

Energy & Store Development Conference

E+Sd 2014

September 7-10, 2014
St. Louis Union Station Hotel
St. Louis, MO



THE VOICE OF FOOD RETAIL 

Retailer Experiences with installed CO₂ Refrigeration Systems

Benny Smith

Price Chopper Supermarkets

Schenectady, NY



Cascade refrigeration

Background :

- Plan expansion 2008
- Timing was good for the sustainable technology
- Refrigeration Manufacturer had a next generation opportunity
- Close to the Corporate Headquarters
- In-house Technicians

Cascade System

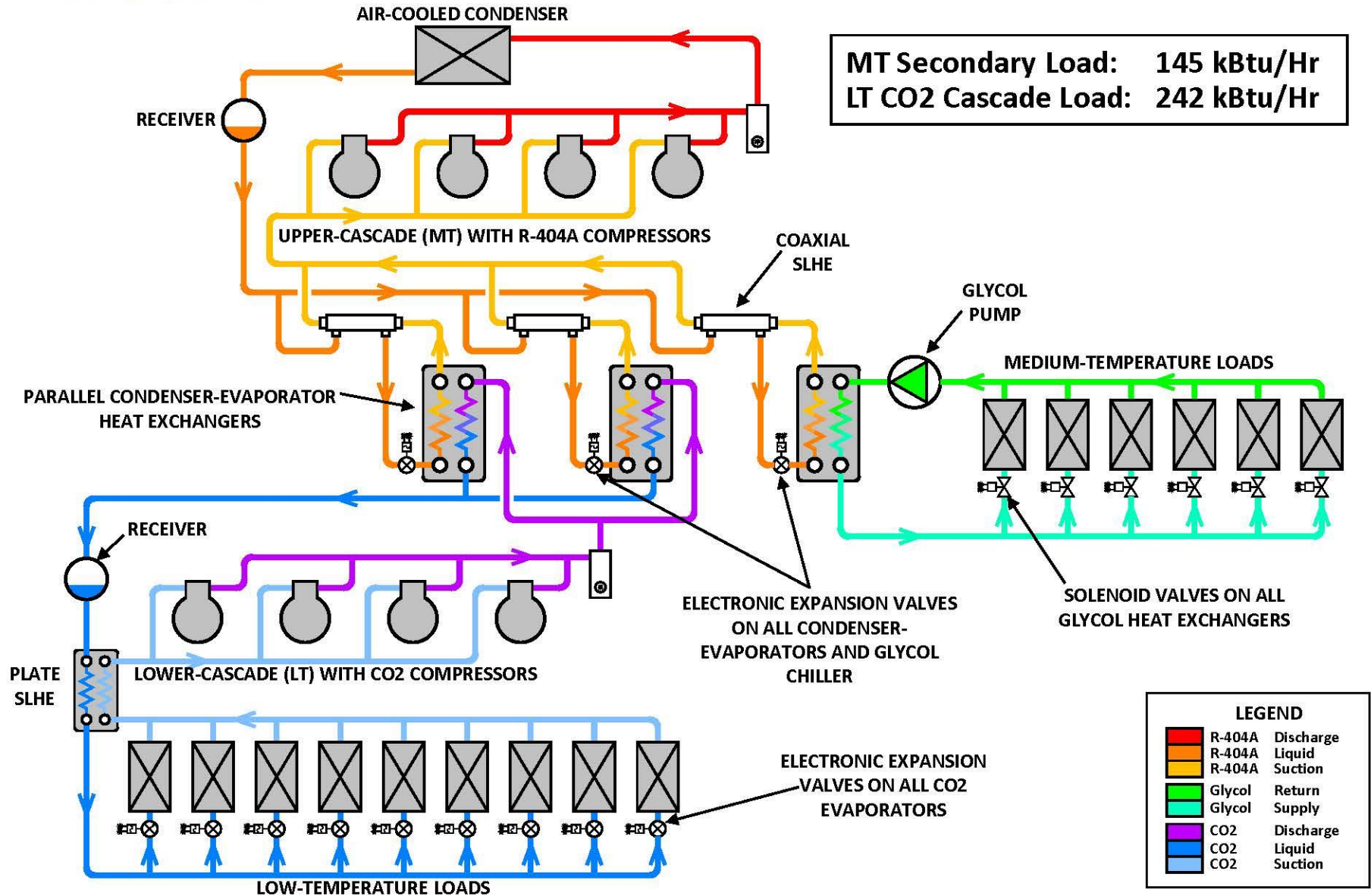
- Carbon Footprint Reduction due to CO₂ Refrigeration System:

5,132 Tons of CO₂ Equivalent



Price Chopper – Saratoga, NY

Combined SNLTX2 / SNMT System





GREEN
B/RACK

CO2 404-A
Glycol (BX)

MEAT FRZ. [6]

A-C To
Meat, Pacl.

HW HW HW

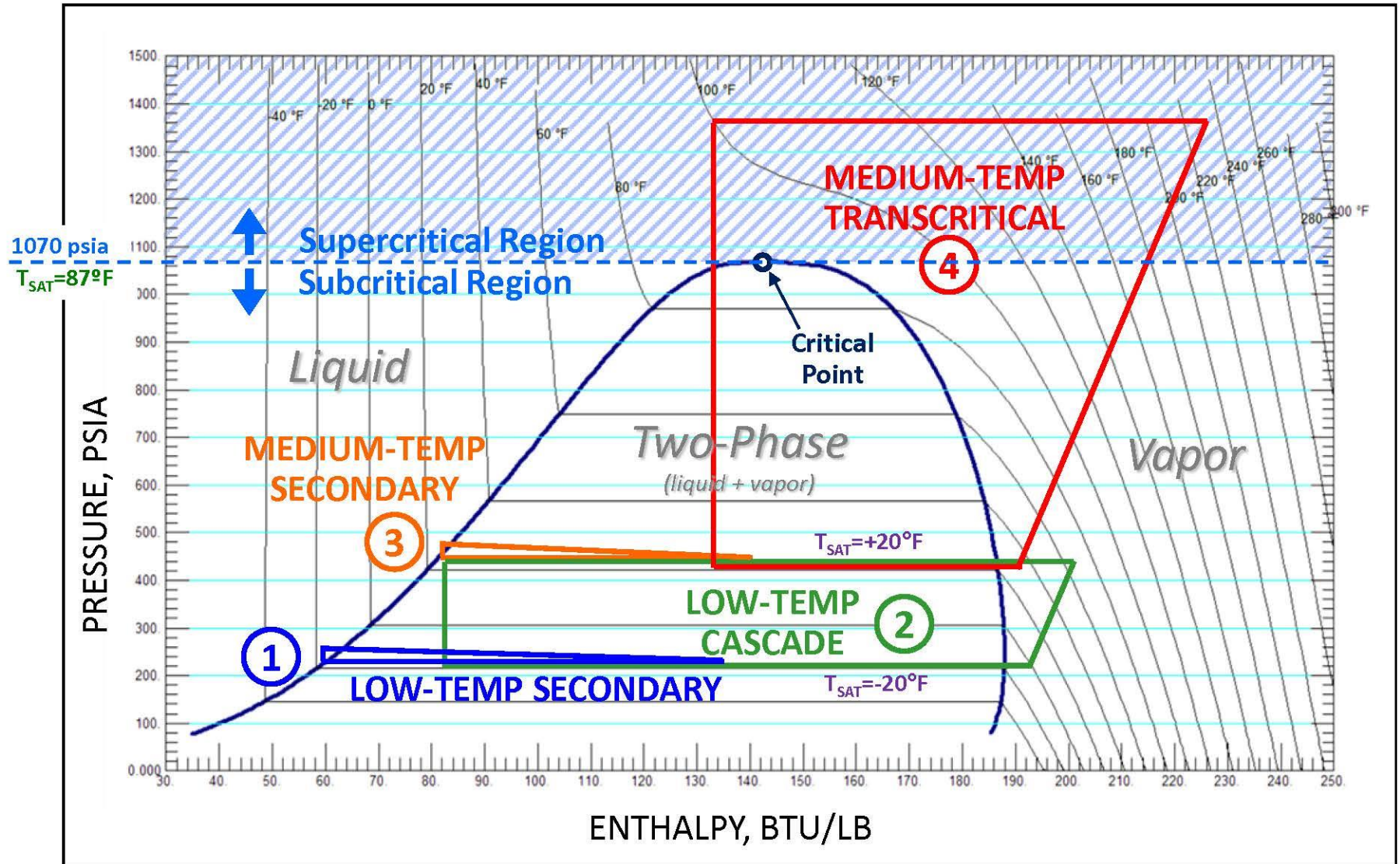
SAFF-Case
Soup case

Comp ON Top
of Cooper?

WILSON & CO.
TREATMENT
1770
SOUTHERN VIRGINIA

CO2 System Types

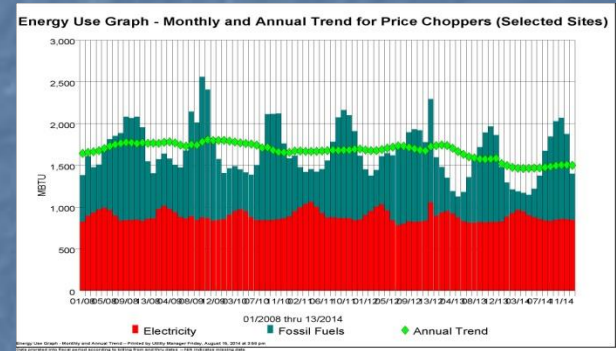
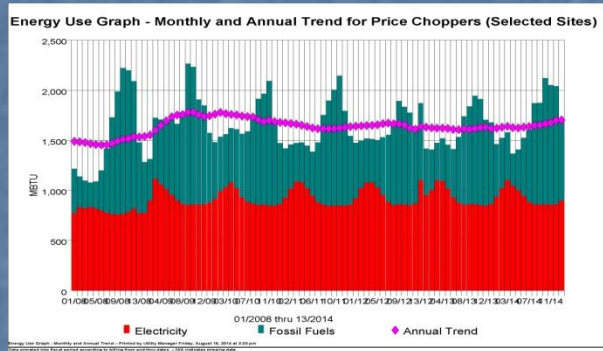
System Cycle Comparison on P-h Diagram



Energy Use Graph- Monthly and Annual Trend

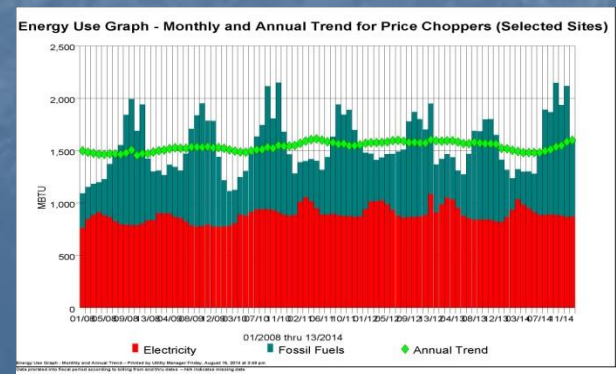
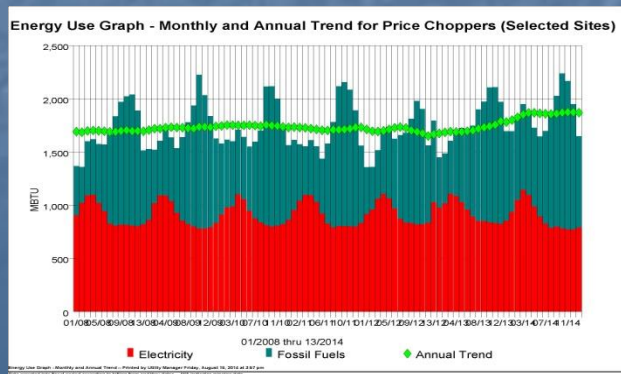
Cascade

#178



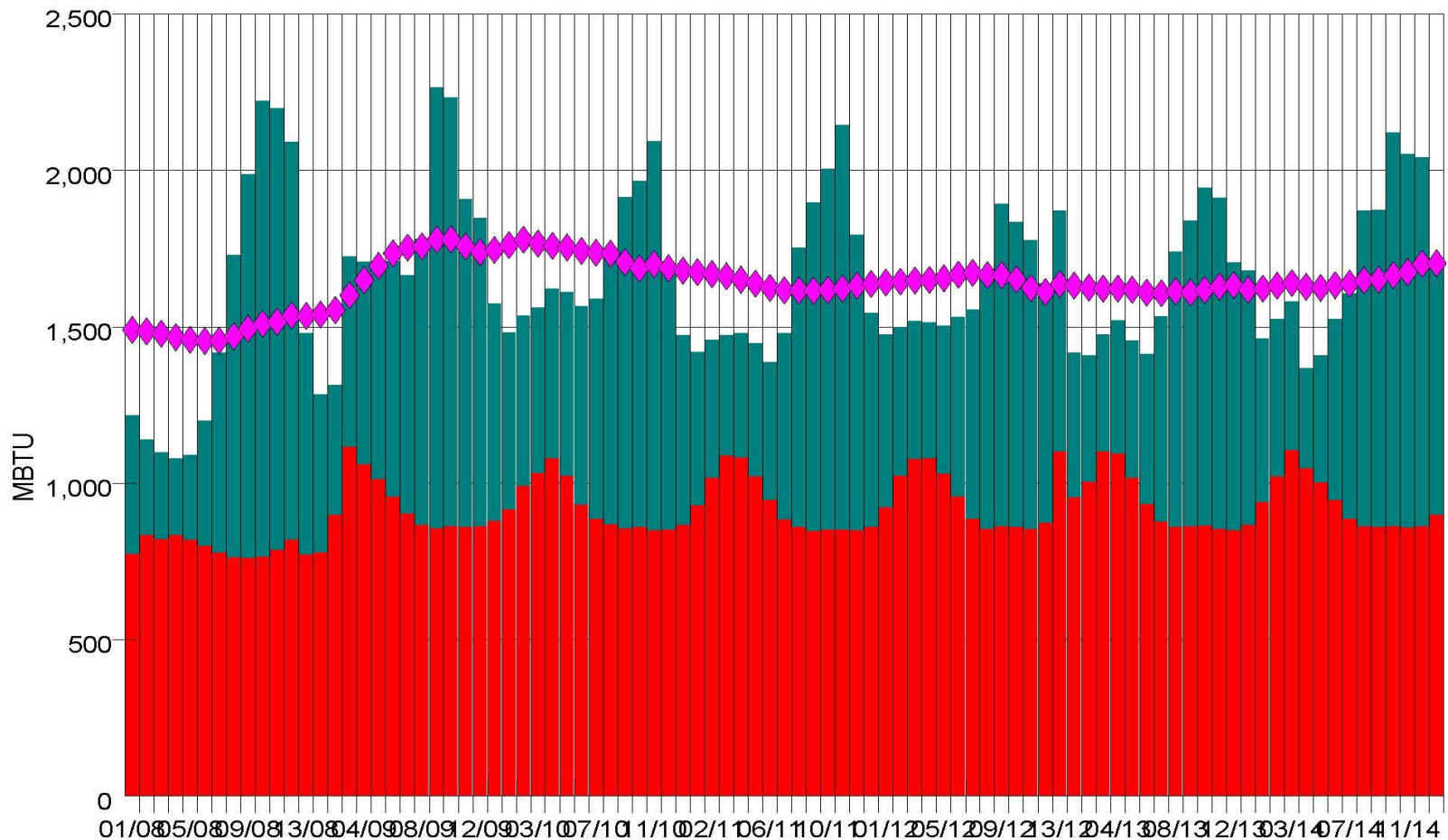
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Cascade

Energy Use Graph - Monthly and Annual Trend for Price Choppers (Selected Sites)



■ Electricity

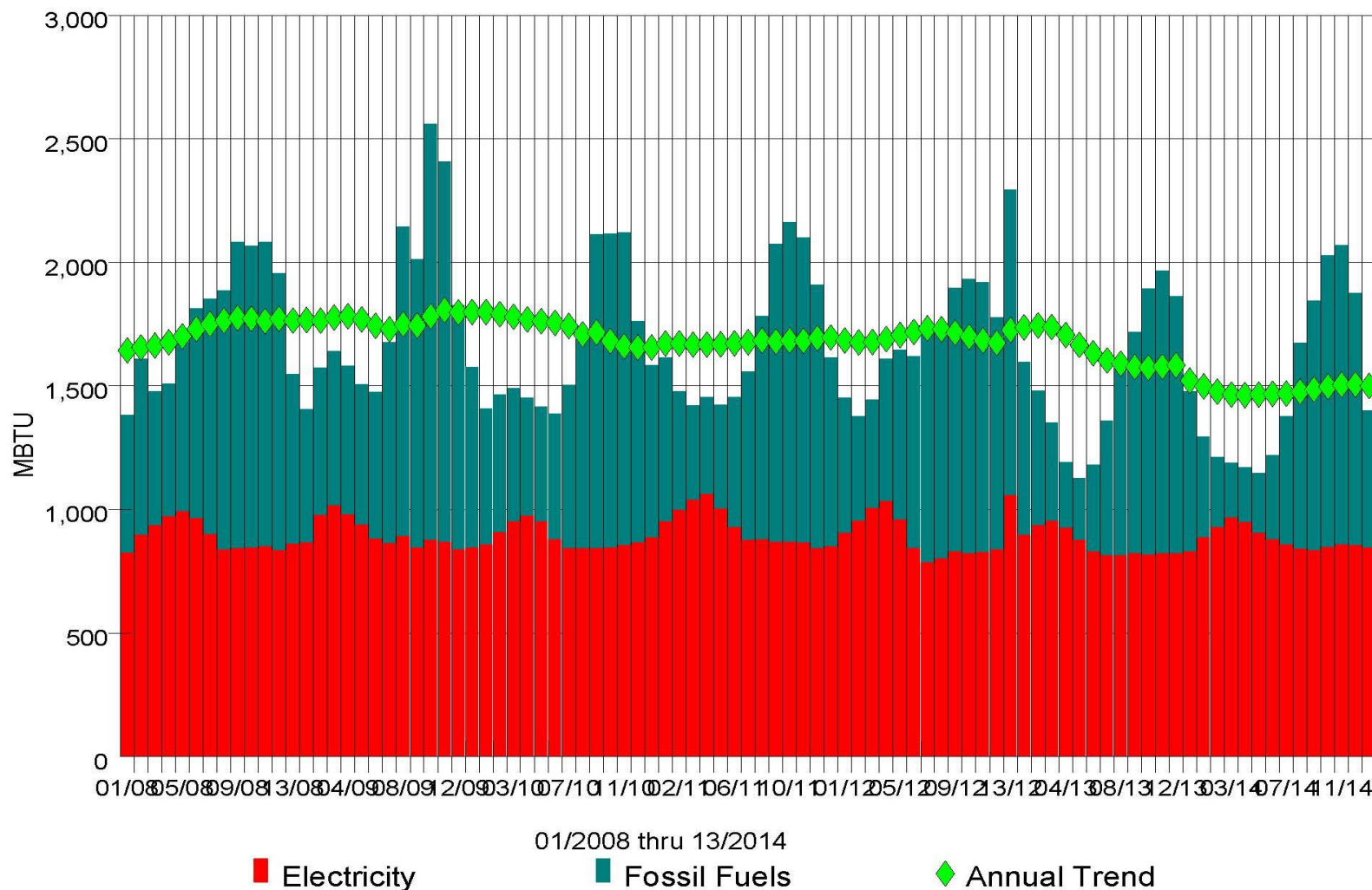
■ Fossil Fuels

◆ Annual Trend

01/2008 thru 13/2014

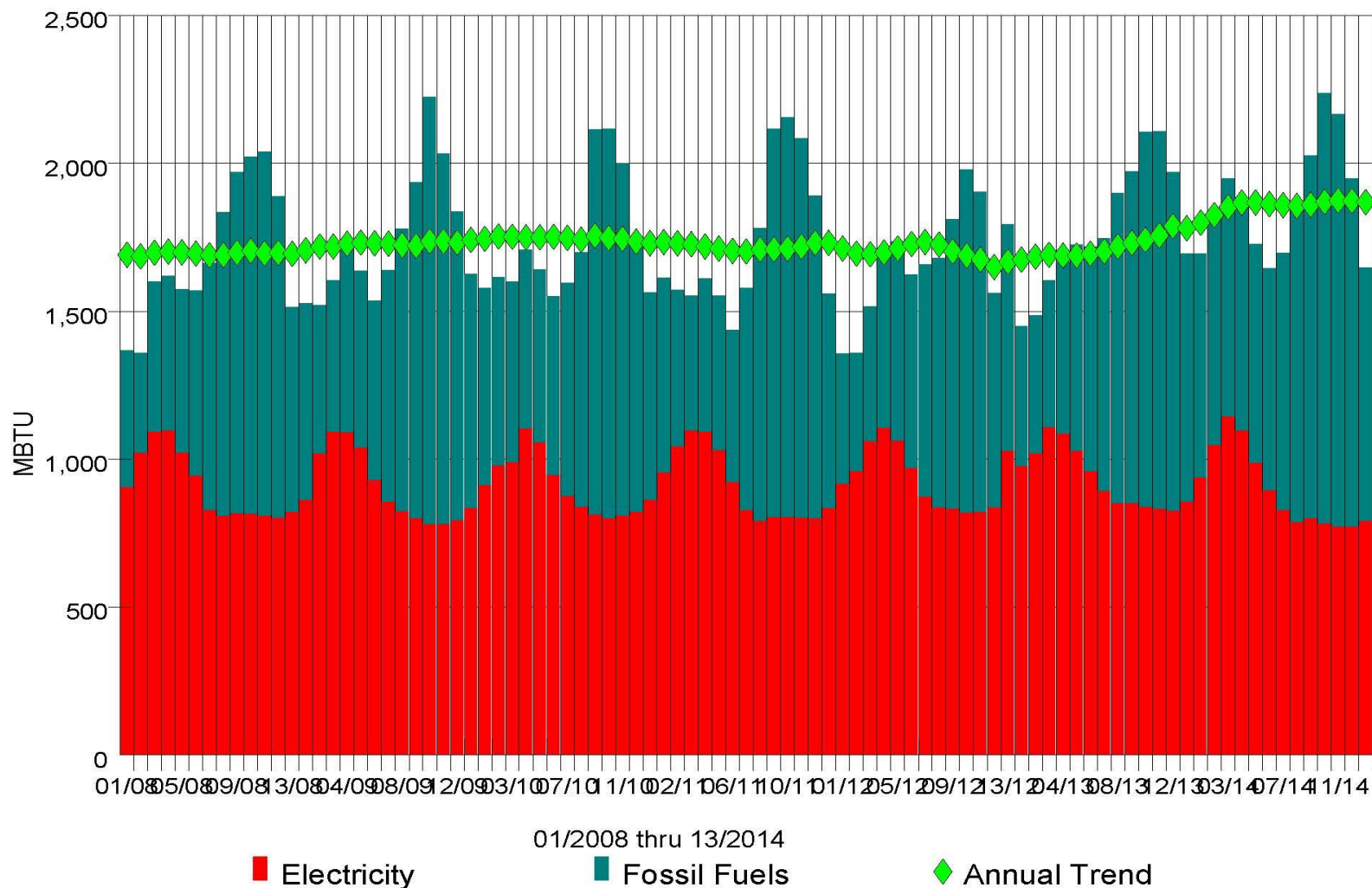
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Energy Use Graph - Monthly and Annual Trend for Price Choppers (Selected Sites)



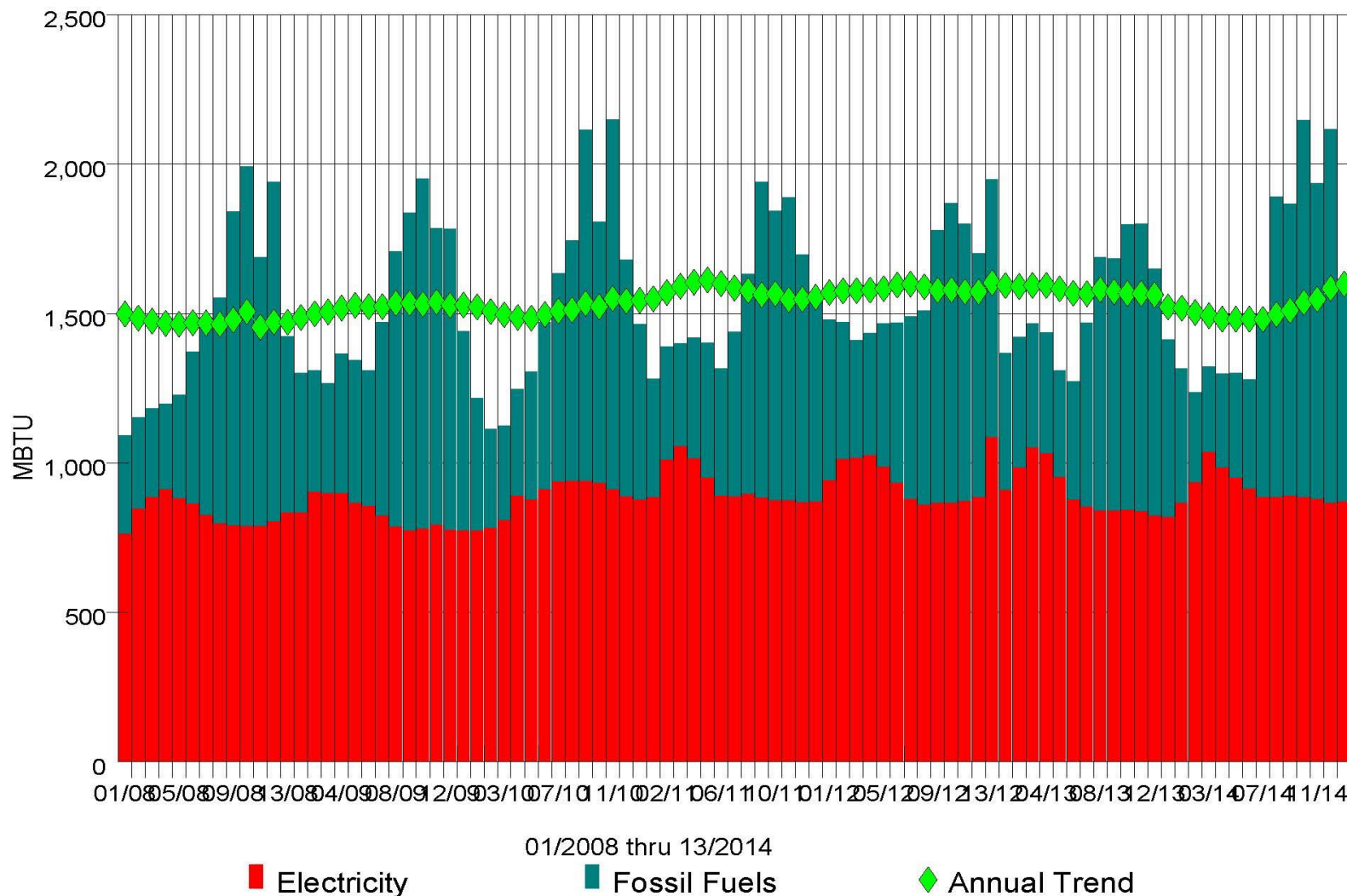
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Energy Use Graph - Monthly and Annual Trend for Price Choppers (Selected Sites)



#199

Energy Use Graph - Monthly and Annual Trend for Price Choppers (Selected Sites)



PRICE
CHOPPER
ID: #158

LOWER
CASCADE

R-744

POE OIL
WATER
BSE-60R

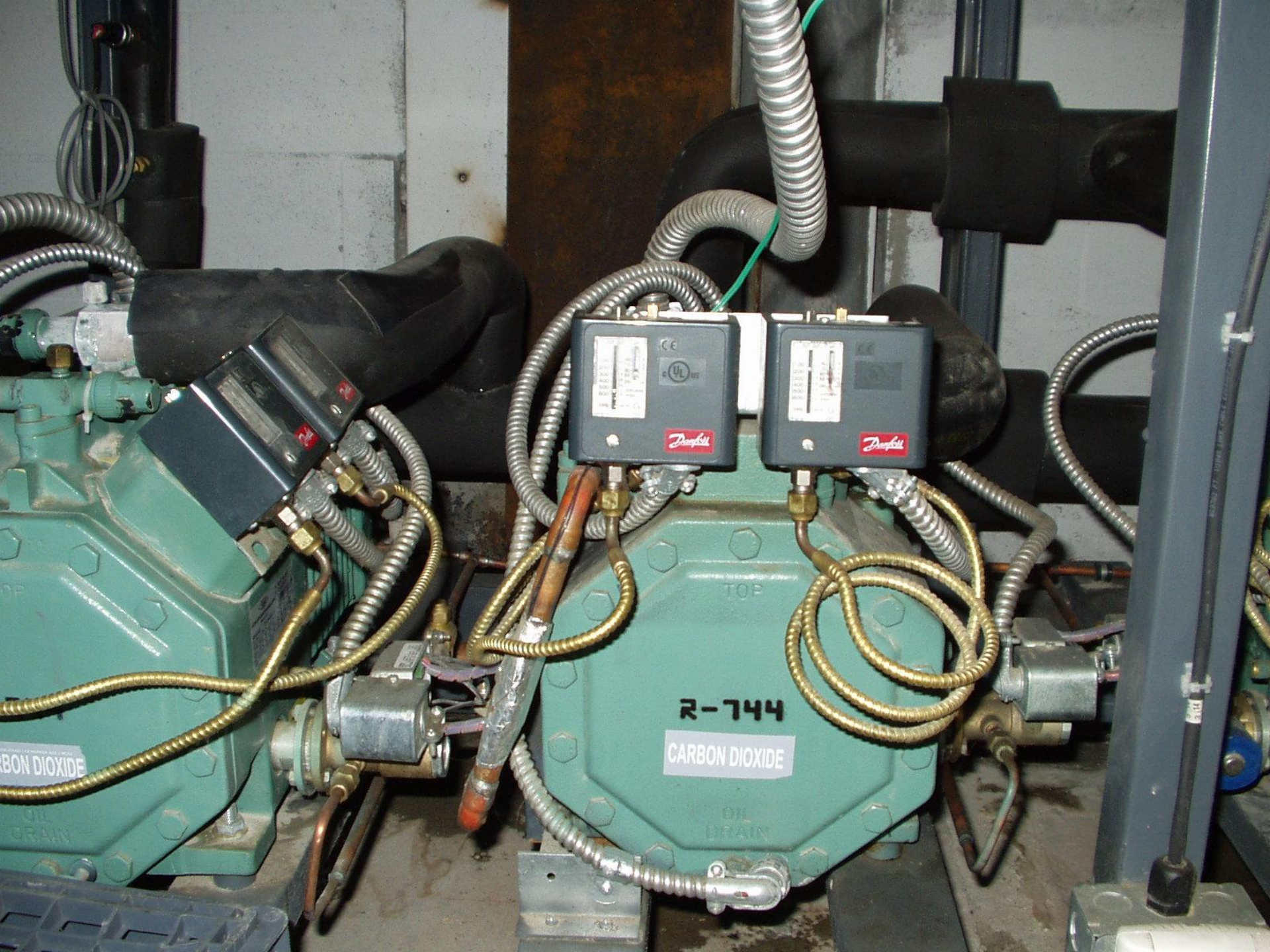
UPPER
CASCADE

R-404A

POE OIL
EMULSION
RL-50H

WARNING
DO NOT
RE-ENTER
UNTIL
ALL
PRESSURE
IS
RELEASED

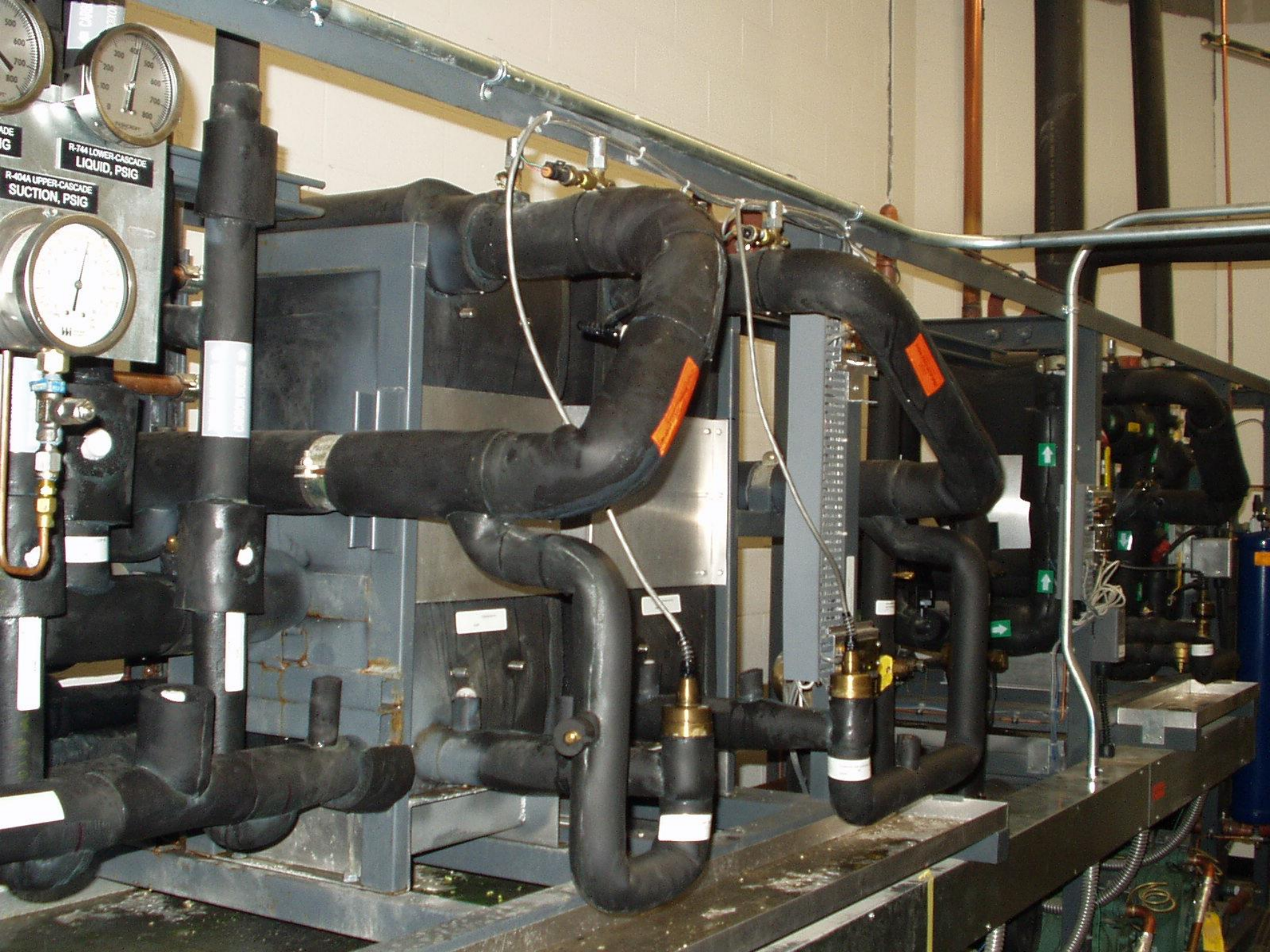




R-744
CARBON DIOXIDE

CARBON DIOXIDE

OIL DRAIN





2008



2014





R-744 LOWER-CASCADE
DISCHARGE, PSIG



R-744 LOWER-CASCADE
SUCTION, PSIG



R-744 LOWER-CASCADE
LIQUID, PSIG

R-404A UPPER-CASCADE
DISCHARGE, PSIG



R-404A UPPER-CASCADE
SUCTION, PSIG





R-744 LOWER-CASCADE
DISCHARGE, PSIG

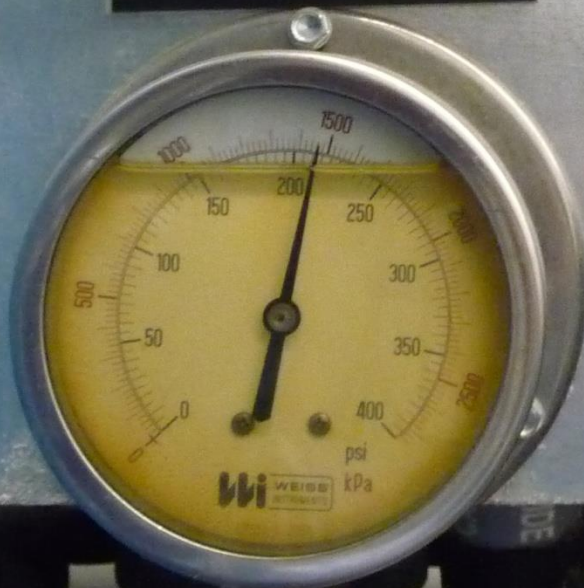


R-744 LOWER-CASCADE
SUCTION, PSIG



R-744 LOWER-CASCADE
LIQUID, PSIG

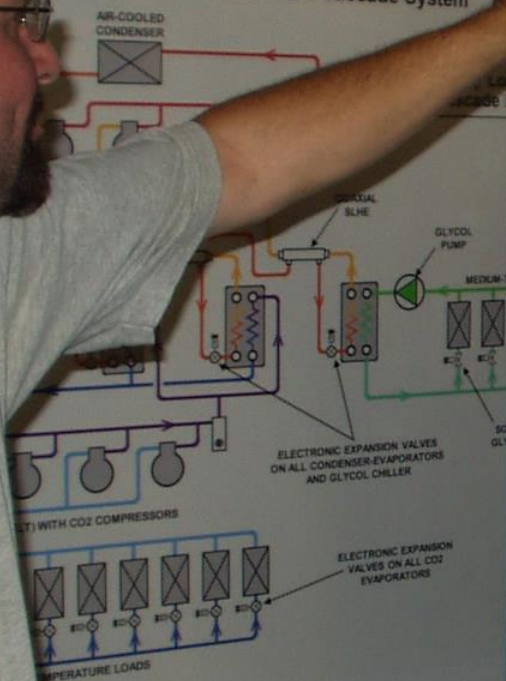
R-404A UPPER-CASCADE
DISCHARGE, PSIG



R-404A UPPER-CASCADE
SUCTION, PSIG



Price Chopper – Saratoga, NY
MTSC Glycol / LTCO2DX Cascade System



CAUTION

RETIGHTEN ALL SWITCHGEAR
BUSING AND ALL ELECTRICAL
CONNECTIONS BEFORE ENERGIZING
ANY ELECTRICAL COMPONENTS

Due to vibration in shipment, connections may work loose. All switchgear and electrical connections must be inspected to the manufacturer's specifications. Only qualified electricians should do this work due to the risk of electrical shock.

HILL PHOENIX



PRICE CHOPPER
ID: #158

LOWER CASCADE

R-744

POE OIL:
BITZER
BSE-60K

UPPER CASCADE

R-404A

POE OIL:
EMKARATE
RL-32H

RACKDLTMT:CO2 DISC PSI:CONTROL VALUE



RACKDLTMT:(LT) -20 CO2:FILTERED PRES

PSI

280

260

240

220

200

180

160

140

0:00

0:00

0:00

0:00

0:00

00-01-14

08-05-14

RACKDLTMT:RACK D COND:CTRL VAL OUT

PSI

230

220

210

200

190

180

170

0:00
08-01-14

0:00
08-02-14

0:00
08-03-14

0:00
08-04-14

0:00
08-05-14

F5: ZOOM-IN

Service Facts

- CO₂ charge 700 lb
- 112 Service Call
- 12.24.2009 Service Tech Wrote in log book:
” Merry Christmas to me! CO₂ Leak Alarm
going Off.”
- Most Leaks occurred at Pressure Relief Valve




BOBOLI

SAUSAGE

DS

14

ALCOHOLIC BEVERAGES
DAIRY PRODUCTS
EGGS
FRESH MILK
FROZEN BREAKFAST
JUICE
VEGETARIAN



Pizza

Frozen Features

Coke's Light
18 Pack
13⁹⁹

Miller Lite
18 Pack
13⁹⁹

Mikes 12 Pack
14⁹⁹

Ice Cream

ICE CREAM

GET 10¢
20¢ 30¢
MORE



Learning and Experiences

- Positive feed back from Techs
- Involve techs early in the project
- Energy usage is compatible
- Electronic Expansion Valve Service greatly reduced
- Installation cost is comparable
CO₂ - \$9.63 sq/ft vs DX - \$9.61 sq/ft



Future thoughts ...what's next

QUESTIONS?

THANK YOU