INTERPRETATION IC 15-1992-1a OF
ASHRAE STANDARD 15-1992
SAFETY CODE FOR MECHANICAL REFRIGERATION

Orig. August 24, 1992
Rev. December 17, 1992

Introduction: This reissued interpretation incorporates an expanded Comments section. This clarification is intended to resolve concerns expressed as a result of publication of the original interpretation in the October, 1992 issue of the ASHRAE Journal. The comments were received from Rusty Hoffman and two other staff members of Hoffman•Hoffman, Inc., P.O. Box 77258, Greensboro, NC 25417-7258.

Original Request from: Eugene L. Smithart, Trane, 3600 Pammel Creek Road, La Crosse, WI 54601-7599

References: This request refers to the classification of high vs low probability systems in Section 5 of ASHRAE Standard 15-1992. This interpretation also applies to Section 4 of ANSI/ASHRAE Standard 15-1989.

Background: Subsection 5.2.1 of Standard 15-1992 is worded as follows:

5.2.1 High-Probability Systems. Any system in which the basic design, or the location of components, is such that a leakage of refrigerant from a failed connection, seal or component could enter the area under consideration. Typical high-probability systems are (a) any direct or indirect open spray system or (b) any arrangement in which refrigerant-containing parts in the refrigerant circuit are located in such a way that refrigerant leakage could enter the area.

This request also applies to Subsection 4.2.1 of ANSI/ASHRAE Standard 15-1989, which is worded the same as 5.2.1 of Standard 15-1992 except for paragraph numbering.

Mr. Smithart's letter describes a water chiller producing chilled water which in turn, passes through an air washer (open spray system). Schematically, it is equivalent to Figure 1, Item 5.1.2.1 (indirect open spray system). In paragraph 5.2.1(a) this is used as an example of a high probability system. However, in this case, the pressure of the water is at all times greater than the pressure of the refrigerant (the chiller employs a low pressure refrigerant) and, therefore, it is not possible for the refrigerant to leak into the water stream and find its way to an occupied space via the air washer. The description of a high probability system is given in Subsection 5.2.1. Since in this case, leakage of refrigerant cannot reach the area under consideration, the system might be considered a low probability system.

The letter opines that a refrigerating system using a water chiller and an open air washer would be considered a low-probability system provided the water pressure is greater than the refrigerant pressure, which eliminates the possibility of refrigerant entering the occupancy.

Question: Is an indirect open spray system that uses a refrigerant pressure lower than the secondary coolant pressure in the chiller a low probability system?

Answer: Yes, providing that the pressure of the secondary coolant is at all times greater than the pressure of the refrigerant (both operating and standby, per paragraph 8.2).

Comments: Use of the indirect spray system as an example of a typical high-probability system in 5.2.1(a) was based on the presumption that the refrigerant pressure was higher than the secondary coolant pressure. Unless the secondary coolant pressure remains greater than the refrigerant pressure under all conditions, the system must be classified as a high-probability system. For clarification, SSPC 15 expects to recommend the following modified text of 5.2.1 and 5.2.2 in the next revision of ASHRAE 15:

5.2.1 High Probability Systems. Any system in which the basic design, or location of the components, is such that leakage of refrigerant from a failed connection, seal, or component could enter the occupied space. Typical high-probability systems are (a) any direct system or (b) any indirect open spray system in which the refrigerant can at any time have a pressure greater than the secondary coolant.

5.2.2 Low Probability Systems. Any system in which the basic design, or location of components, is such that leakage of refrigerant from failed connection, seal, or component cannot enter the occupied space. Typical low-probability systems are (a) indirect closed systems or (b) double indirect systems. In the case of open indirect spray systems, unless the secondary coolant pressure in all conditions covered by 8.2 (i.e., operation, standby, maintenance, shutdown, power failure, etc.) remains greater than the refrigerant pressure, the refrigerant system cannot be classified as a low probability system.