UCSF Parnassus Campus Central Utilities Plant
PCUP Steam Condensate Recovery Effort
Steam Trap Project

• Funds Became Available to Renew traps, valves, fittings. (approx. 564 devices)
• Water and Thermal costs drove the management of steam usage and condensate recovery. (Steam quality improvements)
Building Condensate Meters
SFPUC Non-Residential Water Rates

- Charge per CCF  7/1/12  $5.10
- Wastewater per CCF  7/1/12  $6.55

- **Plus**
  - Suspended solids discharged per lb.  $0.88
  - Oil/grease discharge per lb.  $1.10
  - Chemical Oxygen demand per lb.  $0.215
SF Water Department Sample Stations
UCSF Parnassus Steam Conservation

2010-2011 = 463,533,283 lbs
2011-2012 = 418,812,082 lbs
Y.O.Y. Reduction = 10.68%

MONTHLY STEAM USAGE
- Blue: 2010-2011 Before
- Red: 2011-2012 After
Steam Conservation Savings

- Average Pounds of Steam Saved Per Month = 3,726,766 LBS
- Total Pounds of Steam Saved Per Year = 44,721,201 Pounds
- Steam Production Cost Per Thousand Pounds = $18.29

$817,950 Steam Conservation Savings Annually
UCSF Parnassus Condensate Return Recovery

Boiler Water Makeup (Gallons)

- 4/22/2011 to 5/22/2011
- 6/22/2011 to 7/22/2011
- 8/22/2011 to 9/22/2011
Condensate Return Recovery Savings

**Fuel Savings**

96,620,948 lbs Water
11,613,095 gallons saved \( \times \) 8.32 pounds/gallon

\[\downarrow\]

110 BTU's/lb
(Condensate 180 F - Makeup 70 F) \( \times \) 1 BTU/lb/deg F Temp

\[\downarrow\]

132,853 Therms Gas
96,620,948 lbs Condensate \( \times \) 110 BTU's/lb
100,000 BTU's per Therm \( \times \) 80% Boiler Efficiency

\[\downarrow\]

$79,711 Natural Gas Fuel Savings Annually

**Water Savings**

31,817 Gallons/Day
Average Daily Gallons Before 44,316 - After 12,499

\[\downarrow\]

11,613,095 Gallons/Year
(Condensate 180 F - Makeup 70 F) \( \times \) 1 BTU/lb/deg F Temp

\[\downarrow\]

$13.85/ccf Water Cost
Commodity/ccf $5.10 + Wastewater/ccf $6.55 + Sample Adder/ccf $2.20

\[\downarrow\]

$215,028 Water Savings Annually
Total Annual Reductions

- $1,112,689 Operating Cost
- 6.9 Million Pounds CO2 Emissions
- 11.6 Million Gallons of Water
Items under current investigation/consideration

• Auto-clave quenching water reduction
• Installation of remote water main metering
• Leakage reporting
• Ultra pure water systems
• Restroom Fixture replacements
• Demand based irrigation controllers
Bruce Shapiro
UCSF Facilities Management
Bruce.shapiro@ucsf.edu

Presentation contributors:
Dave Burrill and the Worley Parsons Team @ the PCUP.