


**BUT WE HAVE ALWAYS
DONE IT THAT WAY!**

39 YEARS OF REFRIGERATION EXPERIENCE

SCOTT STROBEL

- **Graduated Minneapolis Roosevelt High School 1973**
 - **Graduated Dunwoody Institute 1975**
 - **Schweigert Meat –Minneapolis 1975-1979**
 - **Armour Foods- St Charles, MN 1979**
 - **Cool Air Mechanical 1979 to present**
 - **Graduated Pipefitters apprenticeship 1981**
 - **Pipefitters Instructor 1989 to present**
 - **Worked 1979-2006**
 - **Mental strain 2006-present, (project manager-sales)**
 - **Member RSES, RETA and IIAR**
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“BUT WE HAVE ALWAYS DONE IT THAT WAY”

We all get set in our ways and tend to do the same things over and over.

Industrial ammonia refrigeration operators are no exception.

Same facility day after day-

“We have always done it like that” or “its always been like that”.

Equipment was installed incorrectly and was never corrected.

Equipment and system deterioration is a slow process.


We are building snowflakes, one of a kind systems.



When troubleshooting

- You will get false information. Nobody wants the big finger pointing at them.
- They want to tell you what it's not.
- When you show them a problem their response is, “How can that be?”- It's always been like that.
- Fix what you know is wrong and perhaps you will find what the big problem is.
- Read the manufacturer's literature or contact the manufacturer.

COMPRESSORS


- **Compressor package components installed wrong at the factory.**
 - **Controls not verified.**
 - **Compressor packages with microprocessors -calibration and operation not verified.**
 - **Compressor rotation not checked.**
 - **Operating at a suction pressure that is lower than needed.**
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CONDENSERS



- **Cleaning of water sump and spray nozzles.**
 - **Operating at too high or too low of a discharge pressure.**
- Probably the most “piping abused” component in the system.**

Installation issues including

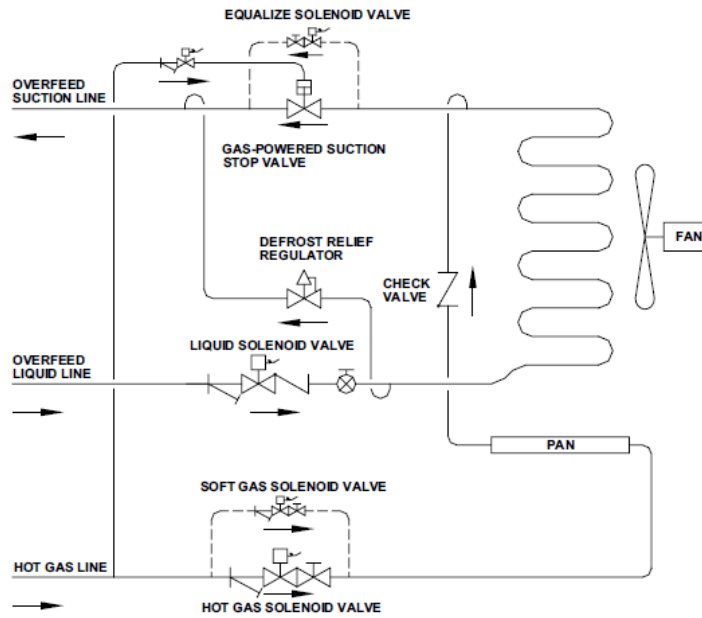
- **Condensers at different heights**
 - **No equalizer line to the receiver**
 - **Reducers welded directly on the condenser outlet**
 - **Condenser drain drop legs too short**
 - **Multiple circuits not trapped.**
 - **Never equalize to the outlets of the condenser in multiple unit installations since this destroys the effect of the trapped liquid legs.**
 - **Water flow inadequate.**
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EVAPORATORS



DEFROST SEQUENCE


EVAPORATOR WITH GAS-POWERED SUCTION STOP VALVE

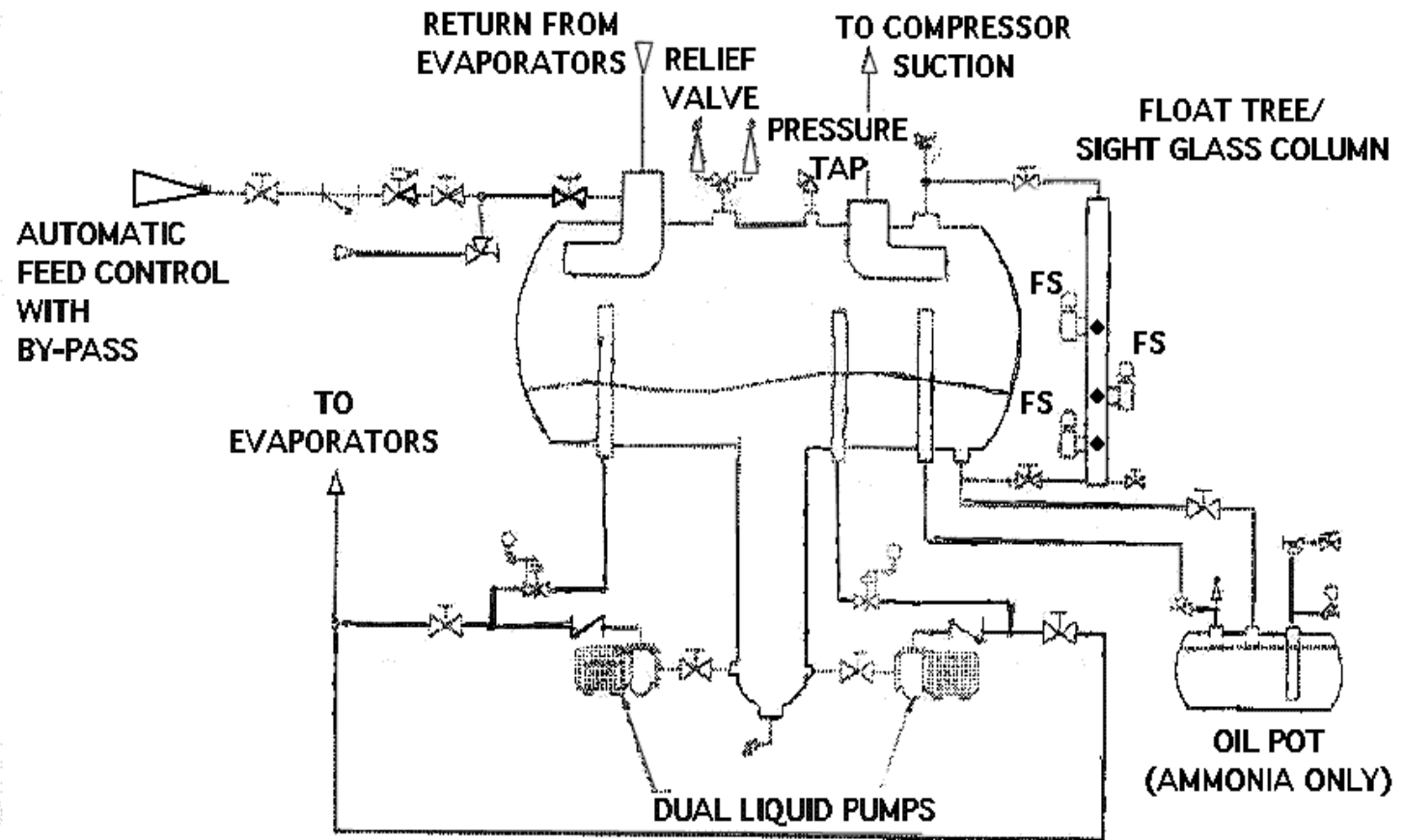


CONTROL VALVE OR RELAY	RELAY	DEFROST STEPS				NORMAL REFRIG.
		PUMPOUT	HOT GAS*	EQUALIZE	FAN DELAY	
Liquid Solenoid	L					
Suction Solenoid	S					
Hot Gas Solenoid	H					
Equalize Solenoid	E					
Fan Motor Relay	F					


- **Defrost issues. Defrost sequence not correct.**
- **Maintenance and cleaning.**
- **Fan and motor rotation.**

MAINTENANCE

- **Remove air and non-condensables**
 - **In an emergency wrong parts or motors are installed.**
 - **Oil draining. Should document amount of oil added and drained.**
 - **Predictive maintenance. Oil samples, vibration analysis.**
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CONTROLS

- **Central control panels are like any electronic device. There are many options that you don't use. Utilize the full benefits of the control system.**
 - **Most have historical data that is a great tool for troubleshooting.**
 - **Limit the number of people that can change the operating settings.**
 - **Check, verify and document the operation of the controls annually.**
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?? Questions

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