

LIGHTNING PROTECTION AT MILITARY STORAGE EXPLOSIVES FACILITIES

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- 1.0 Abstract. Department of Defense Explosives Standards Board (DDESB) was established following the July 10 1926 lightning visit at the Lake Denmark Powder Depot at Picatinny Arsenal, NJ. An assumed “lightning protected” magazine with 600,000 pounds of TNT was set off. Four days of explosions followed with 19 persons killed and 38 wounded. Two years later Congress established DDESB to have oversight for every aspect of explosives under control of the US Armed Forces. Since 1926, some 82 known lightning-caused explosions to federal government facilities have occurred. DDESB inspects military explosives stores for code compliance. The civilian code is NFPA-780, the Army’s is PAM 385-64, the Navy’s is NAVSEA OP5; the USAF’s are AFI 32-1065 and AFMAN 91-101, and DDESB’s standard is 6055.9.

- 2.0 Code Details for Lightning Safety are contained in NFPA-780 Standard for the Installation of Lightning Protection Systems v. 2011. Chapter 8 addresses Structures Housing Explosives Materials.
 - 2.1 Caveat: Absolute safety from lightning is impossible due to the chaotic and unpredictable nature of atmospheric electricity discharges.
 - 2.2 Mandate: Code compliance is required.
 - 2.3 Elements of Lightning Protection:
 - 2.3.1 Air Terminals. Rods, masts or grounded wires are connected to an earth reference.

- 2.3.2 Dedicated wire conductors or building steel connect air terminals to ground.
- 2.3.3 Bonding of all adjacent conductive objects assures an equipotential reference.
- 2.3.4 Grounding. Lightning requires a low impedance earth destination.
- 2.3.5 Surge protection provides defenses for electrical power and signal/data lines.
- 2.3.6 Inspection, maintenance and testing of the system by certified and qualified personnel is vital.

3.0 Conclusion. Lightning protection of explosives storage facilities is mandated by Armed Forces Codes such as Air Force AFI 32-1065; Navy NAV OP SEA 5, and Army PAM 385-64. Personnel responsible for compliance must attend approved lightning protection systems courses and received the required certificates of completion. DDESB may suspend explosives handling activities until LPS deficiencies are corrected.

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