Underwriters Laboratories Inc.®

# Lightning Protection Standards

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# Objectives

- Standards Actively Used Design and Inspection
  - NFPA 780
  - UL 96A
  - UFC 3-570-01
  - AFMAN 91-201
  - NAVSEA OP-5, Vol. 1
  - DA Pamphlet 385-64
- First Three Used for Ordinary Buildings
- Last Three Referenced for Ordnance / Explosive Facilities

# Standard Used for System Design

- NFPA 780
- UFC 3-570-01

# Standard Used for System Inspection

- UL 96A

# Relationship Between the Standards

- NFPA 780
  - Base Document Used by UFC 3-570-01 & UL96A
  - UL96A Designed to Meet All the Min Requirements
  - UFC 3-570-01 Provides Guidance for Areas Not Covered in NFPA 780

- UL96A
  - Intended As an Inspection Standard
  - Defined Requirements
  - Less Interpretations.

# Relationship Between the Standards

- UFC 3-570-01
  - Unified Basic Requirements Between Service Branches
  - Expansion of Requirements for Special Types of Structures
  - Guideline Requirements for Ordnance / Explosive Facilities

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - Section 5-3 refers to NFPA 780 Appendix H for risk assessment to identify structures not needing coverage.
  - 5-4.1 Capped air terminals are not permitted.
  - 5-4.1.2 Air Terminals gives specific distances for exhausting hazardous vapors
  - Air terminals installed on “rubber” (EPDM) type roofs

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - 5-4.1.3 Conductors.
    - Bolted Connections Are Not Allowed on the Roof and Down Conductors.
    - Roof and Down Conductors Shall Be Exothermically Welded or Shall Use High Compression Fittings
  - There Are No Listed High Compression Fittings Listed by UL for This Application.
  - 5-4.2 **Mast System.**
    - The down conductors need to be protected from grade level to a point 3 m (10ft) above grade.

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - 5-4.2.7 Joint Design.
    - Not covered in NFPA 780
  - 5-4.2.8 Joint Test.
    - Not covered in NFPA 780
  - 5-4.4 Faraday Shield System.
    - Not covered in NFPA 780
  - 5-5 NONCONVENTIONAL SYSTEMS.
    - Dissipation Arrays and Those Using Early Streamer Emission Air Terminals Are Not Acceptable and Are Not Be Used.

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - 5-6.2 Bonding Installation Guidelines For Design And Construction.

    Basic Requirements for Bonding of LPS Are in AFI 32-1065 and NFPA 780.

  - 5-7.1 Ground Resistance.
    - Not Covered in NFPA 780 With a Specific Value but Techniques.
  - 5-7.2
    - Plate Electrodes Is Discouraged

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - 5-10.2 Reinforced Concrete Buildings.
    - Reinforcement Steel May Be Used for Down Conductors, in Conformance With NFPA 780. This Is Not Allowed in NFPA 780
  - 5-10.3 Steel Frame Building With Non-conducting Roof and Sides.
    - At Least One Steel Column Must Be Grounded at Each Corner of the Building.
  - 5-10.4 Through 5-10.6
    - Installation Techniques Not Covered in NFPA 780

# Major Differences Between the Standards

- UFC 3-570-01 & NFPA 780
  - 5-10.9 Post Tensioning Systems.
    - The Post Tension Rods Shall Not Be Used As a Path for Lightning to Ground.
  - 5-10.10 Through 5-10.20
    - These Cover Special Types of Ordinary Structures

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# Questions

# Thank You for Attending