

# CODES & STANDARDS

## PART TWO OF MANY: REFRIGERATION STANDARDS & CODES

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In the last issue, I presented a brief history of building and fire codes in the United States and identified the adopted codes in each state. Please note that with the publication in January 2024 of the 2024 editions of the IFC, IMC, UMC, and NFPA1, state and local jurisdictions may begin the process of updating their adopted codes. I will provide periodic updates regarding adopted codes as I receive them. In this issue, I will begin to discuss the history of the standards that have applied to ammonia refrigeration systems over the years, starting with ASHRAE15.

Before we get to that, I want to explain what the difference is between a code and a standard. A standard is a document containing technical guidance for various topics. For instance, IAR Standard 2 is the standard for the Design of Safe Closed-Circuit Ammonia Refrigeration Systems. While these standards are viewed as Recognized and Generally Accepted Good Engineering Practices (RAGAGEP) by regulatory officials from OSHA and EPA, as well as from some state officials, they technically do not have the force of law behind them, until something specific happens.

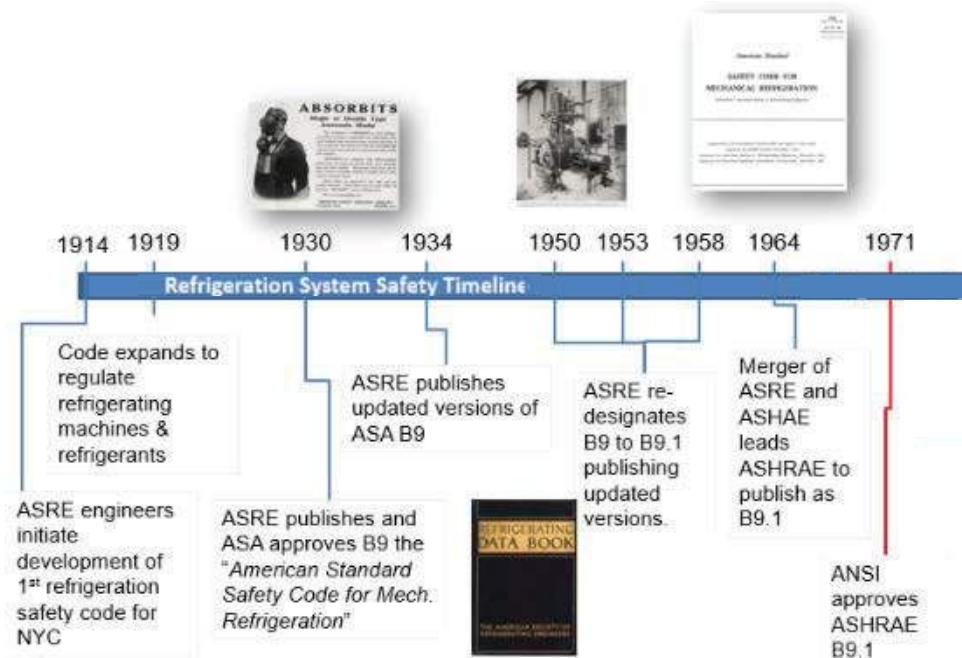


FIGURE 1: ASHRAE STANDARD 15 TIMELINE

I will explain. Let's use design standards for piping to limit our scope for now. Under OSHA and EPA regulations, a facility or company is within their rights to select the standards that they want to follow in the design of their ammonia refrigeration piping. Typically, a facility will select IAR2 as their RAGAGEP. IAR2 references Standard B31.5, which is the Standard for Refrigeration Piping & Heat Transfer Components published by the American Society of Mechanical Engineers (ASME). Now, this standard has been adopted by both of the model mechanical codes by reference. When this happens, and a state or local authority then adopts the mechanical code, the referenced standards become code. That is, they now have the force of law behind them.

So, back to ASHRAE15. The following history was chronicled in Doug Reidl's article, "Celebrating 100 Years of ASHRAE Standard 15," published in the November 2014 edition of the ASHRAE Journal. A timeline of the history is shown in Figure 1. In 1914, members of the American Society of Refrigerating Engineers (ASRE), together with the New York City Fire Department, began to develop a refrigeration safety code for

the city. This new code, designed to promote the safety of refrigeration systems installed in operating within the city, required a permit to build and operate a refrigeration system and went into effect in 1915. This code set minimum design pressures for the system and required labeling of pipes, as well as many other requirements that we take for granted today.

From 1915-19, ASRE worked to expand the safety standard to be more comprehensive and mold it into a more general form that could be adopted by other jurisdictions. In 1930, ASRE published Standard B9, Safety Code for Mechanical Refrigeration. When the American Standards Association (ASA), the predecessor to ANSI, approved B9 in 1932, it became the American Standard Safety Code for Mechanical Refrigeration. It is important to note that at the time, there was little distinction between a standard and a code.

ASRE published several revisions to the standard in the 1950's, during which time, the standard was redesignated B9.1. At the end of that decade, ASRE merged with the American Society of Heating and Air Conditioning Engineers (ASHAE) to form ASHRAE, the American

ASHRAE publishes 1<sup>st</sup> version of ANSI/ASHRAE 15

1978 1989 1992 1994 2001 2004 2007 2010 2013 2016



ASHRAE publishes revised versions of ANSI/ASHRAE Standard 15



Society of Heating, Refrigerating, and Air Conditioning Engineers. ASHRAE published its first update to B9.1 in 1964. By 1971, ANSI had replaced the ASA and put its seal of approval on the 1971 update to B9.1. For the 1978 update, ASHRAE redesignated B9.1 as Standard 15. ASHRAE published further updates throughout the 1980's, 90's and into the 21st century.

It is important to note that IIAR first published Standard 2 in 1974. This edition was approved by ANSI in 1978. IIAR2 was revised and approved in 1984, 1992, 1999 (with an Addendum in 2005), 2008 (with Addendums in 2010 and 2012), and 2014. During this time, BOTH ASHRAE Standard 15 and IIAR Standard 2 applied to ammonia refrigeration systems, often leading to confusion, as there were often conflicting provisions.

In June of 2018, after a formal request from IIAR, and after much consideration, ASHRAE published Addendum A to the 2016 edition of Standard 15, within which the standard committee added Section 2.3 to the standard, which stated that "This standard shall not apply to refrigeration systems using ammonia (R-717) as a refrigerant." In addition, the addendum removed all other references to ammonia

within Standard 15, and for refrigeration systems using ammonia, it instructed the reader to refer to IIAR2.

One final note to bear in mind. If a jurisdiction has not adopted a model code that references the 2016 or later edition of ASHRAE15, then it is possible that the code official for that jurisdiction may require that the facility owner and owner's representatives (otherwise known as contactors, typically) follow ASHRAE15. This would include NFPA1, 2018 and earlier, and the IFC, UMC and IMC, 2015 and earlier. Should this be the case, facility owners or their representatives may petition the AHJ to use newer standards and codes.

In the next issue, I will discuss the history of the piping standards that have, and may still, apply to ammonia refrigeration systems. Please feel free to email me with questions at NH3isB2L@gmail.com.

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