

NFPA® 4

Standard for Integrated Fire Protection and Life Safety System Testing

2015 Edition



NFPA, 1 Batterymarch Park, Quincy, MA 02169-7471
An International Codes and Standards Organization

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NFPA® 4

Standard for

Integrated Fire Protection and Life Safety System Testing

2015 Edition

This edition of NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, was prepared by the Technical Committee on Commissioning and Integrated Testing. It was issued by the Standards Council on April 29, 2014, with an effective date of May 19, 2014.

This edition of NFPA 4 was approved as an American National Standard on May 19, 2014.

Origin and Development of NFPA 4

The basis for NFPA 4, *Standard for Integrated Fire Protection and Life Safety System Testing*, was Chapter 7 of the 2012 edition of NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*. This chapter addressed integrated system testing as part of the overall fire protection and life safety system commissioning concept. Both the 2012 and 2015 editions of NFPA 3 were released as recommended practices as opposed to standards, which meant that the concept of integrated system testing was not required, but only described as a best practice.

The Technical Committee on Commissioning and Integrated Testing determined that while commissioning fire protection systems was not ready for standardization, there was an imminent need to create a standard for testing integrated fire protection and life safety systems. The technical committee requested to separate the concepts of commissioning and integrated system testing into two documents: the first, a recommended practice on commissioning; and the second, a new standard, NFPA 4, addressing the integrated system testing portion. This restructuring and request for a new project was approved by the Standards Council in October 2011 and resulted in Chapter 7 of the 2012 edition of NFPA 3 being removed for the 2015 edition and being used as the basis for NFPA 4.

NFPA 4 is intended to address the testing of the performance of the interconnection between multiple fire protection and life safety systems. Chapter 1 establishes the applicability of the standard and identifies that the standard is applied similar to a design or installation standard, from the perspective that the users should be directed to this standard by scoping provisions in a code, law regulation, or contract document.

NFPA 4 addresses the development of the integrated testing team and the coordination between the integrated testing agents (ITa) and test team. The standard spells out the roles and responsibilities of the owner, the ITa, and the test team in general, as well as qualifications for the ITa.

The standard also provides protocol for both the initial integrated system test that would occur during the construction phase of a project prior to issuance of the Certificate of Occupancy as well as the integrated system testing for existing buildings. Integrated system testing in existing buildings can be in the form of periodic integrated system testing or “trigger-based” testing. NFPA 4 provides the triggers for conducting these post-occupancy integrated system tests as well as the development for a frequency of periodic tests where they are deemed necessary.

Finally, the standard addresses the development of the test plan and the test scenarios as well as the documentation of the test.

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NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents that address commissioning and integrated system testing activities and tasks for fire protection and life safety systems. This includes the requirements for planning, organization, coordination, responsibility, implementation, and documentation of commissioning and integrated system testing of active and passive systems and features that serve a fire protection or life safety purpose.

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A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex C. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

1.1.1* The standard shall provide the minimum requirements for testing of integrated fire protection and life safety systems where such testing is required by the design documents, commissioning plan, governing laws, codes, regulations, or standards.

1.1.2* This standard shall not provide requirements for testing of individual systems.

1.1.3 The requirements of this standard shall apply to new and existing systems.

1.1.4* This standard shall not be interpreted to require integrated fire protection and life safety systems testing unless otherwise required by the design documents or commissioning plan, or by governing laws, codes, regulations, or standards.

1.2 Purpose.

1.2.1 The purpose of this standard shall be to provide a testing protocol that will verify that integrated fire protection and life safety systems perform as intended.

1.2.2 The integrated fire protection and life safety system test shall verify the proper operation and function of all interconnected fire protection and life safety systems.

1.3 Application.

1.3.1* This standard shall apply to integrated passive and active fire protection and life safety equipment and systems.

1.3.2* Integrated systems testing shall verify and document the following:

- (1) Performance in accordance with applicable codes and standards
- (2)*Sequence of operation
- (3) Performance in accordance with manufacturers' published instructions
- (4) Accuracy of record documents

1.4 Equivalency.

1.4.1 Nothing in this standard shall prevent the use of systems, methods, devices, or appliances of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.4.2 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.3 The systems, methods, devices, or appliances that are found equivalent shall be approved.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition.

NFPA 70®, *National Electrical Code*®, 2014 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*, 2013 edition.

NFPA 101®, *Life Safety Code*®, 2015 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems*, 2015 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2015 edition.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

2.4 References for Extracts in Mandatory Sections.

NFPA 3, *Recommended Practice for Commissioning of Fire Protection and Life Safety Systems*, 2015 edition.

NFPA 70®, *National Electrical Code*®, 2014 edition.

NFPA 72®, *National Fire Alarm and Signaling Code*, 2013 edition.

NFPA 101®, *Life Safety Code*®, 2015 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2013 edition.

NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities*, 2012 edition.

NFPA 1031, *Standard for Professional Qualifications for Fire Inspector and Plan Examiner*, 2014 edition.

NFPA 5000®, *Building Construction and Safety Code*®, 2015 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, is the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3* Listed. Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

3.2.4 Standard. A document, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and which is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the *Manual of Style for NFPA Technical Committee Documents*.

3.2.5 Shall. Indicates a mandatory requirement.

3.2.6 Should. Indicates a recommendation or that which is advised but not required.

3.3 General Definitions.

3.3.1* Basis of Design (BOD). A document that shows the concepts and decisions used to meet the owner's project requirements and the requirements of governing laws, codes, regulations and standards. [3, 2015]

3.3.2* Building. Any structure used or intended for supporting or sheltering any use or occupancy. [101, 2015]

3.3.3 Commissioning.

3.3.3.1 Commissioning (Cx). A systematic process that provides documented confirmation that building systems function according to the intended design criteria set forth in the project documents and satisfy the owner's operational needs, including compliance with applicable laws, regulations, codes, and standards. [3, 2015]

3.3.3.2* Commissioning Plan. The document prepared for each project that identifies the processes and procedures necessary for a successful commissioning process. [3, 2015]

3.3.4 Component. A part of an architectural, electrical, or mechanical system. [5000, 2015]

3.3.5 Construction Documents. Plans, specifications, and other documents that describe the construction project.

3.3.6 Construction Phase. The phase during which the systems and materials are fabricated and installed, tested, and accepted.

3.3.7 Drawings.

3.3.7.1* Record (Plan) Drawing. A design, working drawing, or as-built drawing that is submitted as the final record of documentation for the project. A drawing is also referred to as a plan. [3, 2015]

3.3.8 Individual System. See System.

3.3.9* Inspection. A visual examination of a system or portion thereof to verify that it appears to be in operating condition and is free of physical damage. [820, 2012]

3.3.10* Installation Contractor. A person or entity that provides labor and materials to install systems and equipment. [3, 2015]

3.3.11 Integrated System. See System.

3.3.12 Integrated System Tests.

3.3.12.1* Test. A procedure intended to establish the operational status or performance of a system or component. [3, 2015]

3.3.12.1.1 Control Group Test. An integrated system test that verifies the response of one or more individual systems by examining software programming and by testing only one or more initiating devices of another individual system.

3.3.12.1.2 End-to-End Integrated System Test. A test of the response of one or more individual systems to an input on another individual system.

3.3.12.1.3* Integrated Systems Test. A test performed on fire protection and life safety systems to confirm that operation, interaction, and coordination of multiple individual systems perform their intended function. [3, 2015]

3.3.12.1.4 Pre-Functional Testing. Tests performed prior to acceptance testing to confirm compliance with manufacturers' specifications, applicable codes and standards, and the project documents. [3, 2015]

3.3.13 Integrated Testing Agent (ITA). A person or entity identified by the owner, who plans, schedules, documents, coordinates, and implements the integrated testing of the fire protection and life safety systems and their associated subsystems. [3, 2015]

3.3.14 Interface. That place at which individual systems meet and act on or communicate with each other.

3.3.15* Interface Device. A component that connects an individual system to one or more other individual systems.

3.3.16 Issues Log. A formal and ongoing record of failures, deficiencies, or concerns, as well as associated priorities, implications, and resolutions. [3, 2015]

3.3.17* Manufacturer's Published Instructions. Published installation and operating documentation provided for each product or component. The documentation includes directions and necessary information for the intended installation, maintenance, and operation of the product or component. [72, 2013]



3.3.18* Narrative. A written summary description of the property and all applicable fire protection and life safety systems and related integrated operational features. [3, 2015]

3.3.19 Operation and Maintenance Manual. A system-focused composite document that includes the operation and maintenance requirements and additional information of use to the owner during the occupancy phase. [3, 2015]

3.3.20* Owner's Project Requirements (OPR). Documentation of the owner's goals and requirements for the project.

3.3.21* Qualified. A competent and capable person or entity that has met the requirements and training for a given field. [3, 2015]

3.3.22 Registered Design Professional (RDP). An individual who is registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the jurisdiction in which the project is to be constructed, or other professional with qualifications or credentials acceptable to the jurisdiction in which the project is to be constructed. [3, 2015]

3.3.23* Sequence of Operation. A matrix, narrative, or table of system inputs and outputs or responses that illustrate the interactions of interconnected fire protection and life safety systems.

3.3.24 Stakeholder. Any individual, group, or organization that might affect or be affected by the project. [3, 2015]

3.3.25 System.

3.3.25.1 Emergency Power Systems.

3.3.25.1.1 Critical Operations Power Systems (COPS). Power systems for facilities or parts of facilities that require continuous operation for the reasons of public safety, emergency management, national security, or business continuity. [70:708.2]

3.3.25.1.2 Emergency Power Supply (EPS). The source of electric power of the required capacity and quality for an emergency power supply system. [110, 2013]

3.3.25.1.3 Emergency Power Supply System (EPSS). A complete functioning EPS system coupled to a system of conductors, disconnecting means and overcurrent protective devices, transfer switches, and all control, supervisory, and support devices up to and including the load terminals of the transfer equipment needed for the system to operate as a safe and reliable source of electric power. [110, 2013]

3.3.25.1.4 Emergency Systems. Those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction. These systems are intended to automatically supply illumination, power, or both, to designated areas and equipment in the event of failure of the normal supply or in the event of accident to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life. [70:700.2]

3.3.25.1.5 Legally Required Standby Systems. Those systems required and so classed as legally required standby by municipal, state, federal, or other codes or by any governmental agency having jurisdiction. These systems are intended to automatically supply power to selected loads (other than those classed as emergency systems) in the event of failure of the normal source. [70:701.2]

3.3.25.2 Fire Protection Systems. Systems, devices, and equipment used to detect a fire and its by-products, actuate an alarm, or suppress or control a fire and its by-products, or any combination thereof. [1031, 2014]

3.3.25.3* Individual System. A system with no interconnections or a system within an integrated system to the point of interconnection or to the interface device. [3, 2015]

3.3.25.4* Integrated System. A combination of systems that are required to operate together as a whole to achieve overall fire protection and life safety objectives. [3, 2015]

3.3.25.5* Interconnected System. An integrated system that has component systems or devices physically connected to achieve fire protection and life safety objectives.

3.3.25.6* Life Safety Systems. Those systems that enhance or facilitate evacuation, smoke control, compartmentalization, and/or isolation. [1031, 2014]

3.3.25.7* Passive Fire Protection System. Any portion of a building or structure that provides protection from fire or smoke without any type of system activation or movement. [3, 2015]

3.3.26 System Connection.

3.3.26.1* Switch Connection. A connection between multiple individual systems using a device for making or breaking the connection in an electric circuit. [3, 2015]

3.3.26.2* Data Sharing Connection. A connection between multiple individual systems in which data streams are transferred.

3.3.26.3* Interconnection. The physical connections between interconnected systems.

3.3.27 Systems Manual. A compilation of all operational and maintenance manuals and description of the integrated fire protection and life safety systems. [3, 2015]

Chapter 4 General Requirements

4.1 Fundamental Principles.

4.1.1 This chapter shall apply to the testing of both new and existing integrated systems provided for fire protection and life safety.

4.1.2 Integrated testing of new or existing fire protection and life safety systems shall be performed where required by the design documents, commissioning plan, or governing laws, codes, regulations, or standards.

4.2 Integrated System Testing Team.

4.2.1* An integrated system test team shall be established in accordance with this section.

4.2.2 The owner shall be responsible for selecting the members of the integrated system test team.

4.2.3 At a minimum, the integrated test team shall consist of the integrated testing agent (ITA) and the installation, testing, or maintenance personnel for each integrated system.

4.2.3.1* Where permitted by the approved test plan, the owner shall assume the responsibilities of the ITA.

4.2.4* The integrated system test team shall be identified and documented in the test plan.

4.2.5 Personnel responsible for integrated system testing shall meet the qualifications listed in 4.3.

4.3* Qualifications.

4.3.1 Personnel involved in integrated system testing shall meet the requirements of this section.

4.3.2 Team members shall provide evidence of their qualifications when requested by the AHJ.

4.3.3 The integrated system test team shall have a working knowledge of the integration between systems for which testing is being performed.

4.3.3.1 The qualification of team members shall be as required by laws, regulations, codes, and standards relevant to the specific individual system.

4.3.3.2 Where no codes or standards are applicable to a system or portion of a system, the required knowledge of team members shall be in accordance with industry practices relevant to the particular system or portion of a system.

4.3.4* The integrated testing agent shall have skills that demonstrate an experience or knowledge of integrated operations of the design, installation, operation and maintenance of the type of fire protection and life safety systems installed.

4.3.4.1 Where an integrated testing agent is not required for the team, the team shall collectively have an understanding of the design, installation, operation, maintenance, and use of the integrated systems.

4.4 Responsibilities.

4.4.1 The owner shall be responsible for the testing of integrated fire and life safety systems.

4.4.2 The responsibility for integrated fire protection and life safety system testing shall be permitted to be delegated by the building or system owner to another person or organization.

4.4.3 Where the building or system owner has delegated any of the responsibilities for integrated fire protection and life safety system testing, a copy of the written delegation shall be included in the test plan and provided to the AHJ upon request.

4.4.4* The ITa shall be responsible for planning, scheduling, documenting, coordinating, and implementing the integrated system testing of the fire protection and life safety systems.

4.4.5 The test team shall be responsible for executing the test plan as directed by the ITa.

4.4.6 The ITa shall prepare a test plan.

4.5 Test Plan.

4.5.1* For new systems the minimum requirements for a test plan shall include the following:

- (1) Written verification that the integrated system and its individual systems have been installed in accordance with the approved design documents.
- (2)*List of the individual systems to be tested
- (3) Documentation of the individual systems as required by the applicable codes or standards
- (4)*Integrated test team and additional entities required to be in attendance

- (5) Equipment required for testing
- (6) A comprehensive functional matrix depicting all system inputs and associated output functions
- (7)*List of necessary drawings, including riser diagrams and control diagrams
- (8)*Narrative description of the test scenarios, including what is needed for record of completion to document approval by the AHJ
- (9)*The extent of systems to be tested under the direction of the ITa
- (10)*Test schedule, including individual systems
- (11) Periodic integrated systems test frequency

4.5.2* For existing systems the integrated test plan shall include sufficient information to allow the test team to verify that the integrated system(s) functions as was required when the system was initially installed.

4.5.2.1 The test plan shall include as many of the items listed in 4.5.1 as can be provided.

4.5.3* An integrated systems test plan shall not be required for buildings with limited integrated systems, where approved by the AHJ.

4.5.3.1 If an integrated system test plan is not required, integrated system testing is still required.

4.5.4 Testing of integrated systems shall begin by initiating the test scenarios described in the integrated test plan.

4.5.5 The test shall demonstrate that required responses have occurred in accordance with the integrated systems test plan.

4.5.6 Unless otherwise permitted in Section 4.5, integrated system testing shall validate that all of the responses and interactions found on the integrated fire protection and life safety systems conform to the design objectives.

Chapter 5 Test Methods

5.1 General.

5.1.1 This chapter shall apply to the method(s) for testing of integrated fire protection and life safety systems.

5.1.2 The risks associated with integrated testing shall be assessed during development of the test plan.

5.1.2.1 Integrated tests shall not endanger:

- (1) The building occupants
- (2) The personnel conducting the tests
- (3) The building, its contents, or operations

5.1.2.2 The integrated testing agent shall be responsible for ensuring that the assessment of risk is performed and documented by the test team.

5.1.2.3 Where the risk assessment identifies hazards to people, appropriate mitigation measures shall be included in the test plan.

5.1.2.4 Where the risk assessment identifies possible hazards to the building, contents, or operations the owner shall be notified in writing.

5.1.2.4.1 The owner shall determine if appropriate mitigation measures shall be required.



5.1.2.4.2 Where the owner chooses to accept the risk, the test plan shall record the decision.

5.1.2.4.3 Where the owner determines that the risk is not acceptable, appropriate mitigation measures shall be included in the test plan.

5.1.3 Where all of the following conditions and tests are verified, it shall not be required to test all devices on one individual system used to initiate a common response on other individual systems:

- (1) Two or more individual systems are interfaced using an interface device.
- (2) The integration of the systems takes place through a single interface.
- (3) The interface is programmed to deliver notification whenever any initiating device in a defined control group changes state.
- (4) At least one test is conducted by activating one of the initiating devices listed in the control group and observing the response of the interconnected systems (end-to-end test).
- (5) At least one test is conducted by activating an initiating device that is not listed in the control group and observing the response of the interconnected systems (end-to-end test).
- (6) The control group initiating devices have been verified by testing of the individual system in accordance with the applicable system standard for inspection, testing and maintenance.
- (7) For each test, it is verified that the response was in accordance with the functional matrix.

5.2 Test Method.

5.2.1* Integrated testing shall demonstrate that the final integrated system installation complies with the specific design objectives for the project and applicable codes and standards.

5.2.2 Test scenarios shall include events and combination of events, including but not limited to:

- (1) Loss of normal power
- (2) Water flow
- (3) Presence of smoke

5.2.2.1* Test scenarios utilizing a combination of events shall be permitted to include simulated events to activate initiating devices.

5.2.3 Test scenario events shall demonstrate that all interface devices perform their intended function in accordance with the approved design or sequence of operation.

5.2.4* Test scenario events shall verify that all required building functions occur.

5.2.5 Integrated fire protection and life safety systems testing shall verify the interconnections function properly.

5.2.6* During integrated testing, equipment shall be tested in accordance with the applicable system standard to verify systems perform according to their design function.

5.2.7 Written documentation of the testing shall be provided in accordance with Chapter 7.

5.2.8* Testing shall be repeated if changes or corrections are made to systems during testing that could affect the overall functionality of the systems.

5.2.9 Switch connections to fire alarm systems shall be tested in accordance with *NFPA 72, National Fire Alarm and Signaling Code*.

5.2.10 Control circuits requiring electrical power shall be tested for presence of operating voltage.

5.2.11 Loss of power to monitored circuits shall be tested to confirm signal receipt at one of the following:

- (1) A constantly attended location at the premises
- (2) A monitoring station as described in NFPA 731, *Standard for the Installation of Electronic Premises Security Systems*, Chapter 9
- (3) A supervising station as described in *NFPA 72, National Fire Alarm and Signaling Code*

5.2.12 Integrated testing of data sharing systems shall document the following:

- (1) Completion of acceptance testing for each component system
- (2) Verification of data transfer between component systems
- (3) Test of visual and audible signal upon loss of communication
- (4) Test of degrade mode for each component system
- (5) Proper function of integrated data sharing systems

Chapter 6 Test Frequencies

6.1 General. Integrated system testing shall occur as follows:

- (1) Upon installation (initial integrated systems test)
- (2) Periodically
- (3) Upon existing system modification

6.2 Initial Integrated Systems Test.

6.2.1* An initial integrated systems test shall be performed where required by a commissioning plan or integrated system test plan.

6.2.1.1 An initial integrated systems test shall verify the intended operation of all integrated systems and functions in accordance with either of the following:

- (1) Commissioning plan, or
- (2) Integrated system test plan

6.2.1.2 Where an integrated system test plan does not exist, a test plan shall be created in accordance with Section 4.5.

6.2.1.3 Where required, existing buildings that have not completed integrated system testing shall have integrated testing conducted in accordance with this standard.

6.3 Periodic Integrated Systems Testing.

6.3.1 Integrated fire protection and life safety systems shall have periodic integrated systems testing as specified in the test plan.

6.3.2* For existing systems, within five years of the adoption of this standard, an integrated system test plan shall be developed.

6.3.2.1 If an integrated system test plan is not developed within 5 years of the adoption of this standard, integrated systems testing shall be performed.

6.3.3* Integrated systems that were commissioned upon installation shall have periodic integrated systems testing at the interval specified in the commissioning plan.

6.3.4* Where integrated systems have not been commissioned in accordance with NFPA 3, an integrated system test plan shall be developed.

6.3.4.1 Where required by the governing laws, codes, regulations, or standards, the integrated system testing plan, including the integrated testing frequency and a schedule for conducting the tests shall be completed and submitted for approval as specified by the governing authority, codes, regulations, or standards.

6.3.5 In addition to periodic integrated systems testing, integrated system testing shall be performed when any of the following occurs:

- (1) New fire protection or life safety systems are installed and integrated into existing fire protection and life safety systems.
- (2) Existing fire protection or life safety systems are modified to become part of interconnected systems.
- (3) Changes are made to site-specific software for an individual system that is part of an integrated system.

6.3.5.1 Where a failure of an individual system interface occurs during operation or testing of an integrated system, the affected integrated functions shall be required to be re-tested to verify correct operation after repairs have been made.

6.3.5.2* Where an individual system that is part of an integrated system is modified, the portions of the integrated system affected by the change shall be required to be tested to verify correct operation.

6.4 Existing System Modifications.

6.4.1* Integrated system testing shall be performed in accordance with 6.4.2 through 6.4.3 when any of the following occurs:

- (1) New fire protection or life safety systems are installed and integrated into existing fire protection and life safety systems.
- (2) Existing fire protection or life safety systems are modified to become part of an integrated system.
- (3) Changes are made to site-specific software for an individual system that is a part of an integrated system.

6.4.1.1 Where a failure of an individual system interface occurs during operation or testing of an integrated system, the affected integrated functions shall be required to be re-tested to verify correct operation after repairs have been made.

6.4.1.2* Where an individual system that is part of an integrated system is modified, the portions of the integrated system affected by the change shall be required to be tested to verify correct operation.

6.4.2* All changes shall be tested as required by the applicable individual system standards.

6.4.3* In addition to known changes, 10 percent up to a maximum of 50 devices performing the unaffected input functions of each integrated system that has been changed shall be tested to verify correct operation or non-operation of the other integrated systems.

Chapter 7 Documentation

7.1 Application.

7.1.1 Documentation of integrated system testing shall comply with the minimum requirements of this chapter.

7.1.2 Documentation required by other approved installation standards referenced for the individual systems that make up the integrated system shall be used as required by those standards.

7.1.3 This chapter outlines documentation requirements, but does not prohibit additional documentation from being provided.

7.1.4 Upon completion of testing, the integrated testing agent (ITa) shall submit a final report to the owner stating that the integrated system has been tested in accordance with the approved test plan and this standard.

7.2 Minimum Required Test Documentation.

7.2.1 The final test report shall summarize the results of the integrated testing.

7.2.2 The test report shall include a narrative or matrix describing each test and the response of the integrated system and individual systems.

7.2.2.1* The test report shall include a description of the status of each individual system for each test.

7.2.2.2 The report detail for each test shall identify the individual system where a condition was simulated or where a device state change was initiated.

7.2.2.3 The report detail for each test shall identify each individual system where a response occurred as the result of a simulated condition or a change in state for an initiating device.

7.2.3 The test report shall include a statement that all input and output functions of the integrated system have been tested and operate as intended.

7.2.3.1 Where any test result does not comply with the intended design, a description of the fault shall be made in an issues log.

7.2.3.2 Where any test result does not comply with the intended design, corrective action report shall be prepared.

7.2.4 The ITa shall maintain a record of faults, failures, and discrepancies discovered through the testing process in the issues log.

7.2.5 The issues log shall list each separate finding and its corresponding resolution, including dates of discovery and resolution.

7.2.6 Corrective action reports shall be prepared and shall provide a specific and detailed description of actions taken to remediate faults, failures, and discrepancies discovered during the testing process.

7.3 Completion Documents.

7.3.1 Upon completion of testing and after all issues and discrepancies have been resolved, the ITa shall submit completion documents to the owner and, where requested, to other stakeholders.



7.3.2 All documents required by section 7.2 of this standard shall be included in the completion documents.

7.3.3 A copy of the test plan required by 4.5 shall be included in the completion documents.

7.3.4 The completion documents shall include all documentation required by the integrated system design documents or by other governing laws, codes, or standards.

7.4 Record Retention, and Record Maintenance.

7.4.1 The property or building or system owner or the owner's designated representative shall be responsible for records retention.

7.4.2 Records shall be on a medium that will survive the retention period.

7.4.3 All records required by this chapter shall be available for examination by the authority having jurisdiction.

7.4.4 Archiving of records by any means shall be permitted if hard copies of the records can be provided promptly when requested.

7.4.5 All documents required by this chapter shall be retained as follows:

7.4.5.1 Documentation of the initial integrated system test shall be retained until a new initial integrated system test report has been provided to the owner.

7.4.5.2 The two most recent periodic integrated system test documents shall be retained.

7.4.6 All records required by this chapter shall be kept in one location.

7.4.7 The location of the documentations shall be identified at the fire alarm control unit.

7.4.8* Security for documentation shall be determined by the stakeholders.

7.4.9 Where documents cannot be protected from public access, it shall be permitted to remove sensitive information from record documents provided that the owner retains complete documentation that will be made accessible to the authority having jurisdiction at an owner-designated location.

7.5 Forms.

7.5.1 Approved documents and forms shall be used to record integrated testing of fire and life safety systems.

7.5.2 Forms required by other governing laws, codes or standards, or by project specifications or drawings, shall be permitted to be used in place of forms required by this section provided that the minimum required content is included.

7.5.3 Custom forms shall be permitted to be used in place of forms required by this section provided that the minimum required content is included.

7.5.4 Where no form or checklist exists, specific forms or checklists shall be developed to document testing of the integrated system and individual systems.

7.5.5 Unless otherwise permitted or required in 7.5.1 through 7.5.4, Figure 7.5.5(a) shall be used as the issues log form and Figure 7.5.5(b) shall be used as the corrective action report form.

Project: _____ Prepared by: _____ Page ____ of ____

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2015 Edition

CORRECTIVE ACTION REPORT

Project: _____ ID: _____

Equipment/System: _____ Equipment/System ID: _____

Identified from: ☐ Test ☐ Review ☐ Discussion _____ ☐ Site visit _____
Date

The above equipment has been observed and tested, or the performance report reviewed, and was found to not comply with the contract documents.

Deficiencies or issues and effects:

Corrective action: ☐ Required ☐ Recommended

For testing to proceed in a timely manner, it is imperative that the required corrective action be completed by:

_____ Date or Event

Commissioning Agent _____ Date _____ Owner's Representative _____ Date _____

Forwarded to the following parties on _____ for corrective action:
Date

Attachments? ☐ Yes ☐ No

Fill in the following section and return entire form to commissioning agent when corrected.

Statement of Correction

The above deficiencies have been corrected with the following actions:

Signature _____ Firm _____ Date _____

FIGURE 7.5.5(b) Corrective Action Report.