



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



Spark, Flashovers and Corona Discharge and Functional Requirements



Spark



A spark is a visible electrical discharge caused by the ionization of air molecules when an electrical voltage difference exists between two conductive objects. Sparks can occur due to high voltage, improper insulation, or the presence of conductive materials. Sparks can lead to electrical fires if they ignite flammable substances nearby.



Flashover

Flashover refers to the sudden and simultaneous ignition of all combustible materials in an enclosed space. It occurs when the temperature in the space reaches a critical level, causing all combustible materials to ignite almost simultaneously. In electrical contexts, flashovers can occur due to short circuits or electrical faults, leading to catastrophic fires and damage to equipment.



Corona Discharge



When the potential gradient at conductor surfaces is large enough (about 30 kV/cm), existing free electrons strike neutral air molecules with enough locity to dislodge one or more electrons from it. Hence, cumulative ionization of the air near the conductor surfaces occurs. Ionized air is partially conductive. Electric discharge occurs due to the ionized air which results in corona





Corona discharge



Corona discharge is a **bluish** white luminous discharge that appears surrounding a conductor surface and is not **sufficient** to cause **sparking** or flashover.

Corona discharge is an electrical discharge brought on by the ionization of a fluid surrounding a conductor, which occurs when the strength of the electric field exceeds a certain value.

If the field is nonuniform, an increase in voltage will cause a **corona discharge** in the gas to appear at points with highest electric field intensity, which can be observed as a bluish luminescence.

Corona discharge is a bluish white luminous discharge that appears surrounding a conductor surface and is not sufficient to cause sparking or flashover.



Functional Requirements in Electrical Hazards



Functional requirements in electrical hazards pertain to the specifications and standards that electrical systems must meet to ensure safety and reliability.

Some key functional requirements include:

1. Insulation: Electrical systems must have proper insulation to prevent leakage currents, sparks, and short circuits. Insulation materials should be selected based on their voltage rating and application.

2. Earthing/Grounding: Proper grounding of electrical systems prevents electric shock and ensures that fault currents are safely diverted away from equipment and personnel.

3. Overcurrent Protection: Electrical circuits should be equipped with fuses or circuit breakers to protect against overcurrent, which can lead to overheating and fires.

4. Isolation: Adequate isolation mechanisms, such as switches and circuit breakers, should be in place to disconnect electrical equipment during maintenance or in case of emergencies.



Functional Requirements in Electrical Hazards



5. Voltage Regulation: Voltage levels should be regulated within specified limits to prevent overvoltage situations, which can cause equipment failure and electrical fires.

6. Proper Ventilation and Cooling: Electrical equipment, especially high-power devices, should be adequately ventilated and cooled to prevent overheating, which can lead to electrical fires.

7. Regular Maintenance and Inspection: Periodic inspections and maintenance of electrical systems are essential to identify potential hazards and ensure that equipment is in good working condition.

8. Compliance with Standards: Electrical installations and equipment should comply with national and international safety standards to guarantee their reliability and safety.



THANK YOU