

**Code Technology Committee
2006/2007 Cycle
Area of study – Carbon monoxide alarms
Public comments**

The following are code changes for which the CTC has established a position and testified at the 2006 Code Development Hearings. These code changes have received a public comment and will be considered at the 2007 Final Action Hearings. These are assembled for the CTC for determining their position, if any, at the 2007 Final Action Hearings.

M41: Part I (IMC) - Page 1; Part II (IRC) – Page 5; Part III – Page 8

RB109: Page 12

RB110: Page 15

**M41-06/07, Part I
313 (New), Chapter 15**

Proposed Change as Submitted:

Proponent: Mark Riley, City of Troy, MI Building Department, representing himself

PART I – IMC

1. Add new text as follows:

**SECTION 313
CARBON MONOXIDE ALARMS**

313.1 Where required-new construction dwellings. In new construction, dwelling units within which fuel-fired appliances are installed shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).

313.2 Where required-existing dwellings. In existing dwellings, where interior alterations, repairs, fuel-fired appliance replacements or additions requiring a permit occur, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section 313.1.

313.3 Alarm requirements. The required carbon monoxide alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

313.4 Power source and interconnection. The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.

Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.

Exceptions:

1. Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section 313.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.
2. Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.

2. Add standard to Chapter 15 as follows:

UL

UL 2034 Standard for Single and Multiple Station Carbon Monoxide Alarms. Edition 2 including revisions through March 8, 2005

Reason: Over 200 a deaths a year in the United States have been contributed to CO Poisoning, and over 10,000 cases where people were admitted to the hospital emergency rooms. Every major safety agency strongly recommends the use of CO detectors. GAMA recommends the use of CO detectors on their website.

C.S.P.C., U.L. and manufacturer's have spent many hours revising U.L. Standard 2034 to provide a more reliable device. The location requirement is based on research of manufacturer's installation instructions and recommendations from NFPA 720, *Recommended Practice for the Installation of Household Carbon Monoxide (CO) Warning Equipment*

The U.S. Consumer Product Safety Commission (CPSC) recommends that consumers purchase and install carbon monoxide detectors with labels showing they meet the requirements of the new Underwriters Laboratories, Inc. (UL) voluntary standard (UL 2034). The UL standard, published in April 1992, requires detectors to sound an alarm when exposure to carbon monoxide reaches potentially hazardous levels over a period of time. Detectors that meet the requirements of UL 2034 provide a greater safety margin than previously-manufactured detectors.

Properly working carbon monoxide detectors can provide an early warning to consumers before the deadly gas builds up to a dangerous level. Exposure to a low concentration over several hours can be as dangerous as exposure to high carbon monoxide levels for a few minutes - the new detectors will detect both conditions. Most of the devices cost under \$100. Each home should have at least one carbon monoxide detector in the area outside individual bedrooms. CPSC believes that carbon monoxide detectors are as important to home safety as smoke detectors are.

Bibliography: CPSC document #5010

Cost Impact: There is a slight impact of less than 100 dollars per dwelling.

Committee Action:

Disapproved

Committee Reason: The ICC CTC committee currently does not recommend mandatory installation of CO alarms. The Consumer Product Safety Commission has not endorsed CO alarms as being reliable. There are liability issues within the industry that need to be resolved before they are made mandatory. NFPA 720 is the more appropriate standard for installation of CO alarms. The building owner or occupant can install them voluntarily. The current technology will not support the interconnection of multiple CO alarms as required by this change.

Assembly Action:

Approved as Modified

Modify the proposal as follows:

~~**313.4 Power source and interconnection.** The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.~~

~~Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.~~

Exceptions:

1. ~~Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section 313.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.~~
2. ~~Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.~~

(Portions of proposal not shown remain unchanged)

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and Public Comments were submitted.

Public Comment 1:

David C. Delaquila, GAMA-An Association of Appliance and Equipment Manufacturers, requests Disapproval for Part I.

Commenter's Reason: GAMA believes this proposal should be disapproved on the basis that it unfairly identifies fuel-burning appliances as the only source of carbon monoxide. Carbon monoxide alarms should be installed in all residential occupancies, regardless of the type of fuel the appliances use. The recent rash of CO incidents in Washington State (predominantly electric heat pumps) and Texas during power outages as a result of inclement weather reinforces the need for these devices to be installed in all residential buildings. A large majority of the recent CO incidents was attributed to the misuse of power generators. Had these homes had a working CO alarm with battery power backup many of these incidents might have been avoided. Carbon monoxide comes from a variety of sources unrelated to fuel-burning appliances and this proposal does not go nearly far enough to provide safety to all occupancies. Code requirements that address life safety should not fall short of its goal. It should never be the intent of any life safety requirement to protect only a segment of the residential population when a large segment of the population is left unprotected.

Public Comment 2:

Paul K. Heilstedt, PE, Chair, Code Technology Committee (CTC), requests Disapproval for Part I.

Commenter's Reason: The CTC agrees with the action taken by the three code change committees. They correctly note that there are reliability concerns and there is still the question of how long such devices will last before they need replacement. As to the text approved by the assembly, this text will literally require all existing dwelling units to be provided with a carbon monoxide alarm when a permit is pulled for the conditions noted, even if the dwelling unit does not have a fuel fired appliance.

The CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions. This is consistent with the position of the Environmental Protection Agency in their report entitled "Protect your family and yourself from carbon monoxide poisoning", EPA-402-F-96-005, October 1996. The report can be downloaded at: <http://www.epa.gov/iaq/pubs/coftsht.html>

The EPA notes the following:

"So what's a consumer to do?"

First, don't let buying a CO detector lull you into a false sense of security. Preventing CO from becoming a problem in your home is better than relying on an alarm. Follow the checklist of DO's and DON'TS above." [The checklist focuses on appliance use, maintenance and care as well as directives to not idle your car in the garage or use gas powered engines in enclosed spaces].

As far as CO detectors, the EPA report states the following:

"A few words about CO detectors

"Carbon Monoxide Detectors are widely available in stores and you may want to consider buying one as a back-up --BUT NOT AS A REPLACEMENT for proper use and maintenance of your fuel-burning appliances. However, it is important for you to know that the technology of CO detectors is still developing, that there are several types on the market, and that they are not generally considered to be as reliable as the smoke alarms found in homes today. Some CO detectors have been laboratory-tested, and their performance varied. Some performed well, others failed to alarm even at very high CO levels, and still others alarmed even at very low levels that don't pose any immediate health risk. And unlike a smoke alarm, where you can easily confirm the cause of the alarm, CO is invisible and odorless, so it's harder to tell if an alarm is false or a real emergency."

The code change is well intentioned, and there is indeed a health concern due to carbon monoxide poisoning, but a code mandate for carbon monoxide detectors is not the solution.

Public Comment 3:

Ted A. Williams, American Gas Association, requests Disapproval for Part I.

Commenter's Reason: ICC should disapprove this proposal. The ICC Code Technology Committee has published on the ICC website its recommendation from its Area of Study - Carbon Monoxide Alarms. Its recommendation is as follows:

"Recommendation: The CTC recommendation is:

There has not been sufficient justification presented to the CTC to mandate carbon monoxide alarms in new and existing residential type occupancies.

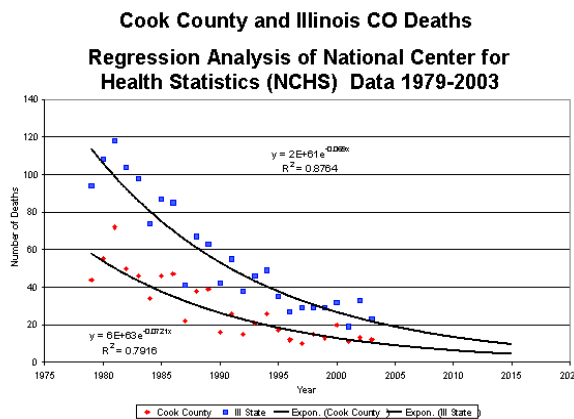
In making this recommendation, the CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions.¹

This recommendation follows many hours of testimony and presentation of documentation (recorded on the ICC website) on CO alarm issues from a wide variety of stakeholders at CTC meetings in Schiller Park, IL and Detroit, MI. ICC committees should address this recommendation in its deliberations and explain alternative actions to the CTC recommendation.

In addition, the following issues of the ICC proposals support disapproval:

- The U. S. Consumer Product Safety Commission (CPSC), in response to separate letter from the NEMA and Gas Appliance Manufacturers Association (GAMA) requesting CPSC support of CO alarm mandates, has stated that it would not support CO alarm mandates until issues of long term reliability of CO alarms were addressed.
- Issues of alarm reliability have not been addressed in published information on alarm performance. As a result, information to date demonstrates poor performance in the field (including data from first responders documented in the National Fire Investigation Response Data System – NFIRS) and in controlled laboratory tests for mitigating false positive and FALSE NEGATIVE activation. The information provided to the CTC and in the public record documents this information in detail.²
- The CO alarm proposal is in conflict with NFPA 720, the ANSI-recognized consensus standard for installation and location of CO alarms. In the case of M41, specifically, occupancies with attached garages are excluded, whereas under NFPA 720, these occupancies are included. Other conflicts with NFPA 720 exist as well.
- M41, through its conflicts with NFPA 720 and focus on new and renovated housing, would not have a demonstrable impact on CO fatalities nationally. Even with 100% COMPLIANCE, PERFECT ALARM RELIABILITY, and PERFECT CONSUMER RESPONSE, these proposals might address only about 20% of CO fatalities since current national residential poisoning incidents involve automobiles in attached garages and older housing without renovation or appliance replacement.
- This proposal does not address THE ONLY GROWING CAUSE OF CO FATALITIES -- PORTABLE EQUIPMENT, INCLUDING GENERATORS.
- CO alarms are not currently a stable product since UL through its Standards Technical Panel 2034 is addressing fundamental issues of alarm life and even activation points. At its upcoming meeting in October, UL will consider proposals to the UL 2034 standard to address deficiencies documented by CPSC and others. The changes proposed would fundamentally alter the design and performance of CO alarms.
- Experience from the City of Chicago, the first major metropolitan jurisdiction in the U. S. to promulgate mandatory CO alarm installation requirements, illustrates in the plot of CO fatalities below THE INEFFECTIVENESS OF MANDATES:
 - Though promulgated in 1994, Chicago and its collar communities in Cook County (many of which have similar mandates) continue to have CO fatalities. Continuing frequency of CO fatalities around ten per year appears to be stable over time and may be expected to continue in the future.
 - The annual number of deaths in this community is consistent with historical trends of declining CO fatalities over time, but no impact or change in this rate of decline can be attributed to the Chicago mandate.
 - For the mandate to have been effective, either CO fatalities would have had to decrease to zero or near zero, or at a minimum, the rate of CO fatalities would have had to show a discontinuous change that could be associated with the promulgation of the mandate.

Reasons for the ineffectiveness of the Chicago mandate are the subject of speculation and may be attributed to lack of compliance, lack of enforcement, lack of appropriate response, failure of alarms to perform as designed, or these and other factors in combination and discussed in AGA's presentation to the CTC.² Nevertheless, the societal cost of the mandate has been significant with no discernable societal benefit.



¹ "Report of the CTC, Area of Study – Carbon Monoxide Alarms," International Code Council Code Technology Committee, September 22, 2005, Detroit Marriott Renaissance Center, Detroit, Michigan [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].

² Williams, Ted A. "CO Alarm Mandates in Model Codes as Public Policy," presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].

Final Action: AS AM AMPC _____ D

M41-06/07, Part II

IRC M1309 (New), Chapter 43

Proposed Change as Submitted:

Proponent: Mark Riley, City of Troy, MI Building Department, representing himself

PART II – IRC

1. Add new text as follows:

SECTION M1309 CARBON MONOXIDE ALARMS

M1309.1 Where-required new construction dwellings. In new construction, dwelling units within which fuel-fired appliances are installed shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).

M1309.2 Where required existing dwellings. In existing dwellings where interior alterations, repairs, fuel-fired appliance replacements or additions requiring a permit occur, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section M1309.1.

M1309.3 Alarm requirements. The required carbon monoxide alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

M1309.4 Power source and interconnection. The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.

Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.

Exceptions:

1. Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section M1309.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.
2. Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.

2. Add standard to Chapter 43 as follows:

UL

UL 2034 Standard for Single and Multiple Station Carbon Monoxide Alarms. Edition 2 including revisions through March 8, 2005

Reason: Over 200 a deaths a year in the United States have been contributed to CO Poisoning, and over 10,000 cases where people were admitted to the hospital emergency rooms. Every major safety agency strongly recommends the use of CO detectors. GAMA recommends the use of CO detectors on their website.

C.S.P.C., U.L. and manufacturer's have spent many hours revising U.L. Standard 2034 to provide a more reliable device. The location requirement is based on research of manufacturer's installation instructions and recommendations from NFPA 720, *Recommended Practice for the Installation of Household Carbon Monoxide (CO) Warning Equipment*

The U.S. Consumer Product Safety Commission (CPSC) recommends that consumers purchase and install carbon monoxide detectors with labels showing they meet the requirements of the new Underwriters Laboratories, Inc. (UL) voluntary standard (UL 2034). The UL standard, published in April 1992, requires detectors to sound an alarm when exposure to carbon monoxide reaches potentially hazardous levels over a period of time. Detectors that meet the requirements of UL 2034 provide a greater safety margin than previously-

manufactured detectors.

Properly working carbon monoxide detectors can provide an early warning to consumers before the deadly gas builds up to a dangerous level. Exposure to a low concentration over several hours can be as dangerous as exposure to high carbon monoxide levels for a few minutes - the new detectors will detect both conditions. Most of the devices cost under \$100. Each home should have at least one carbon monoxide detector in the area outside individual bedrooms. CPSC believes that carbon monoxide detectors are as important to home safety as smoke detectors are.

Bibliography: CPSC document #5010

Cost Impact: There is a slight impact of less than 100 dollars per dwelling.

Committee Action:

Disapproved

Committee Reason: There are reliability issues with the technology resulting in unnecessary fire department calls. There is no federal mandate for CO detectors and the ICC CTC committee does not recommend making them mandatory. The committee believed this issue belongs in Chapter 3 of the IRC rather than in the mechanical section. There were questions about the proper location of the detectors that need to be resolved.

Assembly Action:

Approved as Modified

Modify proposal as follows:

~~**M1309.4 Power source and interconnection.** The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.~~

~~Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.~~

Exceptions:

- ~~1. Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section M1309.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.~~
- ~~2. Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.~~

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and Public Comments were submitted.

Public Comment 1:

David C. Delaquila, GAMA-An Association of Appliance and Equipment Manufacturers, Disapproval for Part II.

Commenter's Reason: GAMA believes this proposal should be disapproved on the basis that it unfairly identifies fuel-burning appliances as the only source of carbon monoxide. Carbon monoxide alarms should be installed in all residential occupancies, regardless of the type of fuel the appliances use. The recent rash of CO incidents in Washington State (predominantly electric heat pumps) and Texas during power outages as a result of inclement weather reinforces the need for these devices to be installed in all residential buildings. A large majority of the recent CO incidents was attributed to the misuse of power generators. Had these homes had a working CO alarm with battery power backup many of these incidents might have been avoided. Carbon monoxide comes from a variety of sources unrelated to fuel-burning appliances and this proposal does not go nearly far enough to provide safety to all occupancies. Code requirements that address life safety should not fall short of its goal. It should never be the intent of any life safety requirement to protect only a segment of the residential population when a large segment of the population is left unprotected.

Public Comment 2:

Paul K. Heilstedt, Chair, Code Technology Committee (CTC), requests Disapproval for Part II.

Commenter's Reason: The CTC agrees with the action taken by the three code change committees. They correctly note that there are reliability concerns and there is still the question of how long such devices will last before they need replacement. As to the text approved by

the assembly, this text will literally require all existing dwelling units to be provided with a carbon monoxide alarm when a permit is pulled for the conditions noted, even if the dwelling unit does not have a fuel fired appliance. The CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions. This is consistent with the position of the Environmental Protection Agency in their report entitled "Protect your family and yourself from carbon monoxide poisoning", EPA-402-F-96-005, October 1996. The report can be downloaded at: <http://www.epa.gov/iaq/pubs/coftst.html>

The EPA notes the following:

"So what's a consumer to do?"

First, don't let buying a CO detector lull you into a false sense of security. Preventing CO from becoming a problem in your home is better than relying on an alarm. Follow the checklist of DO's and DON'TS above." [The checklist focuses on appliance use, maintenance and care as well as directives to not idle your car in the garage or use gas powered engines in enclosed spaces].

As far as CO detectors, the EPA report states the following:

"A few words about CO detectors

"Carbon Monoxide Detectors are widely available in stores and you may want to consider buying one as a back-up --BUT NOT AS A REPLACEMENT for proper use and maintenance of your fuel-burning appliances. However, it is important for you to know that the technology of CO detectors is still developing, that there are several types on the market, and that they are not generally considered to be as reliable as the smoke alarms found in homes today. Some CO detectors have been laboratory-tested, and their performance varied. Some performed well, others failed to alarm even at very high CO levels, and still others alarmed even at very low levels that don't pose any immediate health risk. And unlike a smoke alarm, where you can easily confirm the cause of the alarm, CO is invisible and odorless, so it's harder to tell if an alarm is false or a real emergency."

The code change is well intentioned, and there is indeed a health concern due to carbon monoxide poisoning, but a code mandate for carbon monoxide detectors is not the solution.

Public Comment 3:

Ted A. Williams, American Gas Association, requests Disapproval for Part II.

Commenter's Reason: ICC should disapprove this proposal. The ICC Code Technology Committee has published on the ICC website its recommendation from its Area of Study - Carbon Monoxide Alarms. Its recommendation is as follows:

"Recommendation: The CTC recommendation is:

There has not been sufficient justification presented to the CTC to mandate carbon monoxide alarms in new and existing residential type occupancies.

In making this recommendation, the CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions.¹

This recommendation follows many hours of testimony and presentation of documentation (recorded on the ICC website) on CO alarm issues from a wide variety of stakeholders at CTC meetings in Schiller Park, IL and Detroit, MI. ICC committees should address this recommendation in its deliberations and explain alternative actions to the CTC recommendation.

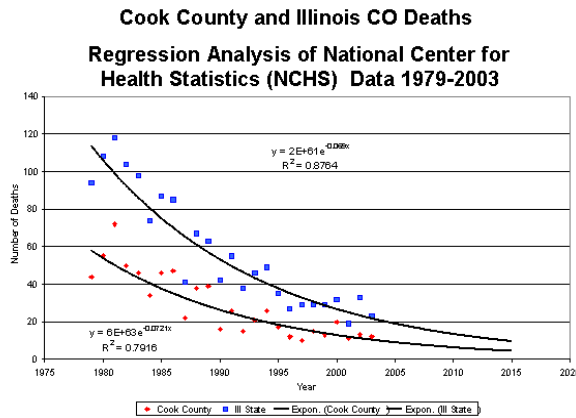
In addition, the following issues of the ICC proposals support disapproval:

- The U. S. Consumer Product Safety Commission (CPSC), in response to separate letter from the NEMA and Gas Appliance Manufacturers Association (GAMA) requesting CPSC support of CO alarm mandates, has stated that it would not support CO alarm mandates until issues of long term reliability of CO alarms were addressed.
- Issues of alarm reliability have not been addressed in published information on alarm performance. As a result, information to date demonstrates poor performance in the field (including data from first responders documented in the National Fire Investigation Response Data System – NFIRS) and in controlled laboratory tests for mitigating false positive and FALSE NEGATIVE activation. The information provided to the CTC and in the public record documents this information in detail.²
- The CO alarm proposal is in conflict with NFPA 720, the ANSI-recognized consensus standard for installation and location of CO alarms. In the case of M41, specifically, occupancies with attached garages are excluded, whereas under NFPA 720, these occupancies are included. Other conflicts with NFPA 720 exist as well.
- M41, through its conflicts with NFPA 720 and focus on new and renovated housing, would not have a demonstrable impact on CO fatalities nationally. Even with 100% COMPLIANCE, PERFECT ALARM RELIABILITY, and PERFECT CONSUMER RESPONSE, these proposals might address only about 20% of CO fatalities since current national residential poisoning incidents involve automobiles in attached garages and older housing without renovation or appliance replacement.
- This proposal does not address THE ONLY GROWING CAUSE OF CO FATALITIES -- PORTABLE EQUIPMENT, INCLUDING GENERATORS.
- CO alarms are not currently a stable product since UL through its Standards Technical Panel 2034 is addressing fundamental issues of alarm life and even activation points. At its upcoming meeting in October, UL will consider proposals to the UL 2034

standard to address deficiencies documented by CPSC and others. The changes proposed would fundamentally alter the design and performance of CO alarms.

- Experience from the City of Chicago, the first major metropolitan jurisdiction in the U. S. to promulgate mandatory CO alarm installation requirements, illustrates in the plot of CO fatalities below THE INEFFECTIVENESS OF MANDATES:
 - Though promulgated in 1994, Chicago and its collar communities in Cook County (many of which have similar mandates) continue to have CO fatalities. Continuing frequency of CO fatalities around ten per year appears to be stable over time and may be expected to continue in the future.
 - The annual number of deaths in this community is consistent with historical trends of declining CO fatalities over time, but no impact or change in this rate of decline can be attributed to the Chicago mandate.
 - For the mandate to have been effective, either CO fatalities would have had to decrease to zero or near zero, or at a minimum, the rate of CO fatalities would have had to show a discontinuous change that could be associated with the promulgation of the mandate.

Reasons for the ineffectiveness of the Chicago mandate are the subject of speculation and may be attributed to lack of compliance, lack of enforcement, lack of appropriate response, failure of alarms to perform as designed, or these and other factors in combination and discussed in AGA's presentation to the CTC.² Nevertheless, the societal cost of the mandate has been significant with no discernable societal benefit.



¹ "Report of the CTC, Area of Study – Carbon Monoxide Alarms," International Code Council Code Technology Committee, September 22, 2005, Detroit Marriott Renaissance Center, Detroit, Michigan [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].

² Williams, Ted A. "CO Alarm Mandates in Model Codes as Public Policy," presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].

Final Action: AS AM AMPC _____ D

M41-06/07, Part III IFGC 311 (New), Chapter 8

Proposed Change as Submitted:

Proponent: Mark Riley, City of Troy, MI Building Department, representing himself

PART III – IFGC

1. Add new text as follows:

SECTION 311
CARBON MONOXIDE ALARMS

311.1 Where required-new construction dwellings. In new construction, dwelling units within which fuel-fired appliances are installed shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).

311.2 Where required-existing dwellings. In existing dwellings where interior alterations, repairs, fuel-fired appliance replacements or additions requiring a permit occur, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section 311.1.

311.3 Alarm requirements. The required carbon monoxide alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

311.4 Power source and interconnection. The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.

Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.

Exceptions:

1. Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section 311.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.
2. Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.

2. Add standard to Chapter 8 as follows:

UL

UL 2034 Standard for Single and Multiple Station Carbon Monoxide Alarms. Edition 2 including revisions through March 8, 2005

Reason: Over 200 a deaths a year in the United States have been contributed to CO Poisoning, and over 10,000 cases where people were admitted to the hospital emergency rooms. Every major safety agency strongly recommends the use of CO detectors. GAMA recommends the use of CO detectors on their website.

C.S.P.C., U.L. and manufacturer's have spent many hours revising U.L. Standard 2034 to provide a more reliable device.

The location requirement is based on research of manufacturer's installation instructions and recommendations from NFPA 720,

Recommended Practice for the Installation of Household Carbon Monoxide (CO) Warning Equipment

The U.S. Consumer Product Safety Commission (CPSC) recommends that consumers purchase and install carbon monoxide detectors with labels showing they meet the requirements of the new Underwriters Laboratories, Inc. (UL) voluntary standard (UL 2034). The UL standard, published in April 1992, requires detectors to sound an alarm when exposure to carbon monoxide reaches potentially hazardous levels over a period of time. Detectors that meet the requirements of UL 2034 provide a greater safety margin than previously-manufactured detectors.

Properly working carbon monoxide detectors can provide an early warning to consumers before the deadly gas builds up to a dangerous level. Exposure to a low concentration over several hours can be as dangerous as exposure to high carbon monoxide levels for a few minutes - the new detectors will detect both conditions. Most of the devices cost under \$100. Each home should have at least one carbon monoxide detector in the area outside individual bedrooms. CPSC believes that carbon monoxide detectors are as important to home safety as smoke detectors are.

Bibliography: CPSC document #5010

Cost Impact: There is a slight impact of less than 100 dollars per dwelling.

Committee Action:

Disapproved

Committee Reason: CO alarms are not within the scope of the IFGC. The ICC CTC committee has not recommended that CO alarms be made mandatory as required by this proposal. It is not clear why the bedroom location was chosen. The alarm may not be audible when the bedroom doors are closed. The Consumer Product Safety Commission has not endorsed CO alarms as being reliable. The dwelling occupants can install CO alarms if they desire them.

Assembly Action:

Approved as Modified

Modify proposal as follows:

~~311.4 Power source and interconnection. The required carbon monoxide alarms shall be powered by the building wiring where such wiring is supplied by a commercial power source and when such source is interrupted, the alarms shall be battery powered. The power supply wiring shall be permanent and without a disconnecting switch other than the branch circuit overcurrent device.~~

~~Where more than one carbon monoxide alarm is required within a dwelling unit, the alarms shall be interconnected in a manner such that the activation of one alarm will cause actuation of all of the alarms within the dwelling.~~

Exceptions:

- ~~1. Alarms installed in existing dwelling units shall not be required to be interconnected and powered by a commercial power source where the work described in Section 311.2 does not result in the removal of interior wall or ceiling finishes thereby exposing the structure and there is no attic, crawl space or basement which could provide access for wiring without the removal of interior finishes.~~
- ~~2. Alarms shall not be required to be interconnected and shall be permitted to be powered only by batteries where installed in buildings without commercial power.~~

Individual Consideration Agenda

This item is on the agenda for individual consideration because an assembly action was successful and Public Comments were submitted.

Public Comment 1:

David C. Delaquila, GAMA-An Association of Appliance and Equipment Manufacturers, requests Disapproval for Part III.

Committer's Reason: GAMA believes this proposal should be disapproved on the basis that it unfairly identifies fuel-burning appliances as the only source of carbon monoxide. Carbon monoxide alarms should be installed in all residential occupancies, regardless of the type of fuel the appliances use. The recent rash of CO incidents in Washington State (predominantly electric heat pumps) and Texas during power outages as a result of inclement weather reinforces the need for these devices to be installed in all residential buildings. A large majority of the recent CO incidents was attributed to the misuse of power generators. Had these homes had a working CO alarm with battery power backup many of these incidents might have been avoided. Carbon monoxide comes from a variety of sources unrelated to fuel-burning appliances and this proposal does not go nearly far enough to provide safety to all occupancies. Code requirements that address life safety should not fall short of its goal. It should never be the intent of any life safety requirement to protect only a segment of the residential population when a large segment of the population is left unprotected.

Public Comment 2:

Paul K. Heilstedt, Chair, Code Technology Committee (CTC), requests Disapproval for Part III.

Committer's Reason: The CTC agrees with the action taken by the three code change committees. They correctly note that there are reliability concerns and there is still the question of how long such devices will last before they need replacement. As to the text approved by the assembly, this text will literally require all existing dwelling units to be provided with a carbon monoxide alarm when a permit is pulled for the conditions noted, even if the dwelling unit does not have a fuel fired appliance.

The CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions. This is consistent with the position of the Environmental Protection Agency in their report entitled "Protect your family and yourself from carbon monoxide poisoning", EPA-402-F-96-005, October 1996. The report can be downloaded at: <http://www.epa.gov/iaq/pubs/coftsht.html>

The EPA notes the following:

"So what's a consumer to do?"

First, don't let buying a CO detector lull you into a false sense of security. Preventing CO from becoming a problem in your home is better than relying on an alarm. Follow the checklist of DO's and DON'TS above." [The checklist focuses on appliance use, maintenance and care as well as directives to not idle your car in the garage or use gas powered engines in enclosed spaces].

As far as CO detectors, the EPA report states the following:

"A few words about CO detectors

"Carbon Monoxide Detectors are widely available in stores and you may want to consider buying one as a back-up --BUT NOT AS A REPLACEMENT for proper use and maintenance of your fuel-burning appliances. However, it is important for you to know that the technology of CO detectors is still developing, that there are several types on the market, and that they are not generally considered to be as reliable as the smoke alarms found in homes today. Some CO detectors have been laboratory-tested, and their performance varied. Some performed well, others failed to alarm even at very high CO levels, and still others alarmed even at very low levels that don't pose any

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immediate health risk. And unlike a smoke alarm, where you can easily confirm the cause of the alarm, CO is invisible and odorless, so it's harder to tell if an alarm is false or a real emergency."

The code change is well intentioned, and there is indeed a health concern due to carbon monoxide poisoning, but a code mandate for carbon monoxide detectors is not the solution.

Public Comment 3:

Ted A. Williams, American Gas Association, requests Disapproval for Part III.

Commenter's Reason: ICC should disapprove this proposal. The ICC Code Technology Committee has published on the ICC website its recommendation from its Area of Study - Carbon Monoxide Alarms. Its recommendation is as follows:

"Recommendation: The CTC recommendation is:

There has not been sufficient justification presented to the CTC to mandate carbon monoxide alarms in new and existing residential type occupancies.

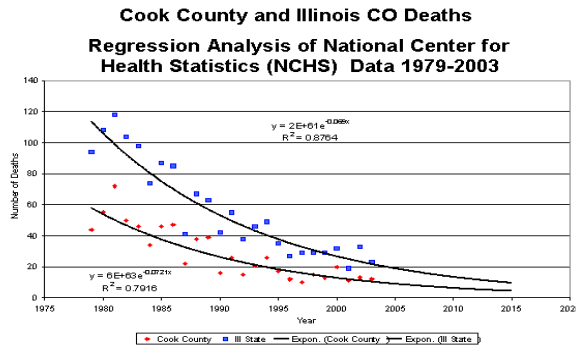
In making this recommendation, the CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions.¹

This recommendation follows many hours of testimony and presentation of documentation (recorded on the ICC website) on CO alarm issues from a wide variety of stakeholders at CTC meetings in Schiller Park, IL and Detroit, MI. ICC committees should address this recommendation in its deliberations and explain alternative actions to the CTC recommendation.

In addition, the following issues of the ICC proposals support disapproval:

- The U. S. Consumer Product Safety Commission (CPSC), in response to separate letter from the NEMA and Gas Appliance Manufacturers Association (GAMA) requesting CPSC support of CO alarm mandates, has stated that it would not support CO alarm mandates until issues of long term reliability of CO alarms were addressed.
- Issues of alarm reliability have not been addressed in published information on alarm performance. As a result, information to date demonstrates poor performance in the field (including data from first responders documented in the National Fire Investigation Response Data System – NFIRS) and in controlled laboratory tests for mitigating false positive and FALSE NEGATIVE activation. The information provided to the CTC and in the public record documents this information in detail.²
- The CO alarm proposal is in conflict with NFPA 720, the ANSI-recognized consensus standard for installation and location of CO alarms. In the case of M41, specifically, occupancies with attached garages are excluded, whereas under NFPA 720, these occupancies are included. Other conflicts with NFPA 720 exist as well.
- M41, through its conflicts with NFPA 720 and focus on new and renovated housing, would not have a demonstrable impact on CO fatalities nationally. Even with 100% COMPLIANCE, PERFECT ALARM RELIABILITY, and PERFECT CONSUMER RESPONSE, these proposals might address only about 20% of CO fatalities since current national residential poisoning incidents involve automobiles in attached garages and older housing without renovation or appliance replacement.
- This proposal does not address THE ONLY GROWING CAUSE OF CO FATALITIES -- PORTABLE EQUIPMENT, INCLUDING GENERATORS.
- CO alarms are not currently a stable product since UL through its Standards Technical Panel 2034 is addressing fundamental issues of alarm life and even activation points. At its upcoming meeting in October, UL will consider proposals to the UL 2034 standard to address deficiencies documented by CPSC and others. The changes proposed would fundamentally alter the design and performance of CO alarms.
- Experience from the City of Chicago, the first major metropolitan jurisdiction in the U. S. to promulgate mandatory CO alarm installation requirements, illustrates in the plot of CO fatalities below THE INEFFECTIVENESS OF MANDATES:
 - Though promulgated in 1994, Chicago and its collar communities in Cook County (many of which have similar mandates) continue to have CO fatalities. Continuing frequency of CO fatalities around ten per year appears to be stable over time and may be expected to continue in the future.
 - The annual number of deaths in this community is consistent with historical trends of declining CO fatalities over time, but no impact or change in this rate of decline can be attributed to the Chicago mandate.
 - For the mandate to have been effective, either CO fatalities would have had to decrease to zero or near zero, or at a minimum, the rate of CO fatalities would have had to show a discontinuous change that could be associated with the promulgation of the mandate.

Reasons for the ineffectiveness of the Chicago mandate are the subject of speculation and may be attributed to lack of compliance, lack of enforcement, lack of appropriate response, failure of alarms to perform as designed, or these and other factors in combination and discussed in AGA's presentation to the CTC.² Nevertheless, the societal cost of the mandate has been significant with no discernable societal benefit.



- ¹ "Report of the CTC, Area of Study – Carbon Monoxide Alarms," International Code Council Code Technology Committee, September 22, 2005, Detroit Marriott Renaissance Center, Detroit, Michigan [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].
- ² Williams, Ted A. "CO Alarm Mandates in Model Codes as Public Policy," presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://iccsafe.org/cs/cc/ctc/Carbon.html>].

Final Action: AS AM AMPC_____ D

RB109-06/07
R313, R313.1.1 (New), Chapter 43

Proposed Change as Submitted:

Proponent: Roger R. Evans, Park City Municipal Corporation, Utah, representing Utah Chapter of ICC

1. Revise as follows:

SECTION R313
~~SMOKE ALARMS~~

2. Add new text as follows:

R313.1.1 Carbon monoxide alarms. Carbon monoxide alarms shall be installed on each habitable level of a dwelling unit equipped with fuel burning appliances. All carbon monoxide detectors shall be listed and comply with UL 2034 and shall be installed in accordance with provisions of this code and NFPA 720. Approved combination smoke and carbon monoxide detectors shall be permitted.

3. Add standard to Chapter 43as follows:

UL	<u>2034-96</u>	<u>Standard for Single and Multiple Station Carbon Monoxide Alarms</u>
NFPA	<u>720-05</u>	<u>Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units</u>

Reason: According to the Journal of the American Medical Association (JAMA), carbon monoxide is the leading cause of accidental poisoning deaths in America. 1,500 people die annually due to accidental carbon monoxide exposure and additional 10,000 seek medical attention. (Medical experts agree that it's difficult to estimate the total number of carbon monoxide incidents because the symptoms of carbon monoxide poisoning resemble so many other common ailments.) www.homesafe.com

Cost Impact: The code change proposal will increase the cost of construction between \$50.00 to \$200.00 per residential unit.

Analysis: Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Reference Standards" provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action:

Disapproved

Committee Reason: The committee disapproved this change after considerable negative testimony. There is no clear direction given for placement of these devices. The CO detectors are prone to false alarm indications. The Department of Homeland Security representative stated that 94 percent of the time these detectors activated it was due to a malfunction of the device. The committee also voiced concern over tying these devices in with the presence of fuel burning appliances.

Assembly Action:

None

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

Roger R. Evans, Park City Municipal Corporation, representing Utah Chapter of ICC, requests Approval as Modified by this public comment.

R313.1.1 Carbon monoxide alarms. Carbon monoxide alarms shall be installed on each habitable level of a dwelling unit equipped with fuel burning appliances. All carbon monoxide detectors shall be listed and comply with UL 2034 and shall be installed in accordance with provisions of this code and NFPA 720. Approved combination smoke and carbon monoxide detectors shall be permitted. In new construction, dwelling units within which fuel-fired appliances are installed shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s).

R313.1.2 Where required-existing dwellings. In existing dwellings, where interior alterations, repairs, fuel-fired appliance replacements or additions requiring a permit occur, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section 313.1.1.

R313.1.3 Alarm requirements. The required carbon monoxide alarms shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. Carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.

UL

2034-96

Standard for Single and Multiple Station Carbon Monoxide Alarms

NFPA

720-05

Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling

Units

Commenter's Reason: This modification is consistent with the assembly action taken on **M41-06/07 Part I, II and III**. According to the Journal of the American Medical Association (JAMA), carbon monoxide is the leading cause of accidental poisoning deaths in America. 1,500 people die annually due to accidental carbon monoxide exposure and additional 10,000 seek medical attention. (Medical experts agree that it's difficult to estimate the total number of carbon monoxide incidents because the systems of carbon monoxide poisoning resemble so many other common ailments.) www.homesafe.com

Public Comment 2:

David C. Delaquila, Gas Appliance Manufacturing Association (GAMA), requests Disapproval.

Commenter's Reason: GAMA believes this proposal should be disapproved on the basis that it unfairly identifies fuel-burning appliances as the only source of carbon monoxide. Carbon monoxide alarms should be installed in all residential occupancies, regardless of the type of fuel the appliances use. The recent rash of CO incidents in Washington State (predominantly electric heat pumps) and Texas during power outages as a result of inclement weather reinforces the need for these devices to be installed in all residential buildings. A large majority of the recent CO incidents was attributed to the misuse of power generators. Had these homes had a working CO alarm with battery power backup many of these incidents might have been avoided. Carbon monoxide comes from a variety of sources unrelated to fuel-burning appliances and this proposal does not go nearly far enough to provide safety to all occupancies. Code requirements that address life safety should not fall short of its goal.

Public Comment 3

Ted A. Williams, American Gas Association, requests Disapproval.

Commenter's Reason: ICC should disapprove this proposal. The ICC Code Technology Committee has published on the ICC website its recommendation from its Area of Study - Carbon Monoxide Alarms. Its recommendation is as follows:

"Recommendation: The CTC recommendation is:

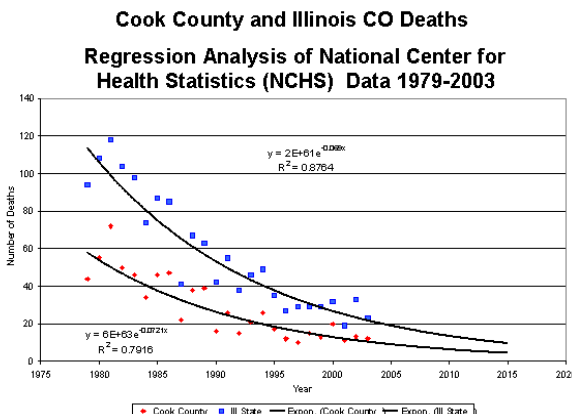
There has not been sufficient justification presented to the CTC to mandate carbon monoxide alarms in new and existing residential type occupancies.

In making this recommendation, the CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions."¹

This recommendation follows many hours of testimony and presentation of documentation (recorded on the ICC website) on CO alarm issues from a wide variety of stakeholders at CTC meetings in Schiller Park, IL and Detroit, MI. ICC committees should address this recommendation in its deliberations and explain alternative actions to the CTC recommendation.

In addition, the following issues of the ICC proposals support disapproval:

- The U. S. Consumer Product Safety Commission (CPSC), in response to separate letter from the NEMA and Gas Appliance Manufacturers Association (GAMA) requesting CPSC support of CO alarm mandates, has stated that it would not support CO alarm mandates until issues of long term reliability of CO alarms were addressed.
- Issues of alarm reliability have not been addressed in published information on alarm performance. As a result, information to date demonstrates poor performance in the field (including data from first responders documented in the National Fire Investigation Response Data System – NFIRS) and in controlled laboratory tests for mitigating false positive and FALSE NEGATIVE activation. The information provided to the CTC and in the public record documents this information in detail.²
- The CO alarm proposal is in conflict with NFPA 720, the ANSI-recognized consensus standard for installation and location of CO alarms. In the case of RB109, specifically, occupancies with attached garages are excluded, whereas under NFPA 720, these occupancies are included. Other conflicts with NFPA 720 exist as well.
- RB109, through its conflicts with NFPA 720 and focus on new and renovated housing, would not have a demonstrable impact on CO fatalities nationally. Even with 100% COMPLIANCE, PERFECT ALARM RELIABILITY, and PERFECT CONSUMER RESPONSE, these proposals might address only about 20% of CO fatalities since current national residential poisoning incidents involve automobiles in attached garages and older housing without renovation or appliance replacement.
- This proposal does not address THE ONLY GROWING CAUSE OF CO FATALITIES -- PORTABLE EQUIPMENT, INCLUDING GENERATORS.
- CO alarms are not currently a stable product since UL through its Standards Technical Panel 2034 is addressing fundamental issues of alarm life and even activation points. At its upcoming meeting in October, UL will consider proposals to the UL 2034 standard to address deficiencies documented by CPSC and others. The changes proposed would fundamentally alter the design and performance of CO alarms.
- Experience from the City of Chicago, the first major metropolitan jurisdiction in the U. S. to promulgate mandatory CO alarm installation requirements, illustrates in the plot of CO fatalities below THE INEFFECTIVENESS OF MANDATES:
 - Though promulgated in 1994, Chicago and its collar communities in Cook County (many of which have similar mandates) continue to have CO fatalities. Continuing frequency of CO fatalities around ten per year appears to be stable over time and may be expected to continue in the future.
 - The annual number of deaths in this community is consistent with historical trends of declining CO fatalities over time, but no impact or change in this rate of decline can be attributed to the Chicago mandate.
 - For the mandate to have been effective, either CO fatalities would have had to decrease to zero or near zero, or at a minimum, the rate of CO fatalities would have had to show a discontinuous change that could be associated with the promulgation of the mandate.
 - Reasons for the ineffectiveness of the Chicago mandate are the subject of speculation and may be attributed to lack of compliance, lack of enforcement, lack of appropriate response, failure of alarms to perform as designed, or these and other factors in combination and discussed in AGA's presentation to the CTC³. Nevertheless, the societal cost of the mandate has been significant with no discernable societal benefit.



- ¹ “Report of the CTC, Area of Study – Carbon Monoxide Alarms,” International Code Council Code Technology Committee, September 22, 2005, Detroit Marriott Renaissance Center, Detroit, Michigan [Available on the ICC website: <http://www.iccsafe.org/cs/cc/ctc/Carbon.html>].
- ² Williams, Ted A. “CO Alarm Mandates in Model Codes as Public Policy,” presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://www.iccsafe.org/cs/cc/ctc/Carbon.html>].
- ³ Williams, Ted A. “CO Alarm Mandates in Model Codes as Public Policy,” presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://www.iccsafe.org/cs/cc/ctc/Carbon.html>].

Final Action: AS AM AMPC
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RB110-06/07

R313, R313.2 (New), R313.3

Proposed Change as Submitted:

Proponent: Frank Stanonik, Gas Manufacturers Association (GAMA)

1. Revise as follows:

SECTION R313 **SMOKE ALARMS AND CARBON MONOXIDE ALARMS**

2. Add new text as follows:

R313.2 Single- or multiple-station carbon monoxide alarms. Single- or multiple-station carbon alarms shall be installed in the following locations:

1. Outside of each separate sleeping area within 10 feet of any bedroom door.
2. On each additional story of the dwelling, including basements, but not including crawl spaces and uninhabitable attics.

Carbon monoxide alarms shall be listed and labeled as complying with ANSI/UL 2034, *Standard for Single and Multiple Station CO Alarms*, or CSA 6.19, *Residential Carbon Monoxide Detectors*, and shall be installed in accordance with the manufacturer’s installation instructions and NFPA 720, *Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units*. Listed combination smoke and carbon monoxide alarms shall be acceptable.

(Renumber subsequent sections)

3. Revise as follows:

R313.3 Power source. In new construction, the required smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Smoke and carbon monoxide alarms shall be permitted to be battery operated when installed in buildings without commercial power or in buildings that undergo alterations, repairs or additions regulated by Section R313.2.1.

4. Add standards to Chapter 43 as follows:

UL 2034-96 Standard for Single and Multiple Station Carbon Monoxide Alarms

NFPA 720-05 Standard for the Installation of Carbon Monoxide (CO) Warning Equipment in Dwelling Units

Reason: The proposed addition to the code would require the installation of carbon monoxide (CO) alarms in dwellings regulated under the International Residential Code. CO is a colorless, odorless gas that is a product of incomplete combustion of fuels such as oil, natural gas,

CTC- Carbon monoxide alarms

2007 Pubic comments

kerosene, gasoline, and wood. High concentrations of CO present a health hazard. Due to the nature of CO, it is only detectible with CO sensing instruments.

The Consumer Product Safety Commission (CPSC) estimates that in 2002 there were 188 CO poisoning deaths associated with the use of a consumer product. It is important to note that the CPSC estimate only includes residential use of consumer products; therefore, fatalities resulting from exposure to CO from an automobile are not included, even in the case of an attached garage.

The proposal applies to all homes because there are a variety of sources of CO, some that are portable, which may cause elevated CO concentrations in a home. For instance, the CPSC estimates that 54% of annual CO fatalities are due to heating systems, while the remaining 46% are attributable to other items such as portable generators, camp stoves, or charcoal grills. Many states and local jurisdictions have already adopted legislation requiring the installation of CO alarms in homes, most recently in Massachusetts.

The proposed code requires carbon monoxide alarms to be listed as ANSI/UL 2034 or CSA 6.19 compliant. These performance standards for CO alarms provide assurance that the product meets specific performance standards. Many questions have been raised as to the reliability, performance, and length of life of a CO alarm. A study published by Mosaic Industries in 2003 titled "Evaluating the Performance of Residential CO Alarms" raises such questions. It is important to note that while the report was published in 2003, all of the alarms tested were manufactured prior to the year 2000. There have been many revisions to the product standards since that time. In an effort to harmonize ANSI/UL 2034 with CSA 6.19 and to update ANSI/UL 2034, revisions have been to increase the number of gases in the Selectivity Test, modify the requirements in the Effect of Shipping and Storage Test, add a new Section 74A to address reliability requirements, and a low humidity test requirement. These product standards continue to improve and have already addressed many of the performance concerns that have raised concern during past CO alarm code proposals.

Bibliography: "Non-Fire Carbon Monoxide Deaths Associated with the Use of Consumer Products, 2002 Annual Estimates," Consumer Product Safety Commission

Cost Impact: The code change proposal will increase the cost of construction. The average retail price of a carbon monoxide alarm is \$30.

Analysis: Results of the review of the proposed standard(s) will be posted on the ICC website by August 20, 2006.

Note: The following analysis was not in the Code Change Proposal book but was published in the "Errata to the 2006/2007 Proposed Changes to the International Codes and Analysis of Proposed Reference Standards" provided at the code development hearings:

Analysis: Review of proposed new standard indicated that, in the opinion of ICC Staff, the standard did comply with ICC standards criteria.

Committee Action: **Disapproved**

Committee Reason: The committee disapproved this proposed change to be consistent with the actions taken on RB109-06/07.

Assembly Action: **None**

Individual Consideration Agenda

This item is on the agenda for individual consideration because public comments were submitted.

Public Comment 1:

David C. Delaquila, Gas Appliance Manufacturing Association (GAMA), requests Approval as Submitted.

Commenter's Reason: GAMA believes that carbon monoxide alarms should be installed in all residential occupancies. The recent rash of CO incidents in Washington State and Texas during power outages as a result of inclement weather reinforces the need for these devices in all residential buildings. A large majority of the recent CO incidents was attributed to the misuse of power generators. Many of these incidents might have been avoided had occupants had a working CO alarm with battery power backup.

Public Comment 2:

Ted A. Williams, American Gas Association, requests Disapproval.

Commenter's Reason: : ICC should disapprove this proposal. The ICC Code Technology Committee has published on the ICC website its recommendation from its Area of Study - Carbon Monoxide Alarms. Its recommendation is as follows:

"Recommendation: The CTC recommendation is:

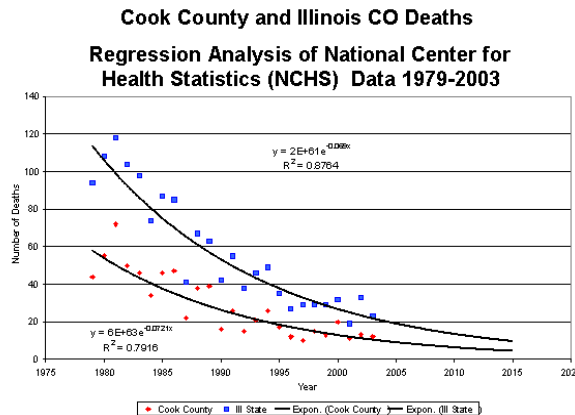
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In making this recommendation, the CTC notes the importance of and the need for compliance with the applicable code provisions for equipment maintenance and compliance with equipment installation instructions to control the hazards associated with CO emissions."¹

This recommendation follows many hours of testimony and presentation of documentation (recorded on the ICC website) on CO alarm issues from a wide variety of stakeholders at CTC meetings in Schiller Park, IL and Detroit, MI. ICC committees should address this recommendation in its deliberations and explain alternative actions to the CTC recommendation.

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² Williams, Ted A. "CO Alarm Mandates in Model Codes as Public Policy," presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://www.iccsafe.org/cs/cc/ctc/Carbon.html>].

³ Williams, Ted A. "CO Alarm Mandates in Model Codes as Public Policy," presented at ICC Code Technology Committee on CO Alarms, July 26, 2005, Schiller Park, Illinois [Available on the ICC website: <http://www.iccsafe.org/cs/cc/ctc/Carbon.htm>].

Final Action:	AS D	AM	AMPC
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