

Case Study

Johns Hopkins University School of Medicine

The Koch Cancer Research Building - Baltimore, MD

Facility Description

Characteristics:

- 267,000 net square –foot building
- 5 floors of laboratories
- 10 stories of office space
- 250-seat, auditorium connects this tower to the Bunting Blaustein Cancer Research Building
- Mission Critical Facility
- Completed in 2006

Existing Conditions:

- 24 power distribution transformers
- 7 year old transformers
- Extremely light electrical load
- Average loading of system as percentage of capacity = 11.7%
- Reasonable harmonics were identified

Challenge

Throughout the facility, significant losses were occurring because of (i.) oversized distribution equipment and (ii.) current and voltage distortion caused by harmonic current producing electronic loads. Over the years, as electronic loads were continually being added to the existing distribution system, which was not designed to operate in an electronic (nonlinear) environment, the entire system and its loads began to operate less efficiently. PQI was contracted by the School of Medicine to engineer a Power System Optimization Solution, which would reduce electrical losses, increase overall power quality and ensure system/load compatibility.



Solution

PQI engineered a Power System Optimization Solution, consisting of the replacement of all 24 transformers with ultra-efficient harmonic mitigating transformers, which were strategically sized, designed and configured to achieve comprehensive harmonic mitigation and energy savings throughout the facility.

Impact

- ✓ **894,977** = Annual kWh savings
- ✓ **\$89,498** = Total annual utility savings
- ✓ **\$43,382** = PQI calculated energy savings
(Only calculated savings in transformers)
- ✓ **\$46,116** = Uncalculated energy savings
(Savings achieved in system and loads by harmonic mitigation)
- ✓ **9.4%** = Reduction in energy costs
- ✓ **2.1 years** = Project Payback

