LTRS
LIQ
VAP
AMMONIA
LOW
LTRL
LIQ
AMMONIA
LOW
HSS
VAP
AMMONIA
LOW
SHPL
LIQ
AMMONIA
HIGH

AMMONIA LABELING & SIGNAGE

RAGAEP Updated with a side of epic fails

By Bill Lape, SCS Engineers

In my pipe and equipment labeling series that was published in the RETA Breeze in late 2019 and early 2020, we discussed ammonia refrigeration pipe and equipment labeling RAGAGEP. In Part I, I highlighted the possible choices for applicable good engineering practices that pertain to such labeling, highlighting the American Society of Mechanical Engineers (ASME) A13.1 and the International Institute of Ammonia Refrigeration (IIAR) Standard 2. In Part II, I began to delve into the details of IIAR's Bulletin 114, and how it's guidelines for piping labels have changed over the years. In Part III, I reviewed the pipe color guidelines in Bulletin 114, along with its guidelines for component, or equipment labeling.

With the publication of IIAR2-2021, the RAGAGEP for pipe and equipment labeling has changed somewhat. IIAR2 still calls out the basic requirements for pipe labeling in Section 5.14.6. This includes the text "AMMONIA" on the label, the physical state of the ammonia in the pipe, the relative pressure level (low or high) of the ammonia in the pipe, the pipe service, which is allowed to be an abbreviation, and an arrow indicating a direction of flow. While this has not changed from the 2014 and 2014 Addendum A editions, what has changed is that Bulletin 114 has now been incorporated into IIAR2 as an informative appendix (Appendix Q). Being an informative, rather than a normative, appendix means that a facility can use several different methods to comply with Section 5.16.4. Following Appendix Q is not required, much like it was not required to follow Bulletin 114. Bear in mind that any method used to comply with Section 5.16.4 must be documented in the facility's process safety information and the operators and the contractors that work on and operate the ammonia refrigeration system must be trained on the labeling method used by the facility.

You may note that the Equalizer Line abbreviation (EQ) is not in the informative appendix. A call to Eric Smith at IIAR confirmed that this is an error in the printing and will be corrected at the next printing. The informative appendix also includes the following new line identifications:

Piping Description	Abbreviation
Flooded Liquid Supply	FLS
Flooded Liquid Return	FLR
Vent Line (Oil Pot)	VNT

Another change relates to the system signage requirements originally found in ASHRAE15, Section 11.2.1. ASHRAE required that the signage include the installing contractor's name and address, the refrigerant number and the amount of refrigerant, the lubricant identity and amount, and the field test pressures applied. When ASHRAE15 deferred to IIAR2 for ammonia in 2018, IIAR2-2014, Section 5.15, took precedence. This section required that signage, or schematic drawings that were kept in a location readily accessible to trained refrigeration staff and first responders, include the following items:

1. Instructions with details and steps for shutting down the system in an emergency;
2. The name and telephone numbers of the refrigeration operating, maintenance, and management staff; emergency responders, and safety personnel;
3. The names and telephone numbers of all corporate, local, state, and federal agencies to be contacted as required in the event of a reportable incident;
4. Quantity of ammonia in the system;
5. Type and quantity of refrigerant oil in the system; and
6. Field test pressures applied.

In IIAR2-2021, Section 5.14.1.1 requires that signage, or schematic drawings that are kept in a location readily accessible to trained refrigeration staff and emergency responders, include the following items:

1. Instructions with details and steps for shutting down the system in an emergency;
2. The contact information for whom to contact in an emergency;
3. Maximum intended inventory of ammonia in the system;
4. Type of refrigerant compressor oil(s);
5. Low side and high side design pressures.

Note that required contact information on the signage or in the schematic drawings has been simplified. The amount of oil in the system is no longer required, and the field test pressures have been replaced with the low side and high side design pressures.

One thing that I do want to highlight is that the instructions for shutting down the system in an emergency, if done by simply pressing the emergency stop, can be detailed using the recommended emergency shutdown signage found in Appendix J of IIAR2, and they do not need to be repeated on the system signage.

Be sure, however, when purchasing such signage that you make any necessary edits to it to properly reflect your system. Otherwise, you may wind up appearing in an Epic Fail column.

If you choose to provide the documentation required in Section 5.14.1.1 in a location that is readily accessible, make sure that it doesn't turn into an Epic Fail.

Bill Lape is Project Director for SCS Engineers. Bill is a Certified Industrial Refrigeration Operator, a Certified Refrigeration Service Technician, and a member of the National Board of Directors of the Refrigerating Engineers and Technicians Association.