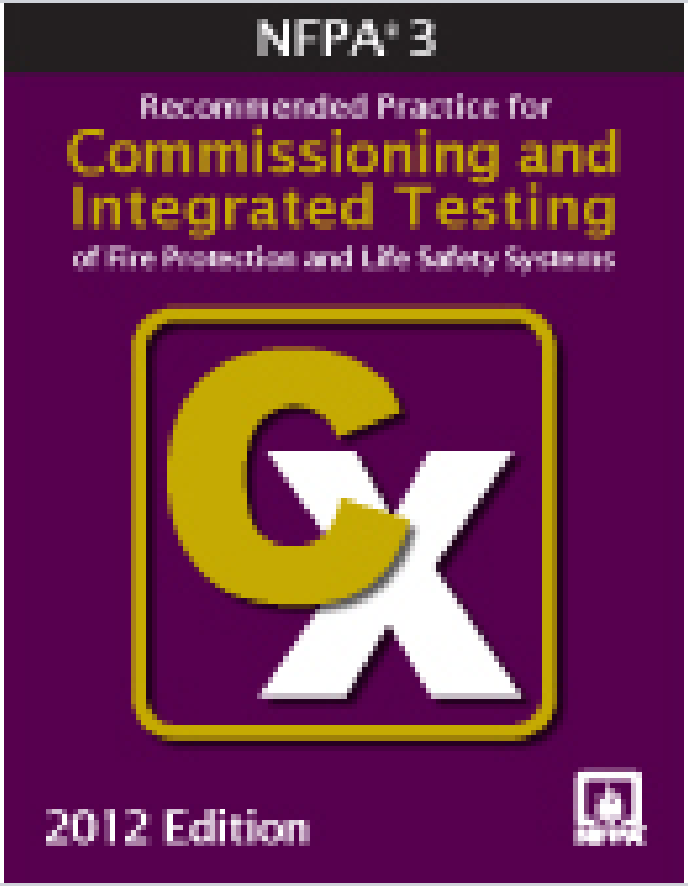

- Recommended Practice on Commissioning and Integrated Testing of Fire Protection and Life Safety Systems, 2012 Edition

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NFPA 3 Overview

Outline

- How we got here
- NFPA starts the creation process
- NFPA 3 Content
- Summary-Charging Statement
- Questions

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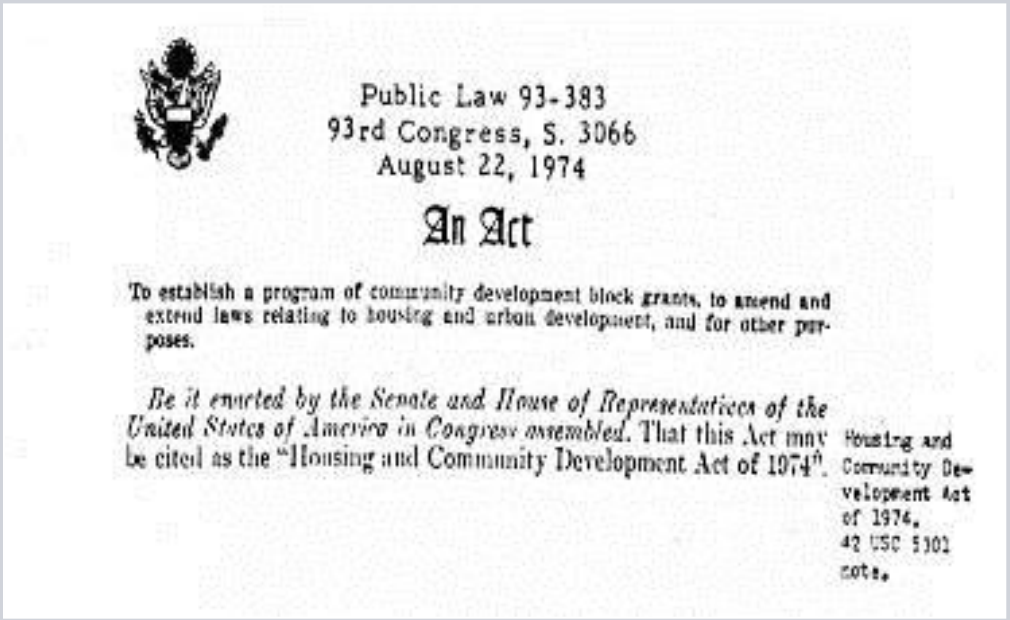
Understanding how we got here

The National Institute of Building Sciences (NIBS) was authorized by the U.S. Congress in the Housing and Community Development Act of 1974, Public Law 93-383.



Public Law 93-383
93rd Congress, S. 3066
August 22, 1974

An Act

To establish a program of community development block grants, to amend and extend laws relating to housing and urban development, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That this Act may be cited as the "Housing and Community Development Act of 1974".

Housing and Community Development Act of 1974, 42 USC 5301 note.

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Understanding how we got here

In establishing the Institute, Congress recognized the need for an organization that could serve as an **interface between government and the private sector**.

The Institute's public interest mission is to serve the Nation by supporting **advances in building science and technology.**

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NIBS Charter

Develop & maintain performance criteria for maintenance of life, safety, health, and public welfare for the built environment.
Evaluate building technology to meet the above criteria.
Conduct related and needed investigations
Assemble, store, and disseminate technical data and related information

The Issue is identified

NIBS has identified trending that is affecting construction

- Increased Construction Costs
- Increased Construction Time or Schedule
- Reduced Quality
- Lowered Performance Results and Expectations
- Systemic Conflicts

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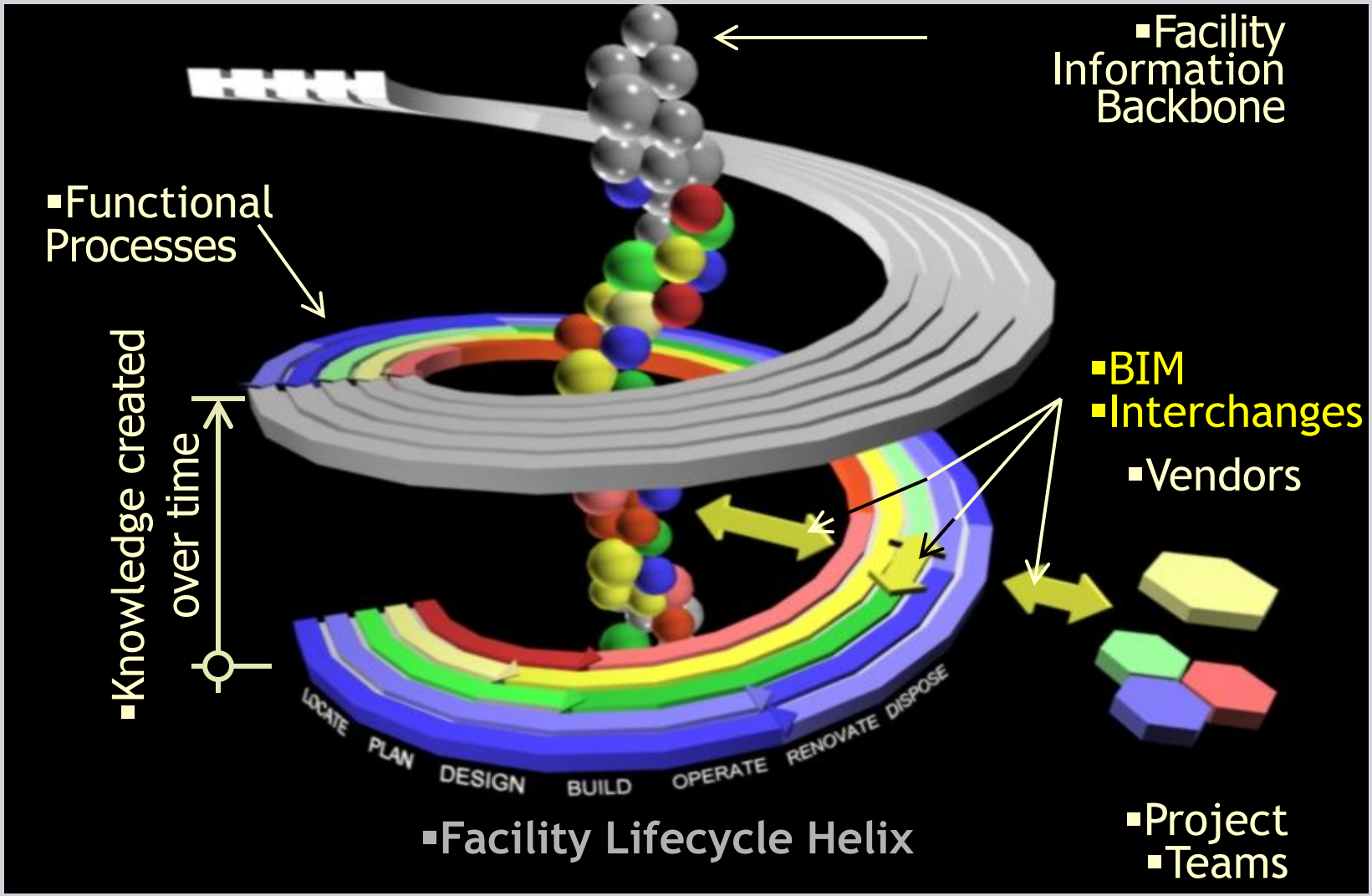

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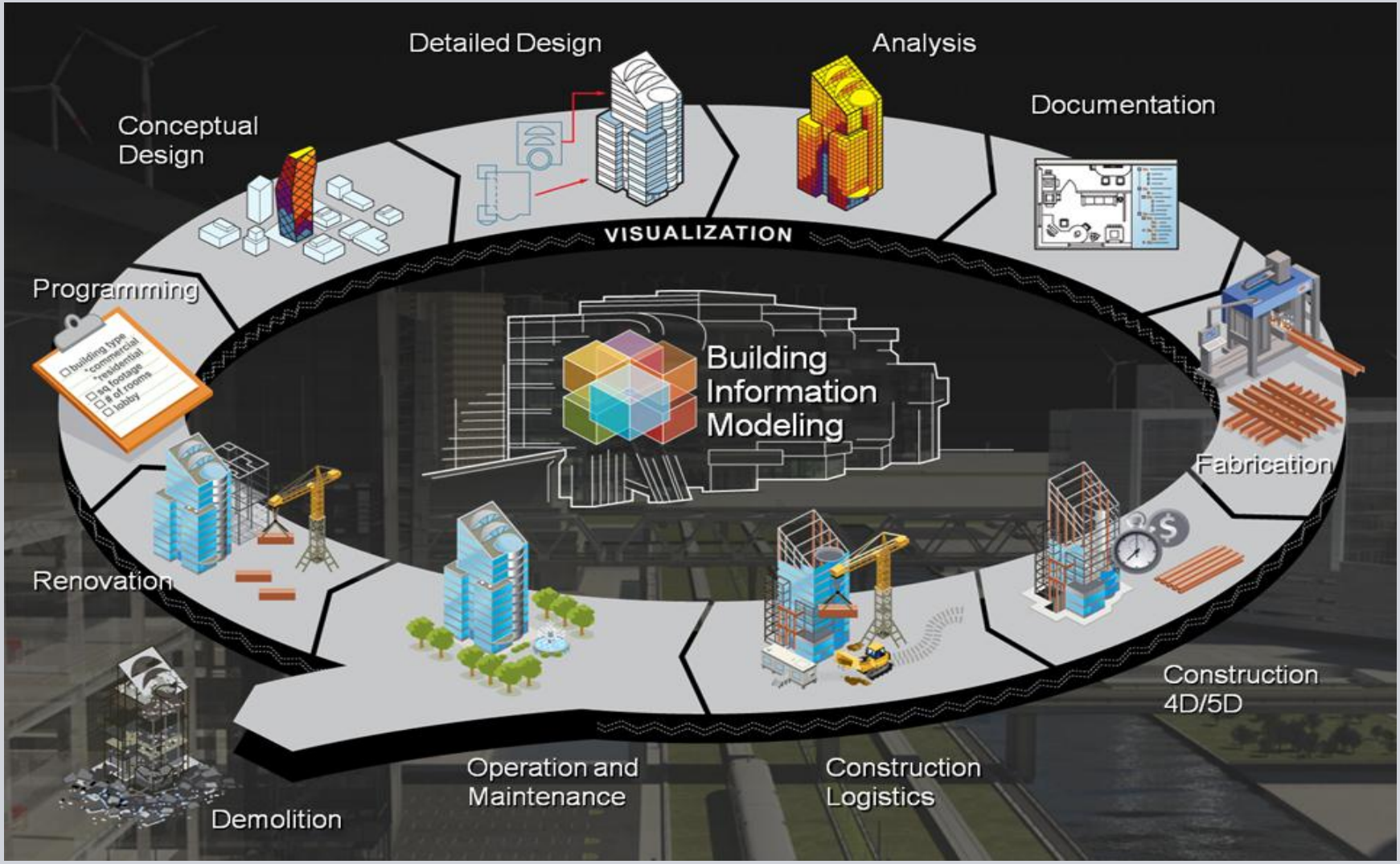

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Start of NFPA 3

David A. Harris, FAIA , Retired 2008, President of the National Institute of Building Sciences (NIBS) sends letter to NFPA on August 11, 2006 requesting the establishment of a new committee project on the subject of “Fire Protection Systems Commissioning” and to produce a Guideline on fire protection commissioning

To be part of NIBS program to produce Total Building Commissioning Guidelines for major building systems

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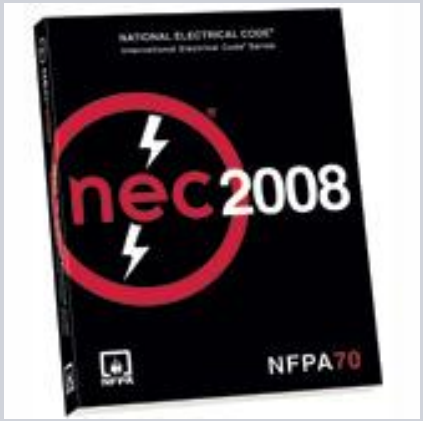

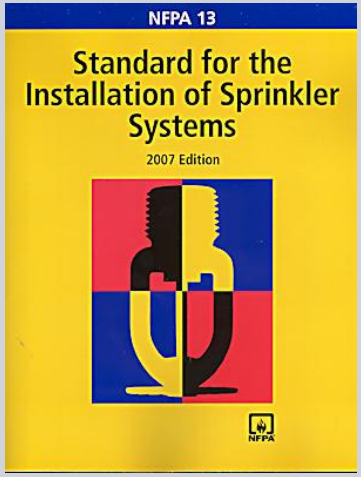

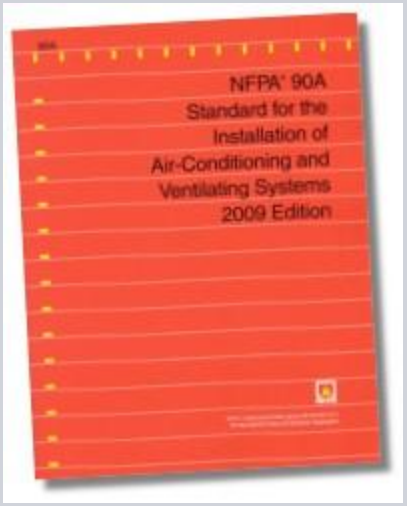

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History

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NFPA Standards Council approves a new Commissioning document

At the April 2010 ROP meeting, the Technical Committee voted to have the first edition of NFPA 3 released as a Recommended Practice

NFPA at its June Association Technical Meeting held June 12–15, 2011, in Boston, MA. It was issued by the Standards Council on August 11, 2011, with an effective date of August 31, 2011, and supersedes all previous editions.

This edition of NFPA 3 was approved as an American National Standard on August 31, 2011.

NFPA 3

What is commissioning???

Lets think about this….

Cx=Commissioning

Commissioning Basics

A process of documentation, adjustment, testing, verification and training, performed specifically to ensure that the finished facility operates in accordance with the ***owner's documented project requirements*** and the ***construction documents***.

It begins in pre-design and continues through design, construction and the life of the facility.

Commissioning Basics

Commissioning is a quality assurance or quality control process that will verify that a building or system will perform as intended.

Commissioning Basics

Performance verification is demonstrated through inspection, testing and documentation of these activities.

The commissioning process varies from the traditional concept of testing and start-up in that commissioning begins at the project inception and continues through design, construction and project closeout; and then throughout the facility's operations phase.

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Commissioning Basics-Goal

The ultimate goal of systems or building commissioning is to ensure that a facility meets the ***operational needs of building owners*** and provides for the ***continued efficient and effective operation*** of the building or systems ***throughout its intended service life***.

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What Commissioning is Not

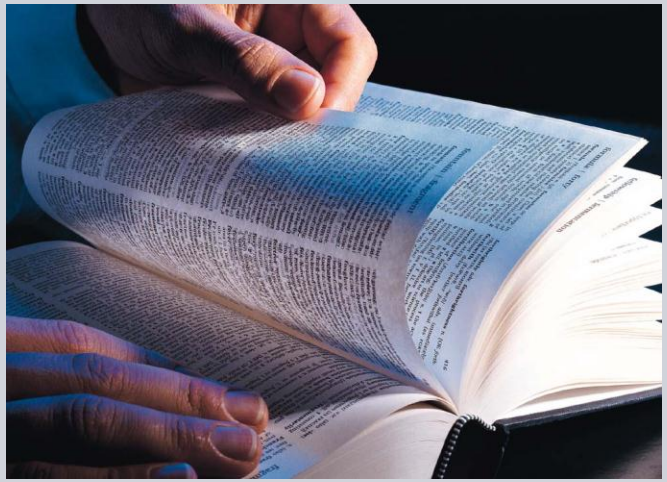
Completing standard forms

Contractors' QA/QC program

Verification of the contractors' QA/QC program

Construction inspection

Construction management



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What Commissioning is Not

NFPA 72 requires all new systems to have a *"Record of Completion"* and refers to final checkout, not commissioning.

FIRE ALARM AND EMERGENCY COMMUNICATION SYSTEM RECORD OF COMPLETION

To be completed by the system installation contractor at the time of system acceptance and approval.
It shall be permitted to modify this form as needed to provide a more complete and/or clear record.
Insert N/A in all unused lines.
Attach additional sheets, data, or calculations as necessary to provide a complete record.

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Objections To Commissioning

"Haven't I already paid for a quality building in my design and construction fees?"

Designer's (A/E) services typically do not include field verification that their design works as intended.

Construction Manager's services typically do not include functional verification that the installed systems meet design intent.

"Isn't the Commissioning Authority just a 'bigger hammer' for the owner to use to pound the designer and contractor?"

No, the CxA must be a team builder by using the commissioning process to the benefit of all.

No, the CxA should respect the traditional construction disciplines. The CxA has a distinct responsibility to owner for system quality and performance.

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Remember The Objectives

Clearly document the ***building owner's needs***

Provide an organized, documented approach to verify quality of deliverables

Verify ***through documentation*** that systems and equipment perform according to ***specifications and the building owner's needs***

Provide for improved ***training of maintenance*** personnel

Provide for improved documentation of operations and maintenance requirements for systems and equipment

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Total Building Commissioning

Purpose:

- Exterior enclosure system to fully support the commissioning process
- Acceptance during each phase
- Documentation during each phase
- System manual and training for operations and maintenance personnel and occupants

CxA Objectives of the pre-design phase:

- Developing the ***owner's project requirements*** (OPR)
- Identifying a scope ***budget*** for the commissioning process
- Developing the initial commissioning plan
- Acceptance of pre-design phase commissioning process activities

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Total Building Commissioning

Commissioning-Focused Review of Design Documents:

- General quality review
- Coordination review
- System specific review
- Schematic design documentation
- Design development documents
- Construction documents

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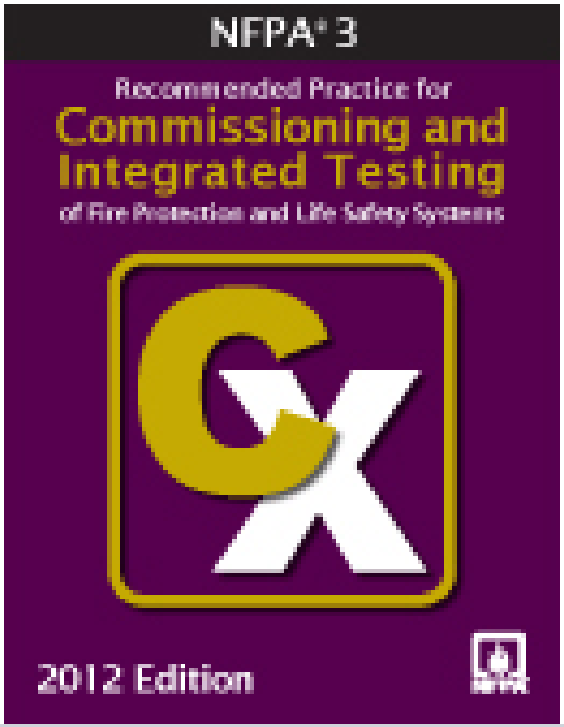

- Recommended Practice on Commissioning and Integrated Testing of Fire Protection and Life Safety Systems,
  - 2012 Edition

NFPA 3 Chapter 1 Administration

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1.1 Scope. This recommended practice provides the recommended procedures, methods, and documentation for commissioning and integrated testing of active and passive fire protection and life safety systems and their interconnections with other building systems.

1.2* Purpose. The purpose of this recommended practice is to describe the commissioning process and integrated testing that will ensure fire protection and life safety systems perform in conformity with the design intent.

1.3* Application.

1.3.1* This recommended practice applies to passive and active fire protection and life safety equipment and systems including, but not limited to, the following:

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Application cont'd

1) Infrastructure supporting the building fire protection and life safety systems within the boundaries of the project
2) Fixed fire suppression and control systems
3) Fire alarm systems
4) Emergency communications systems (ECS)
5) Smoke control and management systems
6) Normal, emergency and standby power systems
7) Normal, emergency and standby power systemsExplosion prevention and control systems
8) Fire-resistant and smoke-resistant assemblies
9) Commercial cooking operations
10) Elevator systems
11) Means of egress systems and components
12) Other systems or installations integrated or connected to a fire or life safety system, such as, but not limited to, access control, critical processes, and hazardous operations

1.3.2 Commissioning should achieve the following:

1) Documentation of the ***owner's project requirements*** (OPR) and the basis of design (BOD) provided
2) Equipment and systems installed as required
3) Integrated testing for all integrated fire and life safety systems performed and documented
4) Delivery of operation and maintenance (O&M) documentation
5) Training of facility operating and maintenance staff
6) Identification and documentation of the requirements for maintaining system performance to meet the original design intent during the occupancy phase

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Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this recommended practice and should be considered part of the recommendations of this document.

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

NFPA 72®, National Fire Alarm and Signaling Code, 2010 edition.

NFPA 731, *Standard for the Installation of Electronic Premises Security Systems,* 2011 edition.

2.3 Other Publications.

Merriam-Webster's Collegiate Dictionary,

2.4 References for Extracts in Recommendations Sections.

NFPA *101;* NFPA 820; NFPA 1031; *NFPA 5000 and Safety Code®,* 2012 edition**.**

Chapter 3 Definitions

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5 Pages, Many new Terms

Key Definitions

Commissioning (Cx). A systematic process that provides documented confirmation that specific and interconnected fire and life safety systems function according to the intended design criteria set forth in the project documents and satisfy the owner's operational needs, including compliance requirements of any applicable laws, regulations, codes and standards requiring fire and life safety systems

Key Definitions

Integrated System. A combination of systems that are required to operate together as a whole to achieve the fire protection and life safety objectives.

Integrated Testing. An assessment of fire protection and life safety systems function and operation using direct observation or other monitoring methods to verify the correct interaction and coordination of multiple systems in conformance with the fire protection and life safety objectives.

Chapter 4 Qualifications of Commissioning Personnel

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4.1 Applicability.

Members of the fire protection and life safety commissioning team should meet the requirements of this chapter.

4.2 Qualifications.

4.2.1 Fire Commissioning Agent (FCxA).

4.2.1.1* General.

4.2.1.1.1 The FCxA should be knowledgeable and experienced in the proper application of commissioning recommendations of this recommended practice and general industry practices.

4.2.1.1.2 The FCxA should be individually identified on the specifications or other enabling documentation.

4.2.1.1.3 The FCxA should provide an objective and unbiased point of view.

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5.1 General.

5.1.1* This chapter provides the recommendations for commissioning fire protection and life safety systems.

5.1.2* Commissioning of fire protection and life safety systems should include, but not be limited to, the planning phase, design phase, construction phase, and occupancy phase

5.2 Planning Phase.

5.2.2* Fire Protection and Life Safety Commissioning Team.

5.2.2.4 Owner.

5.2.2.6 Fire Commissioning Agent (FCxA).

5.2.2.7 Installation Contractor

5.2.2.8 Manufacturer's Representative.
5.2.2.9 RDP. Registered Design Professional
5.2.2.10 Construction Manager/General Contractor.
5.2.2.11 Insurance Representative.
5.2.2.12 Owner's Technical Support Personnel.
5.2.2.13 Third-Party Test Entity.
5.2.2.14 Facility Manager or Operations Personnel.
5.2.2.15 AHJ.
5.2.3 Owner's Project Requirements (OPR).
5.2.4 Commissioning Plan.
5.2.4.1 The commissioning plan should be continuously updated by the fire protection and life safety commissioning team throughout the planning, design, construction, and occupancy phases of the building life cycle.

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Sample of Installation Contractors role in Cx Plan

Installation Contractor

- (1) Include all Commissioning Process requirements and activities in the scope of services.
- (2) Attend required Commissioning Team meetings.
- (3) Include Commissioning Process milestones in the project schedule.
- (4) Implement the training program as required by the Contract Documents.
- (5) Provide submittals to the RDP, Owner and Commissioning Team.
- (6) Develop individual system test plan, including acceptance and integrated testing.
- (7) Notify the General Contractor and FCxA when systems are ready for testing.
- (8) Demonstrate the performance of the systems, including integration.
- (9) Complete the Construction Checklists as the work is accomplished.
- (10) Continuously maintain the Record Drawings as required by the Construction Documents.

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6.1 General.

This chapter should apply to the functions of integrated systems provided for fire protection or life safety in the design phase, construction phase, and occupancy phase of the commissioning process of Chapter 5.

Note: Important to understand, EACH system shall be tested per its individual standard, such as fire alarm NFPA 72. This Integrated Systems Commissioning is the testing of the systems that interact with each other, such as fire alarm with smoke control etc.

Chapter 7 Integrated System Testing

7.1 General.

7.1.1 This chapter applies to the testing of integrated systems provided for fire protection or life safety.

7.1.2 Personnel responsible for integrated testing should meet the qualifications listed in 4.2.8 for ITa.

Note: NFPA 4 Integrated System Testing, a new standard is being created that will provide all of the details necessary in this important aspect of testing. Estimate a 2015 release

Chapter 8 Re-commissioning (Re-Cx) and Retro-commissioning (RCx) of Fire Protection and Life Safety Systems

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8.1* General.

This chapter provides recommendations for the re-commissioning and retro-commissioning recommendations of active and passive fire protection and life safety systems where installed in existing structures.

8.2 Re-commissioning.

8.2.1* Fire protection and life safety systems that have been commissioned upon installation in accordance with the commissioning process of Chapter 5 of this standard should be re-commissioned as specified by a re-commissioning plan.

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Chapter 9 Commissioning Documentation and Forms

9.1* Documentation.

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

9.2 Allowable Documents.

Documents from NFPA and other approved installation standards referenced in the BOD should be utilized.

9.3 Forms and Checklists.

Where no form or checklist exists, specific forms or checklists should be developed to document successful testing of systems and components.

9.4* Document Retention.

Test documents should be retained by the owner for the life of the system.

Annex A Explanatory Material

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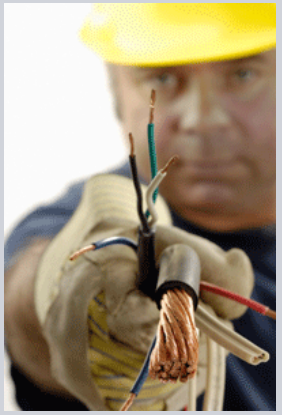
30 Pages of Annex Material for review and reference

Who cares about Commissioning?



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Reference Sources

Rodger Reiswig-NEMA 2nd Vice Chair

Shane Clary, PhD. AFAA Board of Directors

NFPA 3 and NFPA source documents

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Questions

Thank You……..

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