

BFAAM Apprenticeship Program

Period 2

Related Training Instruction (RTI)
Module 7 – NFPA 72 – Single and Multiple
Station Alarms and Household Fire Alarms

Reading material associated with this
module: Chapter 29 of NFPA 72, *National Fire
Alarm Code*, 2013 edition

Single Station/Household General

- Chapter 29 addresses the use of single station (stand alone) smoke alarms, multiple station (interconnected) smoke alarms and household fire alarm systems for residential occupancies
- This is a stand alone chapter, and the requirements of other chapters do not apply unless specifically referenced

29.1

Single Station/Household General

- This chapter does not apply to manufactured housing, which is federally regulated by the Department of Housing and Urban Development
- The objective of the requirements of this chapter are the life safety of the occupants and not property protection

29.1

Single Station/Household General

- The purpose of the requirements of this chapter is to provide a reliable means of notifying the occupants of the presence of fire and the need to escape before the escape is impeded by the fire 29.2
- All devices shall be listed for the purpose for which they are intended 29.3.1

Single Station/Household General

- There are three options for meeting the requirements outlined in this chapter:
 - Installation of smoke alarms
 - Installation of smoke detectors
 - Combination of smoke alarms and smoke detectors29.3.3
- Remote monitoring and interfacing with other systems is permitted
29.3.4

Single Station/Household General

- Fire warning equipment shall produce the audible emergency evacuation signal (code 3 temporal)
- Voice messages are permitted if preceded by 8 cycles of the code 3 temporal signal, the voice message is limited to 10 seconds with 2 cycles of signal between each voice message

29.3.5.2

Single Station/Household General

- Audible signals outside of sleeping rooms shall be a minimum of 15 dBA over ambient
- Audible signals in sleeping rooms shall be a minimum of 15 dBA over ambient or 75 dBA, whichever is higher, measured at the pillow

29.3.6

Single Station/Household General

- Visible signals shall comply with the requirements of Chapter 18 for public mode visible signals 29.3.7
- Notification appliances (both audible and visible) are not required to be synchronized 29.3.9

Single Station/Household Detection Location

- In all sleeping rooms and guest rooms (existing construction exception removed)
- Outside of each sleeping area, within 21' of the door to the sleeping room
- On every level of a dwelling including basements and excluding crawl spaces and unfinished attics
- Living area of a guest suite

29.5.1.1

Single Station/Household Detection Location

- Where the dwelling unit sleeping area is separated from the rest of the living area by a door, detection shall be in each area on each side of the door 29.5.1.2
- Where the interior area exceeds 1000 square feet, detection placed to provide coverage based on 30' spacing, or one detector per 500 square feet

29.5.1.3

Single Station/Household Detection Location

- Where dwelling units include great rooms or vaulted ceilings extending over multiple floors, detection provided at the upper level may also be used for the lower level required detection

29.5.1.3.2

Single Station/Household Notification

- Smoke alarms shall be interconnected so that activation of one unit sounds all units
29.5.2.1.1
- Household fire alarm systems shall provide public mode audibility requirements outside of sleeping rooms, and a minimum of 75 dBA within sleeping rooms
29.5.2.1.2

Single Station/Household Smoke Alarm Power Supplies

- Commercial light and power source, plus 7 days of standby/4 minutes of alarm
- Non commercial light and power source, plus 7 days of standby/4 minutes of alarm
- Nonreplaceable, nonrechargeable primary battery with 10 years of normal operation, plus 4 minutes of alarm and 7 days of trouble

29.6.1

Single Station/Household Smoke Alarm Power Supplies

- If a battery only power supply is specifically permitted, it shall comply with the requirements for a nonrechargeable battery or the requirements for a rechargeable battery
- A spring wound mechanism with a visible indicator is permitted for the non-electrical portion of a listed single station alarm

29.6.1

Single Station/Household Fire Alarm Power Supplies

- Primary power source using commercial power and a secondary source using a rechargeable battery
- Secondary power shall be capable of 24 hours of standby plus 4 minutes of alarm
- Secondary power shall be supervised and provide audible and visible trouble signal on no or low battery condition

29.6.2

Single Station/Household Fire Alarm Power Supplies

- Rechargeable battery shall be automatically recharged within 48 hours
- Rechargeable battery shall provide a distinctive audible trouble signal before the ability to support an alarm condition is lost
- RF systems shall comply with 23.16 (Special requirements for low power radio systems)

29.6.2

Single Station/Household AC Primary Power

- Visible "power on" indicator required
- Power sources in excess of 30 volt power limited fire alarm circuits shall be installed by a qualified electrician
- A restraining means shall be used for the plug of any cord connected installation
- Power shall be provided by either a dedicated circuit or the unswitched portion of a branch circuit

29.6.3

Single Station/Household AC Primary Power

- Operation of a switch or a ground fault circuit interrupter (GFCI) shall not cause loss of power
- Smoke alarms connected to an arc fault circuit interrupter (AFCI) protected circuit shall have a secondary power source
- Loss or restoration of AC power shall not cause an alarm

29.6.3

Single Station/Household Battery Secondary Power

- Acceptable battery replacements shall be clearly identified by manufacturer name and model number
- Trouble signal indication shall be by an audible trouble signal sounding once per minute for 7 days
- Battery must support alarm operation for 4 minutes at the point a low battery signal is generated

29.6.4

Single Station/Household Battery Primary Power

- Acceptable battery replacements shall be clearly identified by manufacturer name and model number
- Must support operation for one year, including weekly testing
- Trouble signal indication shall be by an audible trouble signal sounding once per minute for 7 days
- A visible indication when the battery is removed

29.6.6

Single Station/Household General

- Visible appliances used in conjunction with a smoke or heat alarm are not required to be provided with secondary power 29.6.5
- Any component failure that renders the detector inoperative shall cause a trouble signal or otherwise be apparent to the occupant of the living unit 29.7.1

Single Station/Household General

- Smoke detectors shall be listed to UL 268, smoke alarms shall be listed to UL 217 29.7.2
- Effective 1/1/2019 smoke alarms and detectors shall be listed for resistance to common nuisance sources 29.7.3
- Heat detectors or heat alarms shall be listed for at least 50' spacing, and shall have a temperature rating at least 25°F above the maximum anticipated temperature 29.7.4

Single Station/Household General

- Smoke and heat alarms shall be provided with a convenient means for testing by the occupant 29.7.5
- Household fire alarm initiating devices and notification appliances shall be monitored for integrity so a single open or single ground fault produces a trouble signal 29.7.6.6

Single Station/Household General

- Combination systems are permitted, fire alarm signals shall be distinctive and take precedence over all other signals
- Faults in other systems shall not affect the operation of the fire alarm system
- Connection to single station devices shall be permitted, as long as a short circuit on the connecting wiring does not prevent operation of the single station device 29.7.7

Single Station/Household General

- DACT shall only require one line and only be required to call one DACR number 29.7.9.1.1
- DACT test signal shall be sent at least monthly 29.7.9.1.2
- Supervising stations shall be permitted to verify alarm signals prior to dispatch, as long as the delay does not exceed 90 seconds 29.7.9.2

Single Station/Household General

- Equipment instructions shall contain:
 - Instruction booklet w/typical layouts
 - Testing/maintenance frequency charts
 - Info on emergency evacuation plans
 - Info on how to obtain repair or replacement service, and replacement parts
 - Info that smoke alarms shall be replaced when they fail to respond to tests, or have been in service longer than 10 years from mfg. date

29.8.1.4

Single Station/Household General

- Smoke or heat alarm interconnection
 - In compliance with manufacturers instructions
 - No more than 18 devices (max 12 smoke) can be interconnected with unsupervised wiring
 - No more than 64 devices (max 42 smoke) can be interconnected with supervised wiring
 - Devices from different manufacturers shall not be interconnected unless listed as compatible

29.8.2

Single Station/Household General

- Smoke or heat alarm interconnection
 - A single fault on the interconnecting means shall not prevent the single station operation of any of the interconnected alarms
 - Activation of the test feature on any interconnected alarm shall result in the operation of all interconnected notification appliances

29.8.2

Single Station/Household General

- Smoke alarm and smoke detector spacing and location rules are the same as for Chapter 17, plus:
 - Shall not be located in spaces where temperatures fall below 40° F or exceed 100°
 - Shall not be located where the mounting surface could become considerably warmer or cooler than the room

29.8.3.4

Single Station/Household General

- Smoke alarm and smoke detector spacing:
 - Shall be either photoelectric or equipped with an alarm silencing means where installed within 20' of a cooking appliance
 - Shall not be installed within 3' of a door to a bathroom with a shower or a tub
 - Shall not be installed within 3' of a supply register, and outside the direct airflow

29.8.3.4

Single Station/Household General

- Smoke alarm and smoke detector spacing:
 - Shall not be installed within 3' of the tip of a ceiling fan paddle
 - Shall be located so smoke rising in a stairway is not blocked from the detector by a door
 - Shall be located on the basement ceiling near the entry to the stairs
 - Shall be on the ceiling or within 12" of the ceiling on tray shaped ceilings

29.8.3.4

Single Station/Household General

- Heat alarm and heat detector spacing and location rules are the same as for Chapter 17, with the exception of derating tables for high ceilings

29.8.4

BFAAM Apprenticeship Program

Period 3

Reading Assignment for

Module 1 – Michigan Building Code

Reading material associated with this
module: Chapters 1 & 3 of the Michigan
Building Code, 2015 edition