

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



HEATING AND COOLING SYSTEMS LEGEND

CENTRAL SYSTEM - steam and/or chilled water (2,611,469 SF) ■

INDIVIDUAL, INDEPENDENT, or NO SYSTEMS (2,067,398 SF) ■

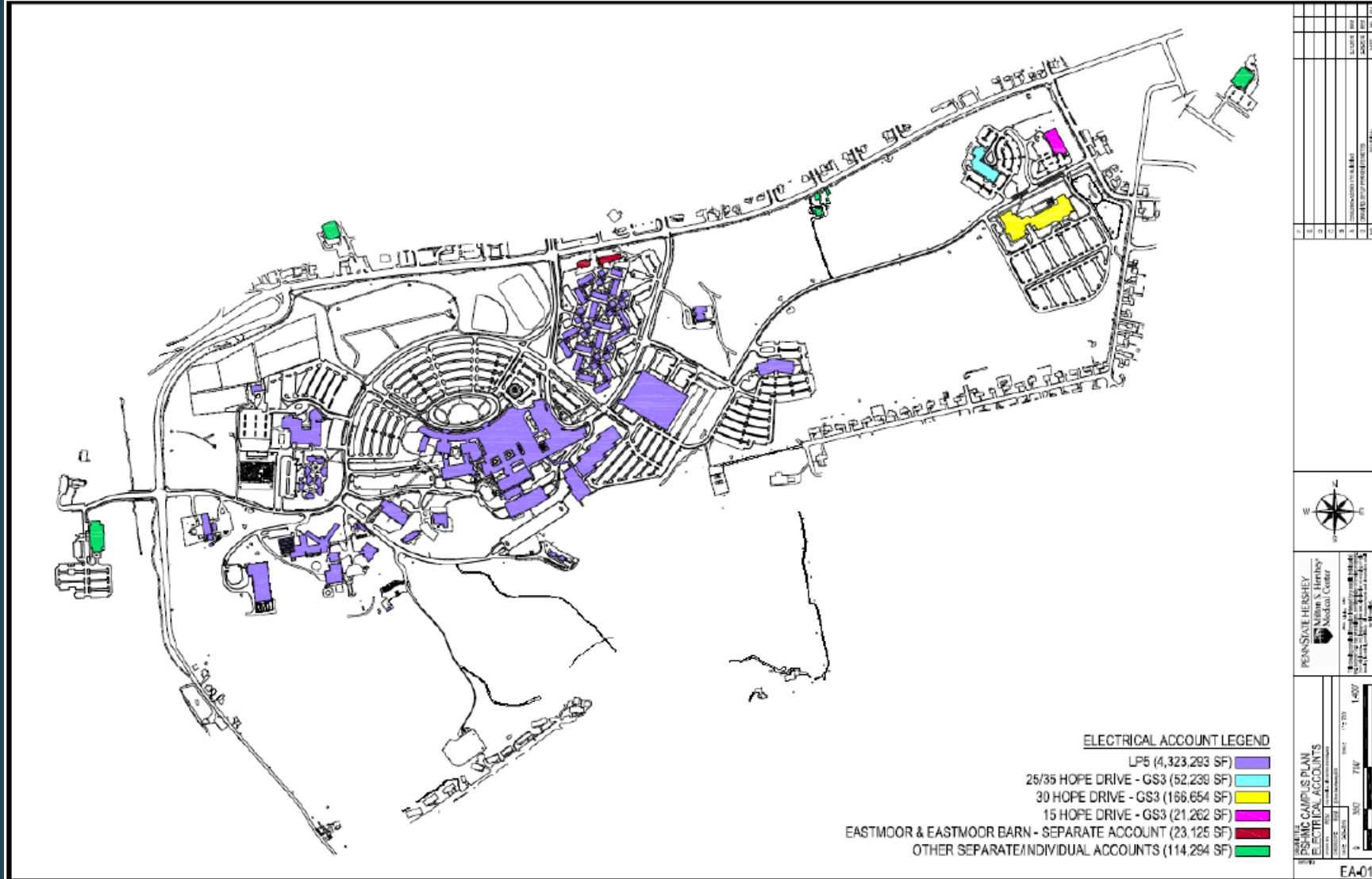
PENN STATE HARRISBURG
 William S. Barclay
 Student Center

PS-100 CAMPUS PLAN
 HEATING & COOLING SYSTEMS

DATE: 12/10
 SCALE: 1"=100'
 0 500 1000

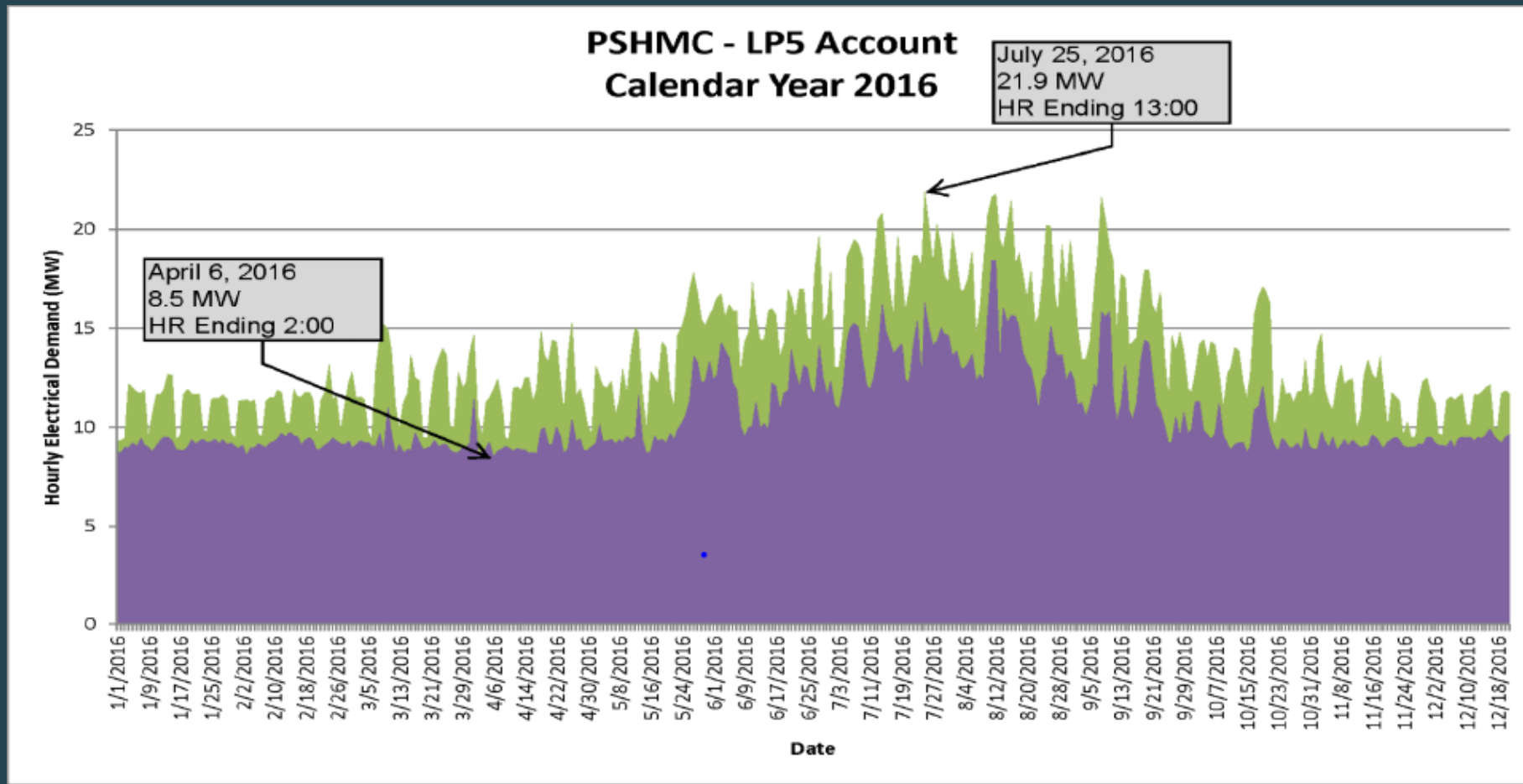
PROJECT NO. 100-01
 DRAWING NO. 100-01-01
 SHEET NO. 1 OF 1

ELECTRICAL ACCOUNT LEGEND

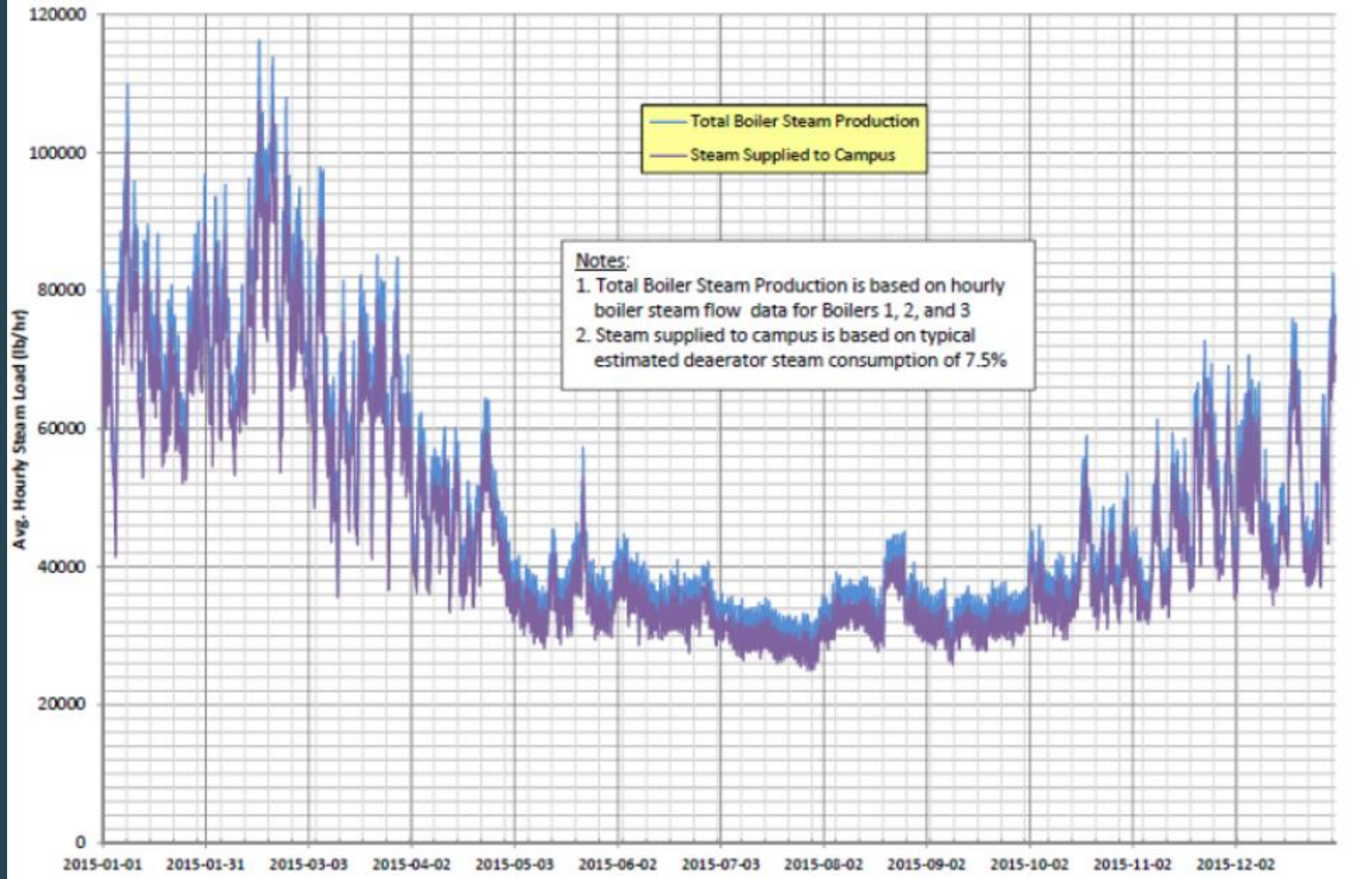


ELECTRIC DEMAND

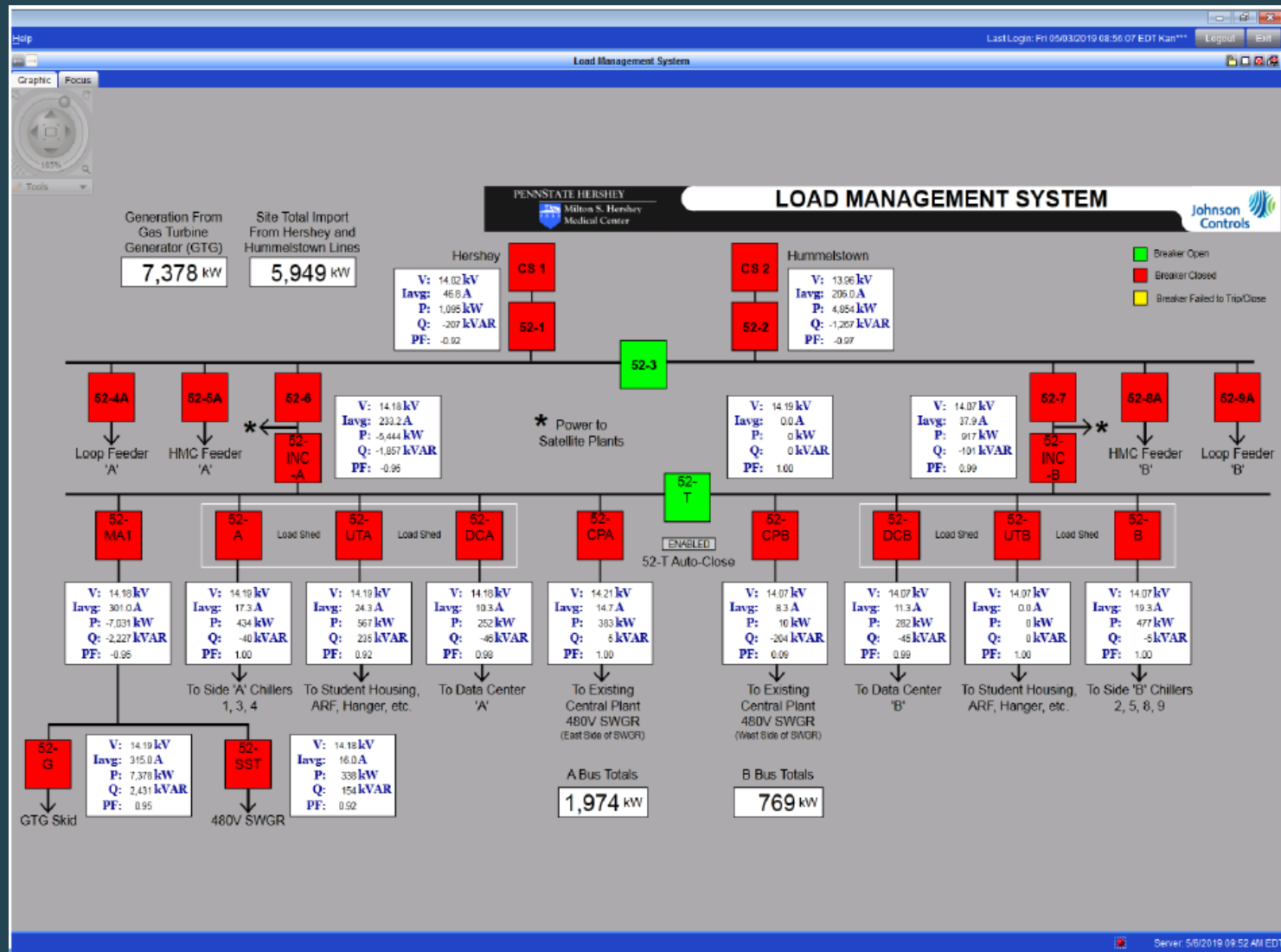
- DAILY MAX / MIN



HOURLY STEAM LOAD PROFILE 2015



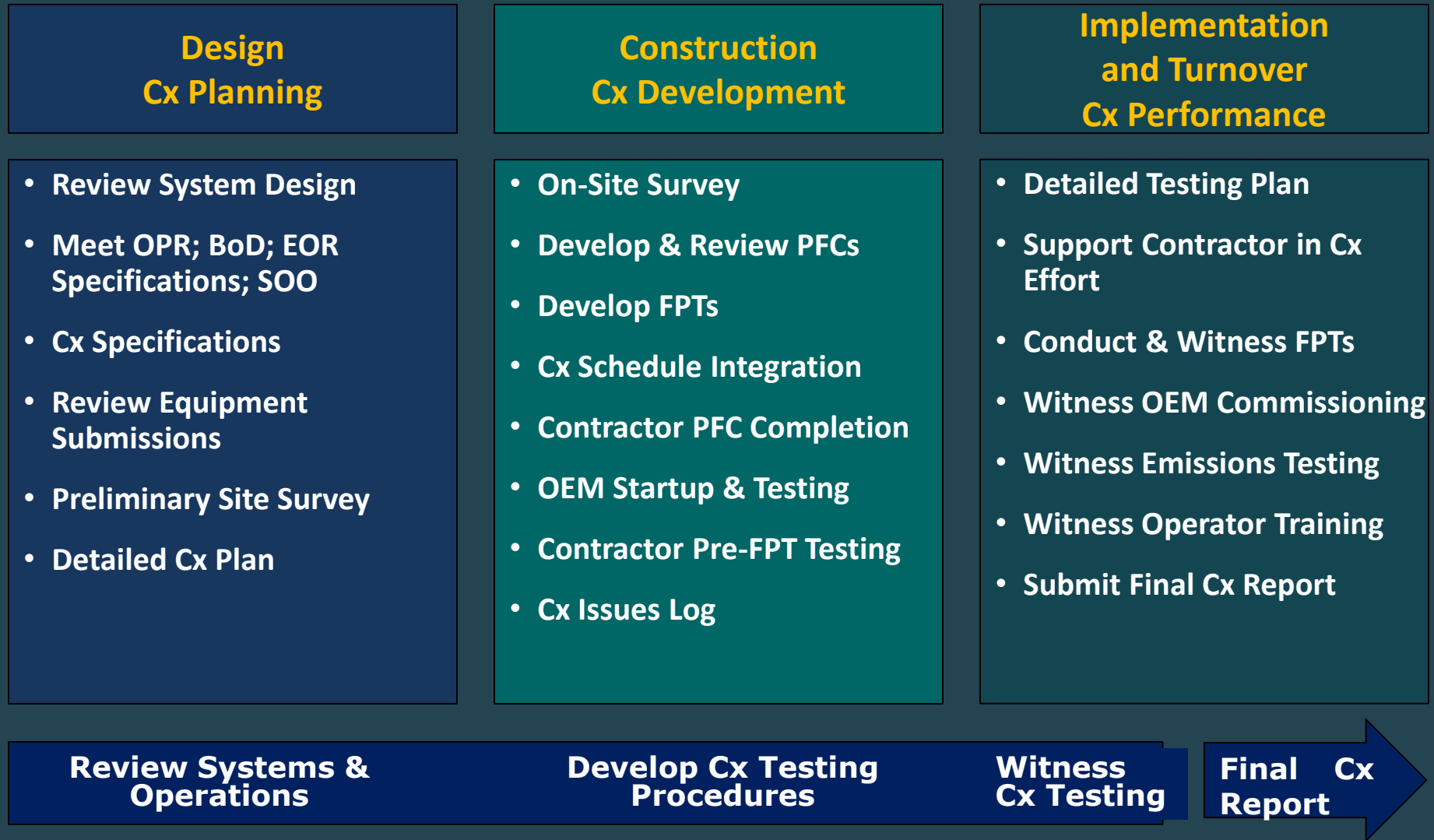
CHP LOAD MANAGEMENT SYSTEM



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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