Some Basic UVM Info

• 425 acres of maintained acreage.
• Central Steam Plant
• Central Chilled Water Plant
• Back Up Boilers
• Research to Day Care
• Multi Campus, CRF, Morgan Horse Farm, Spear Street, Maple Research etc
• Over 5.7 Million Square Feet, 5.2 On Main Campus, Over 200 Buildings
• 70,000 Control Points On Johnson and Honeywell Systems
• Delta V Boiler Controls
• Some Software We Use In PPD. FAMIS, KRONOS, School Dude Utility, Tiscor, Code Blue,
The University of Vermont (UVM) operates and maintains a centralized steam and chilled water plant. The UVM Central Heating & Cooling Plant (CHCP) generates and distributes steam and chilled water to meet the needs of the campus community for space heating & air conditioning, hot water generation and scientific research support. Pressurized steam and chilled water are carried from the plant to campus buildings through a network of underground pipes. The plant is located at the heart of central campus, in the Royall Tyler Theatre Annex. The theatre-building, itself built in 1901, was the University’s original gymnasium. In the late 1960’s the Annex, which at one time served as the auxiliary field-house, was converted into the space for the central plant. The plant, fondly known as the “Cage” from its former days of housing the baseball teams’ batting cages, is operated 24 hours a day, 365 days a year.

The steam is distributed to campus facilities where it is reduced in pressure in order to feed steam heating coils, domestic hot water heaters, sterilizers and humidifiers. As the steam loses its energy to the building systems, it cools and condenses. The condensate is collected within each building and pumped back to the plant through the network of underground piping. The condensate is then “polished” (a process where minerals and sediment removed) and fed back to the boilers to make more steam.

Centralized chilled water used for space cooling (air conditioning) is also piped underground to several main campus buildings from the plant. As the heat is removed from the space by the chilled water it is returned to the Cage, where the heat is rejected. Currently, the chilled water generating equipment at the plant operates six months of the year.

The operating engineers at the “Cage” use an extensive system of computers to monitor, assess, and control heating and cooling in most University buildings. These computers take into account outside temperature and humidity along with real-time indoor temperatures to produce comfortable and functional building environments. The Cage is the metaphorical heart of UVM because it manages the physical health of the campus so that the UVM community can stay focused on its mission to learn and to serve.
Concrete Trench Box /Field Fabricated System
GENERAL CONDITION OF 1980 VINTAGE PIPING

OUTER CASING FAILURE
(3) 50,000 Gallon Oil Tanks
Pre-Engineered/Pre-Insulated System
CHP TO BAILEY/HOWE & MARSH LIFE SCIENCE – 2006/2007

_Pre-Engineered/Pre-Insulated System_
CHILLED WATER LOOP (HSRF):

- More efficient chilled water generation/distribution
- Reduction in HSRF Electric usage
- Existing Chillers will provide both load shed and redundancy for medical school
Plant & Infrastructure
Project Costs 2003-2010

Simpson to Gutterson (Phase III) $ 1,800,000.00
MH N1 (103) to Harris w/ feeds to U-Heights $ 3,100,000.00
MH N6 to MH N3 (thru Davis Center Site) $ 3,200,000.00
MH N3 to MH N1 $ 1,587,900.00
Austin to Millis $ 325,000.00
Chiller Plant & Infrastructure: to BH, RTT & Old Mill/Lafayette $ 11,850,000.00
Chilled Water Infrastructure: Davis Site & Connection to Davis: $ 1,750,000.00
Votey to Perkins $ 400,000.00
Jeffords Steam & CHW; Loop to HSRF $ 3,800,000.00
N. Campus Steam and Chilled (Phase I) $ 2,200,000.00
Totals $ 30,000,000.00
RESULTS
BETWEEN 2003 – 2010
THE CAMPUS GREW BY 500,000 SQFT

• FY 2003 Energy Cost ~ $10 Million
• FY 2008 Energy Cost ~ $15 Million
• FY 2010 Energy Cost ~ $14 Million

• FY 2010 Break Down (All buildings)
  ✓ Electric – $8.4M
  ✓ Natural Gas – $3.7M
  ✓ Water/Sewer – $1.6M
  ✓ Fuel Oil/Propane – $150K
Major Advantages of Centralized Cooling System

- Lower life cycle costs
- Operating cost reduction of about 30%
- Allows optimum system configuration for the Central Heat Plant System
- Reduction of peak electrical power
- Substantially lower costs for the future
- Less construction time for future buildings
- Allows cooling of historical buildings
- Lower emissions - better environment-regionally
- Consolidated chemical treatment
- Consolidated noise generating equipment
Steam and Chilled Water Vault
Cooling Tower Footings
Cooling Tower Structure
Some Piping Work
York Chiller
Computerized Control System