



## Course Objectives

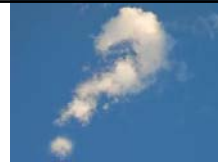
Recognize the benefits of properly commissioned fire and life safety systems relating to NFPA 3 (Recommended Practice on Commissioning and Integrated Testing of Fire Protection and Life Safety Systems).

## What is the Big Deal?

— Various individual standards dealing with acceptance of new and/or modified protective systems that are connected to one another:

- NFPA 13: Standard for the Installation of Sprinkler Systems
- NFPA 14: Standard for the Installation of Standpipes and Hose Systems
- NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection
- NFPA 16: Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
- NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 24: Standard for the Installation of Private Fire Service Mains and Their Appurtenances

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## Reasonable Confusion

### Recent Contractors BLOG: Does NFPA 13 require as-built drawings?

#### **NFPA 25: 12.3.2**

**YES:** As-built drawings, original acceptance test records, and device mfg. bulletins shall be retained to assist in the proper care of the system and its components

**NO:** NFPA 25 can say what they want, NFPA 13 does not.

**BUT:** They adopted NFPA 25 too.

**SO:** Per title, NFPA 25 is only for testing, all other info is just recommended.

**I GET IT:** It is saying IF there are as-builts, they must be stored.

**YES:** And, NFPA 13 only talks about working plans- which are only to be used in the installation phase

**MAKES SENSE:** As-builts are supposed to combine working plans with fitters field notes. And, fitters notes are rough and who has the money to note every change any way.

**AGREE:** What really changes other than a few heads anyway.



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## What are “Project Plans”

### NFPA 3:

- Construction documents
- Record (plan) drawing
- Working (plan) drawing
- Shop drawing

### NFPA 13:

- Preliminary plans
- Working plans> shop drawings
- Approved plans> AHJ deviation approvals
- Owners Certificate

### NFPA 25:

- As-built system installation drawings

### NFPA 72:

- Shop drawings
- Scaled floor plans
- Approved plans
- Floor plans (and “as-built plans cabinet)
- Outline plans
- System Record of Completion

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..... Anyway we have a project team that has been doing these kinds of things for years .....



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## Commissioning

**What is it?  
(NFPA 3) \*\***

A systematic process that provides documented confirmation that specific and interconnected fire protection and life safety systems function according to the intended design criteria and satisfy the owner's operational needs, including compliance requirements of any applicable laws, regulations, codes and standards.

**\*\* Will be voted on by the NFPA Membership the week of June 13, 2011.**

**What is the  
scope of  
NFPA 3?**

The minimum requirements for procedures, methods, and documentation in commissioning and the integrated testing of active and passive fire protection and life safety systems.

**What is the  
purpose of  
NFPA 3?**

The purpose of this standard shall be to provide a reasonable degree of assurance that fire protection and life safety systems function in accordance with the basis of design (BOD) and the owner's project requirements (OPR) through standardization of the processes for commissioning and integrated testing.

## BOD & OPR

### **Basis of Design (BOD):**

A document that shows the concepts and decisions used to meet the owner's project requirements and applicable standards, laws, and regulations. Document describes initial design decisions and system descriptions.

### **Owner's Project Requirements (OPR):**

The documentation that provides the owner's vision for the planned facility, integrated requirements, expectations for how it will be used and operated, and benchmarks and criteria for performance.

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## Previewing the TOC of NFPA 3

- Chapter 1: Administrations
- Chapter 2: Referenced Publications
- Chapter 3: Definitions
- Commissioning
- Integrated Systems
- Interconnected Systems
- Passive Systems
- Re-commissioning
- Retro-commissioning
- Periodic Integrated Testing
- Qualifications of Commissioning Personnel
- Commissioning Documentation and Forms

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## What is the NFPA 3 Application?

- (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) Explosion 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

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## What is the NFPA 3 Application?

Integrated testing shall verify and document the following:

- 1) Performance in accordance with applicable codes and standards
- 2) Compliance with BOD and OPR
- 3)\* Sequence of operation
- 4) New technology, devices, or equipment
- 5) Installation in accordance with manufacturers' requirements
- 6) Accuracy of diagrams of system interconnections and device locations prior to final acceptance

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## Integrated System

A combination or group of systems either interconnected or separate, but required to operate together as a whole to achieve the fire protection and life safety systems.

## Integrated Testing

Assessment of fire protection and life safety systems function and operation using direct observation or other monitoring methods to determine the correct interaction and coordination of multiple systems in conformance with owner's project requirements and the basis of design.

## Periodic Integrated Testing

Fire protection and life safety systems that have been commissioned upon installation in accordance with the commissioning process of this standard shall have integrated testing in accordance with the commissioning plan.

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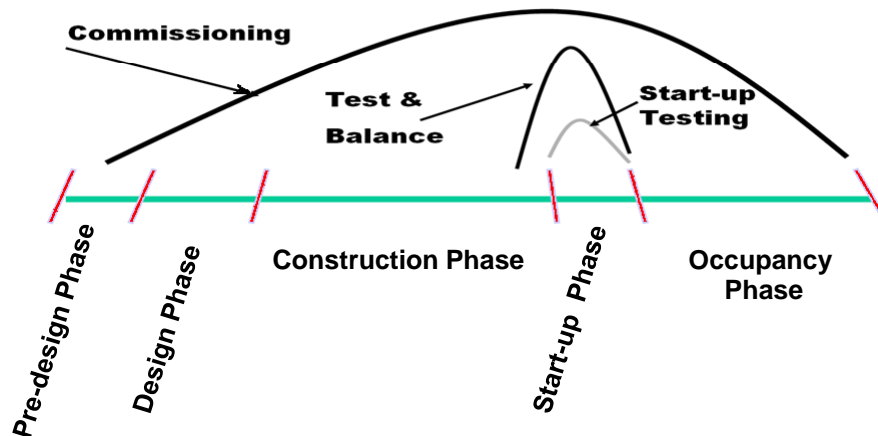


## Commissioning Team

- Owner
- Commissioning Authority (CxA)
- Fire Commissioning Agent (FCxA)
- Installation Contractors
- Manufacturer Representatives
- Registered Design Professional (RDP's)
- Construction Manager/ General Contractor
- Owner's Technical Support Personnel
- Third Party Test Entity
- Facility Manager/Operations Personnel
- AHJ
- Insurance Representative



## NFPA 3 Project Phases



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## The Benefits

### The National Institute of Building Sciences (NIBS)

#### Owners of commissioned systems

- “Organizations that have researched commissioning claim that owners can achieve savings in operations of \$4 USD over the first five years of occupancy as a direct result of every \$1 USD invested in commissioning —an excellent return on investment.”

#### Owners who did not invest in commissioning practices

- “The cost of not commissioning is equal to the costs of correcting deficiencies plus the costs of inefficient operations. For mission-critical facilities, the cost of not commissioning can be measured by the cost of downtime and lack of appropriate facility use.”

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## The Benefits

### Contractors who practice commissioning

- Report reduced change orders
- Better project pre-planning
- Deeper partnership with owners
- Increased opportunity for future routine and compliance inspections and/or testing

### Local maintenance teams who were given commissioned systems

- Realize fewer false alarms and/or disruptions
- Lower maintenance costs
- Better documentation for procedural changes
- Enhanced team training opportunities

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## What Does A Real Commissioned Installation Look Like?

- An approved/reviewed set of drawings were created
- Approved set of drawings were compared to the Installer's as-built set:
  - Location of additional devices and circuit layout were identified
  - Monitoring service (UL Central Station Service) was able to label alarms as owner sees them and could later certify the system
- Pre-test documentation were created validating owners wishes:
  - That only UL Approved equipment be used
  - That only qualified and/certified installers complete work
- Incremental and pre-acceptance testing was conducted and documented
  - Ten percent of the smoke detectors on every initiating-device circuit and signaling line circuit should be removed from their bases, one at a time



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## What Does A Real Commissioned Installation Look Like?

### Continued

- Break one connection on 10% of the initiating devices (manual pull boxes, heat detectors, sprinklers flow switches, valve supervisory switches, spot smoke detectors, duct smoke detectors)
- Break one connection on 10% of the devices on signaling line circuits (trouble alarms)
- Remove one connection on 10% of the appliances on each notification-appliance circuit
- Functional testing yielded high success ratio
- Voice, Horns/Speakers and Strobes were tested only when planned and during agreed upon times
  - Sound measurements were recorded
  - Documentation was honored by AHJ
- Synchronization of initiating devices and auxiliary devices were coordinated for elevator returns, smoke doors, etc. using floor plans



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## What Does A Real Commissioned Installation Look Like?

A very well documented project!

**Sample**

1. PROTECTED PROPERTY INFORMATION

2. FIRE ALARM SYSTEM INSTALLATION

3. TYPE OF FIRE ALARM SYSTEM

4. SIGNALING LINE CIRCUITS

5. ALARM/NOTIFYING DEVICES AND CIRCUITS

6. SUPPLEMENTARY SIGNAL INITIATING DEVICES AND CIRCUITS

7. ALARM/NOTIFYING DEVICES AND CIRCUITS

8. ALARM/NOTIFYING DEVICES AND CIRCUITS

9. ALARM/NOTIFYING DEVICES AND CIRCUITS

10. RECORDING OF

11. RECORDING OF

12. RECORDING OF

13. IDENTIFICATION AND APPROVALS

13.1 System Installation Contractor

13.2 System Service Contractor

13.3 Control Station

13.4 Authority Having Jurisdiction

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## Want More?

- SFPE FPEmag.com
  - Commissioning Buildings for Fire & Life Safety- T. Brown
  - Commissioning Smoke Control Systems- K. Elovitz
  - FP Engineering: Issue No. 48, Q4, 2010
- NFPA 5000
- NFPA Commissioning Fire Protection Systems- D. Hague
- ASHRAE Guideline 0-2005, *The Commissioning Process*
- ASHRAE Guideline 1.1 - HVAC&R Technical Requirements for the Commissioning Process
- NIBS Whole Building Design Guide
- U.S. GSA PBS-P100 & The Building Commissioning Guide

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## Want More?

- AS 1670.1-2004 Fire detection, warning, control and intercom systems - System design, installation and commissioning – Fire
- BS 5839-1 The Design, Installation, Commissioning, and Maintenance of Fire Detection and Fire Alarm Systems
- Testing and Commissioning Procedures for Fire Service Installations in Government Buildings of Hong Kong Special Admin. Region (2007)  
[http://www.archsd.gov.hk/english/publications/publication\\_pdf/e103.pdf](http://www.archsd.gov.hk/english/publications/publication_pdf/e103.pdf)

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Previous

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Research Triangle Park, NC 27709, USA  
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and committed to quality service

Applicant ID No: 257526-001  
Service Center No: 4  
Expires: 31-MAR-2009

### CERTIFICATE OF COMPLIANCE

THIS IS TO CERTIFY that the Alarm Service Company indicated below is included by Underwriters Laboratories Inc. (UL) in its Product Directories as eligible to use the UL Listing Mark in connection with Certified Alarm Systems. The only evidence of compliance with UL requirements is the issuance of a UL Certificate for the Alarm System and the Certificate is current under UL's Certificate Verification Service.

Listed Service From: **CHICAGO, IL**

Alarm Service Company: **(257526-001)** Service Center: **(257526-001)**

**EMERGENCY TWENTY-FOUR INC** **EMERGENCY TWENTY-FOUR INC**  
4170 W IRVING PARK RD 4170 W IRVING PARK RD  
CHICAGO IL 60641 CHICAGO IL 60641

The Alarm Service Company is listed in the following Certificate Service Categories:

File - Vol No.	CCN	UL Listing Category
BP6643 - 1	CYSU	Design Alarm System Monitoring Station, Residential
S2665 - 1	ULP-X	(Signal and Fire Alarm Equipment and Services) (Protective Signaling Services) Central Station

\*\*\* THIS CERTIFICATE EXPIRES ON 31-MAR-2009 \*\*\*

"LOOK FOR THE UL ALARM SYSTEM CERTIFICATE"

  
Engineering Manager  
11-MAR-2009

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## XL Global Asset Protection Services Presentation Evaluation Form

Date: \_\_\_\_\_

Evaluator's Name: \_\_\_\_\_

Course Name: \_\_\_\_\_

1. Overall, how satisfied were you with this course?

- ☐ Very Satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

2. Would you recommend this course to another person?

- ☐ Definitely would
- ☐ Probably would
- ☐ Might or might not
- ☐ Probably would not
- ☐ Definitely would not

Rev.1.0 (May2011)

# XL Global Asset Protection Services Presentation Evaluation Form

3. What did you like best about this course?

4. What did you like least about this course and how could this course be improved?

**Please rate the course in the following areas:**

**Response Definitions: E = Excellent VG = Very Good G = Good F = Fair P = Poor**

5. Met its stated objectives ..... 

E	VG	G	F	P
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Increased your knowledge and skills..... 

E	VG	G	F	P
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Had well –organized course content..... 

E	VG	G	F	P
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Met your needs..... 

E	VG	G	F	P
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Was conducted in a space that was conducive to learning..... 

E	VG	G	F	P
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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10. Do you plan on using any or parts of this course information when you return to your site..... E VG G F P  
☐ ☐ ☐ ☐ ☐
11. Will course materials be useful references for you (or others) when you return to your site..... E VG G F P  
☐ ☐ ☐ ☐ ☐
12. Other comments?

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