SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

UNIT-V

standards on electrical safety

Standards on Electrical Safety

Electrical safety standards are crucial for ensuring safe design, installation, operation, and maintenance of electrical equipment and systems. These standards help mitigate risks like electrical shock, fire, and equipment damage, and they are typically governed by regulatory bodies. Here's an overview of key electrical safety standards:

1. National Fire Protection Association (NFPA) 70 - National Electrical Code (NEC)

- **Scope**: Used primarily in the United States, the NEC covers the installation of electrical systems, focusing on safety from electrical hazards.
- **Key Topics**: It includes rules for wiring, grounding, circuit protection, and use in hazardous locations (Class/Division classification).
- **Edition**: Updated every three years to incorporate new technology and practices.

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2. NFPA 70E - Standard for Electrical Safety in the Workplace

•**Scope**: Focuses on electrical safety in workplaces and is commonly used in conjunction with NEC.

•**Key Topics**: Covers personal protective equipment (PPE), electrical hazard assessments, arc flash hazards, safe work practices, and employee training.

•**Application**: Essential for companies to ensure worker safety during operation and maintenance of electrical equipment.

3. International Electrotechnical Commission (IEC) Standards

•**IEC 60364**: Covers electrical installations in buildings, including protection measures, equipment selection, and installation methods.

•**IEC 60947**: Relates to low-voltage switchgear and control gear.

•**IEC 61508**: Focuses on functional safety and defines standards for programmable electronic systems.

•**IEC 60079**: Series for equipment intended for explosive atmospheres, addressing classification, equipment standards, and maintenance practices.

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4. European Committee for Standardization (CEN) - Low Voltage Directive (LVD)

•**Scope**: Ensures safety in electrical equipment operating within 50–1000 volts AC or 75–1500 volts DC.

•**Key Standards**: EN 60204-1, EN 61439, and EN 60947.

•**Application**: Compliance with LVD is mandatory in the European Union for manufacturers to affix the CE mark on electrical equipment.

5. Occupational Safety and Health Administration (OSHA) Standards (U.S.)

•**Scope**: OSHA has regulations focused on electrical safety, particularly in workplaces under OSHA Standard 29 CFR 1910 (general industry) and 29 CFR 1926 (construction).

•**Key Requirements**: These regulations mandate that employers provide safe working environments, offer training, and ensure equipment is installed, operated, and maintained safely.

6. IEEE Standards (Institute of Electrical and Electronics Engineers)

•**IEEE 1584**: Guidelines for calculating arc flash incident energy, crucial for identifying arc flash hazards and selecting PPE.

•**IEEE C2 - National Electrical Safety Code (NESC)**: Covers safe installation, operation, and maintenance of electrical supply and communication lines.

•**IEEE 80**: Standards for grounding in substations, ensuring safe design to protect against electrical shock.

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7. International Organization for Standardization (ISO)

•**ISO 45001**: Occupational health and safety standard that includes electrical safety provisions for safe work environments.

•**ISO 13849**: Relates to the safety of machinery, covering electrical, electronic, and programmable control systems to ensure safety integrity.

8. Canadian Electrical Code (CEC)

•**Scope**: Similar to the NEC, it provides safety rules for electrical installations in Canada.

•**Edition**: Updated periodically by the Canadian Standards Association (CSA).

9. ATEX (Atmosphères Explosibles) Directive (EU)

•**Scope**: Governs equipment and protective systems used in explosive atmospheres within the EU.

•**Key Parts**: ATEX 114 (directive 2014/34/EU) addresses manufacturing and marking of equipment, while ATEX 137 (directive 1999/92/EC) focuses on workplace safety.

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10. ISO/IEC 60204-1 - Safety of Machinery: Electrical Equipment of Machines

•**Scope**: Specifies requirements for electrical, electronic, and programmable electronic equipment and systems for machinery.

•**Application**: Addresses issues like emergency stop functions, circuit protection, and isolation for machinery and industrial settings.

11. ANSI/NFPA 79 - Electrical Standard for Industrial Machinery

•**Scope**: Covers industrial machinery, including requirements for electrical equipment and wiring for operator safety.

•**Key Areas**: Includes specifications for control circuit protection, operator control stations, and interlocking.

12. National Standards for Specific Countries

•**BS 7671** (UK): Also known as the IET Wiring Regulations, this British Standard governs electrical installations in the UK.

•**JIS (Japan Industrial Standards)**: Includes standards like JIS C 60079, which addresses explosion-proof electrical equipment in Japan.

THANK YOU