



WELCOME TO IIAR CONVENTION



United Insulated Structure Corp.



Richard Watters-Presenter

V.P. Industrial Refrigeration

"The Heat Transfer Experts"

Joliet Cold Storage



"The Heat Transfer Experts"

WHY USE DX AMMONIA?



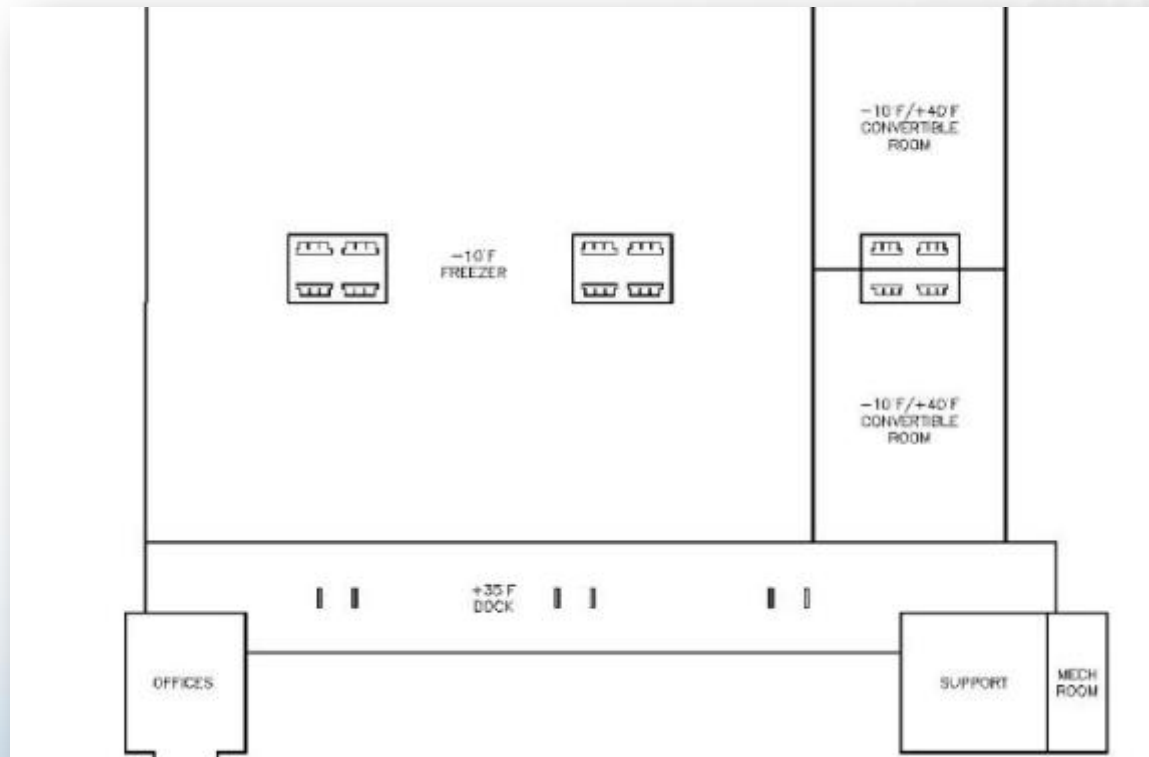
- Lower refrigerant operating charge
- Location Location Location

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Aerial view

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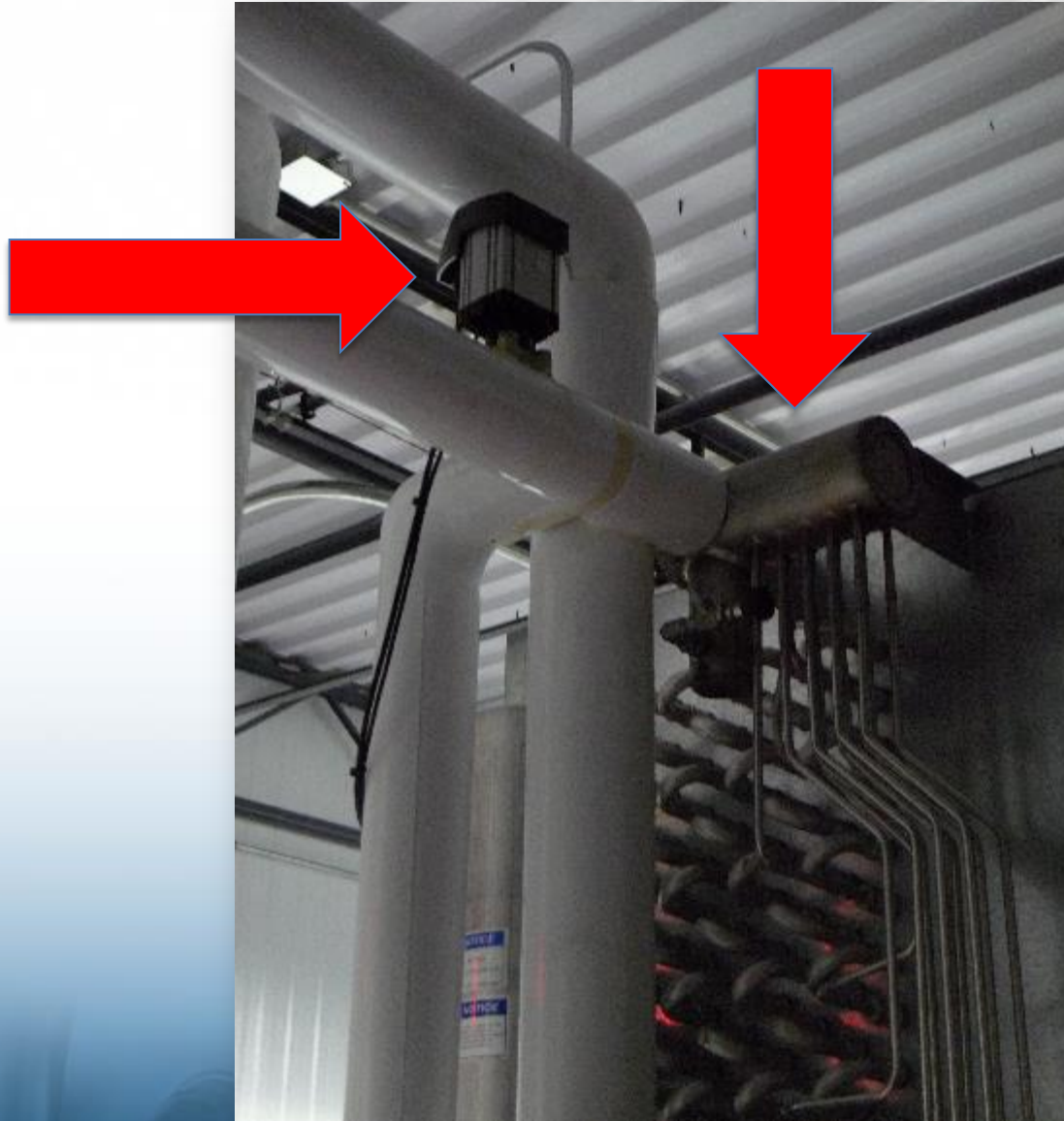


Plan view drawing

Refrigeration system highlights



- Single stage economized -15/+20/+95
- Thermosyphon oil cooling
- Anhydrator System Cleaner
- H.A. Phillips transfer system
- HPR
- +20 and -15 accumulators
- Nickel-Brazed Liquid Sub-Cooler
- Motorized TXV's



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- VFD's on large evaporator fans

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Refrigeration system highlights



- Colmac DX Evaporators

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Refrigeration system highlights



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- Low Charge Condenser

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Refrigerant charge comparison



Liquid over feed/DX Comparison

	JCS – Phase I	JCS – Future with Phase II	Comparison
Freezer Temp. – Deg. F	-10	-10	-10
Freezer sq. ft.	131,300	300,400	90,301
Convertible room. Deg. F	-10/35	-10/35	-10/35
Convertible room sq. ft.	37,800	37,800	45,311
Dock Temp. – Deg. F	40	40	40
Dock area – sq. ft.	31,800	63,600	35,958
Central Refrigeration System	DX	DX	Pumped Re-circulated Liquid
Refrigeration – tons	537	748	335
Ammonia charge – lb.	5,500	8,500	24,000
Total refrigerated sq. ft.	200,940	401,840	171,610
	.0273 #/sqft	.0211 #/sqft	.139 #/sqft

Construction cost



- 2.37% savings over a liquid over feed
- \$100,000.00

Operating efficiency



- 1.3% less than liquid overfeed systems
worst case

Design considerations



- Use the recommended oil (Frick #9 in this case)
- Keep the system dry and oil free
- You will have some liquid return. Defrost, under floor system. Be able to deal with it
- Going to a fluid cooler in place of thermosyphon would have reduced the ammonia charge 750#
- Fluid cooler system would have added \$300,000.00 of install cost to the project
- Liquid injection would lower the install cost and refrigerant charge but would have decreased operating efficiency's by and additional 4.5%

In summary



- Colmac Evaporators worked as advertised
- System is easy to work on
- Restarts quickly after power failure
- Motorized DX valves work great
- Second system is in the works

