

Cool Concepts

For Industrial Refrigeration Systems

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Refrigeration System Operating Issues

Several common complaints are often directed to refrigeration equipment manufacturers, such as;

- Your compressor or refrigerant pump, etc. does not work properly or,
- The evaporative condenser performance is insufficient and not meeting capacity or,
- I keep having the same problem with your equipment.

These arguments place the fault on the equipment. These are very common symptoms directed at equipment manufacturers concerning perceived *faults or problems* with their respective components.

In other words, the components themselves are seen as the reason for the issue instead of the system itself. This is a common misconception.

Realistically, some problems do occasionally occur with the components. These might be due to problems with materials or processes used in manufacturing.

However, the components are high quality and work for many years when properly ap-

plied. This indicates the manufacturers are building good equipment suitable for the applications.

The interesting common thread to all of this is; *these components are selected and applied to the refrigeration system to meet a desired function.*

"...the components themselves are seen as the reason for the issue instead of the system itself."

This means all of these various equipment types work under varying degrees of conditions, and not necessarily as intended or desired.

Here are several examples:

- 1) A new compressor under warranty fails. Why? Perhaps broken valves?

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You should ask yourself; why did the valves fail? When you ask for a warranty claim what does the manufacturer do? They request the return of the valves for inspection.

Were the valves actually defective, or, did the compressor get slugged with liquid? After some time, people tend to remember the valves failed on the compressor, but probably not why. However, they do seem to remember the initial problem; that compressor had bad valves.

2) A new refrigerant pump cavitates during operation. Why? Obviously it's a bad pump. A good pump would work!

Here again is a case of mistakenly placing the problem on the pump. Why does the pump go into cavitation? It does not do this by itself. It is experiencing problems with

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insufficient NPSHA (Net Positive Suction Head Available) during those operating conditions.

The pump is reacting to the operating conditions found in the refrigeration system. The shaft seal may start to leak, the impeller could fail due to cavitation damage, or the

hermetic motor burns out. What does everyone remember? That type of pump always has problems.

The majority of equipment failures are due to the operating conditions experienced by the equipment.

This is where training comes into focus.

This training is not solely directed at the refrigeration system operators alone. The operators are responding to the problems after the system has been installed.

Various problems attributed to equipment are also related to the application or selection of the equipment. The issues may also be due to the design operating conditions, or changes to the original design intent.

System designers developing the overall operation of the ammonia refrigeration systems also need to be aware of the fine points in component application. If the refrigeration system is not designed to account for the full performance range of the equipment, operating issues can develop.

To understand why the equipment does not live up to expectations, you have to understand the nature of the perceived failure or problem issue. You also have to realize why the equipment is affected in that particular manner.

The point to remember is; placing the blame on the equipment for premature failure, continuous problems, or frequent replacement does not solve the underlying issues.

Cold Systems, LLC provides technical assistance to owners and other users of refrigeration systems. Using our services will provide you with long-term value and benefits of:

- Energy reduction with increased efficiency & equipment capability, and
- Reduction of challenging issues & improved operational flexibility

We offer a broad range of services designed to promote safety, reliability, and cost effectiveness for refrigeration systems. You can rely on our 35 years of experience to help solve your problems and increase the cost-effectiveness of your refrigeration system .

