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& FIRE ALARM

ASSOCIATION OF **MICHIGAN**

APPRENTICESHIP PROGRAM

Period 2
Related Training Instruction (RTI)
Module 7 – NFPA 72 Single- and Multiple-Station
Alarms and Household Signaling Systems

Reading material associated with this module:
Chapter 29
NFPA 72, National Fire Alarm Code, 2022 Edition

NFPA 72
National Fire Alarm Code
2022 Edition
Chapter 29 – Single- and Multiple-Station
Alarms and Household Signaling Systems

NFPA 72, 2022 Edition

Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- Introduction:
 - *Chapter 29 addresses the performance, installation, and use of all single- (stand alone) and multiple-station (interconnected) alarms and household fire alarm systems for any occupancy.*
 - *This includes both fire warning and carbon monoxide (CO) equipment.*

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.1 Application:
 - Alarms shall be installed in all occupancies where required by other governing laws, codes, or standards.
 - The requirements of chapters 7, 10, 11, 12, 14, 17, 18, 21, 23, 24, 26, and 27 shall not apply unless otherwise noted.
 - The requirements of this chapter shall not apply to installations in manufactured homes.
 - Installations in manufactured homes are under the jurisdiction of the Department of Housing and Urban Development (HUD). The rules for installation are addressed in the Federal Manufactured Housing Construction Safety Standards (available at <https://www.hud.gov>).
 - This chapter shall apply to the life safety of occupants and not to the protection of property.

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.2 Purpose:
 - The purpose of the fire-warning 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 fire in the normal path of egress.
 - The purpose of the carbon monoxide (CO) warning equipment requirements of this chapter is to provide a reliable means of notifying the occupants of the presence of CO levels that constitute a potential life safety risk and the need for appropriate action.

29.2.1, 28.2.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.3 Basic Requirements:
 - All devices to be installed in conformance with this chapter shall be approved, labeled, or listed for the purpose for which they are intended.
 - The minimum requirements for the number and type of detectors or alarms shall be by **one** of the following arrangements:
 - The minimum number and location shall be satisfied (independently) by the installation of alarms.
 - The minimum number and location shall be satisfied (independently) by the installation of detectors.

29.3.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.3 Basic Requirements:
 - The installation of additional alarms or detectors for additional or duplicate coverage in either of the prior arrangements shall be permitted, however, the **minimum requirement and locations** must be met by only one type (alarms or detectors).
 - Compliance with the minimum requirements of the code cannot rely on the combination of single-station alarms, multiple-station alarms, or household fire alarm systems.
- Supplementary functions, including the extension of an alarm beyond the residential occupancy, shall be permitted and shall not interfere with the performance requirements of this chapter.
- *Supplementary functions can include remote monitoring and interfacing with other systems.*

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.4 Remote Annunciation:
 - Remote annunciation from single- and multiple-station alarms shall be permitted, provided signals at the remote annunciator identify the hazard, *i.e. smoke and CO signals are distinct to identify the specific hazard.*
- 29.5 Notification:
 - Fire-warning equipment installed in residential occupancies shall produce the audible emergency evacuation signal (Code 3 temporal) whenever the intended response is to evacuate the building.
 - Mechanically-powered single-station heat alarms used as supplementary devices are exempt from the requirement for Code 3 temporal unless required by other laws, codes, or standards.

29.4, 29.5.1, 29.5.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.5 Notification:
 - CO warning equipment to be installed in residential occupancies shall produce the T-4 (*four-pulse temporal code*) signal. After the initial 4 minutes of alarm, the 5-second “off” time of the alarm signal (*between the 4 pulse sections of the signal*) shall be permitted to be changed to 60 seconds.
 - Fire-warning equipment producing the code 3 temporal signal shall be permitted to incorporate voice notification under either or both of the following conditions:
 - The voice message is completely contained within the 1.5 second pause period of the code 3 temporal signal.
 - Where the voice message is first preceded by a minimum of 8 cycles of the code 3 temporal signal, the voice message is limited to 10 seconds and is followed by a minimum of 2 cycles of the code 3 temporal signal.
 - The initial 8 cycle period shall not be required to be repeated.

29.5.4, 29.5.5

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.5 Notification:
 - Carbon monoxide warning equipment producing the four-pulse temporal signal shall be permitted to incorporate voice notification under either or both of the following conditions:
 - The voice message is completely contained within the 5 second pause period of the four-pulse temporal signal.
 - Where the voice message is first preceded by a minimum of 6 cycles of the four-pulse temporal signal, the voice message is limited to 10 seconds and is followed by a minimum of 2 cycles of the four-pulse temporal signal.
 - The initial 6 cycle period shall not be required to be repeated.

29.5.6

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.5 Notification:
 - Audible signals outside of sleeping rooms shall be a minimum of 15dbA over ambient.
 - Audible notification signals located in sleeping rooms shall be:
 - A minimum of 15dbA over ambient.
 - A minimum of 5dbA above the maximum sound level that lasts longer than 60 seconds.
 - At least 75dbA.
 - All above to be measured at the pillow level.
 - Where visual signals are provided, they shall comply with the requirements of section 18.5 for public mode visual signaling.

29.5.7, 29.5.8

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.5 Notification:
 - Notification appliances provided for those with mild to severe hearing loss shall comply with the following:
 - An audible notification appliance producing a low frequency alarm signal shall be installed where required by governing laws, codes, or standards, or voluntarily, for people with hearing loss.
 - Visual notification appliances in accordance with the requirements of section 18.5.5.10 for sleeping areas and tactile notification appliances in accordance with the requirements of section 18.10 shall be required for those with moderately severe to profound hearing loss under the following conditions:
 - Where required by governing laws, codes, or standards, or voluntarily, for people with hearing loss.
 - Signals from notification appliances (*both audible and visual*) shall not be required to be synchronized. 29.5.10.1, 29.5.10.2, 29.5.11

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.7 Carbon Monoxide (CO) Detection:
 - Where required by other governing laws, codes, or standards, for a specific type of occupancy, listed CO alarms or detectors shall be installed as follows:
 - Outside each separate dwelling unit sleeping area, within 21' of any door to a sleeping room with the distance measured along the path of travel.
 - On every occupiable level of a dwelling unit, including basements, excluding attics and crawl spaces.
 - In all sleeping rooms and guest rooms containing installed fuel-burning appliances.
 - Other locations where required by applicable laws, codes, or standards.
 - Each CO alarm or detector shall be located on the wall, ceiling, or other location as specified in the manufacturer's published instructions.

29.7.1.1, 29.7.1.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.7 Carbon Monoxide (CO) Detection:
 - *The location of a CO alarm or detector is generally not dependent on mounting height. The density of CO is similar to that of air at room temperature, and CO generally mixes readily with air.*
 - Unless exempted by applicable laws, codes, or standards, CO alarms used to provide a warning function, and where two or more alarms are installed within a dwelling unit, suite of rooms, or similar area, shall be arranged so that the operation of one CO alarm causes all CO alarms within these locations to sound.

A29.7.1.2, 29.7.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.8 Detection and Notification:
 - Smoke detectors and notification appliances shall be permitted to meet the requirements for smoke alarms in this section.
 - Where required by other governing laws, codes, or standards, for a specific type of occupancy, listed single- and multiple-station alarms shall be installed as follows:
 - In all sleeping rooms and guest areas.
 - Outside each separate dwelling unit sleeping area, within 21’ of any door to a sleeping room with the distance measured along the path of travel.
 - On every level of a dwelling unit, including basements.
 - On every level of a residential board and care occupancy (small facility), including basements and excluding crawl spaces and unfinished attics.
 - In the living area(s) of a guest suite.
 - In the living area(s) of a residential board and care occupancy (small facility).

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.8 Detection and Notification:
 - Where the dwelling unit sleeping area is separated from the rest of the living areas by a door, detection shall be in each area on each side of the door.
 - Where the interior floor area, for a given level of a dwelling unit, excluding garage spaces, exceeds 1000sf, smoke alarms shall be placed to provide coverage based on 30' spacing, or one detector per 500sf of floor area.
 - Where dwelling units include great rooms or vaulted ceilings extending over multiple floors, smoke alarms provided at the upper level shall be permitted to be used for the lower level required protection.

29.8.1.2, 29.8.1.3, 29.8.1.3.1, 29.8.1.3.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.8 Detection and Notification:
 - For other than mechanically powered single-station heat alarms and unless exempted by applicable laws, codes, or standards, smoke or heat alarms used to provide a fire-warning function shall be interconnected so that activation of one unit sounds all units.
 - Household fire alarm systems shall provide public mode audibility requirements as follows:
 - Audible signals outside of sleeping rooms shall be a minimum of 15dbA over ambient.
 - Audible notification signals located in sleeping rooms shall be:
 - A minimum of 15dbA over ambient, a minimum of 5dbA above the maximum sound level that lasts longer than 60 seconds, or at least 75dbA whichever is greater.
 - All above to be measured at the pillow level.

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.8 Detection and Notification:
 - Household fire alarm systems shall provide audibility requirements as follows:
 - Notification appliances provided for those with mild to severe hearing loss shall comply with the following:
 - An audible notification appliance producing a low frequency alarm signal shall be installed where required by governing laws, codes, or standards, or voluntarily, for people with hearing loss.
 - Unless otherwise permitted by the AHJ, audible fire alarm signals shall sound only in an individual dwelling unit, suite of rooms, or similar area and shall not be arranged to operate fire-warning equipment or fire-alarm systems outside these areas.
 - Remote annunciation shall be permitted.

29.8.2.2, 29.8.2.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Smoke, heat, and CO alarms shall be powered by one of the following:
 - Commercial light and power source, along with a secondary power source capable of operating the device for at least 7 days in normal condition followed by 4 minutes of alarm. CO alarms shall have sufficient capacity to operate the alarm signal(s) for at least 12 continuous hours.
 - If a commercial light and power source is not normally available, a dependable non-commercial AC power source, along with a secondary power source capable of operating the device for at least 7 days in normal condition followed by 4 minutes of alarm. CO alarms shall have sufficient capacity to operate the alarm signal(s) for at least 12 continuous hours.
 - A nonrechargeable, nonreplaceable primary battery that meets the requirements of 29.9.2.

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Smoke, heat, and CO alarms shall be powered by one of the following (continued):
 - If a battery primary power supply is specifically permitted by other governing laws, codes, or standards, a battery meeting the requirements for a non-rechargeable, non-replaceable battery (29.9.2) or the requirements for a non-rechargeable, replaceable battery (29.9.7).
 - A spring-wound mechanism for the nonelectrical portion of a listed single-station alarm with a visible indication to show that sufficient operating power is not available.

29.9.1

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Primary power source nonreplaceable primary battery:
 - Single-station smoke or CO alarm power requirements are met for at least 10 years of battery life including required periodic testing.
 - Multiple-station alarm power requirements are met for at least 7 years of battery life including required periodic testing.
 - A distinctive audible trouble signal occurs before the battery is incapable of operating the device(s) for alarm purposes.
 - At the battery voltage at which a trouble signal is obtained, the unit can produce a fire alarm signal for at least 4 minutes or a CO signal for at least 12 continuous hours, followed by not less than 7 days of trouble signal operation.

29.9.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Primary power source nonreplaceable primary battery (continued):
 - The audible trouble signal is allowed to be silenced for up to 12 hours.
 - A visible “power on” indicator is provided.
 - Primary replaceable battery, sole power source (nonrechargeable):
 - If alarms are powered solely by a replaceable primary battery, the battery shall be monitored to ensure the following conditions are met:
 - All power requirements are met for at least 1 year of battery life including required weekly periodic testing.
 - A distinctive audible trouble signal occurs before the battery is incapable of operating the device(s) for alarm purposes.

29.9.2,29.9.7

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Primary replaceable battery, sole power source (nonrechargeable)(continued):
 - If alarms are powered solely by a replaceable primary battery the following conditions must be met:
 - For a system-connected unit employing a lock-in alarm feature, automatic transfer is provided from alarm to a trouble condition when the unit has insufficient power to support an alarm condition.
 - At the battery voltage at which a trouble signal is obtained, the unit can produce a fire alarm signal for at least 4 minutes or a CO signal for at least 12 continuous hours, followed by not less than 7 days of trouble signal operation.
 - The audible trouble signal is produced at least one every minute for 7 consecutive days.

29.9.7

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Primary replaceable battery, sole power source (nonrechargeable)(continued):
 - If alarms are powered solely by a replaceable primary battery the following conditions must be met:
 - Acceptable replacement batteries are clearly identified by the manufacturer's name and model number on the unit near the battery compartment.
 - A noticeable, visible indication is displayed when a primary battery is removed from the unit.

29.9.7

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Household fire and CO alarm systems:
 - Household fire and CO alarm systems shall have two independent power sources consisting of a primary power source using commercial power and a secondary source using a rechargeable battery.
 - The secondary source shall be capable of operating the household alarm system for at least 24 hours in the normal condition, followed by 4 minutes of fire alarm or 12 hours of CO alarm.
 - The secondary power source shall be supervised and provide a distinctive audible and visible trouble signal upon removal, disconnection, or low battery condition.

29.9.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Household fire and CO alarm systems:
 - A rechargeable battery used as a secondary power source shall meet the following:
 - Be automatically recharged by an AC circuit of the commercial light and power source within 48 hours.
 - Provide a distinctive audible trouble signal before the ability to support an alarm condition is lost.
 - Low-power wireless (RF) systems shall comply with section 23.16 (special requirements for low-power radio (wireless) systems), except as modified by section 29.10.8.1.1 (periodic monitoring for integrity for low-power radio (wireless) systems).

29.9.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - The AC power source for smoke, heat, and CO alarms and household fire and CO alarm systems shall comply with the following:
 - A visible “power on” indicated is required.
 - Power sources in excess of a maximum 30 volt power limited fire alarm circuit shall be installed by a qualified electrician.
 - A restraining means shall be used for the plug of any cord connected installation, unless the unit utilizes a secondary power source meeting section 29.9 and loss of AC power results in an audible trouble signal meeting section 29.10.6.5 (trouble signal silencing requirements).
 - AC power shall be supplied from a dedicated branch circuit or the unswitched portion of a branch circuit also used for power and lighting.

29.9.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - The AC power source for smoke, heat, and CO alarms and household fire and CO alarm systems shall comply with the following (continued):
 - Operation of a switch (other than a circuit breaker) shall not cause the loss of primary power. Alarms powered by branch circuits protected by arc-fault circuit-interrupters (AFCI) or ground-fault circuit-interrupters (GFCI) shall have a secondary power source.
 - Neither loss nor restoration of primary power shall cause an alarm signal that exceeds 2 seconds.
 - Where a secondary battery is provided, the primary power supply shall be of sufficient capacity to operate the system under all conditions of loading with any secondary battery disconnected or fully discharged.

29.9.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Where alarms include a battery used as a secondary power source, the following conditions shall be met:
 - The secondary power source shall be supervised and shall cause a distinctive audible or visual trouble signal upon removal or disconnection of a battery, or a low battery condition.
 - Acceptable battery replacements shall be clearly identified by manufacturer name and model number on the unit near the battery compartment.

29.9.5

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Where alarms include a battery used as a secondary power source, the following conditions shall be met (continued):
 - A rechargeable battery shall meet the following criteria:
 - Be automatically recharged by the primary power source.
 - Be recharged within 4 hours where power is provided from a circuit that can be switched on or off by other than a circuit breaker (*AFCI* / *GFCI*) or 48 hours when unswitched by other than the circuit breaker.
 - Provide a distinctive audible trouble signal before the battery is incapable of operating the device(s) for alarm purposes.

29.9.5

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Where alarms include a battery used as a secondary power source, the following conditions shall be met (continued):
 - A rechargeable battery shall meet the following criteria:
 - At the battery condition at which a trouble signal is obtained, be capable of producing a fire alarm signal for at least 4 minutes or the CO signal for 12 continuous hours, followed by not less than 7 days of trouble signal operation.
 - Produce an audible trouble signal at least once every minute for 7 consecutive days.

29.9.5

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - If a visual notification appliance is used in conjunction with a smoke or heat alarm, it shall not be required to be provided with secondary power.
 - Where alarms are powered by a rechargeable battery, the following conditions shall be met:
 - The battery shall, with proper charging, be able to power the alarm for a life of 1 year.
 - The battery shall be automatically recharged by a circuit of the commercial light and power.
 - The battery shall be recharged within 4 hours where power is provided from a circuit that can be switched on or off by other than a circuit breaker (*AFCI / GFCI*) or 48 hours when unswitched by other than the circuit breaker.

29.9.6, 29.9.8

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.9 Power Supplies:
 - Where alarms are powered by a rechargeable battery, the following conditions shall be met (continued):
 - Provide a distinctive audible trouble signal before the battery is incapable of operating the device(s) for alarm purposes.
 - For a unit employing a lock-in alarm feature, automatic transfer shall be provided from alarm to a trouble condition.
 - At the battery condition at which a trouble signal is obtained, be capable of producing a fire alarm signal for at least 4 minutes or the CO signal for 12 continuous hours, followed by not less than 7 days of trouble signal operation.
 - The audible trouble signal shall be produced at least once every minute for 7 consecutive days.
 - The battery shall be nonremovable, or a noticeable, visible indication is displayed when the battery is removed from the unit.

29.9.8

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.10 Equipment Performance:
 - Any component failure that renders the detector inoperative shall cause a trouble signal or otherwise be apparent to the occupant of the living unit without the need for test.
 - Smoke detectors shall be listed to UL 268; smoke alarms shall be listed to UL 217.
 - CO detectors shall be listed to UL 2075; CO alarms shall be listed to UL 2034. CO detectors shall meet the sensitivity testing and alarm thresholds of UL 2034.
 - All signals produced from periodic testing of CO alarms or detectors shall be identical to the signal produced when the unit is in alarm.
 - Heat detectors or alarms shall be listed for at least 50' spacing and shall have a temperature rating at least 25°F above the normal ambient temperature and shall not exceed 50°F higher than the maximum anticipated ambient temperature in the room or space where installed.

29.10.1, 29.10.2, 29.10.3.1, 29.10.3.2, 29.10.3.3, 29.10.4.1, 29.10.4.2

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.10 Equipment Performance:
 - Smoke and heat alarms shall be provided with a convenient means for testing by the occupant, system owner, or other responsible parties.
 - The control unit of a household alarm system shall be automatically restoring upon restoration of electrical power and shall be of a type that “locks in” on alarm condition.
 - Initiating devices and notification appliances connected to household control units shall be monitored for integrity so a single open or single ground fault produces a trouble signal.
 - Remote resetting and silencing of a control unit from other than the protected premises shall be inhibited for a minimum of 4 minutes from the initial activation of the fire alarm signal.

29.10.5, 29.10.6.1, 29.10.6.2, 29.10.6.7, 29.10.6.10

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.10 Equipment Performance:
 - A sprinkler waterflow alarm initiating device shall be permitted to be connected to the multiple-station alarms or household fire alarm system to actuate an alarm signal.
 - Household alarm systems shall be permitted to be supervised by a supervising station or a public emergency alarm reporting system.
 - Transmission of signals from single- or multiple-station alarms to a supervising station or public emergency alarm reporting system shall be processed by a household alarm system.
 - Where off-premises supervision is provided, the system shall transmit at least a general alarm signal.
 - Transmission of supervisory and trouble signals is permitted.

29.10.7.8.4, 29.10.9.1, 29.10.9.1.1, 29.10.9.1.2, 29.10.9.1.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.10 Equipment Performance:
 - Supervising stations shall be permitted to verify alarm signals prior to dispatch, as long as the delay does not exceed 90 seconds.
 - Where a DACT is used, it shall only require one line and only be required to call one DACR number.
 - The DACT test signal shall be transmitted at least monthly.
 - Where a communication or transmission means other than a DACT is used, only a single communication technology and path shall be required, and all necessary transmission equipment shall be provided with 24 hours of secondary power and report a trouble on loss of power.
 - All control units shall be designed for cybersecurity as determined by the manufacturer.

29.10.9.7, 29.10.9.10.1, 29.10.9.10.2, 29.10.9.10.3, 29.10.9.10.4, 29.10.10.1

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The supplier or installing contractor shall provide the following to the owner or other responsible party:
 - An instruction booklet illustrating typical layouts.
 - Charts describing operation, method, and frequency of testing/maintenance.
 - Information on establishing an emergency evacuation plan.
 - Information on how to obtain repair or replacement service, and replacement parts.
 - Information that smoke alarms shall be replaced when they fail to respond to tests or have been in service longer than 10 years from manufacture date.

29.11.1.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The interconnection of alarms shall comply with the following:
 - Shall not be interconnected in quantities that exceed the manufacturer's instructions.
 - In no case shall more than 18 devices (of which 12 can be smoke alarms) be interconnected with unsupervised wiring.
 - In no case shall more than 64 devices (of which 42 can be smoke alarms) be interconnected with supervised wiring.
 - Alarms from different manufacturers shall not be interconnected unless listed as compatible with the specific model.
 - When alarms of different types are interconnected, all alarms shall produce the appropriate signal for the phenomena (smoke / CO) being detected or remain silent.

29.11.2.1

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The interconnection of alarms shall comply with the following (continued):
 - A single fault on the interconnecting means between multiple-station alarms 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.

29.11.2.2, 29.11.2.3

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The majority of the smoke alarm and smoke detector spacing and location rules of chapter 29 coincide with those found in chapter 17. Following are specific requirements from chapter 29:
 - Shall not be located within 4” vertically of the peak on peaked ceilings.
 - Shall be located within 36” of the high side, but not closer than 4” from the adjoining wall surface on sloped ceilings having a rise greater than 1’ in 8’.
 - Shall not be located in spaces where temperatures fall below 40°F or exceed 100°F.
 - Shall not be located where the mounting surface could become considerably warmer or cooler than the room.

29.11.3.1, 29.11.3.2, 29.11.3.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The majority of the smoke alarm and smoke detector spacing and location rules of chapter 29 coincide with those found in chapter 17. Following are specific requirements from chapter 29 (continued):
 - Shall not be installed between 10’ and 20’ of a stationary or fixed cooking appliance unless it is listed for resistance to common nuisance sources from cooking in compliance with the 8th edition of UL 217, the 7th edition of UL 268, or subsequent editions.
 - Shall only be installed between 6’ and 10’ of a stationary or fixed cooking appliance if necessary to provide compliance with other sections of the code and the kitchen or cooking area and adjacent spaces have no clear interior partitions or headers, unless it is listed for resistance to common nuisance sources from cooking in compliance with the 8th edition of UL 217, the 7th edition of UL 268, or subsequent editions.

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The majority of the smoke alarm and smoke detector spacing and location rules of chapter 29 coincide with those found in chapter 17. Following are specific requirements from chapter 29 (continued):
 - 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.
 - Shall not be installed within 3' of the tip of a ceiling fan paddle, unless the room configuration restricts meeting this requirement.
 - Shall be located so smoke rising in a stairway is not blocked from the detector by a door or obstruction.
 - Shall be located on the basement ceiling near the entry to the stairs.

29.11.3.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The majority of the smoke alarm and smoke detector spacing and location rules of chapter 29 coincide with those found in chapter 17. Following are specific requirements from chapter 29 (continued):
 - Shall be located on the ceiling or within 12" of the ceiling on tray shaped ceilings.
 - Smoke alarms and detectors shall be installed in rooms with joists or beams in compliance with the requirements of section 17.7.4.2.4.
 - Heat alarms and detectors shall be installed in rooms with joists or beams in compliance with the requirements of section 17.6.3.

29.11.3.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.11 Installation:
 - The majority of the heat alarm and heat detector spacing and location rules of chapter 29 coincide with those found in chapter 17. Following are specific requirements from chapter 29:
 - The derating tables for high ceilings of section 17.6.3.5.1 do not apply.
 - Shall be located within 36” of the high side, but not closer than 4” from the adjoining wall surface on sloped ceilings having a rise greater than 1’ in 8’.
 - Shall not be located where the mounting surface could become considerably warmer or cooler than the room.
 - In rooms with open joists or beams, all ceiling-mounted heat detectors or alarms shall be located on the bottom of joists or beams.

29.11.3.4

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Chapter 29 – Single- and Multiple-Station Alarms and Household Signaling Systems:

- 29.13 Inspection, Testing, and Maintenance:
 - Fire and CO warning equipment shall be maintained and tested in accordance with the manufacturer’s published instructions and per the requirements of 14.4.5 (single- and multiple-station alarms), 14.4.6 (household fire alarm systems), and 14.4.8 (household carbon monoxide detection systems).

29.13.1

END OF PERIOD 2 – MODULE 7

Period 2 Conclusion

- This concludes Period 2 of the apprenticeship program.
- The test will consist of questions about the material covered in Period 2 and will include questions from ***both*** the NFPA 72 National Fire Alarm and Signaling Code, 2022 Edition and the PowerPoint presentations.
- Apprentices will need a passing score on the test as well as their supervisor's approval to graduate from Period 2 of the program.