MEMORANDUM

Dear Committee Members:

After the circulation of votes, the final ballot results are as follows on the attached ballot matrix:

28 Members Eligible to Vote
6 Ballots were not received for Technical Merit by the Final Closing Date of November 7, 2017
5 Ballots were not received for Emergency Nature by the Final Closing Date of November 7, 2017

Technical Merit
22 Affirmative
0 Negative
0 Abstain

According to Section 5-4 of the Regulations Governing Committee Projects, the final results of the TIA # 001-18 ballot achieved the necessary three-fourths majority for affirmative vote (17) on Technical Merit (28 eligible - 6 not returned - 0 abstain = 22 x 75% = 16.5 or **17**).

Emergency Nature
13 Affirmative
10 Negative
0 Abstain

According to Section 5-4 of the Regulations Governing Committee Projects, the final results of the TIA # 001-18 ballot did not achieve the necessary three-fourths majority for affirmative vote (18) on Emergency Nature (28 eligible - 5 not returned - 0 abstain = 23 x 75% = 17.25 or **18**).

Please feel free to contact me by phone at (909) 230-5535 or by email at enrique.gonzalez@iapmo.org, if you have questions.

Regards,

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2018 Uniform Mechanical Code
TIA # 001-18
Final Ballot Results

Ballot Name:	TECHNICAL MERIT UMC TIA # 001-18
Ballot Status:	Ballot has closed.
Members Eligible to Vote:	28
Vote Summary	
Option	Count
Affirmative	22
Negative	0
Abstain	0
Did not vote	6
Voter Name	**Vote**
Wiseman, Bob	Affirmative
Koerber, Ralph	Affirmative
Lovell, Vickie	Affirmative
Mann, David	Affirmative
Hargis, Shawn	Affirmative
Adler, Bob	Affirmative
Feehan, Pennie	Affirmative
Taylor, Don	Affirmative
Trafton, April	Affirmative
Chang, Ian	Affirmative
Smith, Christopher	Affirmative
Surrena, Donald	Affirmative
Delaquila, David	Affirmative
Berger, Donald	Affirmative
Ribbs, Phil	Affirmative
Cudahy, Michael	Affirmative
Scarano, Anthony	Affirmative
Sewell, Robert	Affirmative
Young, Randy	Affirmative
Howard, III, Eli	Affirmative
Afonso, Mike	Affirmative
Carroll, Marguerite	Affirmative
Van Rite, Chris	Did not vote
Garcia, Roel	Did not vote
Kreitenberg, Harvey	Did not vote
Dias, David	Did not vote
Nielsen, John	Did not vote
Pavesic, James	Did not vote

Ballot Name:	EMERGENCY NATURE UMC TIA # 001-18
Ballot Status:	Ballot has closed.
Members Eligible to Vote:	28
Vote Summary	
Option	Count
Affirmative	13
Negative	10
Abstain	0
Did not vote	5
Voter Name	**Vote**
Wiseman, Bob	Affirmative
Koerber, Ralph	Affirmative
Hargis, Shawn	Affirmative
Feehan, Pennie	Affirmative
Trafton, April	Affirmative
Chang, Ian	Affirmative
Smith, Christopher	Affirmative
Surrena, Donald	Affirmative
Delaquila, David	Affirmative
Cudahy, Michael	Affirmative
Scarano, Anthony	Affirmative
Howard, III, Eli	Affirmative
Carroll, Marguerite	Affirmative
Lovell, Vickie	Negative w/ comment
Mann, David	Negative w/ comment
Adler, Bob	Negative w/ comment
Taylor, Don	Negative w/ comment
Dias, David	Negative w/ comment
Berger, Donald	Negative w/ comment
Ribbs, Phil	Negative w/ comment
Sewell, Robert	Negative w/ comment
Young, Randy	Negative w/ comment
Afonso, Mike	Negative w/ comment
Van Rite, Chris	Did not vote
Garcia, Roel	Did not vote
Kreitenberg, Harvey	Did not vote
Nielsen, John	Did not vote
Pavesic, James	Did not vote

UNIFORM MECHANICAL CODE TIA FORM - 2018

Reference Code Section: 220.0, 1111.0 – 1112.5.2, ASHRAE 15-2016

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Proposed language for TIA:

Modify language as follows:

220.0

Refrigeration System, Indirect. A system in which a secondary coolant cooled or heated by the refrigerating system is circulated to the air or other substance to be cooled or heated. Indirect systems are distinguished by the method of application given below. [ASHRAE 15:5.1.2]

Indirect Open Spray System. A system in which a secondary coolant is in direct contact with the air or other substance to be cooled or heated. [ASHRAE 15:5.1.2.1]

Double Indirect Open Spray System. A system in which the secondary substance for an indirect open spray system is heated or cooled by the secondary coolant circulated from a second enclosure. [ASHRAE 15:5.1.2.2]

Indirect Closed System. A system in which a secondary coolant passes through a closed circuit in the air or other substance to be cooled or heated. [ASHRAE 15:5.1.2.3]

1111.0 Pressure-Limiting Devices.

1111.1 Where Required. Pressure-limiting devices complying with Section 1111.2 through Section 1111.4 shall be provided for compressors on all systems operating above atmospheric pressure.

Exception: Pressure limiting devices are not required for listed ~~F~~factory-sealed systems containing less than 22 pounds (9.9 kg) of Group A1 refrigerant ~~listed by an approved agency~~. [ASHRAE 15:9.9.1]

1111.2 Setting. ~~Where required in Section 1111.1, the maximum setting to which a pressure limiting device is capable of being readily set by use of the adjusting means provided shall not exceed the design pressure of the highside of a system that is not protected by a pressure-relief device or 90 percent of the setting of the pressure-relief device installed on the highside of a system. The pressure limiting device shall stop the action of the pressure-imposing element at a pressure not more than the maximum setting.~~

~~**Exception:** On systems using nonpositive displacement compressors, the maximum setting of the pressure limiting device shall not be required to be less than the design pressure of the highside of the system provided the pressure-relief device is located in the lowside, subject to lowside pressure, and there is a permanent (unvalved) relief path between the highside and the lowside of the system.~~

Pressure limiting devices shall be set in accordance with one the following:

(1) For positive displacement compressors:

(a) When systems are protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than 90 percent of the operating pressure for the highside pressure relief device.

(b) When systems are not protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than the system's highside design pressure.

(2) For nonpositive displacement compressors:

(a) When systems are protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than 90 percent of the operating pressure for the highside pressure relief device.

(b) When systems are protected by a lowside pressure relief device that is only subject to lowside pressure, and is provided with a permanent relief path between the systems' highside and lowside, without intervening valves, the compressor's pressure limiting device shall be set not more than the systems' highside design pressure. [ASHRAE 15:9.9.2]

1111.3 ~~Connection~~ Location. ~~Pressure limiting devices shall be connected between the pressure imposing element and the stop valve on the discharge side. There shall be no intervening stop valves in the line leading to the pressure-limiting device.~~ Stop valves shall not be installed between the pressure imposing element and pressure limiting devices serving compressors. [ASHRAE 15:9.9.3]

1111.4 ~~Operation~~ Emergency Stop. ~~Where the system is protected by a pressure relief device, the pressure-limiting device shall stop the action of the pressure imposing element at a pressure not exceeding 90 percent of the setting of the pressure relief device.~~Activation of a pressure-limiting device shall stop the action of the pressure-imposing element. [ASHRAE 15:9.9.4]

1112.4 Evaporators. ~~Evaporators~~ Heat exchanger coils located downstream, or upstream within 18 inches (457 mm), of a heating ~~coil~~ source and capable of being isolated shall be fitted with a pressure-relief device ~~discharging~~ that discharges to another part of the system in accordance with Section 1112.5 through Section 1112.5.2 or outside ~~the building~~ any enclosed space in accordance with ~~the requirements of~~ Section 1112.10. The pressure relief device shall be connected at the highest possible location of the heat exchanger or piping between the heat exchanger and its manual isolation valves.

Exceptions:

(1) Relief valves shall not be required on ~~heating~~ heat exchanger coils that ~~are designed to produce a temperature that will result in the~~ have a design pressure more than 110 percent of refrigerant saturation pressure ~~of the refrigerant being less than the design pressure~~ when exposed to the maximum heating source temperature.

(2) A relief valve shall not be required on self-contained or unit systems where the volume of the lowside of the system, which is shut off by valves, is more than the specific volume of the refrigerant at critical conditions of temperature and pressure, as determined in accordance with Equation 1112.4.

$V_1 / [W_1 - (V_2 - V_1) / V_{gt}] \geq$ (Equation 1112.4)

Shall be more than V_{gc}

Where:

V_1 = Lowside volume, cubic foot (m^3).

V_2 = Total volume of system, cubic foot (m^3).

W_1 = Total weight of refrigerant in system, pounds (kg).

V_{gt} = Specific volume of refrigerant vapor at 110°F (43°C), cubic feet per pound (m^3/kg).

V_{gc} = Specific volume at critical temperature and pressure, cubic feet per pound (m^3/kg). [ASHRAE 15:9.4.4]

1112.5 Hydrostatic Expansion. Pressure rise resulting from hydrostatic expansion due to temperature rise of liquid refrigerant trapped in or between closed valves shall be addressed in accordance with Section 1112.5.1 and Section 1112.5.2. [ASHRAE 15:9.4.3]

1112.5.1 Hydrostatic Expansion During Normal Operation. Where trapping of liquid with subsequent hydrostatic expansion is capable of occurring automatically during normal operation or during standby, shipping, or power failure, engineering controls shall be used that are capable of preventing the pressure from exceeding the design pressure. Acceptable engineering controls include but are not limited to the following:

(1) Pressure relief device to relieve hydrostatic pressure to another part of the system.

(2) Reseating pressure relief valve to relieve the hydrostatic pressure to an approved treatment system. [ASHRAE 15:9.4.3.1]

1112.5.2 Hydrostatic Expansion During Maintenance. Where trapping of liquid with subsequent hydrostatic expansion is capable of occurring only during maintenance—i.e., when personnel are performing maintenance tasks—either engineering or administrative controls shall be used to relieve or prevent the hydrostatic overpressure. [ASHRAE 15:9.4.3.2]

(renumber remaining sections)

Substantiation:

Technical Merit: Current requirements in Chapter 11 were extracted from ASHRAE 15-2016. The modifications clarify the wording in Section 1112.4, and add specific requirements for hydrostatic expansion that occur during normal operation and during maintenance. Additionally, the inequality sign from Equation 1112.4 is removed to clarify that the value of Equation 1112.4 must be greater than "V_{gc}." The updates include a revision for pressure limiting devises to include specific installation locations and pressure requirements. Additionally, specific indirect systems are defined based on the system configuration based on method of application that will assist the end user specify the type of indirect system.

Emergency nature: The emergency nature of this proposed TIA is supported by Section 5-2(a) of the Regulations Governing Committee Projects, "*The document contains an error or an omission that was overlooked during a regular revision process*." The current Uniform Mechanical Code does not

distinguish between hydrostatic expansion during maintenance and normal operation which can lead to confusion in regards to applying the appropriate method of relieving or controlling hydrostatic expansion. Clarification of the inequality of Equation 1112.4 removes confusion and ambiguity for when a relief may not be required, depending on the refrigerant volume. Furthermore, the updates include specific settings for pressure relief devices, based on the system configuration. The modifications are based on ASHRAE 15-2016, latest edition, which is currently referenced for the 2018 edition of the UMC.

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Submitter signature (required): _____April Trafton_____ Date: __October 24, 2017_____

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