERS & PUMPS

- » \$80,900/year cost savings
- » \$21,300 utility incentive