

# Milton S. Hershey Medical Center Co-Generation Plant Commissioning



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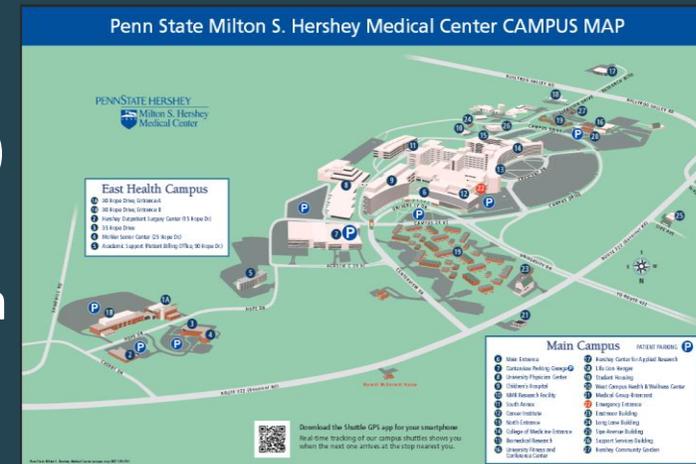
# About RMF

- Headquarters Baltimore, MD
- Established 1983 (36 Years)
- 300+ Personnel
- 13 Production Offices
- Our Services
  - Commissioning
  - Infrastructure Engineering
  - Building MEP Engineering
  - High Performance Design
  - Master Planning
  - Assessment Technology
  - Energy Assessment
  - Civil Engineering
  - Structural Engineering



# Milton S. Hershey Medical Center

- Hershey, PA
- Established 1963
- 550-Acre Campus
- Academic Medical Center
- Hospital
  - 548 Licensed Beds
  - Level 1 Trauma Center; Adult & Pediatric
- College of Medicine
  - Medical Students (150 Students/Class)
  - Physicians Assistants
  - Graduate Degrees in Medical Research
  - \$100-Million in External Research Support



# CUP (Central Utility Plant) Background

- Distributed Heating and Cooling Systems
- CUP Equipment
  - Twelve Chillers
  - Three Boilers
- CHP Equipment
  - One Rentech HRSG
  - One Solar Turbines CTG
  - One JJ Crewe & Son Natural Gas High Pressure Compressor



# NEW CHP Plant Background

- CHP – Combined Heat & Power Plant
- Solar Turbines Taurus 70, 7.5MW, Natural Gas, Combustion Gas Turbine Generator
- JJ Crewe & Son Natural Gas Rotary Screw Type Compressor
- Rentech HRSG with Natural Gas Duct Burner Supplying 80,000-lb/hr Steam
- Construction Completed in 2018
- Expectations
  - Supply 60% Campus Power
  - Supply 96% Campus Steam Usage



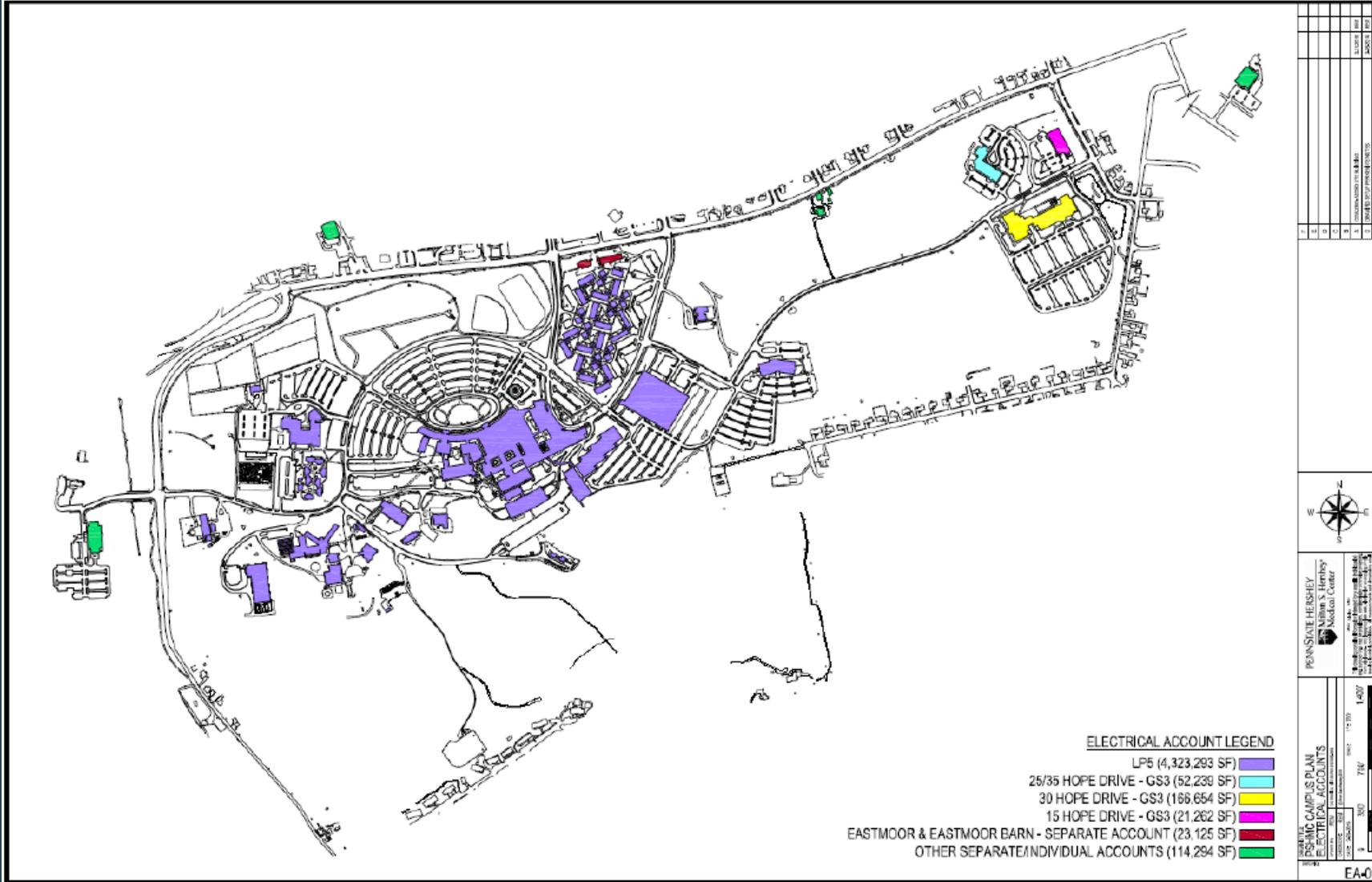
# Project Motivation

- Vulnerability of Aging Infrastructure
- Co-Generation Adds:
  1. Energy Efficiencies and Savings
  2. Another Level of Utilities Protection
  3. Campus Safeguards
  4. Resiliency and Flexibility
  5. Reduced Emissions
- Commonwealth of Pennsylvania Grant plus PPL Rebates & Grants
- Avoidance of Pending Boiler Replacements, Extend Existing Boiler Life
- Impact HMC commitment to reduce carbon emissions
- Lower operational costs



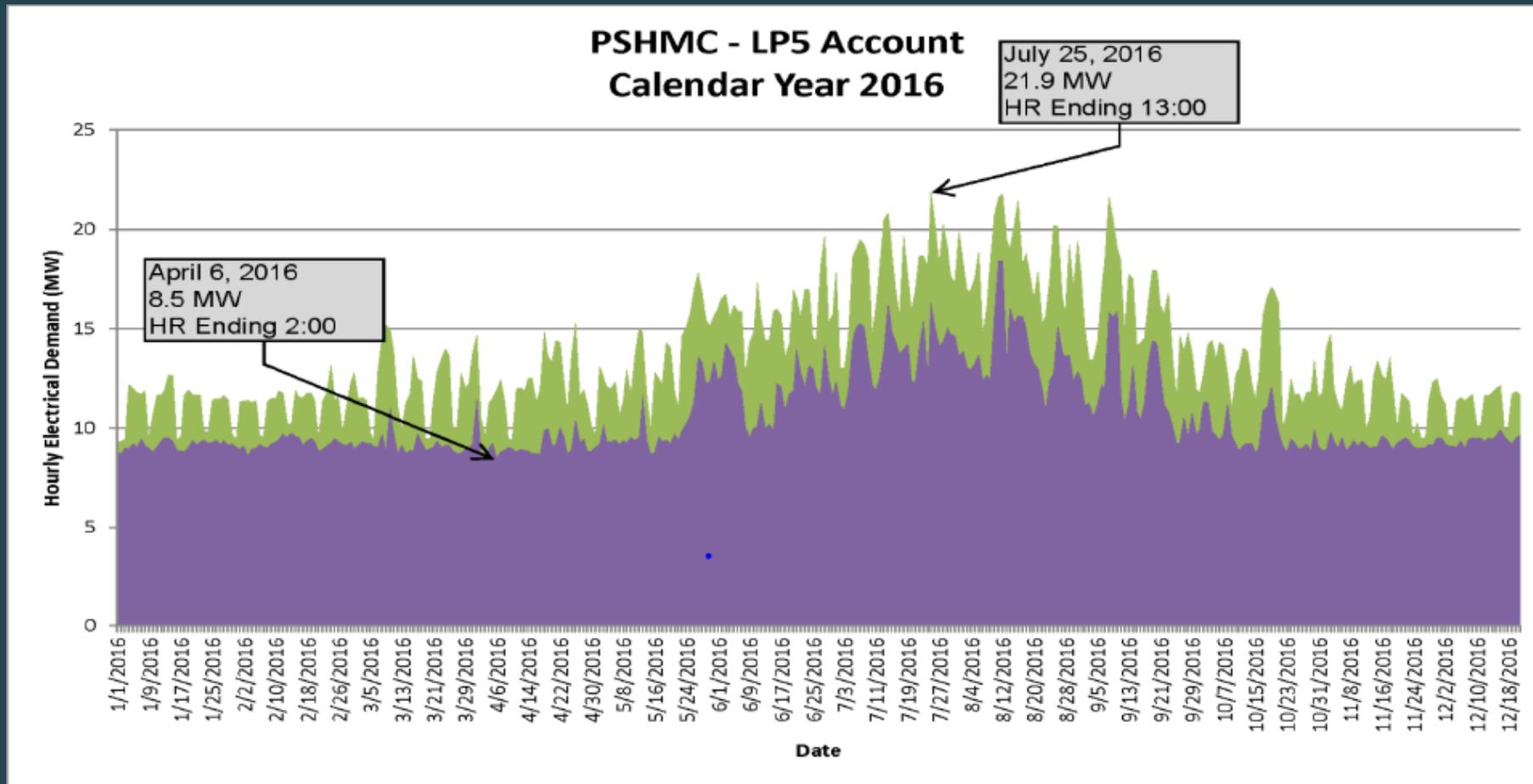


# ELECTRICAL ACCOUNT LEGEND

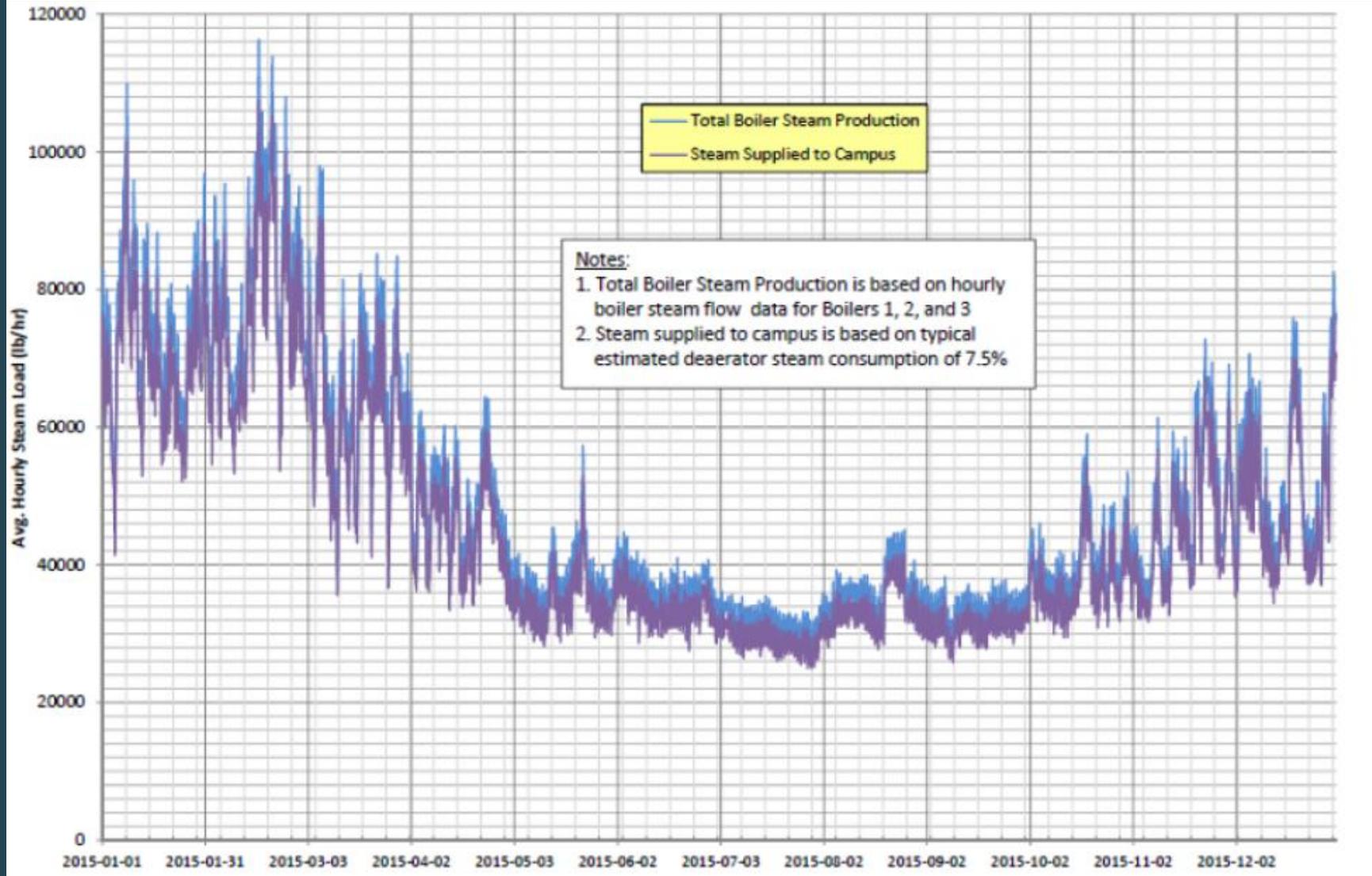


# ELECTRIC DEMAND

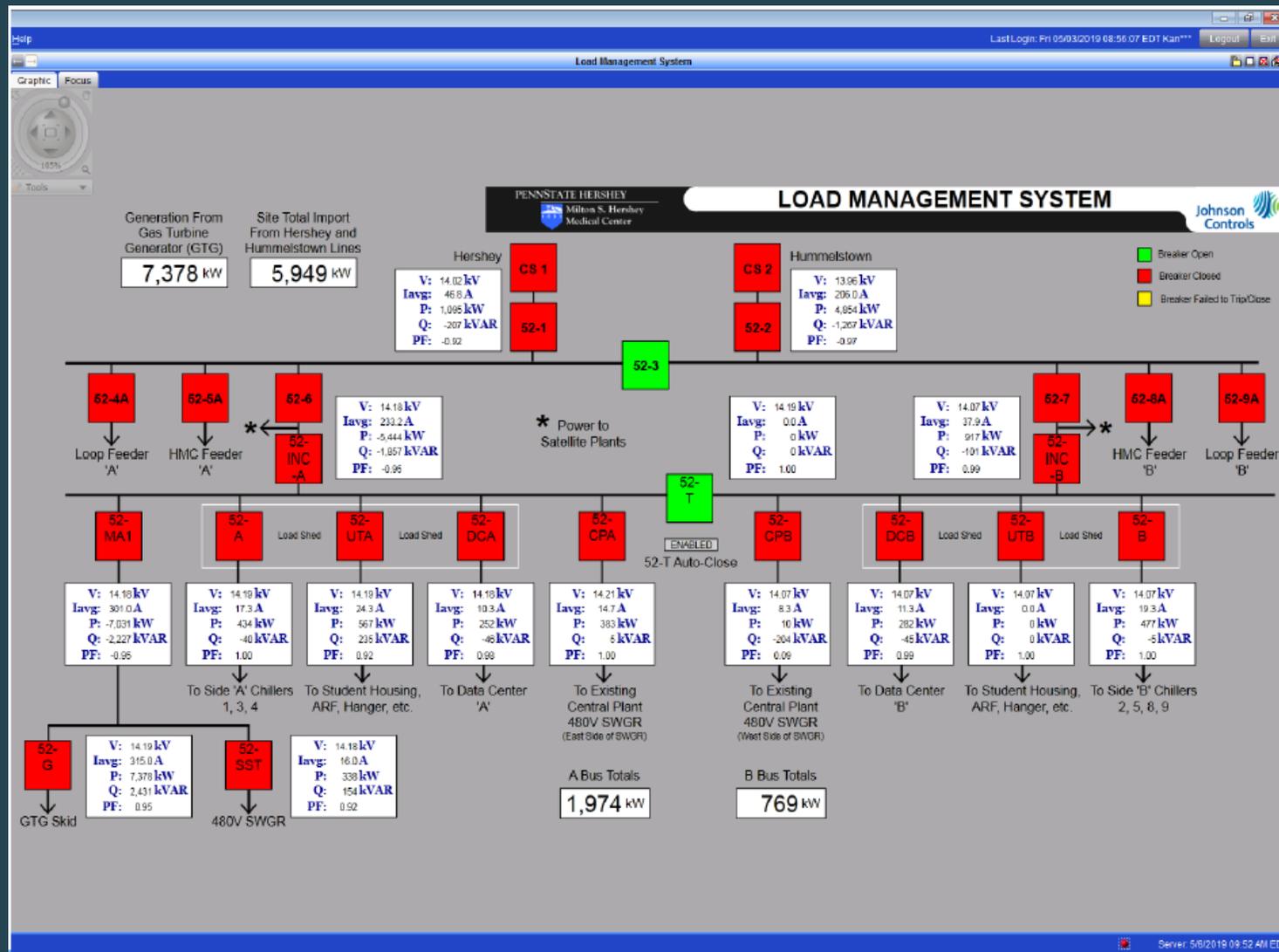
- DAILY MAX / MIN



# HOURLY STEAM LOAD PROFILE 2015



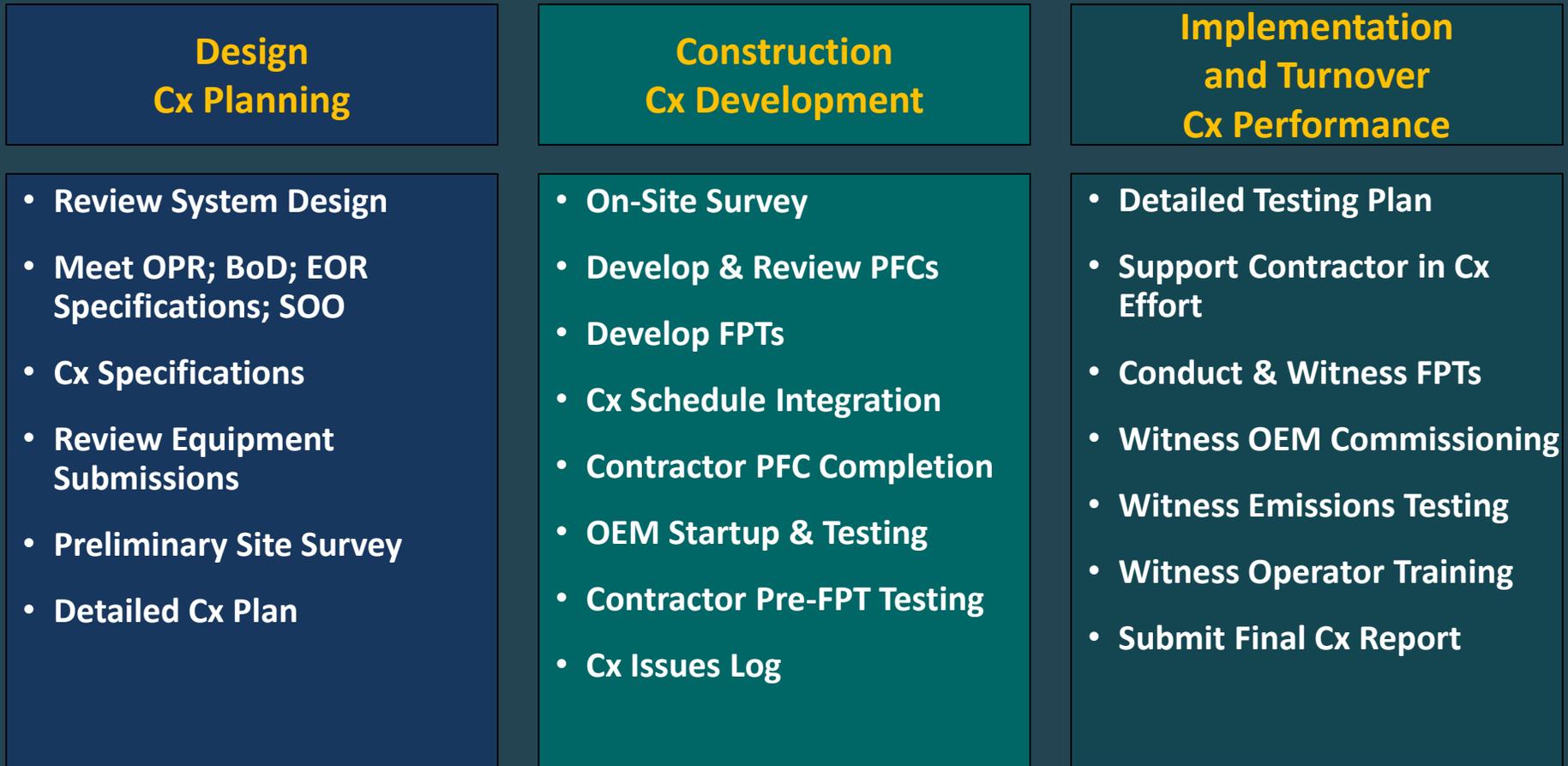
# CHP LOAD MANAGEMENT SYSTEM



# HMC Approach to Commissioning

- On-Site, Hands-on, 'Beyond the Checklist' Commissioning
- Collaboration
  - HMC's priority on selecting the right team for teamwork
  - HMC Project Management and Central Utility Plant Staff
  - CHP Design and Construction Personnel
  - Equipment OEM Field Service Technicians
  - HMC Hospital and College of Medicine Staff
- Holistic Thinking
  - CUP provided utility services affect Hospital, Patients, and College of Medicine

# Commissioning Process



# Unexpected Results

- Equipment Start-Up and Testing Issues
- Control and Protection Software Revisions
- Various Equipment Control Wiring Coordination
- Unexpected Minor Component Failures Affecting Operations
- Coordination and Interaction with the Local Utility
- USGBC in Central PA 2018 Climate Champion Award
  - Reduction of campus carbon emissions by 46,000 tons; Equivalent to taking 7,551 cars off the road
  - Traditional heat & power at approximately 45% efficiency to a CHP at approximately 80% efficiency



# Lessons Learned

- Coordinating Cx Activities between Owner, Campus, & Contractor
- Defining Cx Testing Schedule with Contractor
- Coordinating the Performance of Cx Testing Activities
- Single-Source Equipment Responsibility
- Coordination of Utility Shutdowns and Equipment Testing Schedules
- Critical Shutdowns
  - Maintaining utility services to the Hospital, Critical Care Facilities
  - College of Medicine operations



# Questions?



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***Infrastructure Commissioning***

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**PennState**  
College of Medicine



**PennState Health**  
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