IADMIN

2024 GROUP A PROPOSED CHANGES TO THE I-CODES

Committee Action Hearings (CAH #2)
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ADM1-24

IFGC: 101.2.2.1 (New), 107.1.1 (New)

Proposed Change as Submitted

Proponents: Andrew Bevis, Chair, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org)

THIS PROPOSAL WILL BE HEARD BY THE IFGC CODE COMMITTEE. SEE THE TENTATIVE HEARING ORDER FOR THIS COMMITTEE.

2024 International Fuel Gas Code

Add new text as follows:

101.2.2.1 Systems where hydrogen admixtures greater than 5-percent are supplied. Fuel gas, where hydrogen admixtures are delivered, shall meet the requirements of Chapters 3, 4, 5, and 6 for the supplier-defined hydrogen admixture limits, expressed in volume concentration of gaseous hydrogen for service up to the defined hydrogen admixture limits.

107.1.1 Fuel gases. Where hydrogen admixtures are supplied, the code official shall be provided with compositional description of the fuel gas.

Reason: Section 101.2.2.1

This is one of several revisions that address the potential for hydrogen admixtures. This language confirms that systems delivering hydrogen admixtures to end use appliances and equipment must conform with requirements already in effect for natural gas including installation locations, clearances, and other installation conditions (Chapter 3), gas piping requirements (Chapter 4), appliance and equipment chimneys and vents (Chapter 5), and appliance-specific installation requirements (Chapter 6). This section is applicable to the IRC Chapter 24 as well as the IFGC. Hydrogen admixtures above 5% have a range of >5% - <95% due to the requirements found in Chapter 7 which are exclusively for Gaseous Hydrogen Systems which are defined as having at least 95% hydrogen gas by volume and not more than 1 percent oxygen by volume.

[F] GASEOUS HYDROGEN SYSTEM.

An assembly of *piping*, devices and apparatus designed to generate, store, contain, distribute or transport a nontoxic, gaseous hydrogen containing mixture having at least 95-percent hydrogen gas by volume and not more than 1-percent oxygen by volume. Gaseous hydrogen systems consist of items such as compressed gas containers, reactors and appurtenances, including pressure regulators, pressure relief devices, manifolds, pumps, compressors and interconnecting *piping* and tubing and controls.

Section 107.1.1

Due to the introduction of Hydrogen Admixtures in Natural Gas supplies, this proposed revision provides the requirement the code official be provided with the compositional description of the fuel gas to ensure appliances and equipment and piping systems are listed for use with the correct fuel gas and admixtures for the type of fuel supplied in accordance with section 301.3 Listed and labeled.

301.3 Listed and labeled.

Appliances regulated by this code shall be *listed* and *labeled* for the application in which they are used unless otherwise *approved* in accordance with Section 105. The approval of unlisted appliances in accordance with Section 105 shall be based on *approved* engineering evaluation.

This proposal is submitted by the ICC Plumbing Mechanical Gas Code Action Committee (PMGCAC)

PMGCAC was established by the ICC Board of Directors in July 2011 to pursue opportunities to improve and enhance assigned International Codes or portions thereof. In 2023 PMGCAC has held 26 virtual meetings open to any interested party. In addition, there were several virtual Working Group meetings for the current code development cycle, which included members of the committee as well as interested parties. Related documents and reports are posted on the PMGCAC website at PMGCAC.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The two new sections merely define what is fuel gas as opposed to a hydrogen admixture. The sections do not require any technical change and thus there will not be any labor or material expended as a result of the inclusion of these two sections in the code.

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Public Hearing Results (CAH1)

Committee Action: **Disapproved**

Committee Reason: The committee voted 10-0 and agrees that the way the proposal is written is problematic. The consensus is that the proposal should be revisited with a modification to the proposed code language. There are still a lot of questions regarding higher limits, and there are currently no standards to support or list the code language as submitted for this proposal.

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Individual Consideration Agenda

Comment 1:

IFGC: 101.2.2.1, 107.1.1

Proponents: Andrew Bevis, Chair, Plumbing, Mechanical and Fuel Gas Code Action Committee (pmgcac@iccsafe.org) requests As Modified by Committee (AMC2)

Modify as follows:

2024 International Fuel Gas Code

Delete and substitute as follows:

~~**101.2.2.1 Systems where hydrogen admixtures greater than 5-percent are supplied.** Fuel gas, where hydrogen admixtures are delivered, shall meet the requirements of Chapters 3, 4, 5, and 6 for the supplier defined hydrogen admixture limits, expressed in volume concentration of gaseous hydrogen for service up to the defined hydrogen admixture limits.~~

101.2.2.1 Hydrogen admixture gas supply. Supply systems in which hydrogen is blended into admixtures greater than 5% and not exceeding 20% hydrogen by volume.

Revise as follows:

107.1.1 ~~Fuel gases~~ Gas composition. Where hydrogen admixtures are supplied, the code official shall be provided with compositional

description of the ~~fuel~~ gas.

Reason: This As Modified proposal is submitted in concert with FG 11. The addition of hydrogen admixtures is outside the scope of the IFGC and therefore a change in scope is necessary to incorporate this new technology. This additional item in the scoping Section 102.2.1 was needed to incorporate coverage of hydrogen admixtures by definition. Admixtures are not a "fuel gas" because they are greater than 5% hydrogen but they are not "hydrogen" because they are not greater than 95% hydrogen composite make up.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

The two new sections merely define what is fuel gas as opposed to a hydrogen admixture. The sections do not require any technical change and thus there will not be any labor or material expended as a result of the inclusion of these two sections in the code.

Comment (CAH2)# 328

Comment 2:

IFGC: 101.2.2.1, 107.1.1

Proponents: Ted Williams, Natural Gas Direct, LLC, Natural Gas Direct, LLC (ngdllc@outlook.com) requests As Modified by Committee (AMC2)

Modify as follows:

2024 International Fuel Gas Code

[A] 101.2.2 Gaseous hydrogen systems. *Gaseous hydrogen systems* shall be regulated by Chapter 7.

101.2.2.1 ~~Systems where hydrogen admixtures greater than 5-percent are supplied~~ Hydrogen Admixtures. ~~Fuel gas, where hydrogen admixtures are delivered, shall meet the requirements of Chapters 3, 4, 5, and 6 for the supplier defined hydrogen admixture limits, expressed in volume concentration of gaseous hydrogen for service up to the defined hydrogen admixture limits.~~Admixtures of natural gas blended with hydrogen exceeding 5% hydrogen by volume and not exceed 20% hydrogen by volume shall be regulated by this code.

[A] 107.1 Approval. After the prescribed tests and inspections indicate that the work complies in all respects with this code, a notice of approval shall be issued by the *code official*.

Revise as follows:

107.1.1 ~~Fuel gases~~ Hydrogen admixtures in natural gas supply systems. ~~Where hydrogen admixtures are supplied, the code official shall be provided with compositional description of the fuel gas.~~Where hydrogen admixtures are supplied, the code official shall be provided with information by the natural gas supplier on the maximum percentage hydrogen by volume that is added to the natural gas.

Reason: The current state of knowledge represented by testing and analysis supports use of hydrogen admixtures in natural gas up to and including 20% without additional appliance approval testing or revision of fuel gas distribution requirements and specifications. This state of knowledge also supports an admixture limit of 20% by volume as compatible with appliances and equipment already approved for use with natural gas without additional testing or approvals. Revision for standards for safety for natural gas appliances is currently assessing using the admixture limit of 20% hydrogen by volume as the basis for approval of new appliances and equipment designs by revising the standards for safety "table of test gases" to include a hydrogen admixture of 20% by volume in natural gas listed appliances. As research and analysis continues to address admixture thresholds for natural gas appliances, future actions on standards for safety may justify a higher threshold than the 20% hydrogen by volume for natural gas appliances, but promulgation of requirements that allow

greater than 20% by volume are not justified at this time. The requirement proposed under the newly proposed Section 101.2.2.1 for hydrogen admixture percentages accomplish this and are consistent with other North American codes and standards proposals under active technical consideration by consensus standards and code body activities.
As standards for safety for natural gas appliances and equipment move forward in approving operation on hydrogen admixtures in natural gas up to and including 20% by volume (covered in the proposed Section 101.2.2.1 requirements), authorities having jurisdiction (AHJ) over approval of natural gas systems need to have information on the upper limits of hydrogen in the natural gas supply in the jurisdiction in order to approve of installations that have appliances and equipment that are fully compatible between the natural gas supply and the upper admixture limit relevant to that local jurisdiction. Again, the current state of knowledge supports an admixture limit of 20% by volume as compatible with appliances and equipment already approved for use with natural gas without additional testing or approvals, but new approvals of natural gas appliances and equipment that are listed and labeled for hydrogen admixture limits must be in agreement with the supplied natural gases. Without information from gas suppliers on hydrogen content of natural gas, the AHJ cannot determine the compatibility of proposed appliances and equipment with potential local gas supplies and might approve of installations in which aberrant appliance function and potential safety hazards might emerge as a significant risk. For example, new natural gas appliances not approved for operation on hydrogen admixture natural gases, or for hydrogen admixtures of lower-than-supply-system limits, may present such heightened risks of safe combustion behavior, but without supply information on hydrogen admixture limits, the AHJ cannot provide reliable approvals for installation of such equipment. The requirement proposed as a new Section 107.1.1 helps implement consistent treatment of added hydrogen fractions to natural gas without imposing excessively burdensome alternatives such as documentation of full natural gas compositional descriptions.

Cost Impact: The change proposal is editorial in nature or a clarification and has no cost impact on the cost of construction

Justification for no cost impact:

No new technical requirements are proposed via this comment and, therefore, no change in the cost of construction would be caused.

Comment (CAH2)# 546