

# Schlembe

A presentation for the ASHRAE  
Region XI CRC Technical Program

Regina, SK May 6<sup>th</sup>, 2010

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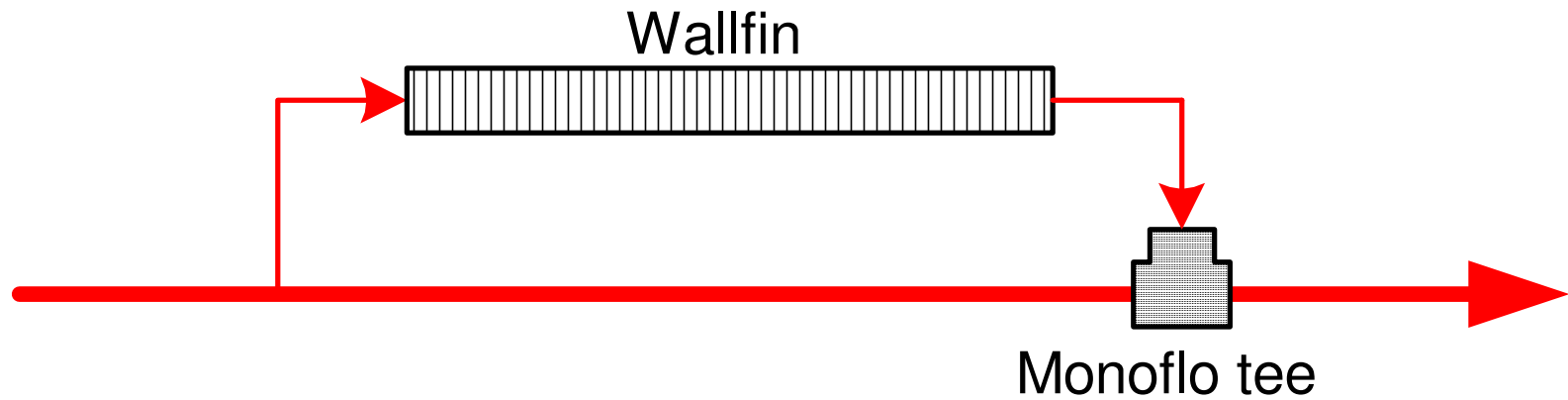
# Schlembe

- Definition coined by Albert Einstein
- *'An improvement that makes things worse'*
- A.K.A. *'theory gets crushed by reality'*

# Monoflo Tee Madness

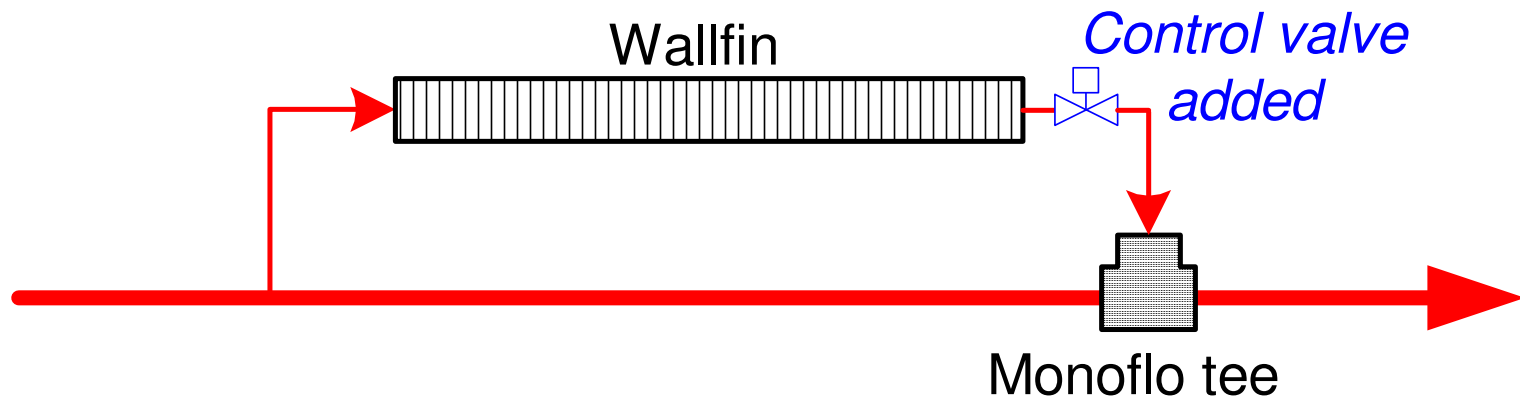
- Elementary school – vent unit and perimeter wallfin with monoflo tees
- Vent unit ran 24/7
- Energy upgrade – schedule vent unit off
- Weekend cold snap – 2.9 °C in principal's office Monday morning

# How Monoflo Tees Work



*Monoflo tee creates pressure drop - convinces some water to flow through wallfin*

# An Added Twist



*Monoflo tee creates pressure drop - convinces some water to flow through wallfin*

# Analysis

- Custodian's room in basement always cold
- Monoflo tees installed wrong since new
- Vent unit had been heating building
- Solution – re-install tees correctly

# Reset Upset

- Elementary school – hydronic heat, constant high supply temperature
- Energy upgrade – new hi-eff boilers on aggressive reset control
- Many heating complaints in shoulder season

# Analysis

- System not balanced
- With hot water low demand loads rarely open – flow went to high demand zones
- With reset more zones more open more often – flow starvation in some zones
- Solution – balance the system



# Delta Blues

- Large central chilled water system
- Energy upgrade – new chillers
- Couldn't load/sequence chillers properly

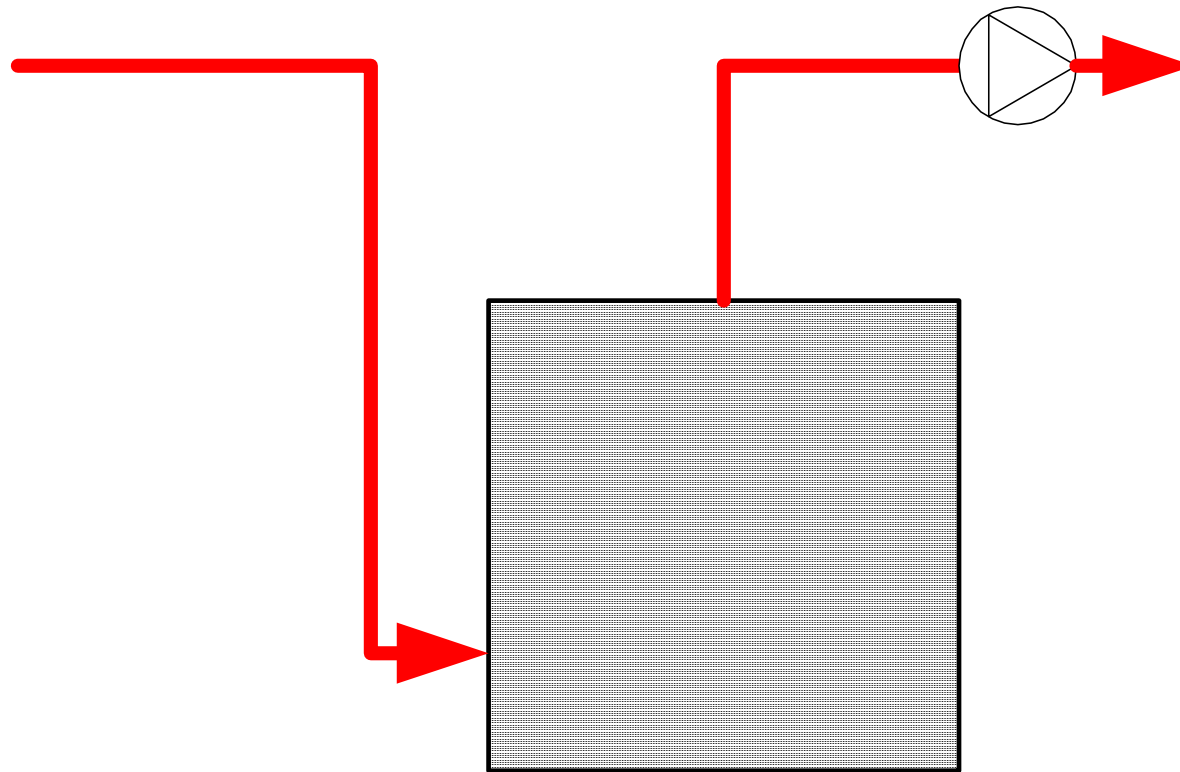
# Analysis

- New chillers selected for 16 °F delta-T
- Existing chilled water coils selected for 10 °F
- Oops
- Solution – lower CHWS, ‘turbocharge’ coils to run at lower flow, higher delta-T

# P-S Palpitation

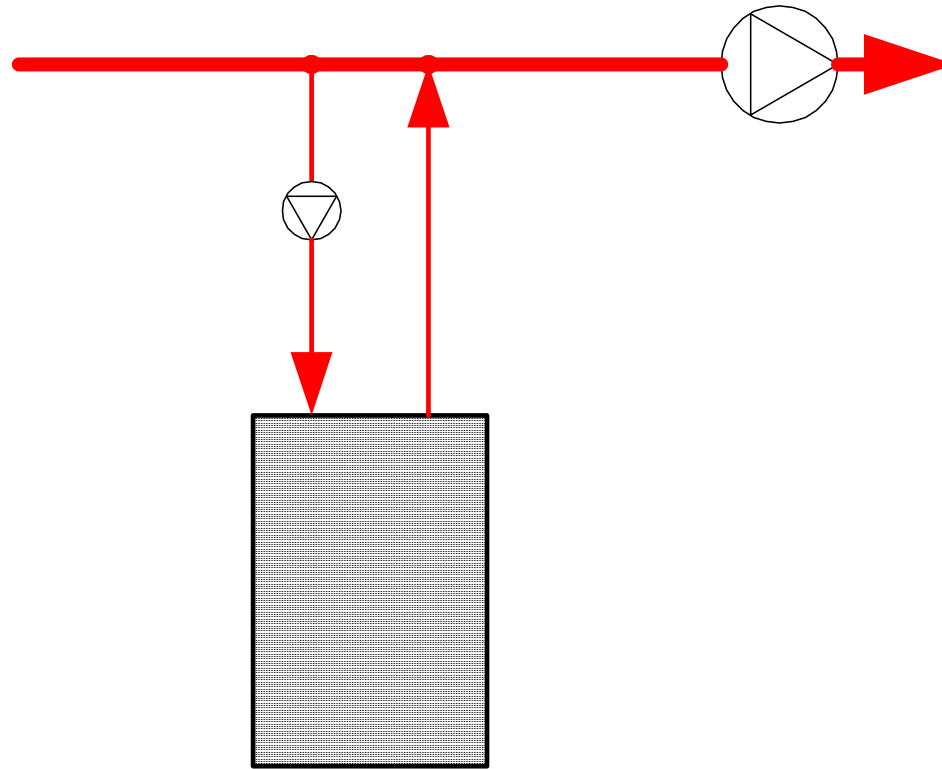
- Old high mass, high temp primary only boiler
- Energy upgrade – new p-s hi-eff boiler, reset control
- Boiler cycles badly, hits high limit, generally misbehaves

# From This...



Boiler

...To This



Boiler

# Analysis

- System flow higher than new boiler flow
- Recirculated return water in p-s connection drops supply temp
- Boiler must really cook to hit setpoint
- Solution – get flows equalized

# Other Things

- VAV retrofit – air distribution
- Condensing boilers
- Setpoint compatibility
- Tenant experience/expectations
- Operator involvement
- Comfort

# *Thank You!*

- For your attendance today
- For supporting ASHRAE
- Questions?