



New Sangren Hall CFC Phase out Plan

In response to LEED New Construction Energy and Atmosphere prerequisite 3, Western Michigan University (WMU) is providing this chlorofluorocarbon (CFC) phase out plan for the Schneider Hall chiller plant. The Schneider Hall chiller plant operates four chillers (Table 1, Attachment 1), and is the central chilled water plant for four buildings including new Sangren Hall.

Table 1

Schneider Hall Chiller Plant							
Chiller Tag #	Type	Make	Model	Year	Capacity (Tons)	Refrigerant (Type)	Refrigerant (Lbs)
083CWCH1	Centrifugal	Trane	CVHE032	1990	336	R-11	580
083CWCH2	Centrifugal	Trane	CVHE032	1990	336	R-11	580
083CWCH3	Absorption	Thermax	Model SS	2012	323	N/A	N/A
083CWCH4	Absorption	Thermax	Model SS	2012	323	N/A	N/A

The Schneider Chiller Plant is located approximately 1,200 feet northwest of new Sangren Hall and was expanded and upgraded in 2012 as part of the new Sangren Hall Project. Energy and Atmosphere prerequisite 3 requires that the project have zero use of CFC-based refrigerants in new base building heating, ventilating, and air conditioning and refrigeration (HVAC&R) systems, or have a plan in place to phase out CFC's within five years. This document serves as our formal commitment to phase out these chillers within five years of the project completion date, which was August 13th, 2012.

Implementation

Since the base HVAC&R systems are part of a central plant, USGBC requires that a comprehensive CFC phase out conversion prior to project completion, or demonstrate a commitment to phasing out CFC-based refrigerates to later than 5 years after the project is completed.

Minimize Refrigerant Leakage

In order to be eligible for a phase out plan, WMU is required to reduce annual leakage rates to less than 5%. Both chillers currently have an annual leakage rate of less than 5%, and therefore can be phased out within 5 years (Table 2, Attachment 2).

Table 2

Schneider Hall Refrigerant Leakage Rate				
Chiller Tag #	Refrigerant Added (Lbs)	Total Charge	Years	Annual Leakage Rate
083CWCH1	116	580	23	0.9%
083CWCH2	0	580	23	0.0%

Phase Out Plan

The two R-11 chillers being addressed by this phase out plan are currently 23 years old, and therefore phase out is considered to be economically feasible since WMU expects these particular chillers to have an expected service life of 25-30 years. WMU currently has 10 electric chillers that are 20 years or older and contain CFC's (Table 3, Attachment 3).

Table 3

R-11 Chillers 20 Years or Older			
Chiller Plant	Chiller Tag #	Refrigerant Type	Age
Miller/Shaw	041CWCH1	R-11	1990
	041CWCH2	R-11	1990
Schneider	083CWCH1	R-11	1990
	083CWCH2	R-11	1990
Waldo	061CWCH1	R-11	1990
	061CWCH2	R-11	1990
Bernhard	059CWCH1	R-11	1987
	059CWCH2	R-11	1987
Kohrman	044CWCH1	R-11	1991
	044CWCH2	R-11	1991

Due to the age and condition of these machines, they will all need to be replaced within the next 10 years. Miller/Shaw has the two machines that are in the worst condition, and Schneider has two machines that are the next in most need of replacement. All replacement machines will use an environmentally preferable refrigerant.

Phase out Date

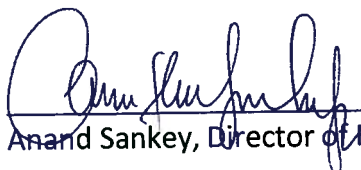
WMU is required to replace the two machines in Schneider no later than August 2017. Replacement of these machines will have to take place outside of the cooling season, and be up and running in spring 2017 for the cooling season.

Phase Out Cost

The approximate cost of replacing the two R-11 chillers in the Schneider chiller plant is \$500,000. The rest of the chiller plant including, pumps, towers, and piping were upgraded in 2012 when the absorbers were added to pick up the load of New Sangren Hall.

Attachments

1. Western Michigan University CFC Program: Identified Equipment with 50 LBS or Greater Refrigerant
2. The Maintenance Authority (TMA) Report: CFC Records for 083CWCH1 and 083CWCH2
3. Western Michigan University Chiller Replacement Study


Anand Sankey, Director of Engineering

4/16/13
Date

Western Michigan University CFC Program
Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
009 OAKLAND RECITAL	AC	208	HCFC 22	50+	Trane	RAUC060GPJ130	J94081096	1994	009REAHU1
015B WALDO STADIUM	AC	2102	HCFC 22	489	York	YCAS-160-46XD	RPGM3999AA	1998	015BRECH1
022 CAMPUS SERVICES	AC	1650	HCFC 22	50+	McQuay	WHRO20CE	5SC0716100		022RECH1
024 LEE HONNORS	AC	0120	HCFC 22	125	Trane	CCAB030	U90A01635	1990	024CWCH1
027 MCCRACKEN	AC	1560	HCFC 22	60	Copeland	4DA3-2000TSK-100	ET57F039835		027RECU1
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331B		029RE1C1
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331C		029RE1C2
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331D		029RE1C3
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331E		029RE1C4
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331F		029RE1C5
029 COMPUTER CENTER	AC	1018	HFCC 22	50+	Liebert	FH245AUA10	147331G		029RE1C6
032 SEIBERT ADMIN.	AC	Roof	HCFC 22	65	Trane	SSHA4006LD	B4G00595		032RECU1
032 SEIBERT ADMIN.	AC	0108	HCFC 22	60	Liebert	FH199AUC10	136727A		032RE1C1
032 SEIBERT ADMIN.	AC	0108	HCFC 22	60	Liebert	FH199AUC01			032RE1C2
032 SEIBERT ADMIN.	AC	0108	HCFC 22	50+	Liebert	CD218A-C	136727B		032RE1C3

Western Michigan University CFC Program
 Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
041 MILLER/GILMORE	AC	1001	CFC 11	770	Trane	CVHE040	L89M04026	1990	041CWCH1
041 MILLER/GILMORE	AC	1001	CFC 11	770	Trane	CVHE040	L89M04038	1990	041CWCH2
044 KOHRMAN	AC	1051	CFC 11	575	Trane	CVHE028	L9201977	1991	044CWCH2
044 KOHRMAN	AC	1051	CFC 11	575	Trane	CVHE028	L92A02709	1991	044CWCH1
049 SRC	AC	1091	HCFC 22	605	Trane	3765RT300	U93A03764	1993	049CWCH2
049 SRC	AC	1091	HCFC 22	605	Trane	3765RT300	U93A03765	1993	049CWCH1
049 SRC	AC	1091	HFCC 22	200+	Pool Pac	SWHP140E	930101	1993	049REAHU1
051 511 MONROE	AC	0231	HFCC 22	50+	Trane	RAUC060GPJ130	J94081096		051RECH1
053 LAWSON AREAN	ICE MAKER	0140	HCFC 22	1750	Vilter	M17K358ESD	#1=31124		053BRCH1
053 LAWSON AREAN	AC	Roof	HCFC 22	125	Bohn	JLD500H2D	A98K00154	1999	053RECU1
053 LAWSON AREAN	AC	Roof	HFCC 22	125	Bohn	JLD500H2D	A98K00153	1999	053RECU2
056 ROOD	AC	045	HCFC 22	440	Trane	RTHA300	U92A07037	1991	056CWCH2
056 ROOD	AC	045	HCFC 22	440	Trane	RTHA300	U92A07038	1991	056CWCH1
056 ROOD	AC	Accel. Lab	HCFC 22	50+	Trane	CGWD			056REDX1
059 BERNHARD CENTER	AC	ME-G02	CFC11	770	TRANE	CVHE036	L87C0111	1987	059CWCH1

Western Michigan University CFC Program
 Identified Equipment with 50lbs or Greater of Refrigerant

BLDG. # AND NAME	SYSTEM	LOCATION	REF	AMOUNT (lb)	MAKE	MODEL	SERIAL NUMBER	YEAR	Tag Number
059 BERNHARD CENTER	AC	ME-G02	CFC 11	770	TRANE	CVHE036	L87C0112	1987	059CWCH2
059 BERNHARD CENTER	Freezer	ME-G02	HCFC 22	70+	Copeland	3DB3-1000-TFC	CT 91L 022235		059RECU18
061 WALDO LIB.	AC	ME-1	CFC 11	1000	Trane	CVHE040	L89J03081	1991	061CWCH2
061 WALDO LIB.	AC	ME-1	CFC 11	1000	Trane	CVHE040	L89J03086	1991	061CWCH1
062 UNIVERSITY ARENA	AC	R-1	HCFC 22	102	Snyder General	RPS060CLY	3ZA0063801		062RERTU1
062 UNIVERSITY ARENA	AC	P-2(W)	HCFC 22	500	McQuay	ALP185C	5ZA8184601		062RECU1
062 UNIVERSITY ARENA	AC	P-1(E)	HCFC 22	500	McQuay	ALP185C	5ZA8184701		062RECU2
081 MILLER RAMP	AC	RF-1	HCFC 22	80	Trane	TTA180B300BA	H22198403	1984	081RECU1
083 SCHNEIDER	AC	SB05	CFC 11	580	Trane	CVHE032	L89H02893	1990	083CWCH1
083 SCHNEIDER	AC	SB05	CFC 11	580	Trane	CVHE032	L89H02840	1990	083CWCH2
107 HAENICKE HALL	AC	Roof Top	HCFC 22	50+	McQuay	ALBO 45C	57D8140401	1999	107RECU1

TMA Reports

CFC Cylinder and Equipment

by Equipment Tag

Found 2 that matched your query.

Transaction Date	Technician	Reclaimed/ Added	Cylinder Tag	Pounds	Notes	Service
Equipment Tag: 083CWCH1						
12/14/2001	Cornelius Medendorp	Added	RC-R11	- 116 lbs. R-11	Added to chiller after overhaul was performed. tal chiller capacity 575lbs	211

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TMA Reports

CFC Cylinder and Equipment

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Search all:

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083CWCH2

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WMU Chiller Replacement Study

Chillers		Year	Age	Capacity	Condition			
Location	Mark	Type	Manufacturer	Model	Installed	Age	Tons	Condition
McCracken		C	Trane	Centravac, VSD	2006	6	800	VG
Friedmann	Chiller #1	A	York	Millenium	1997	15	400	F
	Chiller #2	A	York	Millenium	1997	15	400	F
Bernhard Center	Chiller 1	C	Trane	Centravac, 3-stage	1987	25	360	G
	Chiller 2	C	Trane	Centravac, 3-stage	1987	25	360	G
Schneider Hall	CH-1	C	Trane	Centravac	1990	22	336	F
	CH-2	C	Trane	Centravac	1990	22	336	F
	CH-3	A	Thermax	Model SS	2012	0	323	E
	CH-4	A	Thermax	Model SS	2012	0	323	E
Miller/Shaw	Chiller 1	C	Trane	Centravac, 3-stage	1990	22	380	F
	Chiller 2	C	Trane	Centravac, 3-stage	1990	22	380	F
Waldo Library		C	Trane	Centravac	1990	22	360	F
		C	Trane	Centravac	1990	22	360	F
Kohrman	CH-01	C	Trane	CVHE	1991	21	240	F
	CH-02	C	Trane	CVHE	1991	21	240	F
	CH-1	A	York	Isoflow	1997	15	750	P
	CH-2	A	York	Isoflow	1997	15	750	P
	CH-3	A	York	Isoflow	1997	15	750	P
Rood		S	Trane	Series R	1991	21	260	F
		S	Trane	Series R	1991	21	260	F
Student Recreation	CH 1	S	Trane	Series R	1993	19	300	VG
	CH 2	S	Trane	Series R	1993	19	300	VG
CHHS		A	York	Millenium	2005	7	140	G
		A	York	Millenium	2005	7	340	G