



# Refrigerant Management at Giant Eagle



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Energy Manager



# Agenda

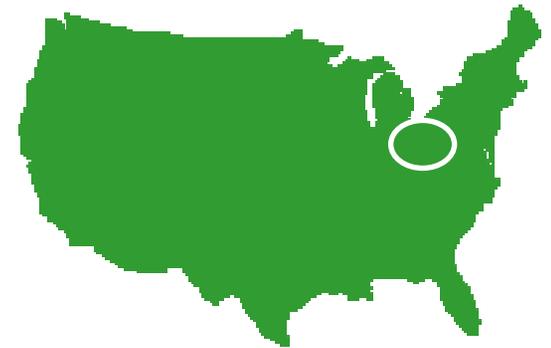
- About Giant Eagle
- Refrigerant Management Team
- Refrigeration Equipment
- Service Providers
- Refrigerant Management System
- Using the Information
- GreenChill Partnership
- Recognition





# About Giant Eagle

- 163 Corporate Supermarkets/59 Independents
- 151 Fuel Station/Convenience Stores
- Market Area – W. PA, E. OH, N. WV, W. MD
- Stores SF sizes from 26K to 126K with a 69K average
- New stores are 90+ K SF





# Refrigerant Management Team

- Giant Eagle Engineering & Maintenance Groups
- Refrigeration Service Providers & Technicians
- Refrigerant Monitoring and Reporting Service



# Refrigeration Systems

- Central Compressor Rooms
- Parallel Racks
- 4000 lb. Average Store Refrigerant Charge
- Heat Reclaim
- Gas Defrost
- Acquisition Stores



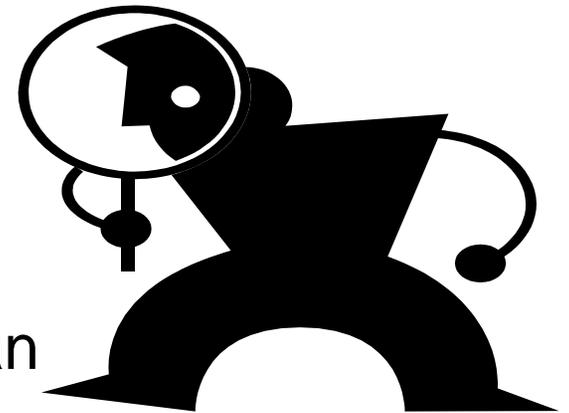
# Service Providers

- (7) Refrigeration Service Providers in 2008
- 70% Stores with One Service Provider
- Full Service Contract – Includes Refrigerant
- Preventative Maintenance Schedule
- Defined Response Time



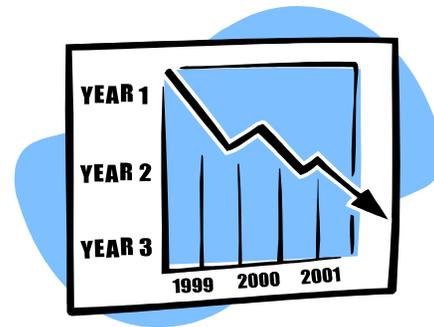
# Preventative Maintenance Program

- Check Monthly for Refrigerant Leaks
  - Display Cases
  - Walk-Ins
  - Roof Condensers
  - Compressor Room
  - Pits, Risers & Remote Manifolds
- Record and Track Receiver Levels
- Identify and Correct Potential Leaks
  - Vibration
  - Condenser Fan Blades
  - Metal-to-Metal Rub Points
- Keep Compressor Room & Racks Clean



# Refrigerant Management System

- Leak Detection
- Refrigerant Tracking
- Web-Based Reporting
- Leakage & Usage
- Automatic Email Alerts
- PM Program
- Training

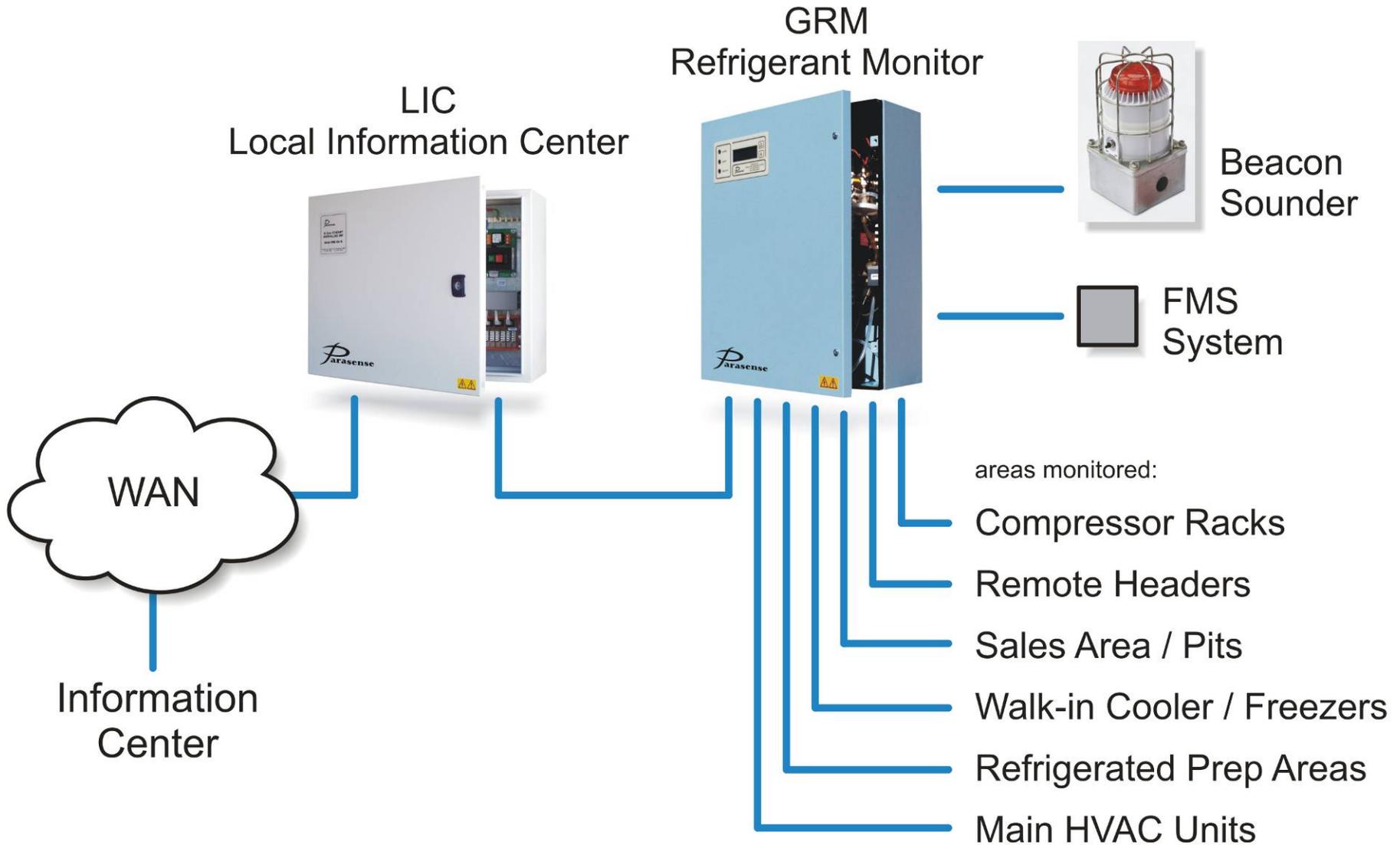


# Ideal Leak Detection System

- Reliable and Low Maintenance
- Consistent Sensitivity
- Refrigerant Specific
- Tracks Both Intensity and Duration of Leak
- Provides Multiple Levels of Alarm
- Provides Actionable Alarms (no false alarms)
- Samples Multiple Points in the Store
- Notifies When System is Off-Line
- Remote Monitoring Capability



# Giant Eagle Typical Layout



# Automated Email Alerts – Leak Detection

**From:** Refrigerant Leak Report  
**Sent:** Sunday, May 24, 2009 6:35 AM  
**To:** Chris Sender, Jim Galehan Cc: Jim Snyder; PIC VA  
**Subject:** Giant Eagle 5878 ~ Howe Ave - Refrigerant Leak Detection Report

**Giant Eagle - Refrigeration Leak Detection Report**  
This report shows new leaks reported in last 24 hours  
for 5878 ~ Howe Ave

Channel	Name	Occurred	Event Type	PPM
3	Rack C	2009-05-23 22:06:17	Alarm	392
3	Rack C	2009-05-23 21:36:17	Alarm	339
3	Rack C	2009-05-23 21:06:17	Alarm	351
3	Rack C	2009-05-23 20:36:17	Alarm	453
3	Rack C	2009-05-23 20:06:17	Alarm	461
3	Rack C	2009-05-23 19:36:17	Alarm	364
3	Rack C	2009-05-23 19:06:17	Alarm	140
3	Rack C	2009-05-23 18:36:17	Alarm	56
4	Rack D	2009-05-23 22:08:38	Alarm	53
4	Rack D	2009-05-23 21:38:39	Alarm	50

Total events : 38

[Click to See Report](#)

# Automated Email Alerts – Refrigerant Usage

## Giant Eagle Headline News



*Refrigerant Usage*

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Site : 1238 ~ Vermillion

RACK D (*charged with 800 lbs of R402A*)  
Equipment status is : **Compliant**

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On 8/13/2009, LON WHITE added 54 lbs of refrigerant to RACK D at 1238 ~ Vermillion  
Usage event reference number = HLN5487 .. Works order = 4153201

The 12 month rolling average refrigerant usage is now 7%

**Note :** This equipment remains compliant, but action should always be taken to reduce usage

Usage activity in the past 12 months :

8/13/2009 : 54 lbs added by LON WHITE

8/13/2009 : Verified as leak free by LON WHITE

Total usage for past 12 months = 54.0 lbs

[Click here to visit the Headline News Web Site](#)

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# Automated Email Alerts

-Time, Date, Location and Event History

- Targeted Information

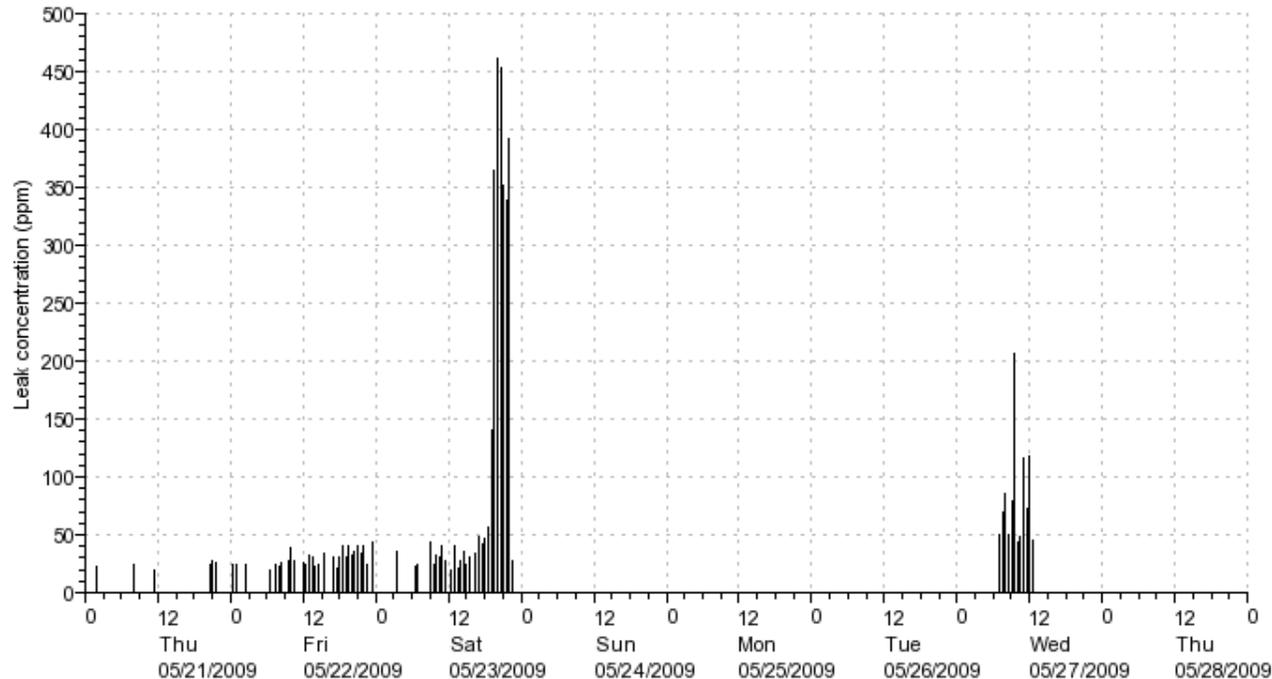
## System Leakage Report

[Back a level](#)

5878 ~ Howe Ave [62,614 sq ft]

From 05/21/2009 to 05/29/2009

Rack C



# Refrigerant Tracking

- Access at Store Level or Via the Web to Refrigerant Tracking Program

Site : 5878 ~ Howe Ave [Add/edit a site and/or equipment](#)

Equipment : RACK A   
Refrigerant = R402A, charge = 1250 lbs

Technician : CHRIS SENDER

Date :

Event type : Record refrigerant usage

Amount added :  (lbs)

Location : Rack

Cause : Valve

Action : Repaired

Work order :   Billable

**Simplicity Is Very Important**

- Leak Location
- Cause
- Action

# Monthly and Annual Usage

## Refrigerant Usage - 12 Months

Refrigerant type :  Region/Maintainer :  Store :

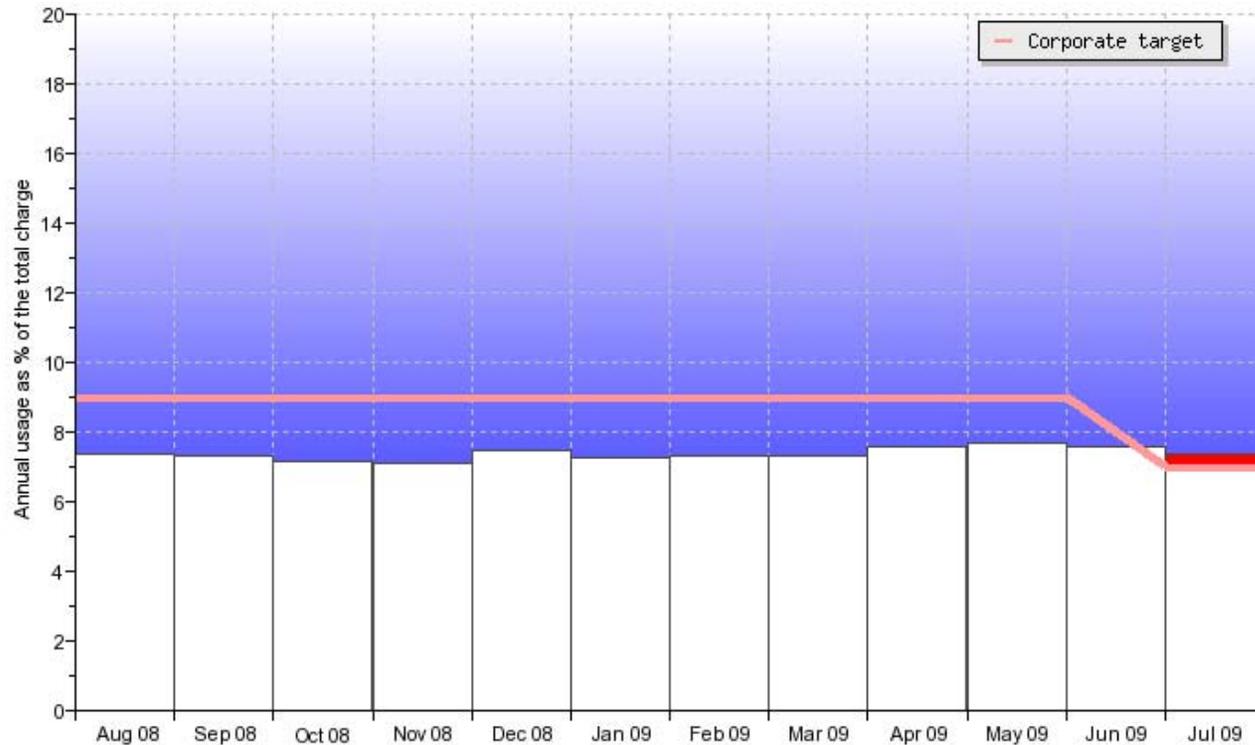
Month	This month's usage		Projected annual usage		12 month rolling average	
	<i>lbs used</i>	<i>% of charge</i>	<i>lbs used</i>	<i>% of charge</i>	<i>lbs used</i>	<i>% of charge</i>
Jan	3,061	0.5%	46,072	7.2%	45,949	7.2%
Feb	2,840	0.4%	45,216	7.1%	46,468	7.3%
Mar	2,934	0.5%	44,548	7.0%	46,252	7.2%
Apr	4,672	0.7%	45,268	7.1%	47,890	7.5%
May	5,389	0.8%	46,409	7.2%	48,935	7.6%
Jun	3,589	0.6%	46,224	7.3%	48,511	7.7%
Jul	4,432	0.7%	46,590	7.4%	47,384	7.5%
Aug						
Sep						
Oct						
Nov						
Dec						

# KPI for Refrigerant Usage

## Refrigerant Usage KPI Reports

Show me the report for :

[View the pdf](#)



# Store Leakage Ranking

## Store Refrigerant Leakage Comparisons

From : 07/19/2009 ... To : 08/16/2009 ... Recalculate All stores All store sizes [166]

		Leak Events				Refrigerant Usage	
Location		Leak Index	Alert	Alarm	Critical	lbs	% of charge
Group averages		0.0	61	1	0	23.3	0.5
<a href="#">5878 ~ Howe Ave [62,614 sq ft]</a>		9.5	1531	0	0	274.0	6.1
<a href="#">4097 ~ North Madison [67,000 sq ft]</a>		4.8	1025	2	0	0.0	0.0
<a href="#">0060 ~ Monroeville [95,361 sq ft]</a>		4.7	1016	0	0	0.0	0.0
<a href="#">6386 ~ Butler Road [65,451 sq ft]</a>		4.2	898	0	0	0.0	0.0
<a href="#">4035 ~ Edinboro [44,445 sq ft]</a>		3.7	797	0	0	108.0	3.7
<a href="#">0203 ~ Chesterland [40,585 sq ft]</a>		3.0	642	0	0	1.0	0.0
<a href="#">4051 ~ Howland [73,343 sq ft]</a>		2.4	508	1	0	80.0	2.1
<a href="#">4075 ~ Community Center [82,918 sq ft]</a>		2.3	485	0	0	202.0	8.2
<a href="#">4133 ~ Middlefield OH [43,176 sq ft]</a>		1.9	399	1	0	0.0	0.0
<a href="#">0009 ~ Hempfield [82,682 sq ft]</a>		1.8	380	0	0	0.0	0.0

# KPI for Refrigerant Leakage

## Refrigerant Leakage

Show me the report for :

[View the pdf](#)



# This Year/Last Year Comparison

## Refrigerant Usage - This Year v Last Year

Last twelve months | All store sizes [166] | All stores

<input type="button" value="Next"/> <input type="button" value="Last"/>		This year			Last year		
Location	<input type="text"/> <input type="button" value="clear"/>	Leak Index	Usage (lbs)	% of charge	Leak Index	Usage (lbs)	% of charge
<b>Group averages</b>		0.3	244.7	6.2	0.3	283.6	7.2
<a href="#">0002 ~ Kennedy Township [69,010]</a>		0.5	9.0	0.3	0.1	410.8	12.5
<a href="#">0004 ~ Bethel Park [69,514]</a>		0.2	169.0	2.7	0.0	305.0	4.9
<a href="#">0008 ~ New Kensington [102,005]</a>		0.0	121.0	2.0	0.1	117.0	1.9
<a href="#">0009 ~ Hempfield [82,682]</a>		1.0	153.0	3.5	0.2	3.0	0.1
<a href="#">0010 ~ Irwin [106,241]</a>		0.3	565.6	12.4	1.7	552.0	12.1
<a href="#">0014 ~ Village Square [125,355]</a>		0.1	197.4	2.3	0.0	600.3	7.1
<a href="#">0017 ~ Shakespeare Street [56,765]</a>		0.0	180.0	3.7	0.3	30.0	0.6
<a href="#">0025 ~ West View [65,378]</a>		0.0	4.0	0.1	0.0	1.0	0.0
<a href="#">0031 ~ Caste Village [48,677]</a>		0.0	14.0	0.4	0.7	56.0	1.7
<a href="#">0032 ~ Murrysville [57,381]</a>		0.4	49.0	2.0	0.0	0.0	0.0

Stores 1 to 10 of 165

# Store Leakage by Monitoring Point

## Store Refrigerant Leakage Report

5878 ~ Howe Ave [62,614 sq ft]

From 07/19/2009 to 08/16/2009

System	Leak Index	Alert	Alarm	Critical
<a href="#">Rack A</a>	0.1	1	0	0
<a href="#">Rack B</a>	7.9	106	0	0
<a href="#">Rack C</a>	1.7	23	0	0
<a href="#">Rack D</a>	7.2	97	0	0
<a href="#">Dairy Sales Area</a>	14.5	195	0	0
<a href="#">Frozen Sales Area</a>	20.2	272	0	0
<a href="#">Fresh Meat Sales</a>	14.4	193	0	0
<a href="#">Service Deli Sales</a>	12.3	165	0	0
<a href="#">Groc.Frzs/Meat Frz</a>	13.2	177	0	0
<a href="#">Prod.Clr/Prep.Rm</a>	8.7	117	0	0
<a href="#">Meat Clr/Prep.Rm</a>	4.8	65	0	0
<a href="#">Produce Sales Area</a>	8.9	119	0	0

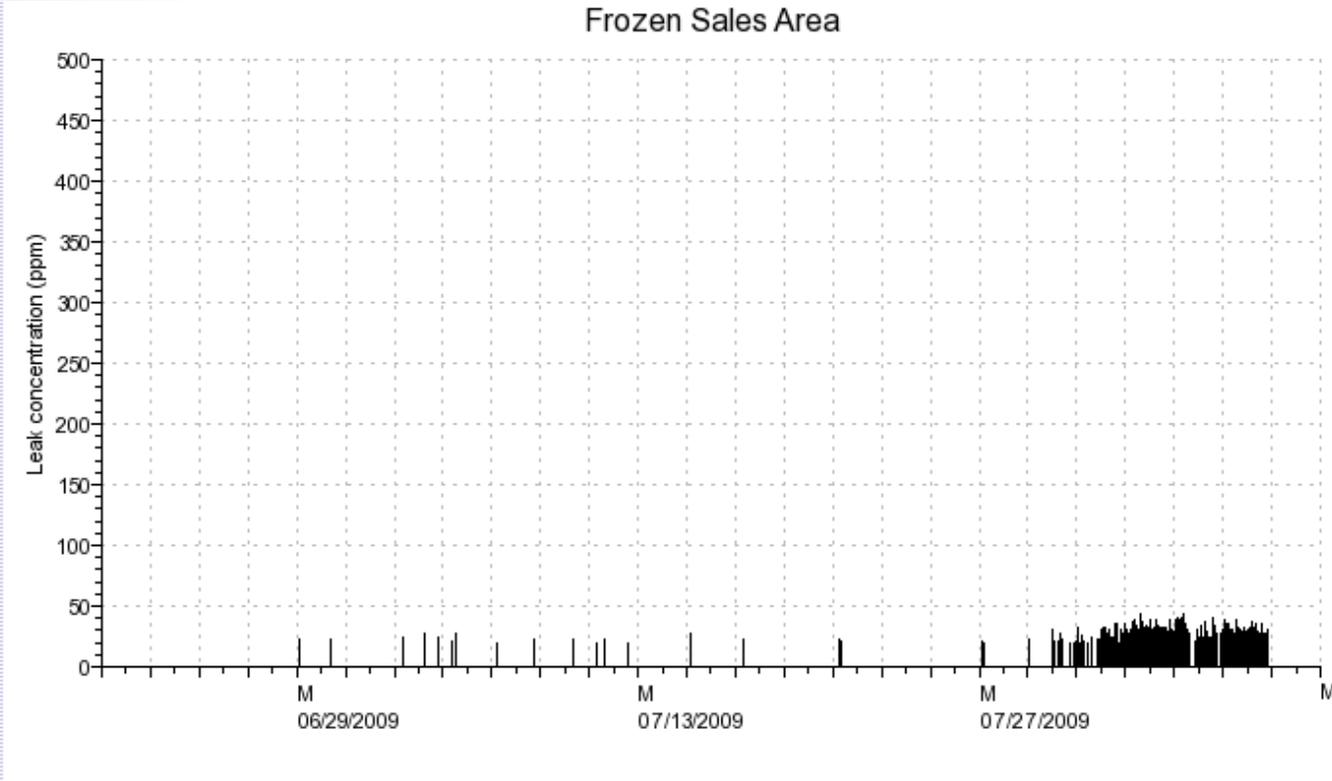
# Graphic View of Monitoring Point

## System Leakage Report

5878 ~ Howe Ave [62,614 sq ft]

From 06/21/2009 to 08/10/2009

Frozen Sales Area



# Using the Information

## Usage Sorted by Location

Racks	40%
Display Cases	21%
Condensers	12%
Field Piping	10%
Walk-in Coolers/Freezers	8%
Condensing Units	4%
A/C Equipment	4%
Remote Headers	2%

## Usage Sorted by Cause

Pipe Failure	25%
Valves	29%
Mechanical Joints	17%
Control Capillary Lines	15%
Welded Joints	14%

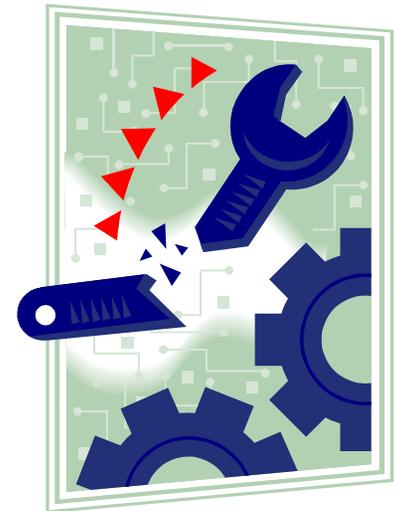
# Identify Problem Areas

- High usage stores
  - Aging equipment
    - Display Cases
    - Condensers/Evaporator Coils
    - Manifold Assemblies
    - Valves
  - Poor design/installation
    - Improper brazing techniques
    - Incomplete pressure testing/evacuation
    - Improper or non-existent pipe supports
    - Lack of expansion relief
    - Metal-to-metal contact
  - Vibration



# Identify Problem Areas (cont.)

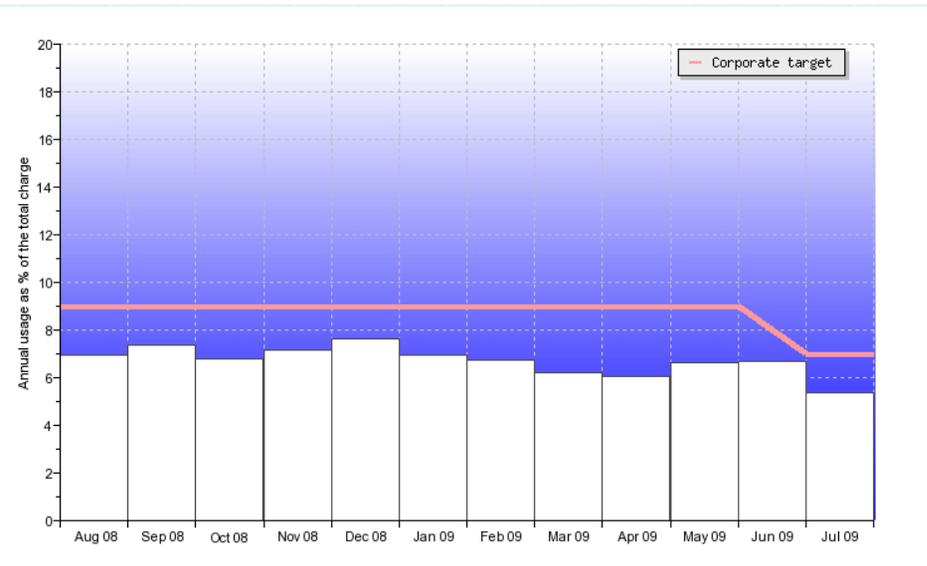
- High usage service providers
  - High KPI's
  - Poorly-trained or unmotivated technicians
  - Incomplete leak checks during PM's
  - Slow response time for alarms
  - Not using store leak detector as a tool
  - First leak found syndrome
  - Poor service practices
    - Dirty compressor racks
    - Not replacing valve caps during service
    - Overuse of temporary fixes



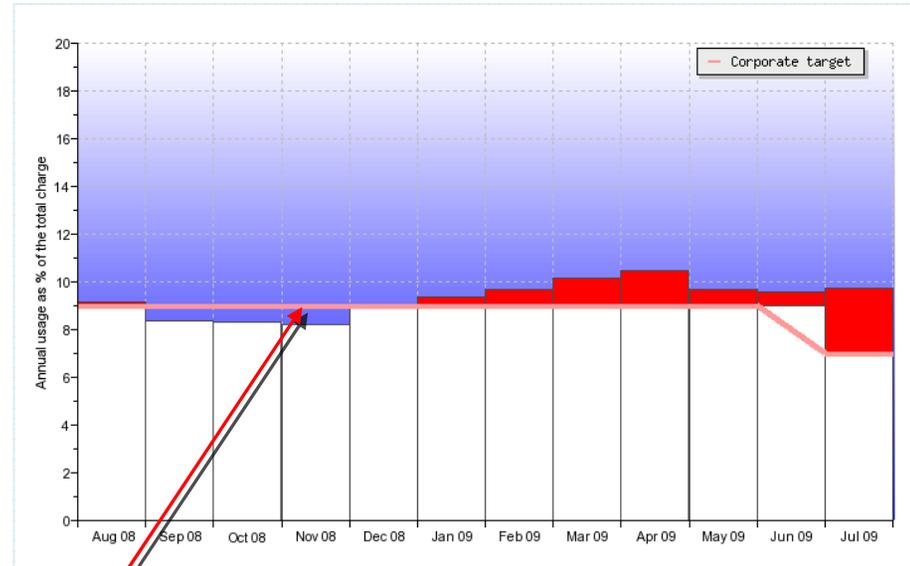
# KPIs for Service Providers

- You Must Have Targets - All Contractors Are Not Equal

## Contractor A



## Contractor B



Corporate Refrigerant  
Usage Target

# Develop Solutions

- Replace or rebuild aging/leak-prone equipment
- Identify and correct poor installation practices
- Identify and correct vibration issues
- Using KPI process, identify under-performing service providers and work with them to bring them up to standard



# GreenChill Awards

**2007**

Co-recipient along with Harris Teeter of the GreenChill member award for the lowest leak rate with a 10%



**2008**

- Sole recipient of the GreenChill member award for the lowest leak rate with a 7.8%
- 20% year-to-year improvement

# Benefits of GreenChill Partnership

- Demonstrates commitment to improving the environment by reducing emissions that harm the ozone layer and contribute to global warming
- Benchmark Leak Rates Against National and Member Averages
- Installation and Retrofit Guidelines to Improve Corporate Specs
- Refrigerant Charge Standards for New Stores
- Recognition for Leak Rate and Charge Reduction



# Recognize Achievements

- Team awards
- Plaques for each service provider
- Personal thank you to service techs from senior management along with gift cards or logo imprinted tools



# Why We Succeeded

- Invested in refrigerant monitoring technology
- Trained service providers and in-house staff to use technology
- Established goals for continuous improvement
- Measured performance against goals
- Communicated performance
- Recognized team success
- Joined EPA GreenChill

