



# Water and Energy Efficiency at M Health Fairview

**Thomas Stocking**  
**MnTAP Advisor: Laura Sevcik**  
**Company Supervisor: Gabby Appel**



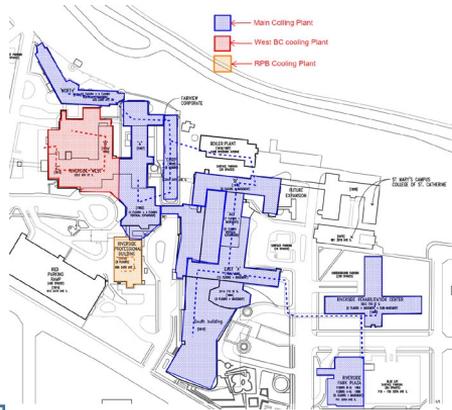
UNIVERSITY OF MINNESOTA  
**Driven to Discover<sup>SM</sup>**

# Company Background



## M Health Fairview

- ❖ 6,400 Employees
- ❖ Full Health Services



## West Bank

- ❖ 1.7 Million Square Feet
- ❖ 11 Buildings on Campus
- ❖ Hospital Open 24/7



# Incentive to Change

- **Technology Accessibility**
- **Environmental Concern**
- **Financial Savings**



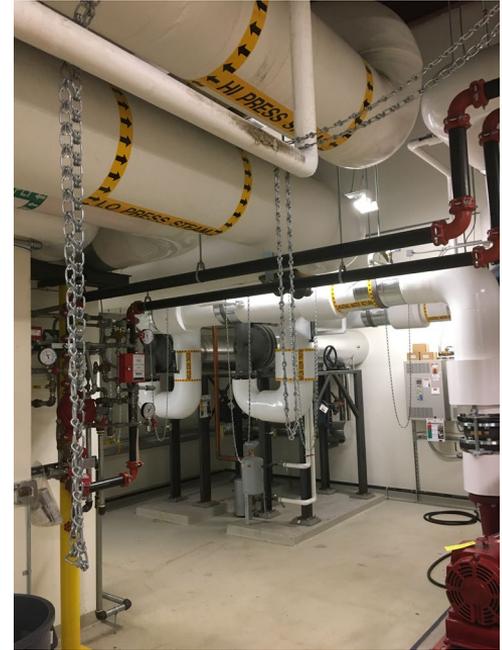
# Steam on UMMC West Bank

## Usages

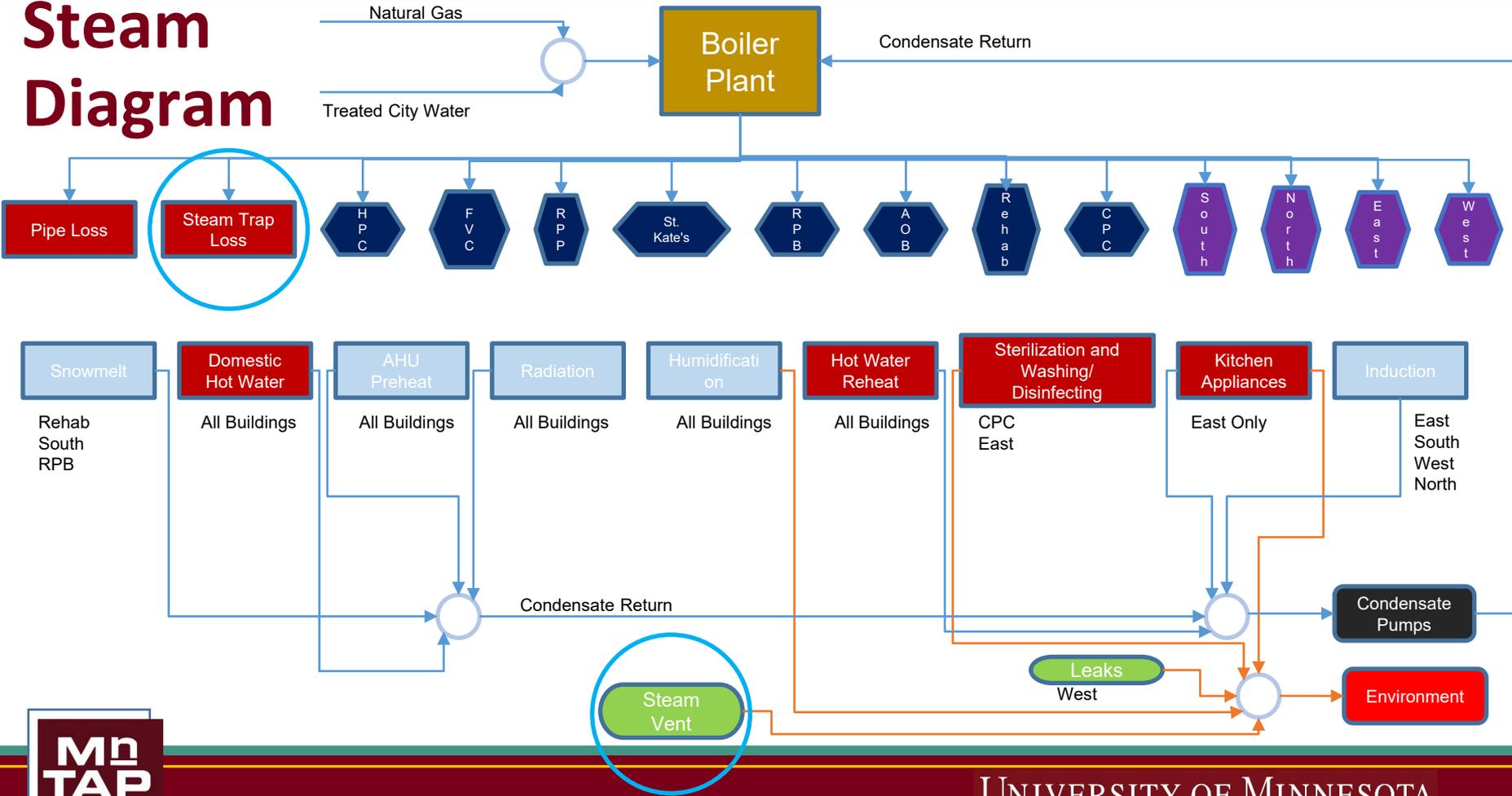
- Air Heating
- Hot Water
- Humidification
- Sterilization

## Production

- Boiler Plant
- Natural Gas
- City Water
- Water Softening
- Condensate



# Steam Diagram



# Steam Traps

## Use and Design

- Valve between steam and condensate
- Water accumulation prevented
- Float trap
- Inverted bucket trap

## When Failed

- Trap failed open or closed
- Steam loss
- Water hammer damage



# Steam Trap Survey

- Ultrasonic leak detector
- Personal protective equipment
- Traps tested at orifice
- Cycle testing
- Trap activity
- Basis for untested traps
- Trap quality checks



## Steam Trap Survey Results

1. Location and tag number
2. Description of trap sound
3. Determination of trap status
4. Steam trap list

## Steam Trap Survey Trends

1. High pressure traps
2. Hard to reach traps
3. Trap size to orifice size

- **760 Traps on campus**
- **173 checked; 35 not calling**
- **27 failed open**
  - **19% that tested failed**
  - **14 high pressure traps**
  - **1 high condensate load trap**

# Solutions

Recommendation	Annual reduction	Total cost	Annual savings	Payback period	Status
Replace failed steam traps	14,000 MMBTU and 1,550,000 gallons of water	\$22,500	\$190,000	2 months	Recommended
Recommence yearly steam trap surveys	15,000 MMBTU and 1,650,000 gallons of water	\$85,000	\$240,000	5 months	Recommended
Install variable frequency drives	2250 MWh	\$150,000	\$260,000	7 months	Recommended
Optimize water softener settings	3,000 lbs of salt and 20,000 gallons of water	\$0	\$7,000	0 months	Recommended
Tie in single pass cooled AHUs to chilled water	458,000 gallons of water	\$20,000	\$5,500	43 months	Recommended
Flash high pressure condensate before venting	-	-	-	-	Needs further investigation

# Personal Benefits

## Highlights:

- Experience the mechanical work of buildings
- Contribute to patient care and environmental care
- Work with wonderful Supervisors and Engineers

