

**DEPARTMENT OF COMMERCE**  
**SUMMARY OF PUBLIC HEARING COMMENTS AND AGENCY RESPONSE**

Clearinghouse Rule Number: 10-011		Hearing Location: Madison, Wisconsin	
Rule Number: Chapters Comm 2, 41 and 45		Hearing Date: March 4, 2010	
Relating to: Mechanical Refrigeration			
Comments: Oral or Exhibit No.	Presenter, Group Represented, City and State	Comments/Recommendations	Agency Response
1	James D. Hadley, PE Milwaukee, Wisconsin	1a. Recommends adding a note explaining which paragraphs of section 606 of the <i>International Fire Code</i> <sup>®</sup> and NFPA <sup>®</sup> 1 chapter 53 apply.	1. An informational Note has been added explaining that neither the IFC nor NFPA 1 are applied by the Department to mechanical refrigeration systems.
		1b. States ASHRAE 15, IIAR 2 and the ASME Boiler and Pressure Vessel Code provide solid pressure-relief protection.	1b. Support is noted.
Oral and 2	Philip Golden, PE Golden Industrial Refrigeration Mukwonago, Wisconsin	2a. Comm 45.11 (1) (d) and (3): Indicates the proposed changes do not adequately clarify what constitutes a need to upgrade to the current code when other parts of a system are modified. Recommends further clarification, including removal of any ambiguity, and adding examples if necessary.	2a. An informational Note has been added that encourages designers, contractors and owners to contact the Department to discuss their intentions for alterations and to determine, on a case-by-case basis, any upgrades that are then needed.
		2b. Comm 45.20 (3): States the definition of “alteration” is too broad and subject to interpretation by inspectors as well as designers and installing contractors. Recommends removing the ambiguity and making the language more straightforward.	2b. See response immediately above.
		2c. Comm 45.31 (1) (a) Note: Recommends adding reference to providing a building owner or user with at least a 24-hour notice prior to an inspection.	2c. This notice currently is provided through a reminder-of-permit-expiration that is mailed to the owner 60 days prior to the expiration, requesting they contact the inspector to arrange for a permit-renewal inspection.
		2d. Comm 45.31 (2) (b) 3. e.: States this section does not specify which design calculations must be made available during installation inspections. Recommends defining all the design calculations that are required, including the basis for relief design and ventilation design, ammonia charge, stress calculations, wind loading, and structural supports. States all design calculations should be performed by a registered design professional and sealed appropriately.	2d. Concern is noted and will be addressed in training sessions the Department expects to present as the rule changes become effective, particularly since plan review by the Department is not required prior to the installations.
		2e. Comm 45.33: Recommends adding a fax number or a designated e-mail address to facilitate formal correspondence of a written notice of an accident within the required 24-hour period.	2e. A fax number has been added, and the requirement for the notice to be in writing has been deleted.
		2f. Comm 45.40 (1) and (2): States ANSI/ASHRAE 15 and ANSI/IIAR 2 clearly are industry standards and are appropriate to reference in Comm 45 – but recommends deleting the edition designation so that when a subsequent edition	2f. Support is noted. However, current law requires the Department to obtain approval from the Attorney General prior to adopting by

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		is published, Comm 45 will not then reference an out-of-date standard.	reference any edition of any standard, and requires listing the specific edition in the reference to the standard.
		2g. Comm 45.508: For ammonia refrigeration systems, states the recommendation to install eye-wash-and-body-shower units within a machinery room, with a walking distance of no more than 50 feet, should instead be a requirement.	2g. IIAR 2 recommends these units at this maximum distance within machinery rooms for ammonia systems, in addition to requiring a unit outside the machinery room. The outside unit provides an acceptable minimum level of safety.
		2h. Comm 45.511 (2) (d): Recommends clarifying that the detection and alarm systems are for refrigerants, and recommends also requiring annual testing of remote controls for shutdown of compressors and refrigerant pumps.	2h. The rules have been changed as recommended.
		2i. Comm 45.613 (1) (a): Recommends clarifying that the required emergency remote control for ventilation, at the engine room door, is to be inside the building; and recommends requiring a second control near the egress door, on the outside of the building.	2i. The required single remote control is an acceptable minimum level of safety. Building owners can choose to provide additional remote controls, for a higher level of safety.
		2j. Comm 45.613 (1): States this section does not address remote control machinery, and there is no discussion of an automatic shutoff of high-pressure liquid feed immediately piped away from the high-pressure receiver. Recommends requiring two remote-control stations for emergency shutdown of machinery in the engine room and electrical shutoff of high-pressure liquid supply – with one station outside the engine room door and inside the building, and the second station near the egress door and outside the building.	2j. Comm 45.613 (1) (b) modifies IIAR 2 section 13.3.1.6 to require remote emergency manual shutdown controls for compressors in all cases, which is an acceptable minimum level of safety. Building owners can choose to provide multiple automatic controls, for a higher level of safety.
		2k. Comm 45.70: Recommends applying the requirements for ozone-depleting refrigerants, such as for minimizing releases, to refrigerants with a high global-warming potential.	2k. The rules have been changed to require minimizing the release of any refrigerant.
		2L. Recommends including a standard for color-coding non-insulated refrigerant pipes so they can be differentiated from other utility lines in a plant, such as for compressed air, natural gas, and cooling-tower water.	2L. The piping-identification criteria in ANSI A13.1 that are applied through ASHRAE-15 section 11.2.2(b), and the identification criteria in IIAR 2 section 10.5, provide acceptable minimum levels of safety. Owners can choose to also provide color-coded identification.
		2m. States both ASHRAE 15 and IIAR 2 require a low-side minimum design	2m. The system design pressures in ASHRAE 15

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		working pressure of 150 pounds per square inch (gage). Suggests increasing this design pressure to 250 psig in chapter Comm 45 – which would result in fewer ammonia releases, for only a minimal increase in cost that would be a very small increase in project cost.	section 9.2 and IIAR 2 section 9.1 provide an acceptable minimum level of safety; building owners can choose to provide a higher level of safety.
		2n. States IIAR 2 section 9.1.4 recommends that high-side vessels receive post-weld heat treatment per its Appendix J. Suggests changing this recommendation to a requirement in Comm 45.	2n. If this change is made by the technical review committee that updates IIAR 2, the Department will consider adopting it in Comm 45.
		2o. States IIAR 2 section 9.1.6 specifies a 1/16-inch corrosion allowance for vessels that may be exposed to external corrosion. Believes it will take some educating for engineers and design/build contractors to learn and apply this new section, and it may be necessary to have vessel manufacturers specifically call out the 1/16-inch corrosion allowance in a subject vessel's U1-A form to show compliance.	2o. Concern is noted and may be addressed in training sessions the Department expects to present as the rule changes become effective. This concern could likewise be addressed through the technical review committee that updates IIAR 2.
		2p. States IIAR 2 section 10.2.3 recommends not using ½-inch or less pipe, and indicates clarification may be useful to avoid misunderstandings and conflicting interpretations by inspectors and installing contractors.	2p. Recommendations in referenced standards are not requirements and consequently are not enforced by the Department.
		2q. Notes IIAR 2 section 11.1.5 prohibits locating relief valves in refrigerated spaces unless precautions are taken to prevent moisture migration into the valve body or relief line, but IIAR 2 then provides no guidance on how to prevent the migration. Recommends requiring (1) installation of a rupture disk in the relief main upon penetrating a wall or roof of a cold space to ambient and (2) a means of draining moisture from above the rupture disk.	2q. There may be multiple means of preventing moisture migration that are as acceptable as the respondents' proposal.
		2r. Notes IIAR 2 section 11.3.3 requires the materials of construction for relief piping to comply with the materials requirements for closed-circuit ammonia systems. Believes it will take some educating for engineers and design/build contractors to learn and apply this new section.	2r. Concern is noted and may be addressed in training sessions the Department expects to present as the rule changes become effective.
		2s. Notes that under IIAR 2 section 11.3.4, sizing of discharge piping downstream of multiple relief devices must be based on the discharge capacities of all relief devices that are expected to discharge simultaneously. Indicates there is uncertainty in the industry about who determines which valves are expected to relieve simultaneously. States a fire condition should dictate this, and it should be the worst case scenario. Recommends requiring the sizing to be based instead	2s. If this change is made by the technical review committee that updates IIAR 2, the Department will consider adopting it in Comm 45.

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		on the discharge capacities of all the relief devices that are piped to a common relief header in the same room.	
		2t. States both IIAR 2 and ASHRAE 15 require one ammonia detector connected to a supervisory alarm, and the detection system must activate audio/visual alarms and emergency ventilation. Not addressed is the need for automatic shutdown of mechanical equipment, such as compressors and refrigerant pumps. Suggests requiring two ammonia sensors – with the first sensor having an adjustable range of 0-250 ppm for the purpose of activating the audio/visual alarm and emergency ventilation, and the second sensor having a range of 0-2% for the purpose of shutting down the mechanical equipment.	2t. Comm 45 requires manual shutdown switches, which is an acceptable minimum level of safety. Building owners can choose to also provide automatic switches, for a higher level of safety. If the recommended requirements are adopted through the technical review committee that updates IIAR 2, the Department will consider adopting them in Comm 45.
		2u. Indicates the emergency ventilation rate specified in IIAR 2 section 13.2.3.3 and in IIAR bulletin 111 for machinery rooms with ammonia systems has not been finalized yet. Recommends modifying the section to require basing the ventilation rate on the latest edition of bulletin 111.	2u. Bulletin 111 is currently being reviewed by the technical review committee that updates IIAR 2. After that process is completed and reflected in IIAR 2, the Department will consider referencing this bulletin in Comm 45.
		2v. States there are existing ammonia refrigeration plants in Wisconsin that do not conform with the requirement for a direct egress to the outdoors. Some engine rooms have been built in the center of the building or on a mezzanine. This issue needs to be addressed to determine how an owner can become “code-compliant” in terms of egress. Clearly, safe egress is a matter of human safety and should be addressed without putting undue economic hardship on the owner. IIAR 2 section 13.3.3.3 partly addresses this by requiring at least one exit door that opens to the outdoors directly or through a vestibule-type exit equipped with self-closing, tight fitting doors. For installations which predate the current code and which do not have an exit directly to the outdoors, suggests requiring a vestibule with a direct line of sight and a travel distance of no greater than 50 feet, and maintaining the vestibule clear at all times. Where this is not practical, a permanently fixed stair which is in the machinery room and which discharges to an unlocked roof hatch could be required.	2v. As noted in response 2a above, an informational Note has been added that encourages designers, contractors and owners to contact the Department to discuss their intentions for alterations and to determine, on a case-by-case basis, any upgrades that are then needed. Retroactively requiring an enclosed means of egress to the outdoors typically would be prohibitively and unjustifiably expensive.
		2w. States there currently are no code provisions to safeguard oil or ammonia access locations for an ammonia system. These locations can range from a few to hundreds, for either draining oil or releasing ammonia, and should be secured (1) for the safety of employees and (2) to prevent theft of ammonia relating to illegal	2w. ASHRAE section 11.6.1 requires stop valves to be capped, plugged, blanked or locked close when not in use. If this section is changed by the technical review committee that updates IIAR 2 to

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		drugs or homeland security. Recommends requiring all oil drain ports and ammonia access locations to be equipped with a locking device that is accessible only by qualified plant personnel.	always require locking these and other access locations when not in use, the Department will consider adopting this change in Comm 45.

*File reference: Comm 45/Hearing summary2ac*