Equipment Upgrades in a Space-Constrained Plant:

University of Rochester Boiler Installation

Presented By:

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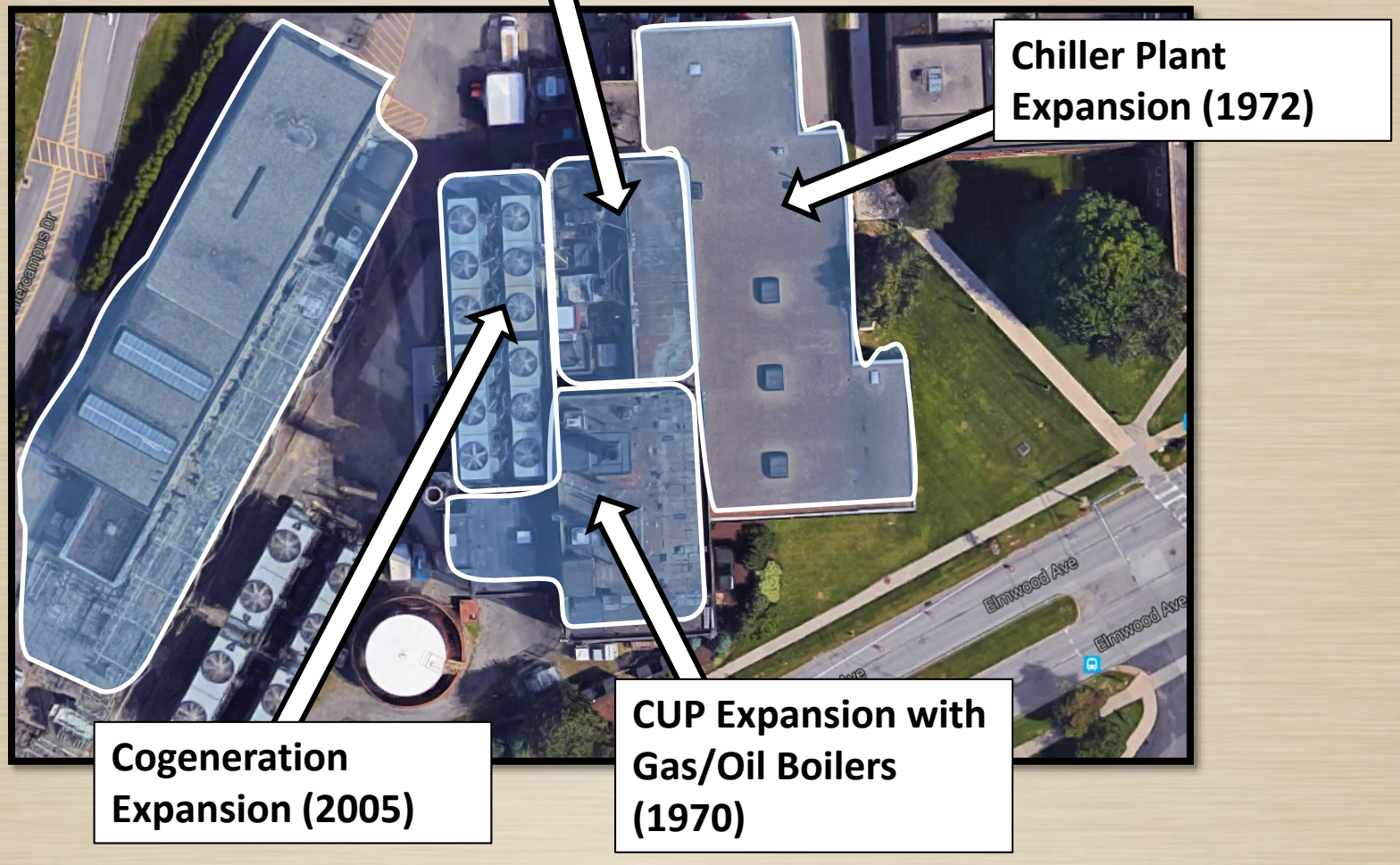
International District Energy Association

Campus Energy Conference 2017

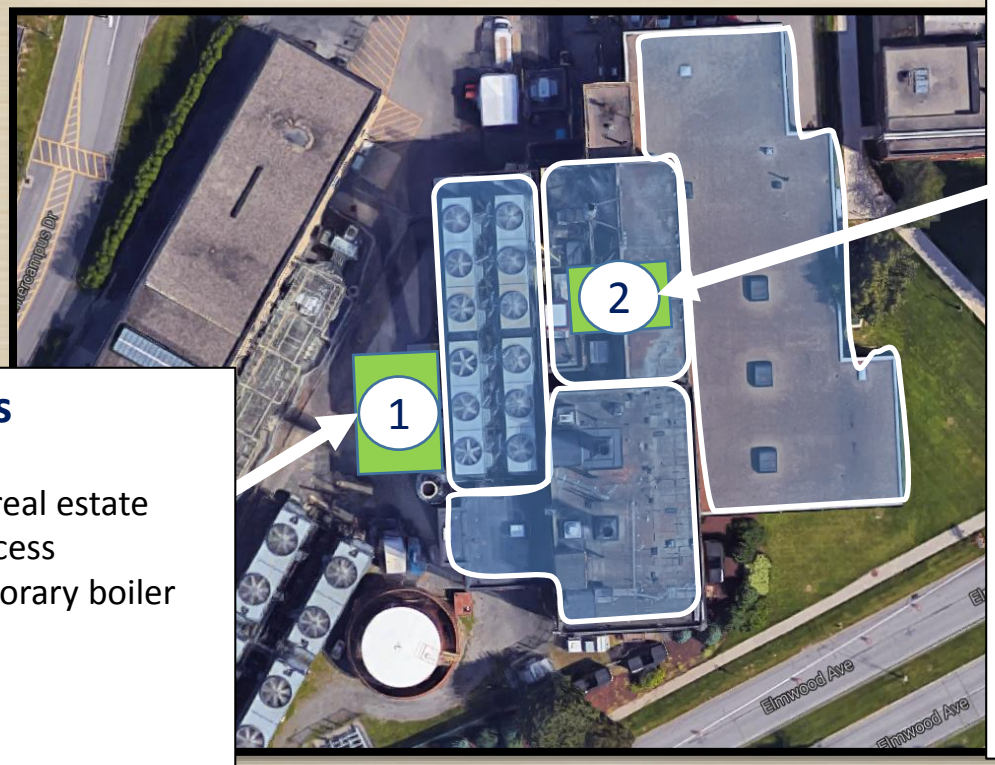
Goal of Presentation

Provide a case study of how the University of Rochester and Sega worked together to install a boiler into the middle of an existing plant.

Project Background



Placement Considerations



Disadvantages

- New stack
- Uses valuable real estate
- Limits plant access
- Removes temporary boiler option

Advantages

- Easiest placement
- No demo required
- Enclosure required

Disadvantages

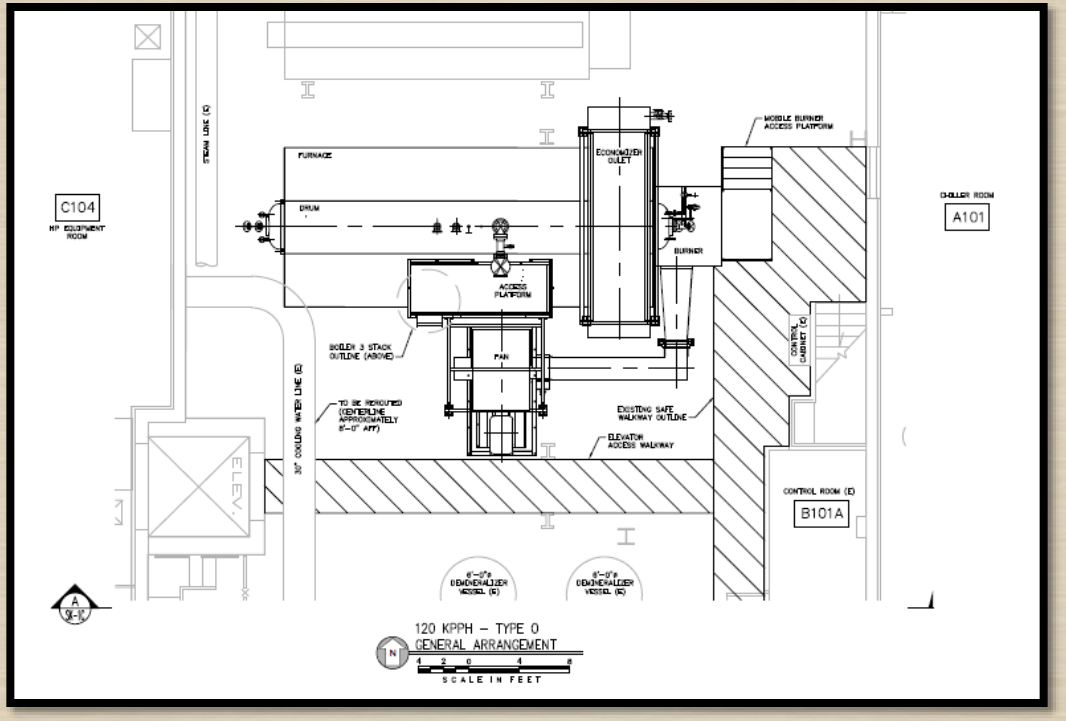
- Difficult move-in (obstacles)
  - Chiller
  - Two walls
  - Conduit chase
- Existing boiler demo required
- Limited indoor space

Advantages

- Better operator access
- Preserves outside space
- Preserves temporary boiler option
- Opportunity to remove harmful materials

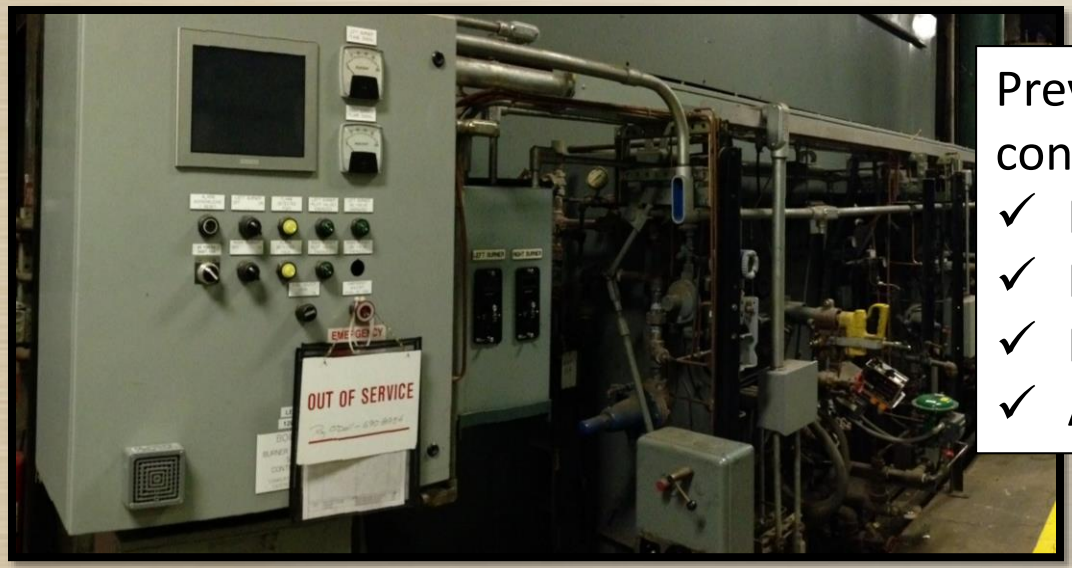
Placement Decision: Indoor

- Lowest evaluated cost option
- Best long-term plant flexibility
- Allowed for optimizing internal space



Challenges for Indoor Boiler Option

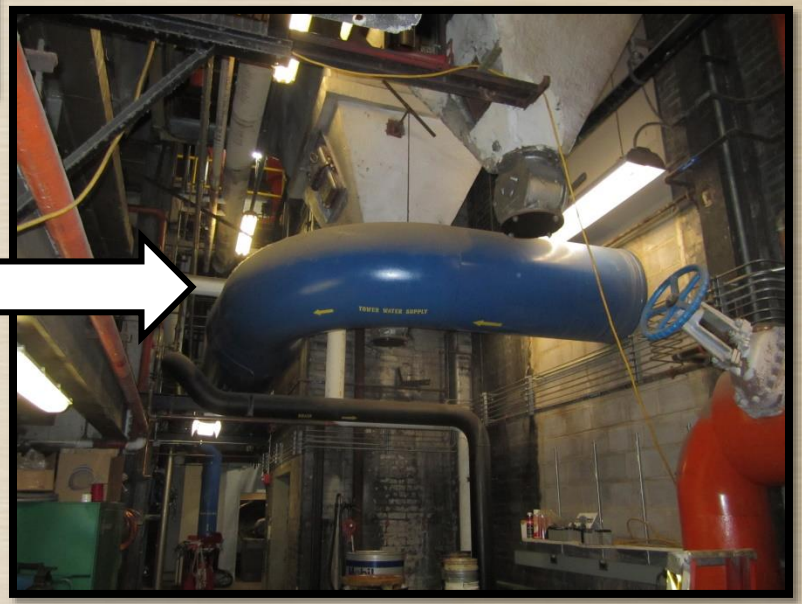
Existing asbestos-filled boiler in way



Previous study confirmed asbestos construction:

- ✓ Boiler insulation
- ✓ Breeching
- ✓ Piping
- ✓ Ash hoppers

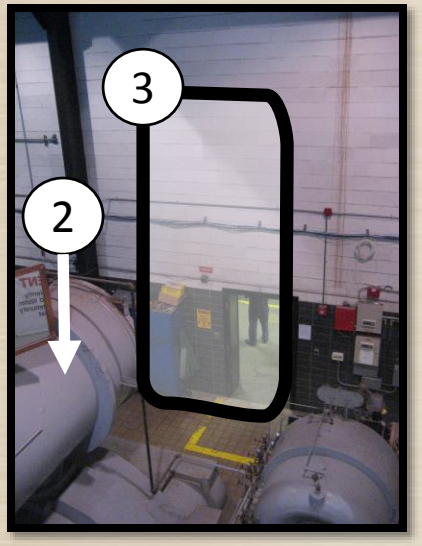
24” cooling tower water piping in way

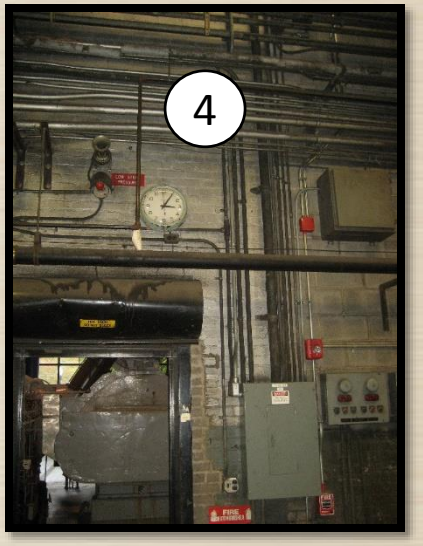


Challenges for Indoor Boiler Option

Obstacles for move-in:

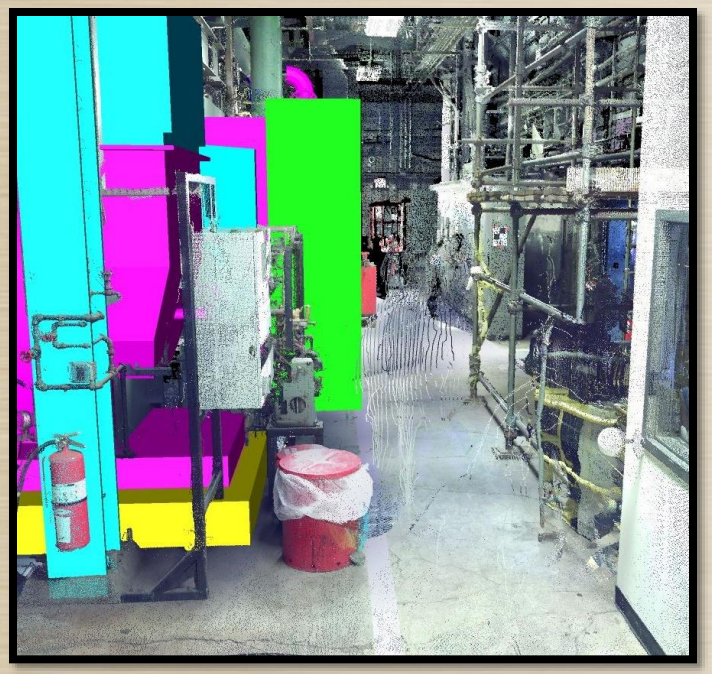
1. Exterior glass wall
2. Existing chiller
3. Interior CMU wall
4. Conduit chase
5. “Minor” obstacles

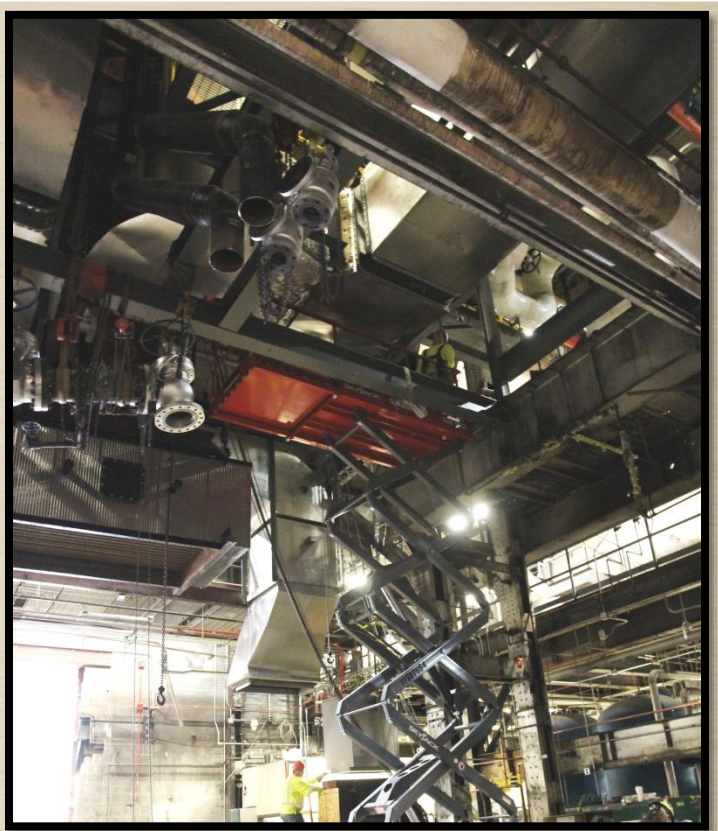




Challenge Solutions

Challenge	Solution
Limited Space	1. Utilize an O-Style Boiler to best fit space 2. Perform layout design in a 3D environment (scans) 3. Top-down construction





Challenge Solutions

Challenge	Solution
Asbestos / Demolition	1. Address schedule/budget for abatement and removal 2. Simplify new install through re-use of existing infrastructure 3. Floor design to best accommodate new boiler (open hole)

Challenge Solutions

Challenge	Solution
Move-in	1. Remove unnecessary infrastructure (side benefits) 2. Optimize timing for exterior wall removal/replacement 3. Prepare “move-in” opening – deciding factor on overall boiler size 4. Shoring to support floor 5. Communication and planning with other campus divisions

Outcome

- Construction substantial completion 09/30/2016
- Startup / tuning / commissioning completion 11/16/2016
- Performance and emissions testing completion 11/25/2016

QUESTIONS?

UNIVERSITY of ROCHESTER