

# Economizers: Design, Performance, and Commissioning Issues

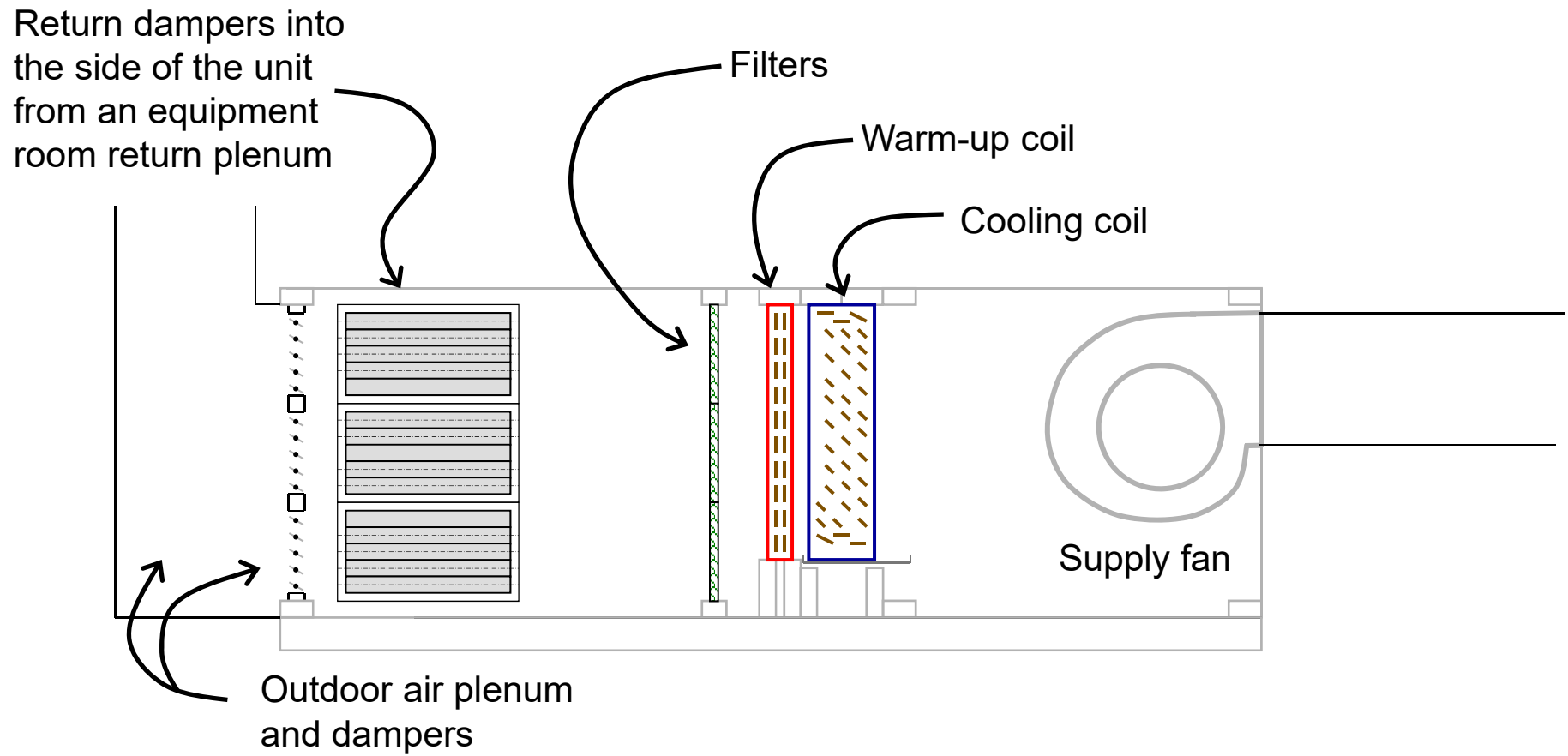
A Baffling Economizer Problem



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# A Baffling Economizer Problem



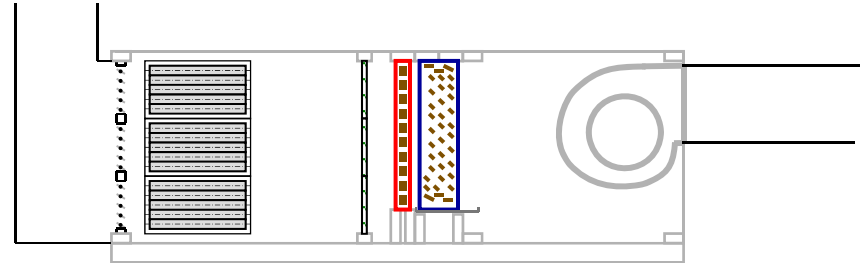
# A Baffling Economizer Problem

## The Problem

- Frozen coil
- Unit constantly trips on freezestat in extreme weather; will not operate

## The Temporary Solution

- Drain coils
- Jump freezestat
- Operate on minimum outdoor air
- Try to heat using reheat coils



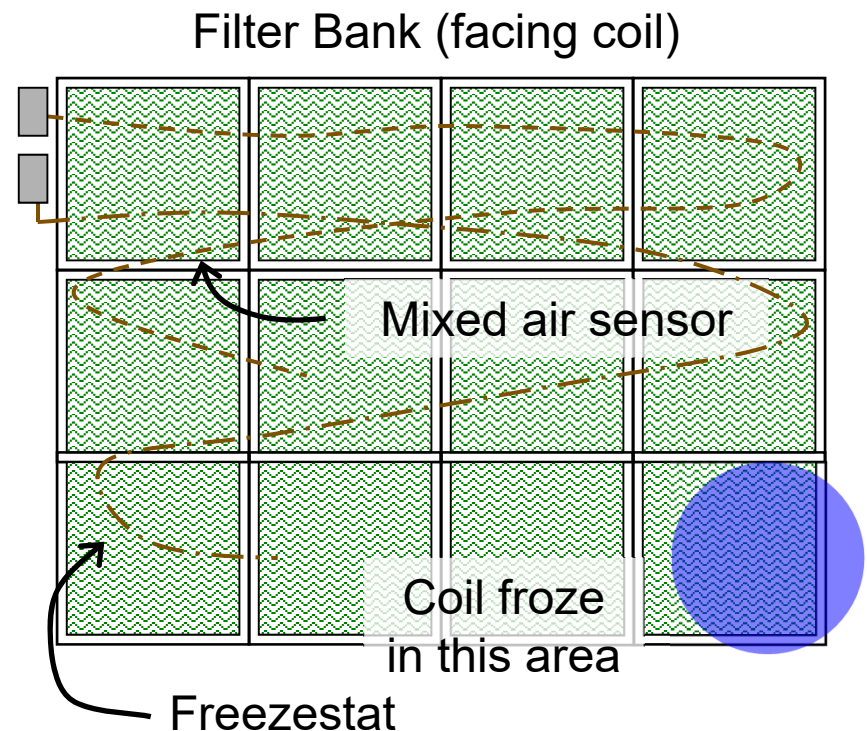
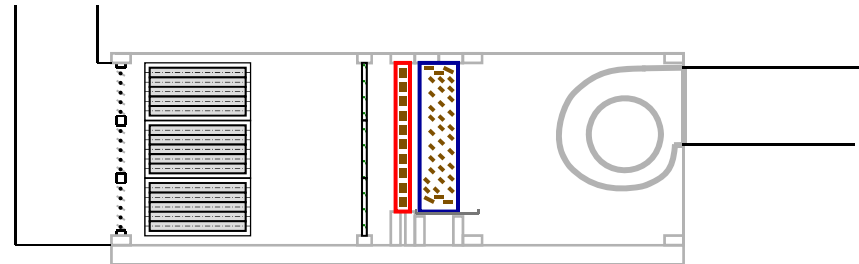
## The Result

- Building temperatures in the low to mid 60's°F at best
- Unhappy client

# A Baffling Economizer Problem

## Diagnostic Technique

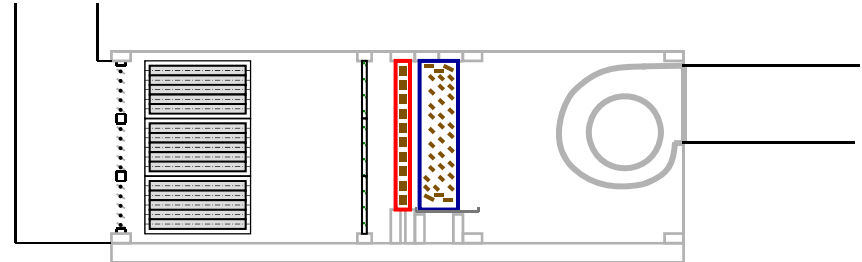
- Inspect the system
- Observations:
  - Damper face velocities are very low (1,000 fpm)
  - Parallel blades
  - Dampers blow air down as they close
  - Coil had frozen on bottom right side (facing coil)
  - Noted temperature sensing element locations
  - MOA set as a percent of stroke



# A Baffling Economizer Problem

## Functional Test

- Perform a temperature traverse
  - Use hand-held temperature sensor
  - Use the filter grid as a frame of reference
  - Assess velocity by “feel”



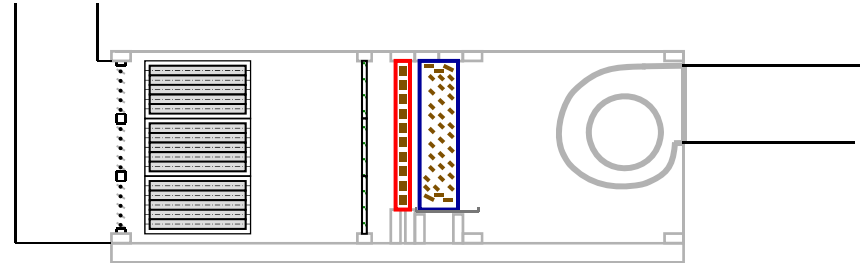
Filter Bank (facing coil)



# A Baffling Economizer Problem

## Functional Test

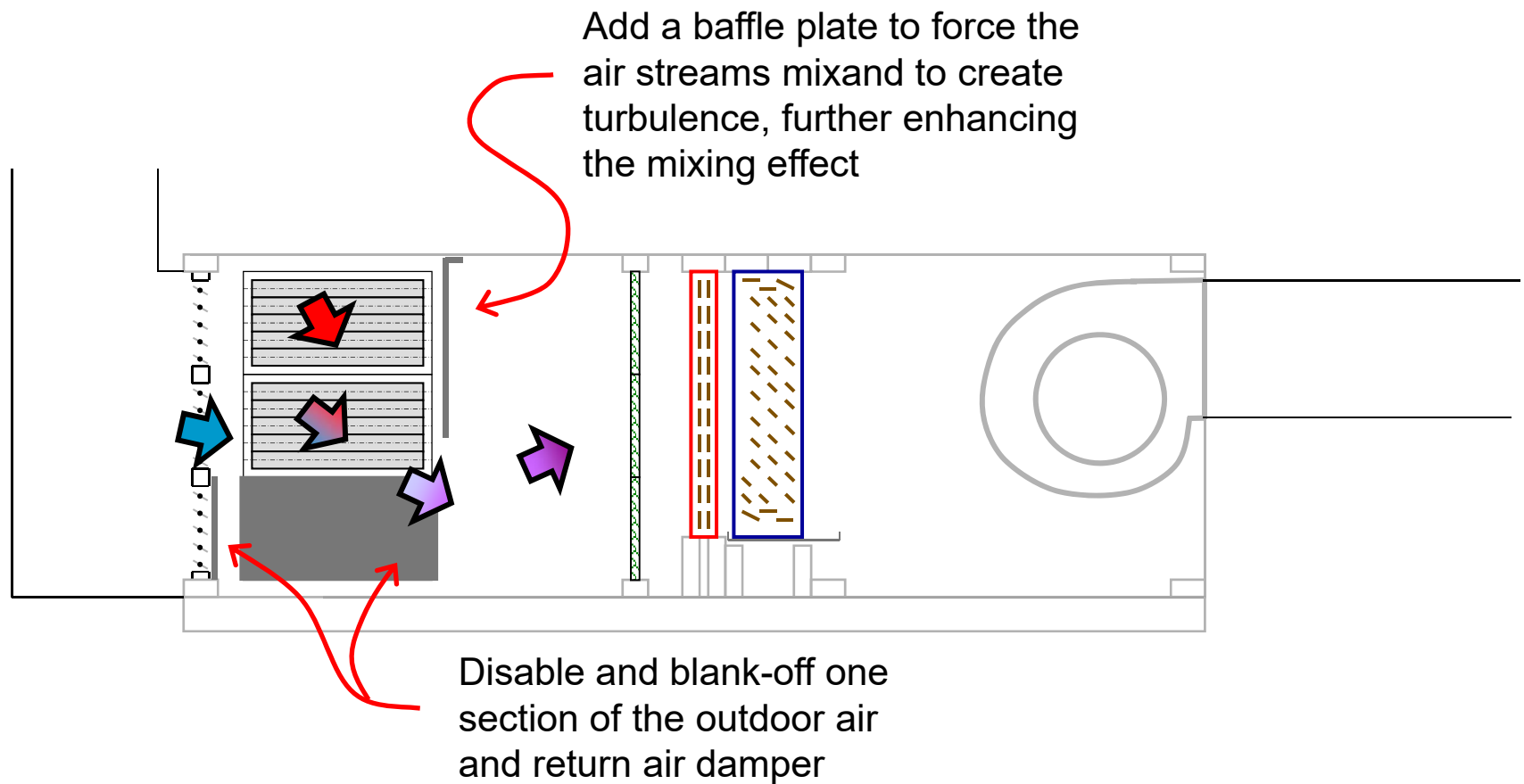
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Filter Bank (facing coil)



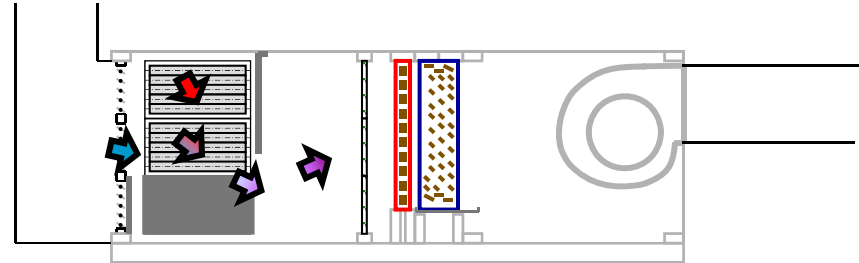
# Solving the Problem



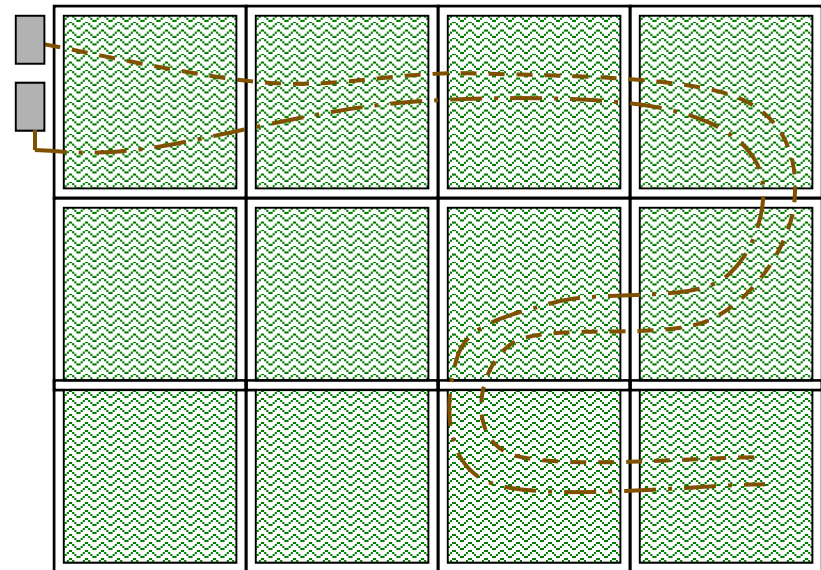
A BAFFLING PROBLEM

# Solving the Problem

- Relocate the existing sensing elements
- Adjusted the minimum outdoor air based on temperature at the fan discharge (true mixed condition)
- Add a mixed air low limit control to the process
- Recommend considering additional sensing elements pending operating experience after the modification



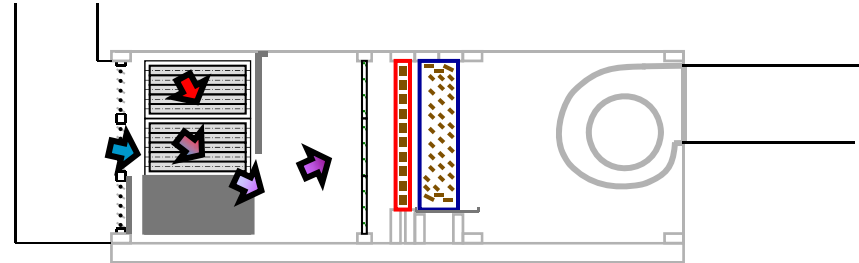
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Filter Bank (facing coil)

59°F Med.	60°F Med.	58°F Med	55°F Slow
58°F Med.	58°F Med.	56°F Med.	52°F Med.
56°F Fast	52°F Fast	50°F Fast	47°F Fast