



## National Center for Healthy Housing

### NCHH's 2015 Proposals to Upgrade International Property Maintenance Code and International Existing Building Code to Make Homes Healthier

On January 12, 2015, NCHH submitted proposals to improve the 2016 editions of two model codes by the International Code Council (ICC): the International Property Maintenance Code (IPMC) and the International Existing Building Code (IEBC). If the proposals are accepted, state and local communities will be able to adopt them and make homes healthier through better maintenance and safer remodeling. The proposals are:

1. **Carbon monoxide alarms in IPMC and IEBC:** Since the 2012 edition, the International Fire Code (IFC) requires life-saving carbon monoxide alarms in almost all multifamily homes with an attached garage or a fuel-burning appliance. Similarly, starting with the 2012 edition, the International Residential Code (IRC) requires an alarm in one- and two-family homes and townhomes of three stories or fewer whenever a remodeling permit is issued. Unfortunately, the greatest risk is in homes with old appliances or poorly isolated garages when the owners are not planning any remodeling that requires a permit. We proposed to [amend the IPMC so all dwellings have a carbon monoxide alarm](#) and to [amend the IEBC to reinforce the requirements of the IFC](#).
2. **Check for Lead-Safe Certified Renovation Firms:** Since 2010, firms conducting renovation, repair, and painting (RRP) activities in pre-1978 housing and child-occupied facilities must comply with the regulations at 40 CFR Part 745. With only limited exceptions, the firms must be lead-safe certified by the U.S. Environmental Protection Agency (EPA) or one of the 14 states authorized by EPA to administer the program. We proposed to [amend the IEBC so that the property owner must include a copy of the lead-safe certification in the construction documents when seeking a remodeling permit from the local code official](#). By requiring the certification in the permit application, we will reach the property owner at a “teachable moment.” This proposal only applies to homes with three or more units or townhomes with four or more aboveground floors. We plan to reach one- and two-family homes with a similar proposal to the IRC when it is up for amendment in a few years.
3. **Improve pest elimination:** The IPMC currently requires that pest infestations and rodent harborage be eliminated. However, it is vague on what this entails and who was responsible. We proposed to [amend the IPMC to clarify the requirements and to add an optional appendix that jurisdictions could adopt to require integrated pest management](#).
4. **Health standards for radon, asbestos and lead:** We propose [to amend the IPMC by adding an optional appendix that would make it easier for local agencies to cooperate in](#)

[protecting residents from the hazards posed by radon, asbestos, and lead](#). If accepted, code officials could rely on a health department's determination that a hazard exists and order the property owner to mitigate the hazard and pay for testing to confirm the hazard was removed. Our hope is that the language in the model code may make it easier for local jurisdictions to cooperate.

The ICC will post these, as well as proposals submitted by others, on its website at [www.iccsafe.org](http://www.iccsafe.org) by March 13, 2015. From April 19 to 30, committees will convene in Memphis, TN, to consider the proposals and vote whether to approve, reject, or modify them. From September 30 to October 7, the full body will consider public comments on all proposals and make final decisions. Online voting is available, though only government officials may participate. The hearings and meetings will be webcast. Contact [Tom Neltner](#) at [tneltner@nchh.org](mailto:tneltner@nchh.org) or 443-539-4160 for more information.

## IEBC Lead-Safe Certification

**Proponent:** Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org)

*Revise as follows:*

**[A] 106.2 Construction documents.** Construction documents shall be in accordance with Sections 106.2.1 through ~~106.2.5~~ 106.2.6.

*Add new text as follows:*

**[A] 106.2.6 Certifications where painted surfaces are disturbed.** Where repair, alteration, or addition being performed in a Group R-2, R-3, or R-4 occupancy built before 1978 is covered by the Lead Renovation, Repair, and Painting rule at 40 CFR 745 or a state program authorized by that rule, and will disturb painted surfaces, the construction documents shall include a copy of the firm's certificate to conduct the disturbance activities under the applicable rule.

Exception: The occupancy is not a target housing or child-occupied facility as defined by 40 CFR Part 745.

*Add new standard(s) as follows:*

U.S. Environmental Protection Agency, 40 CFR 745 Lead-Based Paint Poisoning Prevention in Certain Residential Structures, July 1, 2012.

### **NCHH's Reasoning:**

Since April 22, 2010, renovations performed for compensation in child-occupied facilities and housing built before 1978 must comply with federal requirements at 40 Code of Federal Regulations (CFR) Part 745 Subpart E, known as the Renovation, Repair, and Painting (RRP) rules. While it was not a consensus process, the Environmental Protection Agency (EPA) adopted the rule in 2008 after more than a decade after considering more than 750 public comments,<sup>1</sup> completing a detailed cost-benefit analysis, and demonstrating that the rule would result in a net benefit to society.<sup>2</sup> As of December 31, 2014, 14 states<sup>3</sup> (Alabama, Delaware, Georgia, Iowa, Kansas, Massachusetts, Mississippi, North Carolina, Oklahoma, Oregon, Rhode Island, Utah, Washington, and Wisconsin) have adopted equivalent regulations and are responsible for administering the requirements. In the remaining 36 states, EPA is responsible for compliance and enforcement.

As of December 31, 2014, more than 130,000 firms have been certified by EPA or a state to perform work covered by the RRP rule.<sup>4</sup> More than 500,000 individuals have been certified to supervise the work on behalf of these lead-safe certified renovation firms. With these numbers, property owners have reasonable access to sufficient lead-safe certified renovation firms and certified renovators.

EPA has taken aggressive action to enforce the RRP rule. In 2014 alone, EPA took action against 61 renovators, as well as one home improvement chain, requiring compliance with the rule, and

collecting more than \$500,000 in fines.<sup>5</sup> The 14 EPA-authorized states have taken additional enforcement actions.

These enforcement actions highlight two challenges. First, people in the homes and child-occupied facilities were not adequately protected from lead hazards, especially lead in dust. Children are most vulnerable to lead because exposure can cause permanent harm to their brain development.<sup>6</sup> Second, renovators who are certified and complying with the rule are put at a serious competitive disadvantage against those who ignore or are unaware of the requirements.

Rather than focusing on enforcement, a better approach is to prevent the violations through education and planning and to level the playing field for the hundreds of thousands of renovators that consistently comply with the RRP rule. While state and local building code officials have no direct responsibilities to ensure compliance with these federal and state requirements, their role in administering the IEBC as required by Section 101.3 to “achieve compliance with minimum requirements to safeguard the public health, safety and welfare insofar as they are affected by the repair, alteration, change of occupancy, addition and relocation of existing buildings” is critical to educating contractors and identifying potential compliance problems so that children’s health is protected.

This proposal adds a new Section 106.2.6 that requires permit applicants who are conducting activities covered by the rule to include, with the other construction documents, a copy of their lead-safe certified renovator certificate. It would only apply to Group R-2, R-3, and R-4 occupancies built before 1978 that are in the scope of the rule. An exception in the section makes clear that the requirement would only apply in child-occupied facilities, such as child-care centers, and housing other than those without a separate bedroom (known as zero-bedroom dwellings).

By requiring the documentation as part of the IEBC permitting process, renovators are alerted to the RRP requirements so that they can obtain the necessary training and certification before undertaking the work. They will also be reminded of their work practice compliance requirements under the RRP rule. This provision asks the code official to confirm that the person has submitted a copy of the certificate provided by EPA or the state. It does not ask the code official to enforce the federal rule. Because it is not a technical requirement, it is appropriate to include in Chapter 1 for administrative requirements.

This oversight will help to level the playing field between contractors who are complying with the rule and noncompliant contractor entities who are underpricing and undercutting their competitors. By merely asking an applicant for the missing documents, the code official can influence entities not following the law into compliance before the work even starts.

Compliance is important because renovation of painted surfaces in pre-1978 housing is a significant source of lead dust that poisons children. The dangers associated with lead poisoning are well known: serious health effects, detrimental effects on cognitive and behavioral development, with serious personal and social consequences that may persist throughout their lifetime.<sup>6</sup>

There is no safe level of lead exposure for children; even low levels of lead exposure can damage intelligence.<sup>6</sup>

### **Bibliography:**

- <sup>1</sup> Lead Renovation, Repair, and Painting Program Docket, U.S. Environmental Protection Agency, accessed January 7, 2015, <http://www.regulations.gov/#!docketBrowser;rpp=25;po=0;dct=PS;D=EPA-HQ-OPPT-2005-0049>
- <sup>2</sup> Lead Renovation, Repair, and Painting Program OMB Review Under Executive Order 12866, U.S. Environmental Protection Agency, <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2005-0049-1438>
- <sup>3</sup> Locate Certified Renovation and Lead Dust Sampling Technician Firms, U.S. Environmental Protection Agency, accessed January 7, 2014, [http://cfpub.epa.gov/flpp/searchrrp\\_firm.htm](http://cfpub.epa.gov/flpp/searchrrp_firm.htm)
- <sup>4</sup> Fiscal Year 2015, Justification of Appropriation Estimates for the Committee on Appropriations, USEPA, 2014, EPA-190-R-14-002, page 480-482, [www.epa.gov/ocfo](http://www.epa.gov/ocfo).
- <sup>5</sup> EPA Takes Action to Protect Public from Harmful Lead Exposure, U.S. Environmental Protection Agency, 2014, <http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceec8525735900400c27/4d5ce2ba2475c83485257db30058c496%21OpenDocument>
- <sup>6</sup> CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in “Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention, Centers for Disease Control and Prevention, 2012, [www.cdc.gov/nceh/lead/acclpp/cdc\\_response\\_lead\\_exposure\\_recs.pdf](http://www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf)

**Cost Impact:** Will not increase the cost of construction.

Renovators are already required to comply with the RRP rule. This proposal will simply require that the construction documentation submitted to the building code official include the certificate demonstrating that the firm is a lead-safe certified renovation firm. Under the rule, the renovation firm is required to possess these certifications at the work site. Therefore, including them in the construction documentation should not affect construction costs.

The economic benefits from this rule are substantial. Authorizing a code official to be able to ask for the certificates should prompt property owners to select the certified renovation firms that can provide the necessary documents. To become certified, the renovators had to complete a training course successfully and demonstrate that they have the knowledge to perform the work safely. The firms and the renovators also committed to complying with the rule.

The renovations performed by certified individuals and firms should be done more safely. Consistent with the rule, they will avoid making excessive lead-contaminated dust, contain the dust they incidentally make, clean up any dust residues, and pass a wipe test they administer. In justifying the rule, the EPA demonstrated that these methods will result in fewer children with high levels of lead in their blood. As a result, children are less likely to suffer harm from lead-contaminated dust.

The rule may actually lower the costs of construction by avoiding the costs of expensive clean-ups when a renovation firm lacking the training and certification creates lead-contaminated dust that remains after the renovations are done. Once dust is spread throughout a home, it is difficult and expensive to clean up.

## IPMC Carbon Monoxide Alarm

**Proponent:** Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org)

*Add new text as follows:*

**403.7 Carbon monoxide alarms.** Carbon monoxide alarms shall be installed in accordance with Section 1103.9 of the International Fire Code in Group R occupancies and in dwellings not regulated as Group R occupancies.

**704.4 Carbon monoxide alarms.** Carbon monoxide alarms shall be installed in accordance with Section 1103.9 of the International Fire Code in Group R occupancies and in dwellings not regulated as Group R occupancies.

*Add new standard(s) as follows:*

International Fire Code Section 1103.9

### **NCHH's Reasoning:**

In 2011, 49 million homes had carbon monoxide alarms.<sup>1</sup> Almost 4.5 million more homes had an alarm in 2011, compared to 2009.<sup>2</sup> These alarms protect residents and their guests from carbon monoxide poisoning which kills more than 300 people annually and hurts thousands more.<sup>3</sup> The carbon monoxide typically results from incomplete combustion of a fuel, usually when a vehicle, furnace, water heater, or fireplace is either functioning poorly or is warming up and has not yet reached optimum performance.<sup>4</sup> The risk is greatest where there are older appliances or where the garage is not properly isolated from the occupied area.

When carbon monoxide exposes residents to dangerous levels of this odorless, tasteless, invisible gas, the alarm warns them to get to safety before their brains are so starved of oxygen that they become sleepy or disoriented and unable to escape.<sup>3</sup> The alarm complements the many educational and code-related efforts to reduce carbon monoxide generation and exposure and serves to prevent death and serious harm much as a smoke alarm does.

According to health and safety experts at the Centers for Disease Control and Prevention (CDC),<sup>3</sup> the Consumer Product Safety Commission (CPSC),<sup>5</sup> and the National Fire Protection Association (NFPA),<sup>6</sup> all dwellings with either an attached garage or a fuel-burning appliance should have a functioning carbon monoxide alarm. Recognizing the gaps in the existing codes, elected officials in the many states have adopted laws requiring the alarms, often in response to a tragedy.<sup>7</sup> The National Electric Manufacturers Association (NEMA)<sup>8</sup> also agrees. A decade ago, a five-year Underwriters Laboratory study confirmed the reliability of the alarms and concluded the alarms are not susceptible to nuisance activations.<sup>9</sup>

The ICC's International Fire Code (IFC) section 1103.9 and International Residential Code (IRC) section R315.3 now require carbon monoxide alarms in almost all dwellings with an attached garage or fuel-burning appliance. The IRC requirement is triggered by new construction or work requiring any permit without regard to whether the work affected a fuel-burning

appliance. The IFC requirement applies to Group I and R occupancies (with a limited exception) and, therefore, not to homes covered by the IRC. Because the IFC alarm requirement is in a maintenance provision in Chapter 11, it applies to existing conditions and operations pursuant to section 102.2 and not only construction. While the maintenance provisions of section 1103 may result in the need for a permit pursuant to section 1103.1 to correct deficiencies, they are not triggered solely by a permit.

This proposal adds two new sections to the IEBC. New section 403.7 would require alarms in homes in accordance with the IFC as part of the prescriptive compliance methods covered by Chapter 4. New section 704.4.4 would do the same as part of work area compliance methods for Level 2 alterations.

In those jurisdictions that have both the IFC and the IEBC, this proposal is designed to improve compliance in those communities. In those jurisdictions with the IEBC but not the IFC, a more protective state law may apply. If no state law applies, this proposal would require an installation of a carbon monoxide alarm when a permit is triggered by the IEBC. Owners of these units will incur costs of about \$42 each, but these costs will be far outweighed by the many millions saved on emergency hospitalizations and victim rehabilitation. See the cost-benefit analysis below for details.

#### **Bibliography:**

- <sup>1</sup> American Housing Survey for the United States: 2011, U.S. Census Bureau, 2013, p. 37, <http://www.census.gov/content/dam/Census/programs-surveys/ahs/data/2011/h150-11.pdf>
- <sup>2</sup> American Housing Survey for the United States: 2009, U.S. Census Bureau, 2011, p. 18, <http://www.census.gov/programs-surveys/ahs/data/2009/h150-09.html>
- <sup>3</sup> Carbon Monoxide Poisoning Frequently Asked Questions webpage, Centers for Disease Control and Prevention, accessed January 8, 2015, <http://www.cdc.gov/co/faqs.htm>
- <sup>4</sup> Carbon Monoxide: Background, American Gas Association, accessed January 8, 2015, <https://www.aga.org/carbon-monoxide>
- <sup>5</sup> CPSC Recommends Carbon Monoxide Alarm for Every Home, Consumer Products Safety Commission, Release#01-069, 2001, <http://www.cpsc.gov/en/Recalls/2001/CPSC-Recommends-Carbon-Monoxide-Alarm-for-EveryHome/>
- <sup>6</sup> Carbon Monoxide Safety Tips, National Fire Protection Association, accessed January 8, 2015 at <http://www.nfpa.org/safety-information/forconsumers/fire-and-safety-equipment/carbon-monoxide/carbon-monoxide-safety-tips>
- <sup>7</sup> CO Detection Requirements webpage, Life Safety Solutions Online, accessed January 8, 2015 at <http://www.lifesafetysolutionsonline.org/co-detection-requirements/>
- <sup>8</sup> Recommend Policies, State and Local Legislation for Carbon Monoxide Life Safety Device Legislation and Local Ordinance Drafting, National Electric Manufacturers Association, 2013, <http://www.lifesafetysolutionsonline.org/wp-content/uploads/2014/03/NEMA-Recommendations-on-State-CO-Legislation-2013.pdf>
- <sup>9</sup> Carbon Monoxide Alarm Field Study, Underwriters Laboratories, 2002, <http://ulstandardsinonet.ul.com/stp/addlinfo/old/CARBON%20MONOXIDE%20ALARM%20FIELD%20STUDY.pdf>
- <sup>10</sup> International Codes-Adoption by Jurisdiction (December 2014), International Code Council, 2014, [www.iccsafe.org/gr/Documents/stateoptions.pdf](http://www.iccsafe.org/gr/Documents/stateoptions.pdf).

- <sup>11</sup> 2007 Performance and Accountability Report, U.S. Consumer Products Safety Commission, 2007, p. 41, <http://www.cpsc.gov/en/Media/Documents/About/Budget-and-Performance/Annual-Performance-Reports/Archive/2007-Performance-and-Accountability-Report/>
- <sup>12</sup> Hospital burden of unintentional carbon monoxide poisoning in the United States, 2007, Am J Emerg Med 2012 Jun; 30(5):657-64. doi: 10.1016/j.ajem.2011.03.003, Iqbal S, Law HZ, Clower JH, Yip FY, Elixhauser A, <http://www.ajemjournal.com/article/S0735-6757%2811%2900105-7/abstract>.
- <sup>13</sup> Carbon Monoxide-Related Hospitalizations in the U.S.: Evaluation of a Web-Based Query System for Public Health Surveillance, Public Health Rep. 2010 May-Jun; 125(3): 423–432, Iqbal S, Clower JH, Boehmer TK, Yip FY, Garbe P, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2848267/>
- <sup>14</sup> Non-Fire Carbon Monoxide Incidents, National Fire Protection Association, 2012, <http://www.nfpa.org/~media/Files/Research/NFPA%20reports/Non%20fire%20Incidents/osnonfirecarbonmonoxide.pdf>

**Cost Impact:** Will increase the cost of construction.

#### COSTS:

Carbon monoxide (CO) alarms listed as complying with ANSI/UL 2034 typically costs approximately \$25 per unit and are relatively simple to install. We estimate the total installed cost to be \$42 per dwelling.

According to the 2011 American Housing Survey (AHS),<sup>1</sup> an estimated 49 of 115 million occupied homes (41.6% of all homes) had working carbon monoxide detectors. About half of these detectors were powered only by batteries. Overall, 46% of owner-occupied homes and 33% of renters had detectors. The rates varied by region of the country with the Northeast at 65%, the Midwest at 54%, the West at 30%, and the South at 27%. The AHS does not track garages that are attached separately from those that are not attached.

The IFC has been adopted statewide in 28 states and locally in 11 more.<sup>10</sup> Unless the state or locality opted not to adopt Section 1103.9 of the IFC or a limited exception applies, a CO alarm is required all dwelling units in Group I or R occupancies containing a fuel-burning appliance or that has an attached garage (other than an open parking garage or ventilated enclosed parking garage). The units must be equipped with a single station CO alarm listed as complying with UL 2034 installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. In these jurisdictions, the proposal will only improve compliance with IFC and not increase construction cost.

In states without a statewide IFC, 17 have adopted the IEBC statewide or locally.<sup>10</sup>

- For the seven with no state or local IFC, Illinois and Massachusetts have state laws requiring CO alarms in all dwellings, West Virginia requires it in most dwellings covered by the IEBC, and Maine requires alarms when the property is sold.<sup>7</sup> Therefore, only Florida, Michigan, and Maryland would be impacted by the proposal. Michigan legislature has already given the Code Commission authority to require CO alarms.<sup>7</sup>
- Of the remaining 10 with local IFCs, Colorado requires CO alarms in all dwellings, Montana requires alarms in rental property, Wisconsin requires them in multifamily

housing, and New Hampshire on substantial rehabilitation.<sup>7</sup> Therefore, Louisiana, Nevada, Delaware, Missouri, Nebraska, North Dakota, and Texas would be impacted by the proposal in Group I and R occupancies.

#### BENEFITS:

The benefits of a CO alarm in fewer deaths, emergency room visits, hospitalizations, treatment, and rehabilitation far outweigh the \$42 per home cost. The U.S. Consumer Product Safety Commission (CPSC) estimated the societal costs of unintentional non-fire CO poisoning deaths associated with consumer products at \$705 million annually from 1999 to 2002.<sup>9</sup>

A 2012 study<sup>10</sup> estimated that the hospitalization cost for confirmed carbon monoxide poisonings was more than \$26 million in 2007, based on 21,304 emergency room visits and 2,302 hospitalizations. This estimate only includes the cost of confirmed hospitalizations and not (1) the rehabilitation and long-term treatment costs, and (2) the thousands of cases where the poisoning occurred but was not confirmed, usually because the person was unaware of the exposure. In 2007, for every confirmed case there were an estimated five probable or suspected cases.<sup>11</sup> More recent numbers are not available though they should have decreased due to the actions by state and local legislatures, as well as implementation of the 2012 editions of the IRC and IFC.

Beyond victim hospitalization and treatment costs, carbon monoxide costs communities whose emergency responders respond to non-fire-related incidents. In 2012, the National Fire Protection Association estimated that municipal fire departments responded to an annual average of 72,000 of these incidents between 2006 and 2010, with 94% of the incidents occurring in residential properties and 73% in one- or two-family homes.<sup>12</sup> The alarms are likely to increase the number of responses, but, based on the UL study, few will be the result of nuisance alarms.<sup>9</sup>

## IEBC Carbon Monoxide Alarms

**Proponent:** Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org)

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- <sup>5</sup> CPSC Recommends Carbon Monoxide Alarm for Every Home, Consumer Products Safety Commission, Release#01-069, 2001, <http://www.cpsc.gov/en/Recalls/2001/CPSC-Recommends-Carbon-Monoxide-Alarm-for-EveryHome/>
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**Cost Impact:** Will increase the cost of construction.

#### COSTS:

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According to the 2011 American Housing Survey (AHS),<sup>1</sup> an estimated 49 of 115 million occupied homes (41.6% of all homes) had working carbon monoxide detectors. About half of these detectors were powered only by batteries. Overall, 46% of owner-occupied homes and 33% of renters had detectors. The rates varied by region of the country with the Northeast at 65%, the Midwest at 54%, the West at 30%, and the South at 27%. The AHS does not track garages that are attached separately from those that are not attached.

The IFC has been adopted statewide in 28 states and locally in 11 more.<sup>10</sup> Unless the state or locality opted not to adopt Section 1103.9 of the IFC or a limited exception applies, a CO alarm is required all dwelling units in Group I or R occupancies containing a fuel-burning appliance or that has an attached garage (other than an open parking garage or ventilated enclosed parking garage). The units must be equipped with a single station CO alarm listed as complying with UL 2034 installed and maintained in accordance with NFPA 720 and the manufacturer's instructions. In these jurisdictions, the proposal will only improve compliance with IFC and not increase construction cost.

In states without a statewide IFC, 17 have adopted the IEBC statewide or locally.<sup>10</sup>

- For the seven with no state or local IFC, Illinois and Massachusetts have state laws requiring CO alarms in all dwellings, West Virginia requires it in most dwellings covered by the IEBC, and Maine requires alarms when the property is sold.<sup>7</sup> Therefore, only Florida, Michigan, and Maryland would be impacted by the proposal. Michigan legislature has already given the Code Commission authority to require CO alarms.<sup>7</sup>
- Of the remaining ten with local IFCs, Colorado requires CO alarms in all dwellings, Montana requires alarms in rental property, Wisconsin requires them in multifamily housing, and New Hampshire on substantial rehabilitation.<sup>7</sup> Therefore, Louisiana, Nevada, Delaware, Missouri, Nebraska, North Dakota, and Texas would be impacted by the proposal in Group I and R occupancies.

## BENEFITS:

The benefits of a CO alarm in fewer deaths, emergency room visits, hospitalizations, treatment, and rehabilitation far outweigh the \$42 per home cost. The U.S. Consumer Product Safety Commission (CPSC) estimated the societal costs of unintentional non-fire CO poisoning deaths associated with consumer products at \$705 million annually from 1999 to 2002.<sup>9</sup>

A 2012 study<sup>10</sup> estimated that the hospitalization cost for confirmed carbon monoxide poisonings was more than \$26 million in 2007, based on 21,304 emergency room visits and 2,302 hospitalizations. This estimate only includes the cost of confirmed hospitalizations and not (1) the rehabilitation and long-term treatment costs, and (2) the thousands of cases where the poisoning occurred but was not confirmed, usually because the person was unaware of the exposure. In 2007, for every confirmed case there were an estimated five probable or suspected cases.<sup>11</sup> More recent numbers are not available though they should have decreased due to the actions by state and local legislatures, as well as implementation of the 2012 editions of the IRC and IFC.

Beyond victim hospitalization and treatment costs, carbon monoxide costs communities whose emergency responders respond to non-fire-related incidents. In 2012, the National Fire Protection Association estimated that municipal fire departments responded to an annual average of 72,000 of these incidents between 2006 and 2010, with 94% of the incidents occurring in residential properties and 73% in one- or two-family homes.<sup>12</sup> The alarms are likely to increase the number of responses, but, based on the UL study, few will be the result of nuisance alarms.<sup>9</sup>

# IPMC Pest Elimination

**Proponent:** Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org)

## SECTION 202 DEFINITIONS

### GENERAL DEFINITIONS

*Revise as follows:*

INFESTATION. The noxious presence, within or contiguous to, a structure or *premises* of insects, ~~rats~~ rodents, vermin or other pests.

*Add new text as follows:*

- INSECT. All species of classes of Arachnida and Insecta (Hexapoda) of the phylum Arthropoda including flies, mosquitoes, bed bugs, crickets, cockroaches, moths, bees, wasps, hornets, fleas, lice, beetles, weevils, gnats, ants, termites, mites, ticks, spiders, and scorpions.
- PEST. Noxious insect, rodent, or other vermin.
- RODENT. A member of the order Rodentia, including but not limited to field and wood mice, wood rats, squirrels, woodchucks, gophers, Norway rats (Rattus norvegicus), roof rats (Rattus rattus), and house mice (Mus musculus).
- SANITARY. A condition that is free of infestation, pest residues, rotting material, uncontained sewage or animal waste, and accumulation of rubbish or garbage.

*Revise as follows:*

**302.5 Rodent harborage.** Structures and *exterior property* shall be kept free from rodent harborage and *infestation*. There shall be no accumulation of trash, paper, boxes, firewood, lumber, scrap metal, food, or other materials that support rodent harborage in or around any dwelling or premises. Stored materials shall be placed in boxes or stacked in stable piles elevated at least six inches (152 mm) above the ground or floor and at least six inches (152 mm) from the walls. There shall be no accumulation of stagnant water in or around any dwelling or premises. Where rodents are found, they shall be promptly eliminated by *approved* processes that will not be injurious to human health. After pest elimination, proper precautions shall be taken to ~~eliminate rodent~~ remove food and water sources or harborage and to prevent reinfestation.

*Add new text as follows:*

**302.5.1 Rodent prevention.** There shall be no trees, shrubs, or other plantings in the soil within six inches (152 mm) of any dwelling.

**302.5.2 Rodent exclusion.** There shall be no holes or open joints in exterior walls, foundations, slabs, floors, or roofs that equal or exceed one-quarter inch (6 mm). The areas surrounding windows, doors, pipes, drains, wires, conduits, vents, and other openings that penetrate exterior walls shall be sealed.

*Revise as follows:*

**309.1 Infestation.** Structures shall be kept free from insect and rodent *infestation*. *Infestations* Structures in which insects or rodents are found shall be promptly ~~exterminated~~ eliminated by *approved* processes that will not be injurious to human health. After pest elimination, proper precautions shall be taken to prevent reinfestation.

**309.2 Owner.** The *owner* of any structure shall be responsible for pest elimination within the structure prior to renting or leasing the structure. The *owner* shall maintain the building and premises to keep pests from entering the building and dwelling units; inspect and monitor for pests; and investigate occupant reports of unsafe or unhealthy conditions; provide written responses to occupant reports; and make needed repairs in a timely manner.

**309.5 Occupant.** The *occupant* of any structure shall be responsible for the continued rodent and pest-free condition of the structure. The *occupant* shall inspect and monitor for pests; report infestations to the owner; and cooperate with the owner's requests to ensure pest-free conditions.

- **Exception:** Where the *infestations* are caused by defects in the structure, the *owner* shall be responsible for pest elimination.

*Add new text as follows:*

## **Appendix B Integrated pest management**

### **B101 General**

**B101.2 Integrated pest management defined.** A systematic strategy for managing pests that consists of prevention, exclusion, monitoring, and suppression of pests. Where chemical pesticides are necessary, a preference is given to materials and methods that maximize safety and reduce environmental health risk. Methods to manage pests include eliminating their harborage places; removing or making inaccessible their food and water sources; routine inspection and monitoring; identification of evidence found; treatment that is scaled to and designed for the infestation; and using pesticides with the lowest toxicity in a manner with the least exposure to residents and the environment.

**B101.1 General.** Integrated pest management (IPM) methods shall be used to maintain every dwelling free of infestation, openings that allow pest entry, conditions that harbor pests or provide them with food or water, and visible pest residue or debris.

**B101.3 Pest management professional.** In multi-family housing, a pest management professional who is certified or trained in integrated pest management shall develop and manage the pest elimination program.

**B101.4 Pesticide use.** Only pesticides that are registered for use with the U.S. Environmental Protection Agency and the state's regulatory agencies may be used. Foggers and organic phosphates shall only be used by firms and individuals licensed by the state to apply these pesticides.

## **NCHH's Reasoning:**

This proposal is designed to address a number of problems regarding the IPMC's existing pest-related provisions and to add an optional appendix regarding integrated pest management for jurisdictions seeking to eliminate pests more effectively and consistently. The primary objective of the proposal is to make the requirements clearer and easier to comply with for owners and operators as well as code officials who are not pest management professionals.

### **1. Proposed changes to terminology and definitions:**

- **Extermination v. elimination:** The 2009 edition of the IPMC replaced the outdated term “extermination” with the outcome-focused term “pest elimination” and dropped descriptions of pest elimination such as “fumigation” and “poison spraying.” However, sections 302.5 on rodent harborage and 309.1 on infestation retained the word “exterminated.” The term is not defined. This proposal corrects that inconsistency by using “eliminated” instead.
- **Infestation and honey bees or crickets:** The term “infestation” is currently defined as “The presence, within or contiguous to, a structure or premises of insects, rats, vermin or other pests.” It has a number of serious problems:
  - It is not a sentence. It essentially says, “The presence a structure or premises of pests.” We propose deleting the commas before and after “within or contiguous” to make it grammatically correct.
  - It would call for the elimination of beneficial insects, such as honey bees and crickets outside, because they are insects under a common meaning of the term. We propose to add the word “noxious” to narrow the scope to those insects which are harmful to living things (the meaning of noxious<sup>1</sup>) and exclude beneficial or innocuous insects. We considered other terms, but, since noxious is already used in section 302.4 regarding weeds and section 403.4 regarding process ventilation, we wanted to avoid creating a new term for code officials to interpret. We put the word before “presence” to make clear that where an insect or animal is present makes a difference. A squirrel inside a home would be a noxious presence but outside it would not be one.
  - By adding the word “noxious,” we think it is appropriate to replace “rats” with “rodents.” Rodents such as squirrels are fine outside a structure, but if inside they are an infestation that needs to be eliminated. In addition, the term “rodents” is used 11 times in the code including in the definition of “pest elimination.”
- **Define basic terms used throughout the code:** The code does not define four pest-related terms (insect, rodent, pest, and sanitary) despite their use many places in the code. Without definitions for these terms, property owners, managers, and occupants may have very different understandings of what the code requires. As a result, their disputes may limit the effectiveness of the code and undermine its intent of protecting health and safety. It also burdens code officials who are called upon to intervene with their own interpretation.
  - “Insect” is used eight times. Sometimes the use means all insects such as for screens and doors, and other times more narrowly in conjunction with the term

“infestation.” The proposal defines it as the classes of Arachnida and Insecta in the phylum Arthropoda and gives common examples. While technically spiders (a member of Arachnida) are not insects, they are commonly considered insects.

- “Rodent” is used 13 times. The proposal defines it as members of the order Rodentia and gives common examples.
  - “Pest” is used 11 times. The proposal defines it as “noxious insect, rodent, or other vermin.” This definition is also important because federal law defines the term more broadly to include weeds, mold, and bacteria. In the structural setting, the common understanding of pests does not include these items. We recognize that the word “noxious” is somewhat redundant but think the clarity helps.
  - “Sanitary” is used 29 times. The proposal defines it as “a condition that is free of infestation, pest residues, rotting material, uncontained sewage or animal waste, and accumulation of rubbish or garbage.” This definition captures our understanding of what the term means based on a review of the 29 uses. Each of these conditions can cause diseases or attract pests that undermine the occupant’s health.
- **Harborage and exclusion:**
    - The term “harborage” is used four times in the code: in the definition of “pest elimination” and in section 302.5 regarding rodent harborage. However, the term is not defined and the section dealing with rodent harborage says the harborage must be eliminated but does not explain what it is or give any examples. Rather than create a definition, the proposal adds a description that gives examples of materials that can be harborage; explains that stored materials need to be 6” from the floor or walls to limit harborage; and says that there should not be an accumulation of stagnant water. Rodents need a ready source of water to survive, especially mice. Many experts call for 18”, but we thought that was excessive.
    - The proposal adds two new sections under the rodent harborage section. Section 302.5.1 calls for plantings to be 6” from a dwelling to make it more difficult for rodents to access the dwelling since they do not want to be visible while seeking an opening to the structure. Section 302.5.2 calls for exterior openings to be less than 1/4” since mice can go through holes or cracks bigger than that amount.

## **2. Proposed clarification of owner and occupant responsibilities:**

The proposal more clearly defines the relative responsibilities of the owner and the occupant in the rental setting. It requires the occupant to inspect and monitor for pests, report infestations to the owner, and cooperate with the owner’s requests to ensure pest-free conditions. The owner would be required to maintain the exterior of the building, inspect and monitor for pests, investigate complaints, and provide feedback to occupants on the resolution of their complaints.

In a single-occupant or single-tenant structure, existing section 309.3 makes the occupant/tenant fully responsible.

By removing these ambiguities in the current code, code officials should be able to resolve disputes more easily and reduce the need to defend interpretations.

### **3. Proposed optional requirements in an appendix for integrated pest management:**

The proposal adds an appendix that jurisdictions may elect to adopt if they want to require integrated pest management (IPM). This pest elimination has been shown to be more consistently effective, especially when someone with asthma may be in the structure. It uses a systematic strategy to prevent, exclude, monitor, and suppress pests. It also promotes the use of the least toxic pesticide in a manner with the least exposure to residents and the environment.

Proposed new section B101.2 would require that a pest management professional trained in IPM conduct the pest elimination in multi-family housing. In these situations, pest elimination is particularly difficult because of the shared control. The National Pest Management Association, which represents most of the country's firms, certifies firms who adopt and implement IPM under its GreenPro certification program.<sup>2</sup>

Proposed new section B101.4 would remind owners and operators that only pesticides approved by the state and federal government may be used. In addition, it would require a state-licensed firm to apply foggers and organophosphates because these pesticide applications are liable to be misused by an individual and result in dangerous exposures.

#### **Bibliography:**

<sup>1</sup> Noxious, Merriam-Webster Dictionary, Encyclopedia Britannica Company, accessed January 7, 2015 at <http://www.merriam-webster.com/dictionary/noxious>

<sup>2</sup> GreenPro, National Pest Management Association, accessed January 7, 2015 at <http://www.certifiedgreenpro.org/>

**Cost Impact:** Will not increase the cost of construction

The proposal will not increase the cost of construction. The requirement in the optional appendix to use an IPM-trained pest management professional to control pests may increase the labor rates charged by the firm, but these costs should be offset by the savings from more effective pest control.

## IPMC Health Standards Appendix

**Proponent:** Jonathan Wilson, National Center for Healthy Housing, representing National Center for Healthy Housing (jwilson@nchh.org)

*Add new text as follows:*

### **Appendix B Health Standards**

#### **B101 General.**

**B101.1 Scope.** The provisions of this chapter shall govern the minimum conditions and standards for the health of persons at residential premises.

**B101.2 Approved agency.** An approved agency is a government agency responsible for the health of a resident in a dwelling. In most jurisdictions, the approved agency is a health department.

**B101.3 Findings.** When a code official has evidence that a hazardous condition as described in section 102 is likely to exist, the code official is authorized to require the owner or occupant responsible for maintenance to remove the hazardous condition. The code official may rely on a report from an approved agency as evidence that the hazardous condition is likely to exist or that the condition has been removed and has been returned to compliance.

**B101.4 Testing or inspection.** The code official is authorized to require the property owner to conduct appropriate testing or inspection methods as evidence of compliance with this appendix. The code official may accept results from an approved agency or from an individual licensed in accordance with federal, state, or jurisdiction laws to conduct the testing or inspection. The testing or inspection results shall be deemed sufficient to establish whether a premises is in compliance with the requirements of this appendix. The property owner shall be responsible for the cost of testing or inspection.

#### **B102 Hazardous conditions.**

**B102.1 Lead-based paint hazards.** Lead levels in dust or soil at or above federal regulatory limits pursuant to 40 CFR Section 745.65 is a hazardous condition, unless the jurisdiction has adopted more protective standards; in such a case, those more protective standards will apply.

**B102.2 Friable asbestos-containing material hazards.** Significantly damaged friable asbestos-containing material as defined by 40 CFR Part 763 is a hazardous condition unless the jurisdiction has adopted a more protective standard. Friable means that the material, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

**B102.3 Radon.** Radon present at levels at or above the level that the jurisdiction has designated as requiring reduction is a hazardous condition. If no designation has been made, then hazardous condition is four picocuries per liter of air (pCi/L) in the lowest habitable level of the dwelling.

*Add new standard(s) as follows:*

- U.S. Environmental Protection Agency, 40 CFR 745.65 Lead-Based Paint Poisoning Prevention in Certain Residential Structures, 2012.
- U.S. Environmental Protection Agency, 40 CFR 763 Asbestos-Containing Material in Schools, 1987

**NCHH’s Reasoning:** Three health hazards, lead, asbestos and radon, pose significant risk to many dwellings but go unmentioned in the IPMC. As a result, residents are not adequately protected for three reasons:

1. Residents are unlikely to know they are at significant risk because the hazards are not visible or are masked in dust and debris. While many retail hardware stores carry low-cost test kits to allow residents to measure the hazard, unless they know of the danger, residents may not use them until the harm has been done.
2. They are only likely to be found in a structure that is poorly maintained, repaired, or renovated. However, once created, they are unlikely to be addressed through standard maintenance and housekeeping.
3. Many government agencies, such as health departments are capable of assessing the hazard but often lack the authority provided by a property maintenance code to efficiently address the risk.

This proposal gives the jurisdiction the language it needs to address these all-too-common hazards. The jurisdiction would elect to adopt a new optional Appendix B to the IPMC that defines these hazardous conditions and gives the code official the authority to act. As with all appendices, if the jurisdiction does not affirmatively adopt the appendix, it will have no effect.

The requirements are designed to be triggered by section 101.3 when a government agency (defined as an approved agency) responsible for the health of a resident in a dwelling provides the code official with a report showing that one of the three hazardous conditions is likely to exist. Based on the report, the code official would require the owner or occupant to eliminate the hazardous condition and conduct the necessary testing and inspection to confirm the property has returned to compliance. The testing and inspection may be conducted by the government agency making the initial finding or by an individual licensee in accordance with federal, state, or local laws to perform the work.

The code official would be entitled to rely on the analysis performed by the approved agency-- most likely the state or local health department. The code official would not be expected to have any specialized knowledge of the hazard or the hazardous condition and would only be authorized and not mandated to act.

Section 102.1 describes lead-based paint hazards and refers to 40 CFR 745.65 unless the jurisdiction has adopted a more protective standard. These levels in the regulation define the amount of lead in dust or soil that is likely to poison a child in the dwelling. The dangers associated with lead poisoning are well known: serious health effects, detrimental effects on cognitive and behavioral development, with serious personal and social consequences that may persist throughout their lifetime.<sup>1</sup> Lead affects a child’s intelligence even at very low levels of exposure.

While there is no safe level of lead exposure for children, the U.S. Environmental Protection Agency (EPA) regulation provides levels that can be measured and reasonably achieved. The agency adopted this regulation in 2001 after extensive public notice and comment including conducting a cost-benefit analysis. The levels in that regulation are:

- Lead-based paint on an existing painted surface—0.5 percent by weight or 1.0 milligrams per square centimeter;
- Dust on floors—40 micrograms of lead per square foot of settled dust ( $\mu\text{g}/\text{ft}^2$ );
- Dust on interior window sills—250  $\mu\text{g}/\text{ft}^2$ ;
- Dust on window troughs (wells)—400  $\mu\text{g}/\text{ft}^2$ ;
- Bare soil in children's play areas—400 parts per million (ppm) of lead; and
- Bare soil in areas of the yard that are not children's play areas—1,200 ppm.

Many states have adopted these levels into their regulations to guide health departments and environmental agencies responsible for protecting children from lead-based paint hazards.

In most situations, lead-based paint hazards are the result of paint in a pre-1978 dwelling being deteriorated or being disturbed in a manner that generates dust contaminated with lead. Repairing the paint may limit making the hazardous condition worse, but it does not clean up the problem. Only through testing and inspection can one determine if the hazardous condition has been removed.

Section 102.2 describes asbestos hazards and references EPA's regulations at 40 CFR Part 763 unless the jurisdiction has adopted more protective standards. Those regulations protect people, especially children, from lung cancer, asbestosis, and mesothelioma. These regulations were adopted in 1987 after extensive public notice and comment and apply to asbestos-containing materials in schools. Many states have adopted regulations similar to these.

Asbestos-containing material is any material or product that contains more than one percent asbestos. It would only present a hazardous condition under this proposal if it was friable and was significantly damaged. Friable means that the material, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure. A material is damaged if it has deteriorated or sustained physical injury such that the internal structure of the material is inadequate or, if applicable, which has delaminated such that its bond to the substrate (adhesion) is inadequate or which for any other reason lacks fiber cohesion or adhesion qualities. The damage is significant if it is extensive and severe.

If the asbestos is not significantly damaged, the hazardous condition would not exist. However, once significantly damaged, the asbestos is likely to have been released. Only through testing and inspection can one determine if the asbestos has been appropriately cleaned.

Section 102.3 describes radon, a naturally occurring, odorless, tasteless, invisible gas over four picocuries per liter of air as a hazardous condition unless the jurisdiction has adopted a more protective level. At this level, radon poses a significant risk of lung cancer, second only to secondhand smoke, when it seeps into the home through cracks in the foundation from the soil.

EPA adopted this level in the 1980s, and three ANSI consensus standards by the American Association of Radon Scientists and Technologists (AARST) have adopted it. These consensus standards address how the levels should be measured, how the levels should be mitigated, and what testing and inspection is needed to confirm the hazardous condition has been eliminated.

**Bibliography:**

<sup>1</sup> CDC Response to Advisory Committee on Childhood Lead Poisoning Prevention Recommendations in “Low Level Lead Exposure Harms Children: A Renewed Call of Primary Prevention, Centers for Disease Control and Prevention,” 2012, [www.cdc.gov/nceh/lead/acclpp/cdc\\_response\\_lead\\_exposure\\_recs.pdf](http://www.cdc.gov/nceh/lead/acclpp/cdc_response_lead_exposure_recs.pdf)

**Cost Impact:** Will not increase the cost of construction.

The hazardous conditions described in the new optional Appendix B should not be present in a properly constructed and maintained home.