



# ***Energy Valve Optimization***

**CSHE Kings River  
Valley Children's Hospital  
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# Energy Valve Optimization



## Agenda

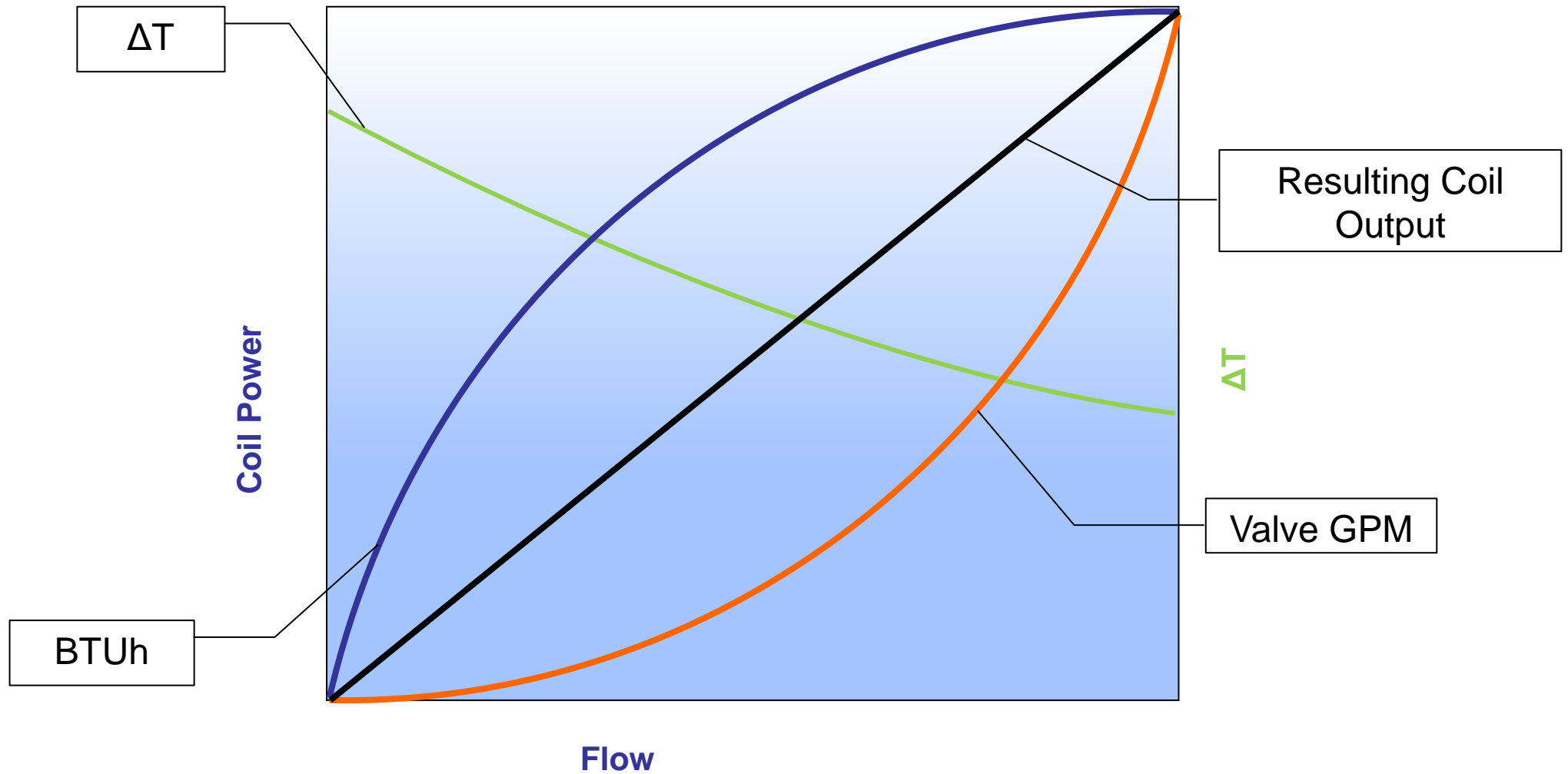
- Why Energy Valves?
- How Energy Valves work
- Optimizing performance

# Why Energy Valves

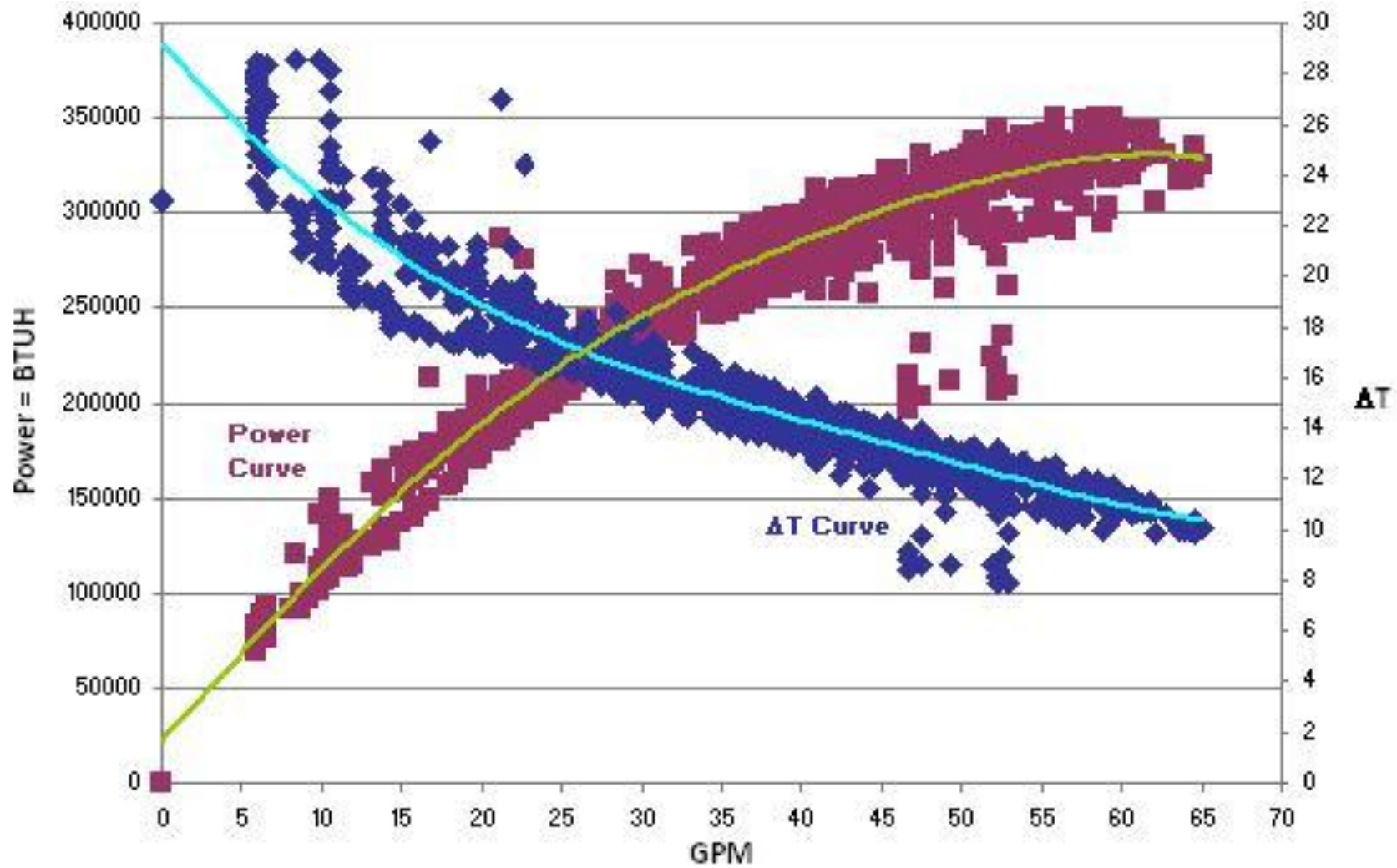
## Coil Performance



Coil Performance

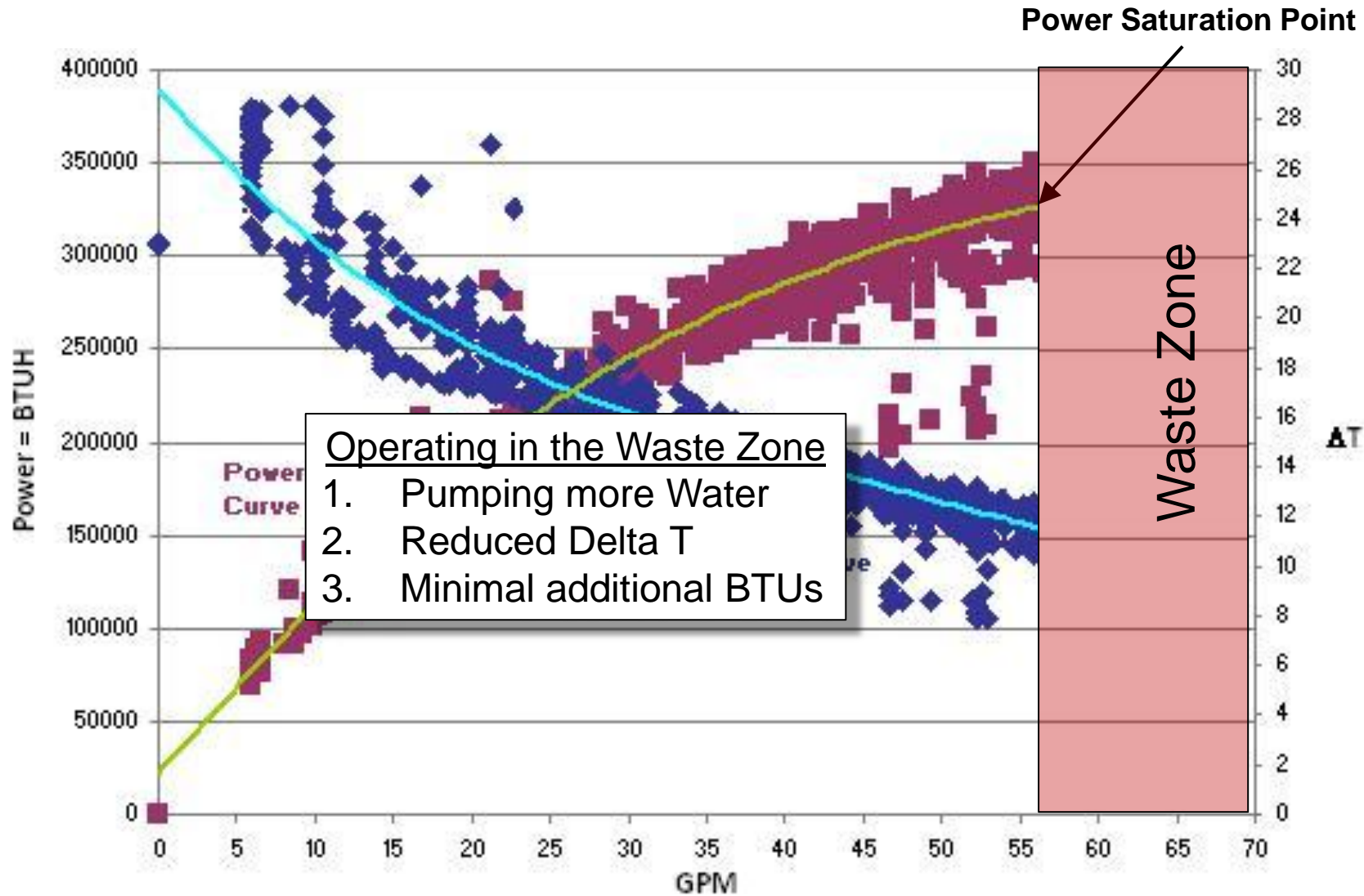


# Why Energy Valves Coil Performance



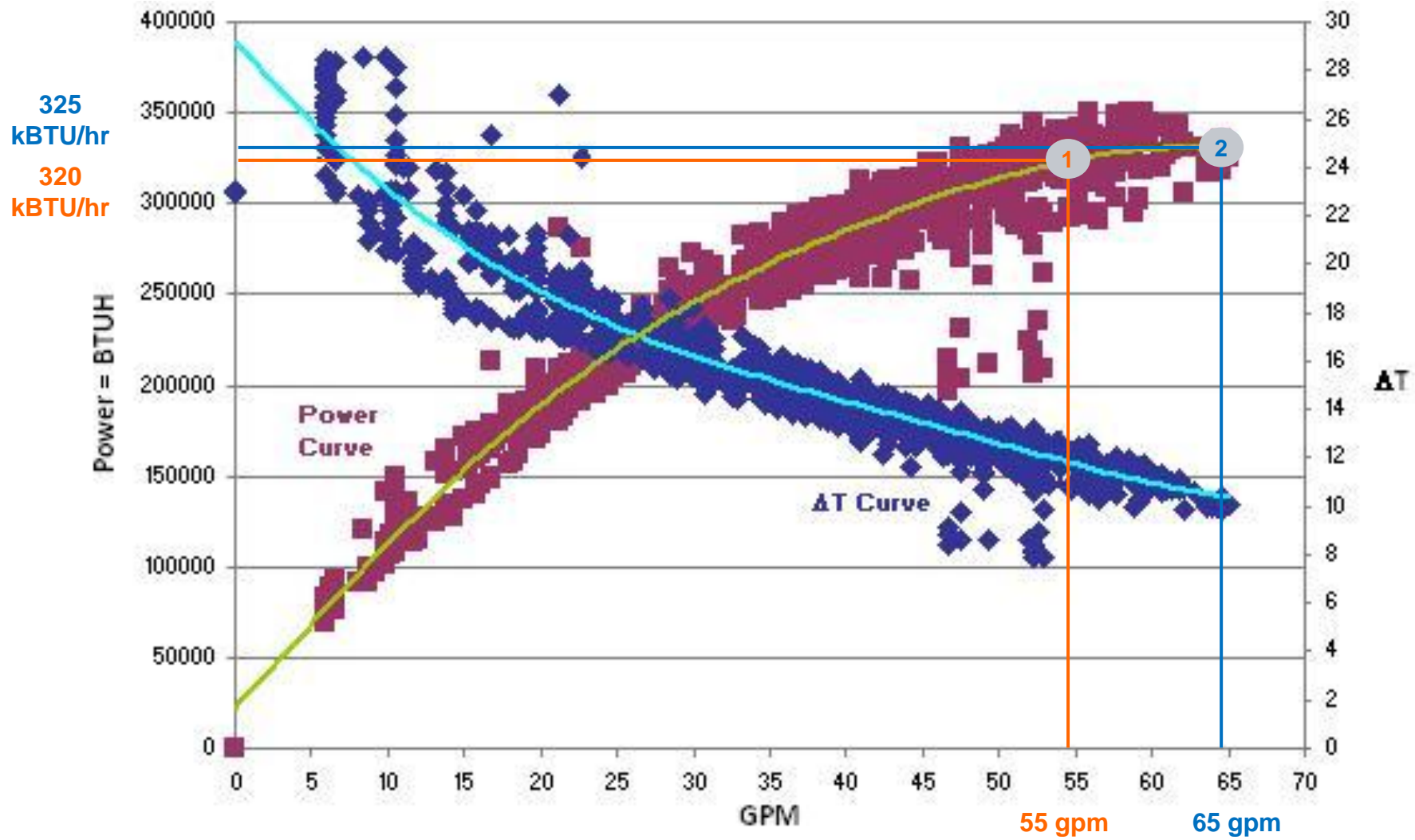
# Why Energy Valves

## Coil Performance



# Why Energy Valves

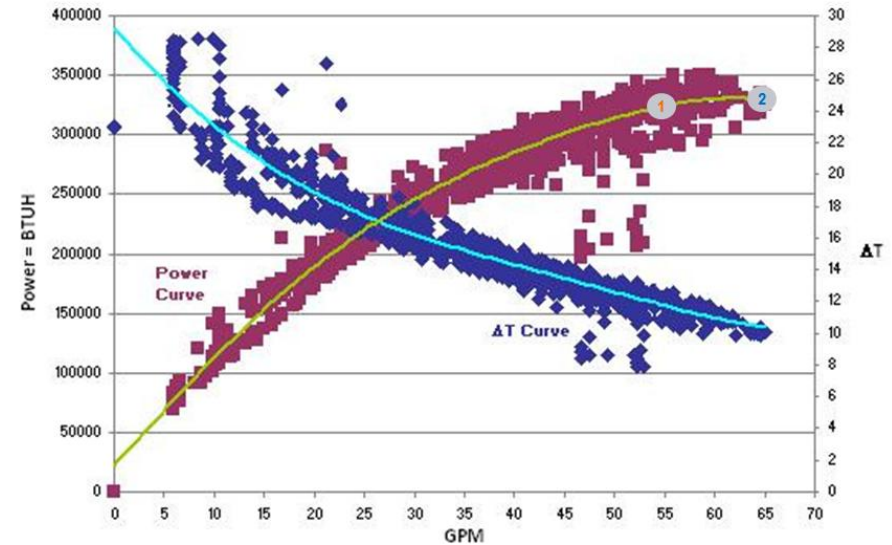
## Coil Performance



# Why Energy Valves Coil Performance

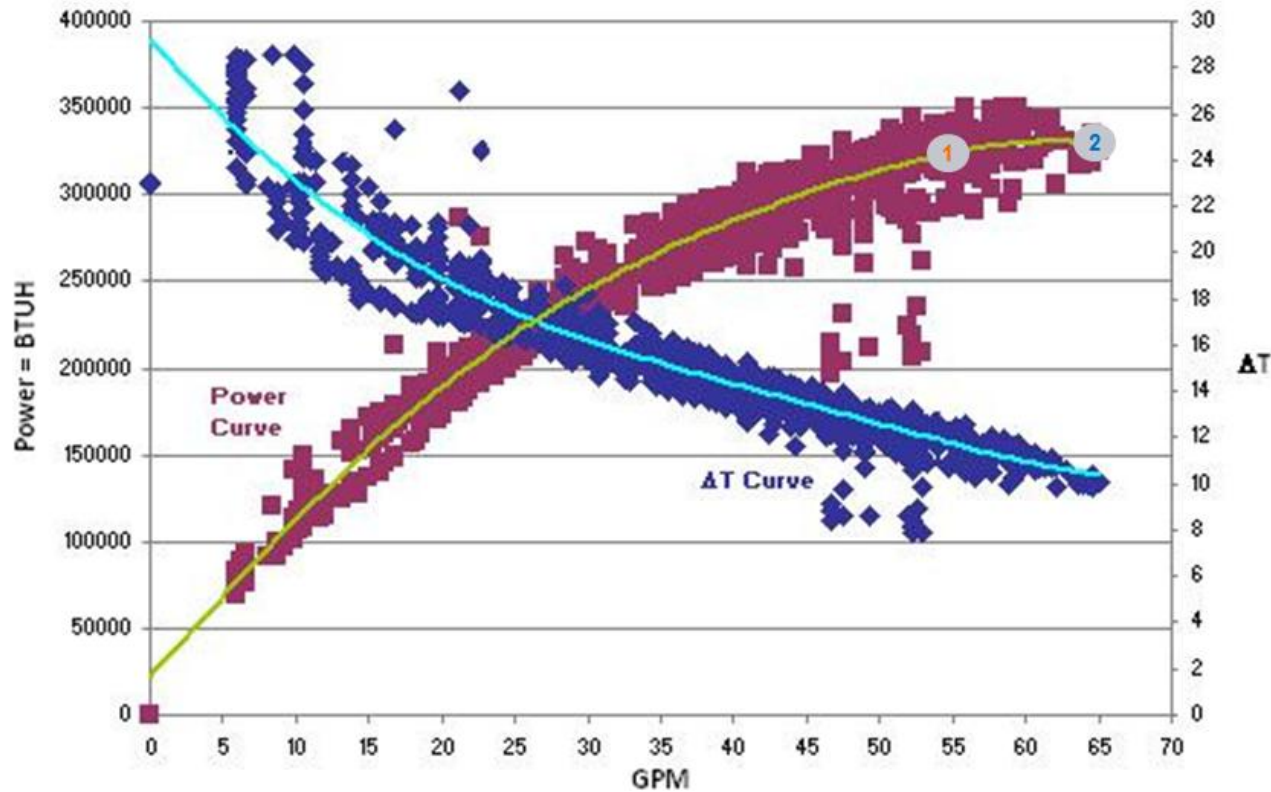


	1	2	Δ
BTUh	320,000	325,000	1.6%
GPM	55 GPM	65 GPM	18%
Pump hp	Hp increase = $(65/55)^3$		65%



$$\frac{HP_2}{HP_1} = \frac{GPM_2}{GPM_1}$$

# Why Energy Valves Coil Performance



It takes **65%** more pump energy to create **1.6%** more BTUh.



# Why Energy Valves

## Plant Performance

### Plant Efficiency

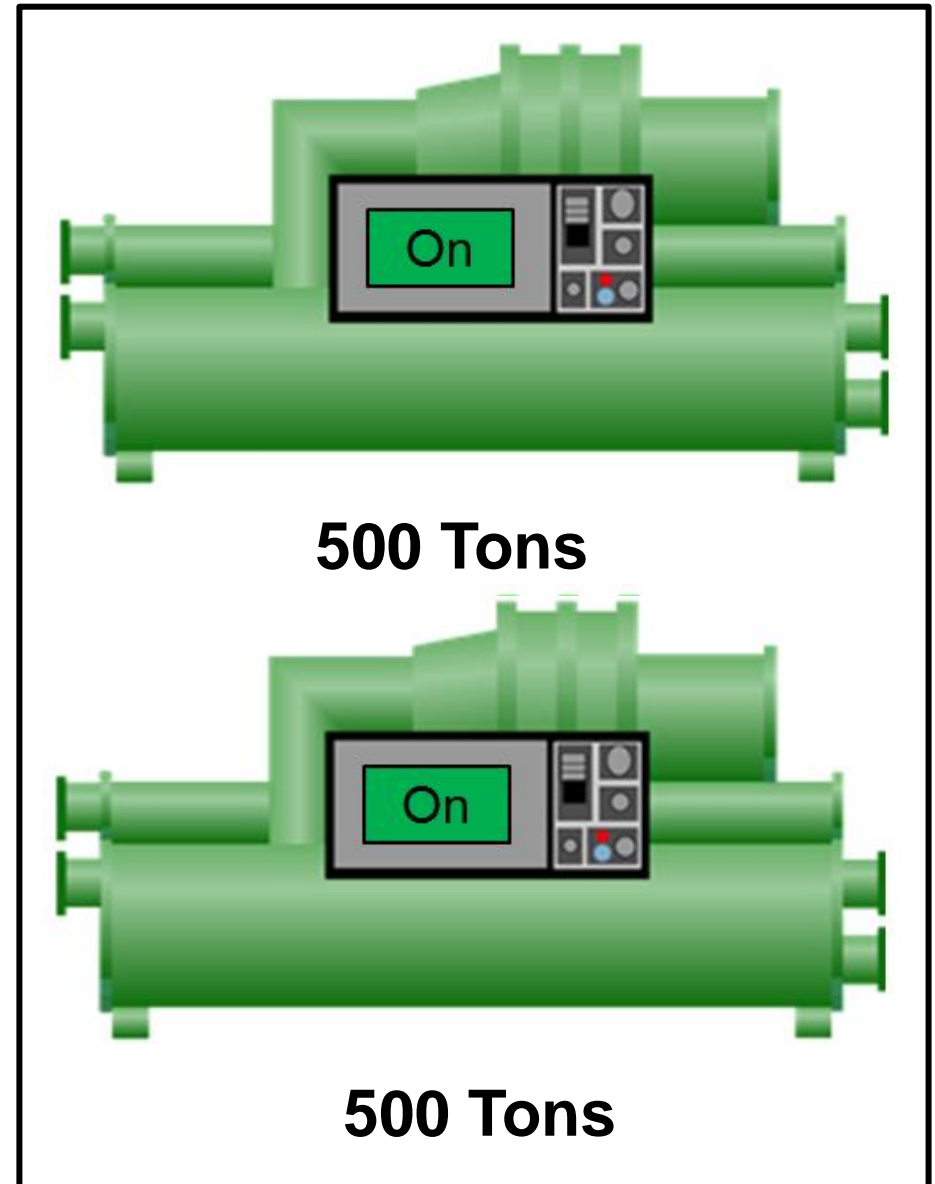
- **Chillers**

- Plant is more efficient at Design  $\Delta T$  than at low  $\Delta T$
- Low DT (high flows) can cause Improper staging

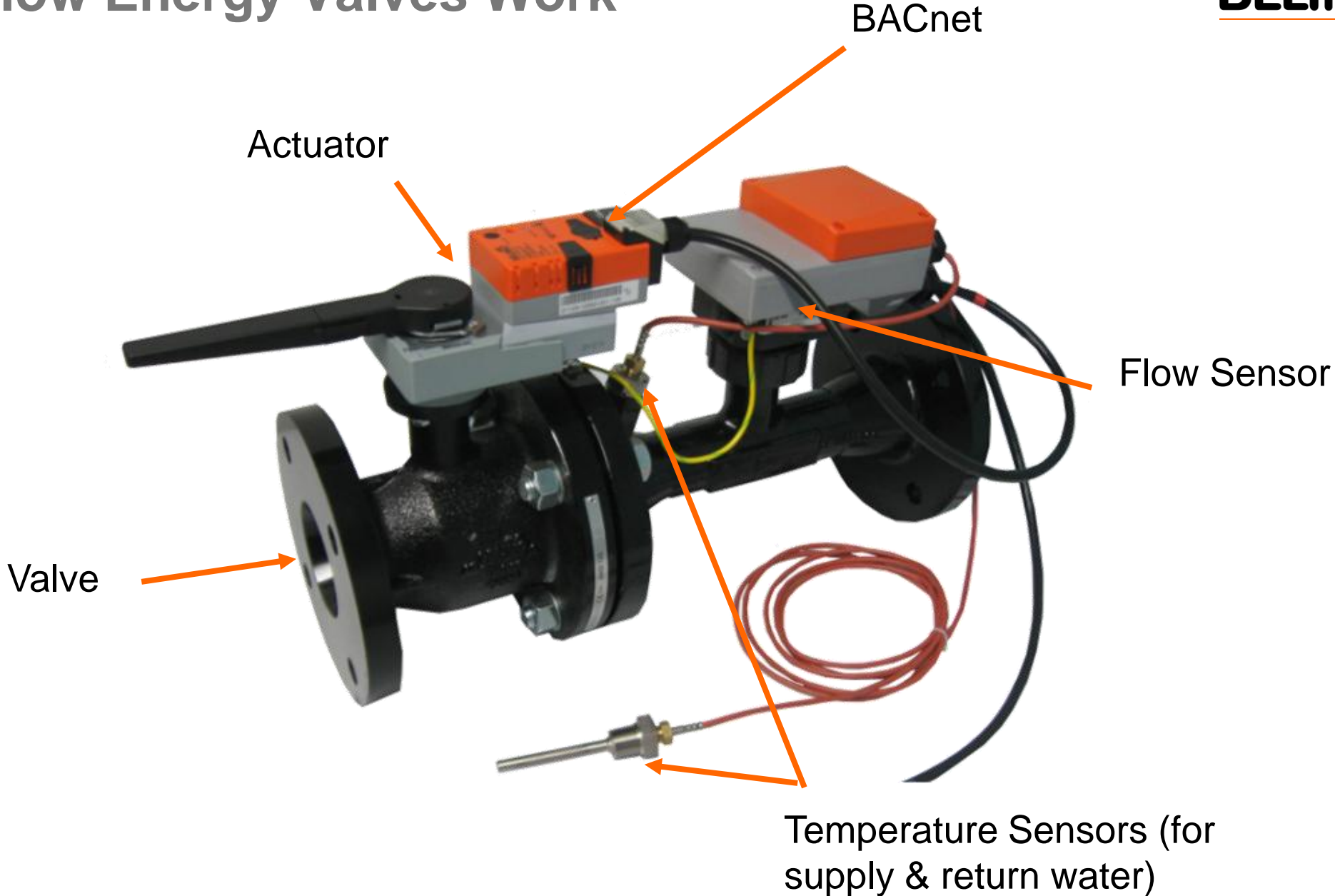
$$GPM = \frac{Tons \times 24}{\Delta T}$$

$$GPM = \frac{500 \times 24}{12} = 1,000$$

$$GPM = \frac{500 \times 24}{8} = 1,500$$



# How Energy Valves Work



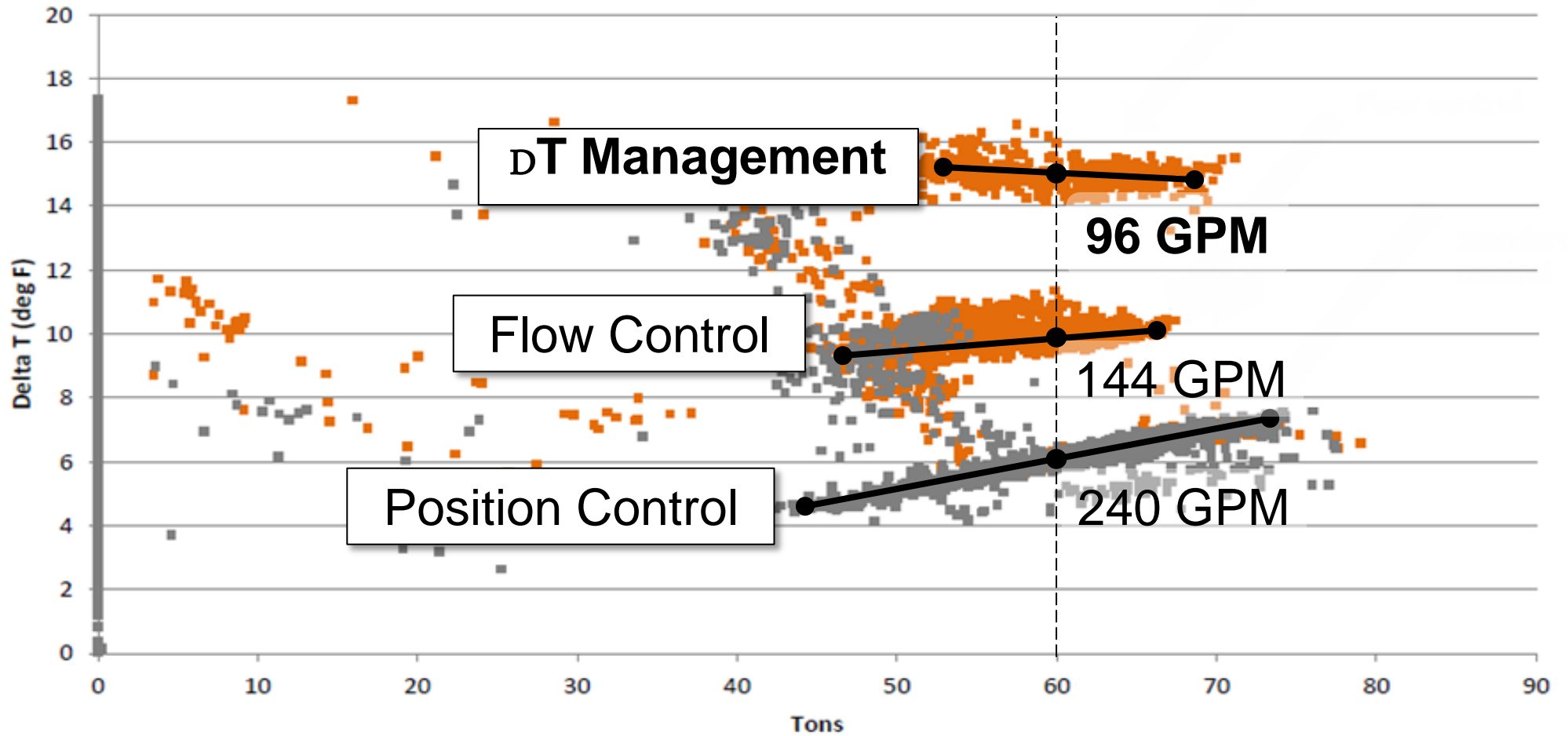
# How Energy Valves Work

*Large Tech Company in North Carolina*



### Delta T vs. Tons - B500 AHU3

■ Smarts On ■ Smarts Off

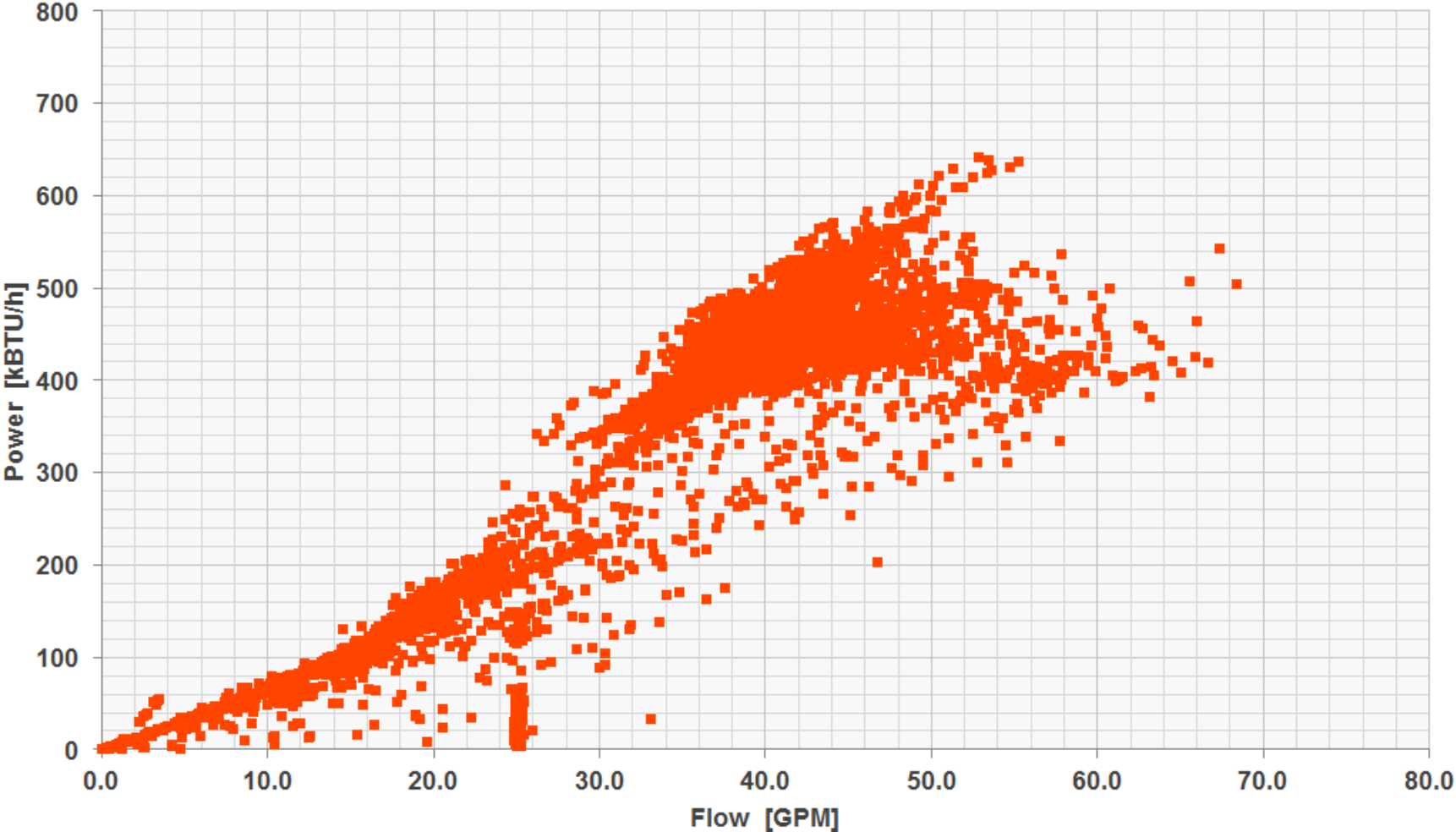


# Optimizing Performance

## Valley Children's Data



POWER AND DT VS FLOW



# Optimizing Performance

## Valley Children's Data



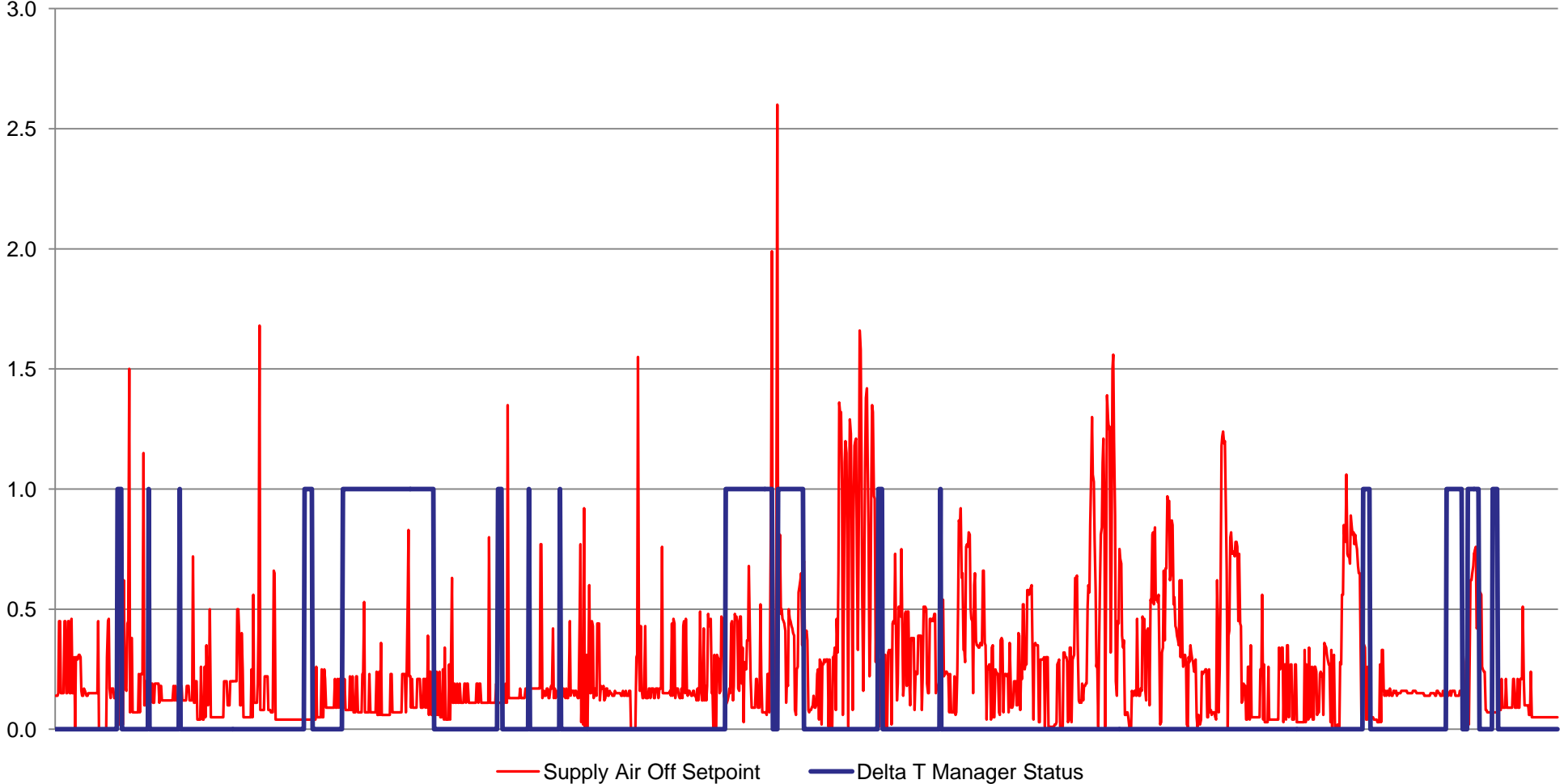
Delta T Manager Active Minutes	Standby	Active	% Active
Position Control	14,279	3,560	20%
Flow Control	214,902	9,399	4%
Power Control			
Totals	229,181	12,959	24%

DeltaT Degrees in °F	Min	Average	Max
Position Control	0.04	5.16	20.37
Flow Control	0.03	15.57	33.29
Power Control			

	AVG GPM Projected	AVG GPM Actual	Total Gallons Projected	Total Gallons Actual	Total Gallons Saved
Flow in GPM by Projected DDC Signal	75	27	1,013,937	261,284	752,652
% of Over Flow	179.64%				74.23%

# Optimizing Performance

## Valley Children's Data



# Optimizing Performance

## *Benefits for Valley Children's*



- **Properly balanced**
- **Better control of central plant**
- **Meet cooling loads**
- **Continuous commissioning**
- **Identify locations of air in the system**



Thank You

