

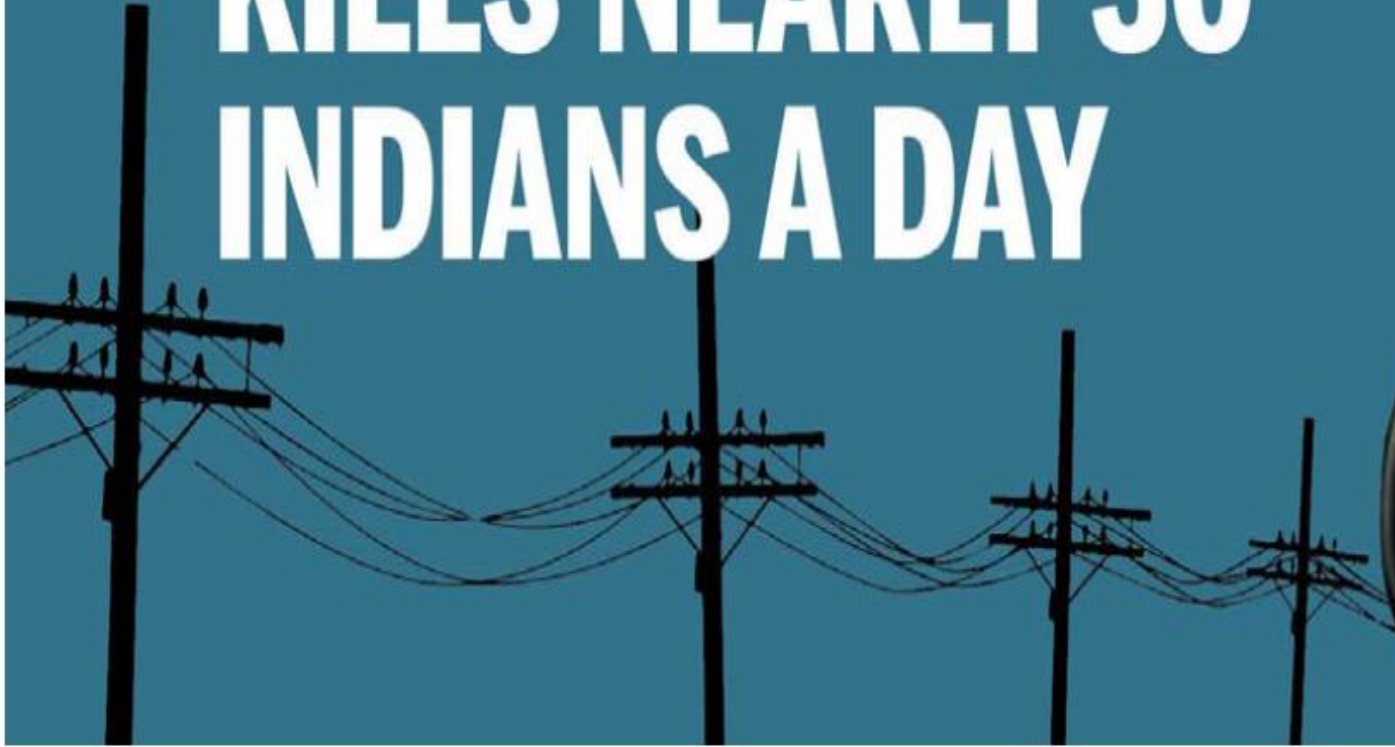
**ELECTRICAL SAFETY FOR YOUR SELF
AND YOUR LOVED ONE – PRACTICES &
REGULATION**

**Dr. RAJESH ARORA
.....A LEARNER**

ELECTRICAL ACCIDENT GIVES PAIN



ELECTROCUTION
KILLS NEARLY 30
INDIANS A DAY



ELECTROCUTION -HUMANS

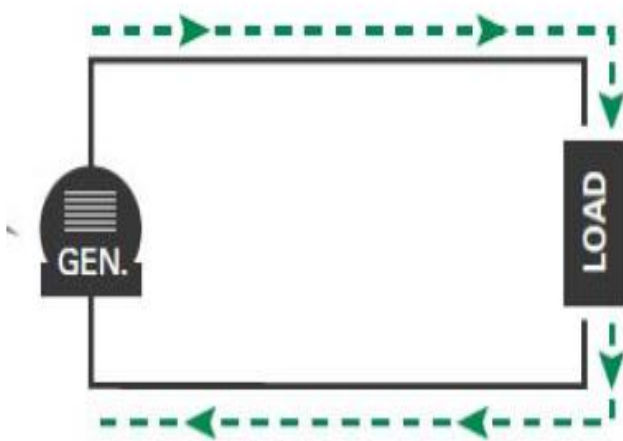


ELECTROCUTION - ANIMALS



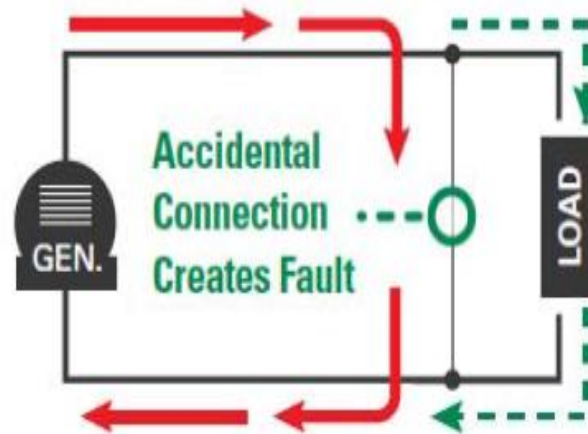
SHORT CIRCUIT CONCEPT

① CURRENT FLOW



System voltage and load resistance determine the flow of current.

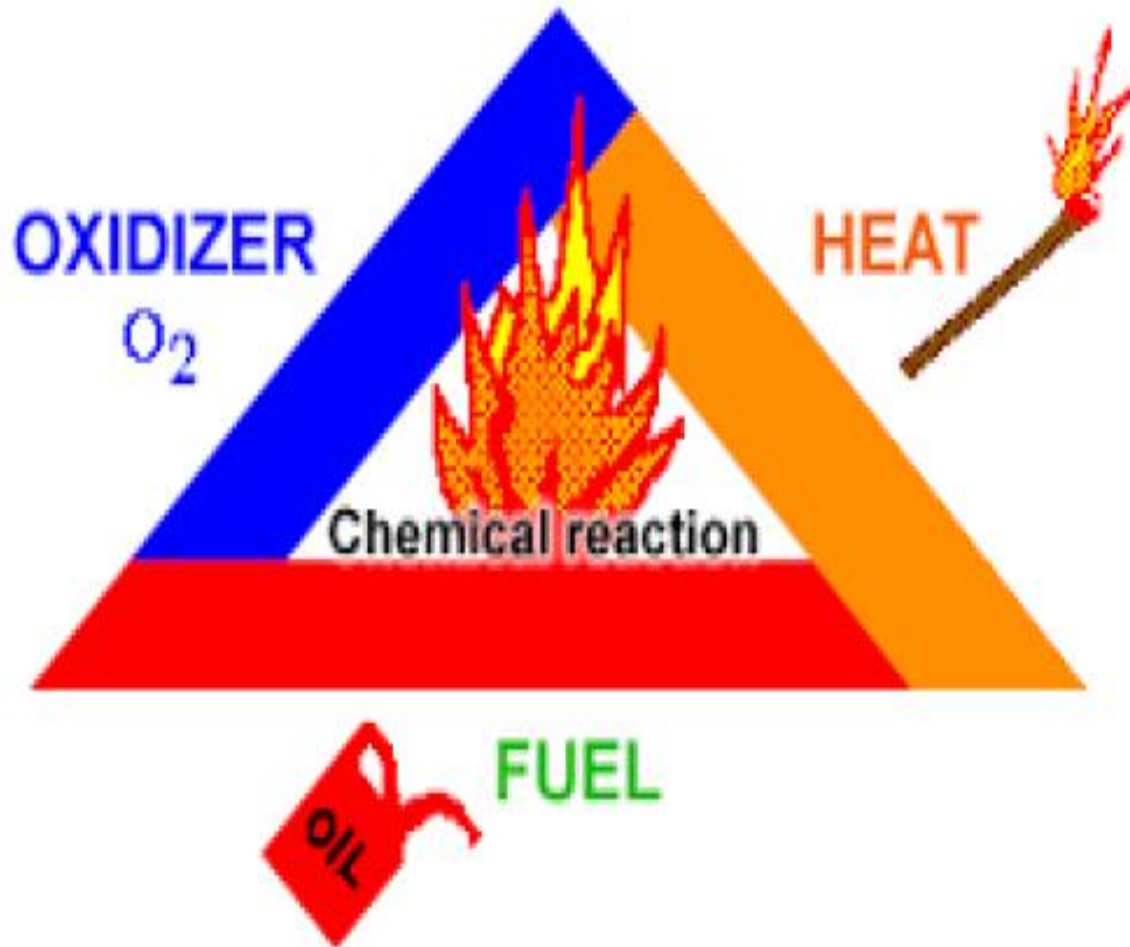
② SHORT CIRCUIT



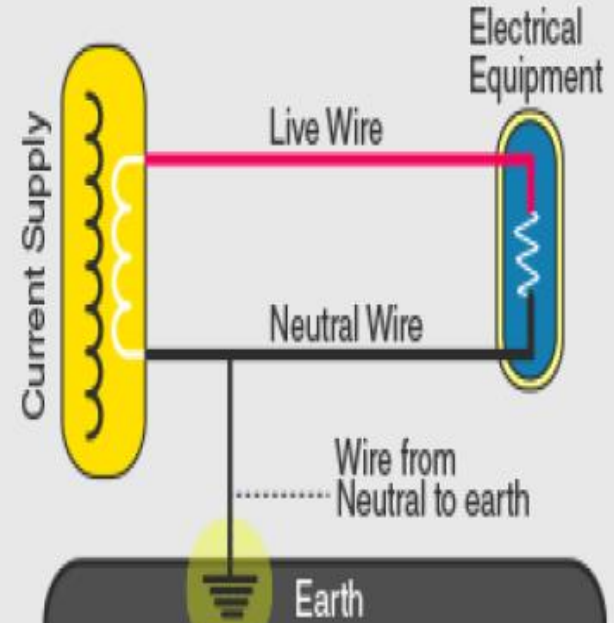
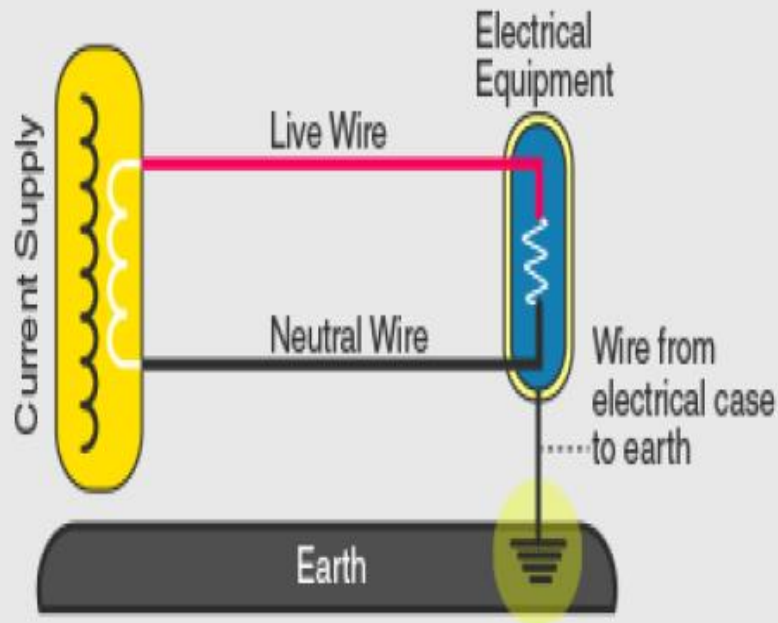
(red lines indicate increased current)

During a short circuit, only the resistance of the fault path limits current. Current may increase to many times the load current.

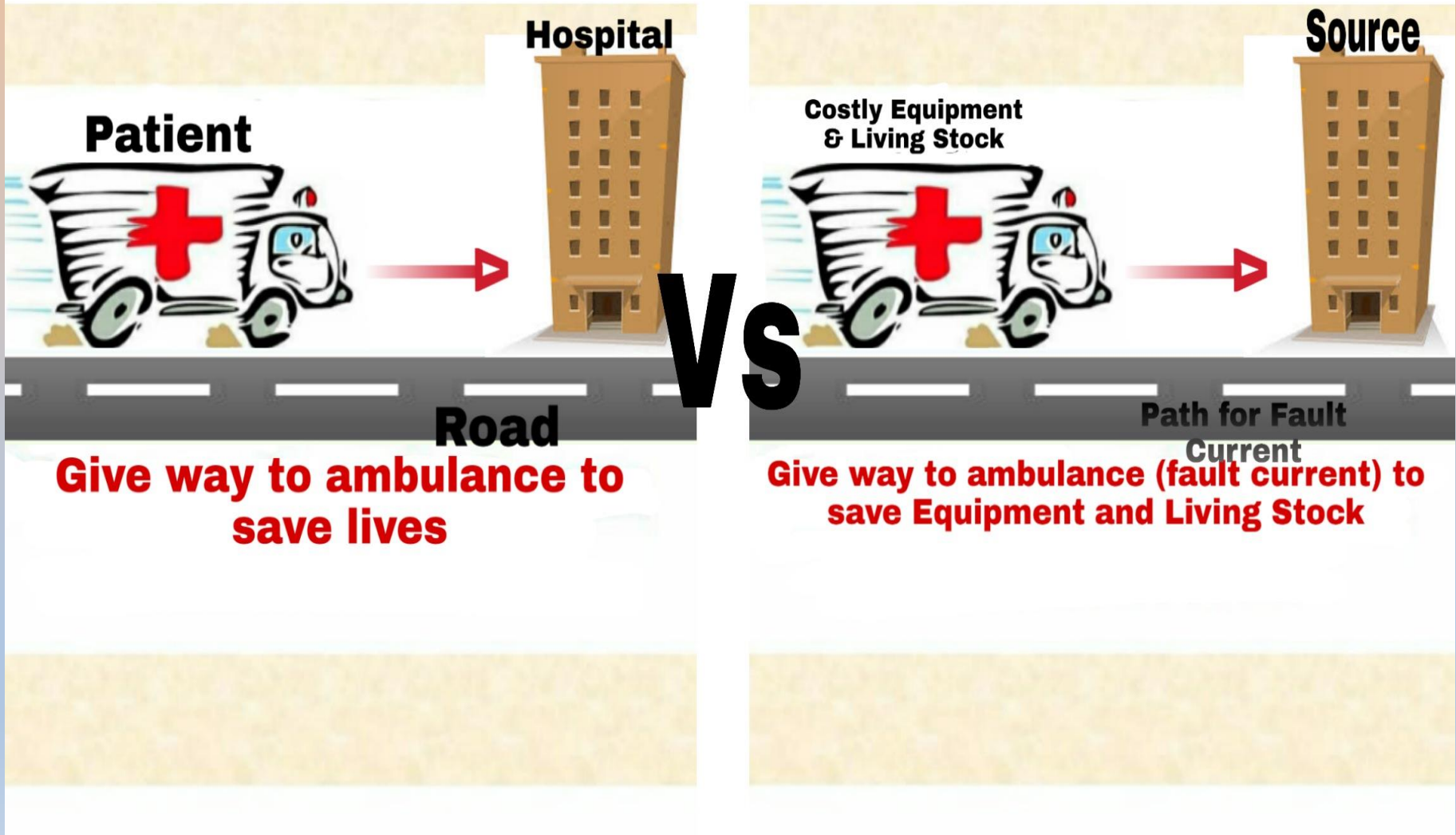
FIRE TRIANGLE



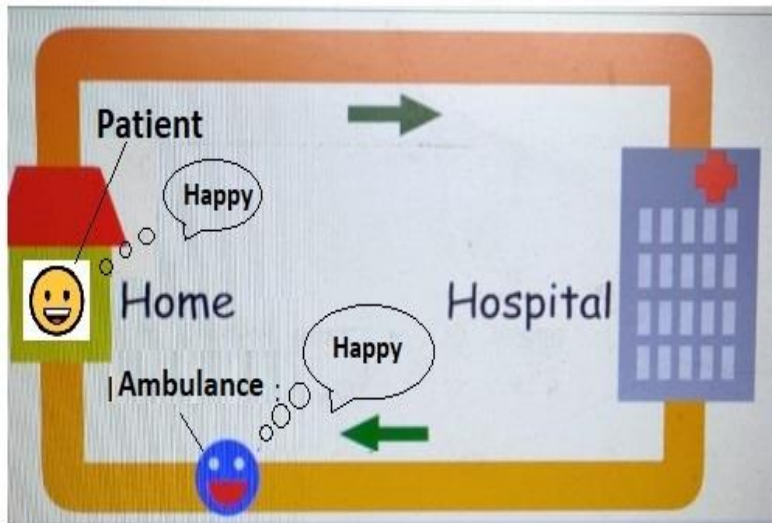
EQUIPMENT & NEUTRAL EARTHING



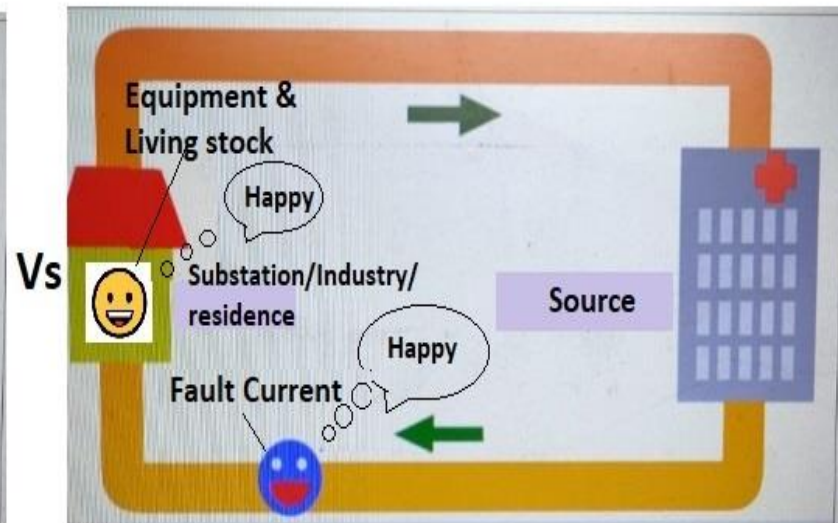
Analogy of Fault Current Path



EXPLANATION OF FAULT RETURN CURRENT



Patient is happy because he/she is able to reach to the hospital. Ambulance is happy because it gets a path to get to the hospital



Costly equipment & living stock are saved as the fault current gets a path to get back to the source.

LET US UNDERSTAND THE FACTS

IN THE PRESENT ERA THERE IS
ONE THING WHICH IS LOVED ,
LIKED BY EVERY ONE.....IN
FACT DIFFICULT TO LIVE
WITHOUT IT.....

YOUR MOBILE PHONE



IMPORTANT FACTS ABOUT CHARGER



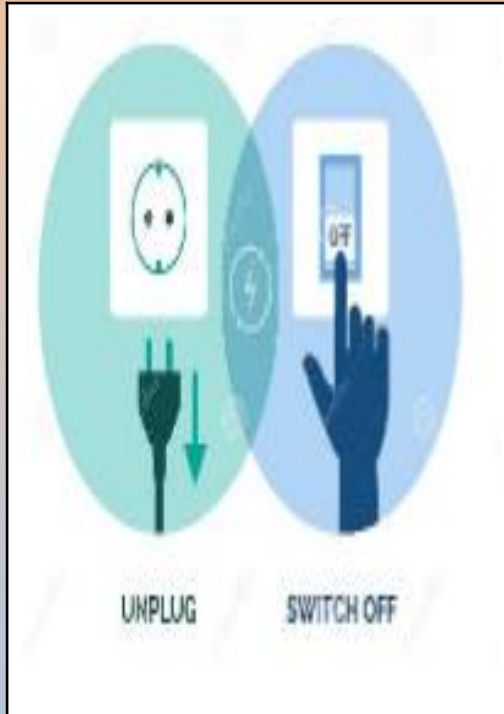
**TIME TO LOOK AT SMALL BUT
VERY CRUCIAL AND IMPORTANT
TO ENSURE SAFETY**

LET'S BEGIN.....



Avoid Over Loading of Outlets / Extension Cords

आउटलेट/एक्सटेंशन कॉर्ड्स को ओवरलोड करने से बचें



Unplug Appliances When Not in Use to Save Energy As Well As Minimise Risk & Shock & Fire

ऊर्जा बचाने के साथ-साथ जोखिम और झटके और आग को कम करने के लिए उपकरणों को अनप्लग करें जब वे उपयोग में न हों



**AVOID LOOSE
ELECTRICAL
CONNECTIONS**

**Loose Connection Must Be
Avoided**

ढीले कनेक्शन से बचना चाहिए



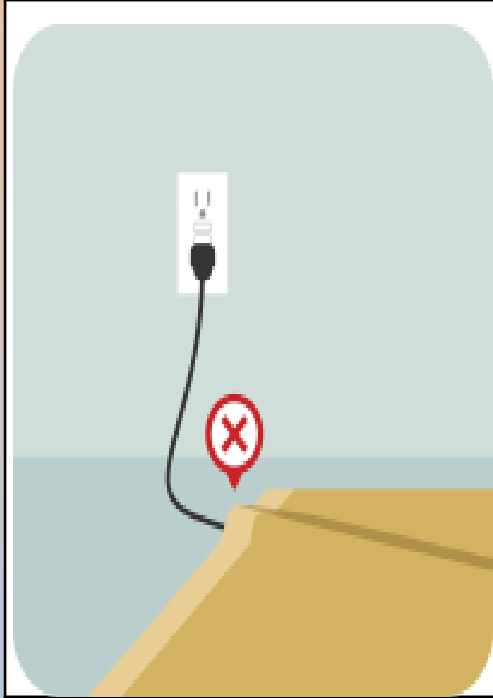
Extension Cords Should Only Be Used on A Temporary Basis

एक्सटेंशन कॉर्ड्स का उपयोग केवल अस्थायी आधार पर किया जाना चाहिए



Never Plug Space Heater or Any Heavy Loads into An Extension Cord or Power Strip

कभी भी स्पेस हीटर या किसी भारी भार को एक्सटेंशन कॉर्ड या पावर स्ट्रिप में प्लग न करें



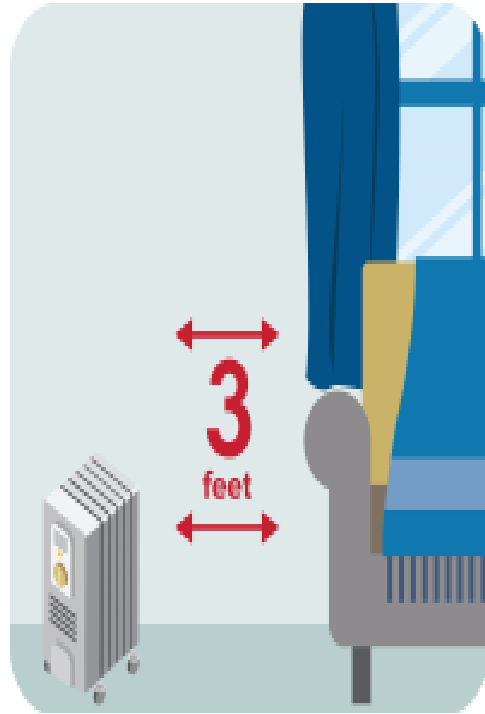
**Never Run Cords Under Rugs /
Carpets, Doors or Windows**

**तारो को कभी भी गलीचों/कालीनों,
दरवाजों या खिड़कियों के नीचे न चलाएँ**



Make Sure Extension Cords Do Not Become Tripping Hazards

सनिश्चित करें कि एक्सटेंशन कॉर्ड ट्रिपिंग के खतरे न बनें



Keep Papers & Other Potential Combustibles At Least 3 Feet Away from Space Heaters & Other Heat Sources

पेपर और अन्य संभावित ज्वलनशील पदार्थों को स्पेस हीटर और अन्य ताप स्रोतों से कम से कम 3 फीट की दूरी पर रखें



**Make Sure You Use Proper Rating
Illumination Fitting for Illumination
Lamps**

**सनिश्चित करें कि आप रोशनी वाले
लैम्प के लिए उचित रेटिंग की रोशनी
वाली फिटिंग का उपयोग करें**



**Make Sure Your Home Has Smoke
(Fire Detection) Alarm and Replace
the Unit Every 10 Years**

**सुनिश्चित करें कि आपके घर में धुआँ
(आग का पता लगाने वाला) अलार्म है
और यूनिट को हर 10 साल में बदल दें**



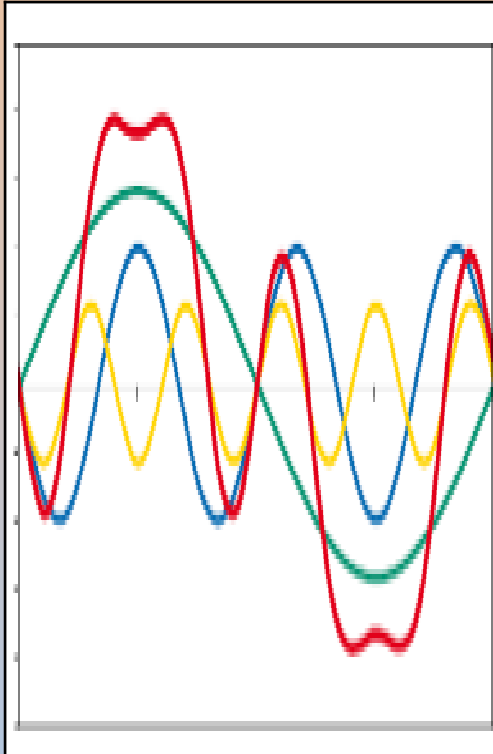
**Kindly Ensure Proper Earthing /
Grounding Design Based on the
Requirement of Site**

**कृपया साइट की आवश्यकता के आधार
पर उचित अर्थिंग / ग्राउंडिंग डिज़ाइन
सुनिश्चित करें**



**Proper Selection of MCB / RCCB or
Any Other Protective Device**

**एमसीबी/आरसीसीबी या किसी अन्य
सुरक्षात्मक उपकरण का उचित चयन**



Harmonics : Use Gadgets with Less Harmonics Generation / Use Proper Harmonic Filters

हार्मोनिक्स: कम हार्मोनिक्स जेनरेशन वाले गैजेट्स का इस्तेमाल करें / उचित हार्मोनिक फिल्टर्स का इस्तेमाल करें



Proper Selection of Cables & Wires

केबल और तारों का उचित चयन



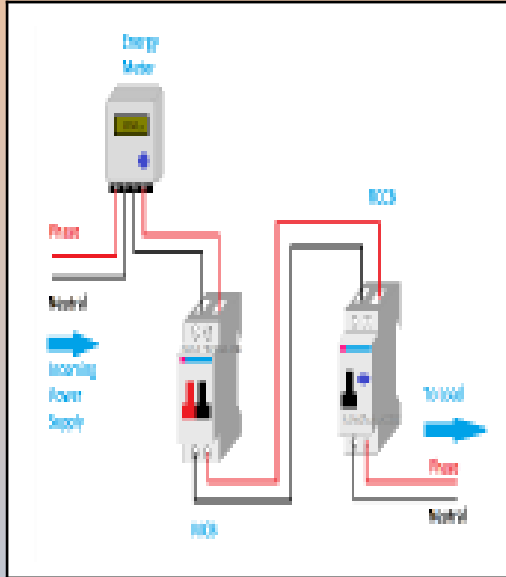
Use of Good Quality Gadgets. Also Not to Use Outdated /Outlived/ Damaged Gadgets or Appliances

अच्छी क्वालिटी के गैजेट्स का इस्तेमाल। साथ ही पुराने/पुराने/क्षतिग्रस्त गैजेट या उपकरणों का उपयोग न करें



**Proper Maintenance of Equipments
& Gadgets. Avoid Use of Outdated /
Damage Equipments**

**उपकरणों और गैजेट्स का उचित रखरखाव।
पुराने/क्षतिग्रस्त उपकरणों के उपयोग से
बुँचें**



Proper Protection System Coordination

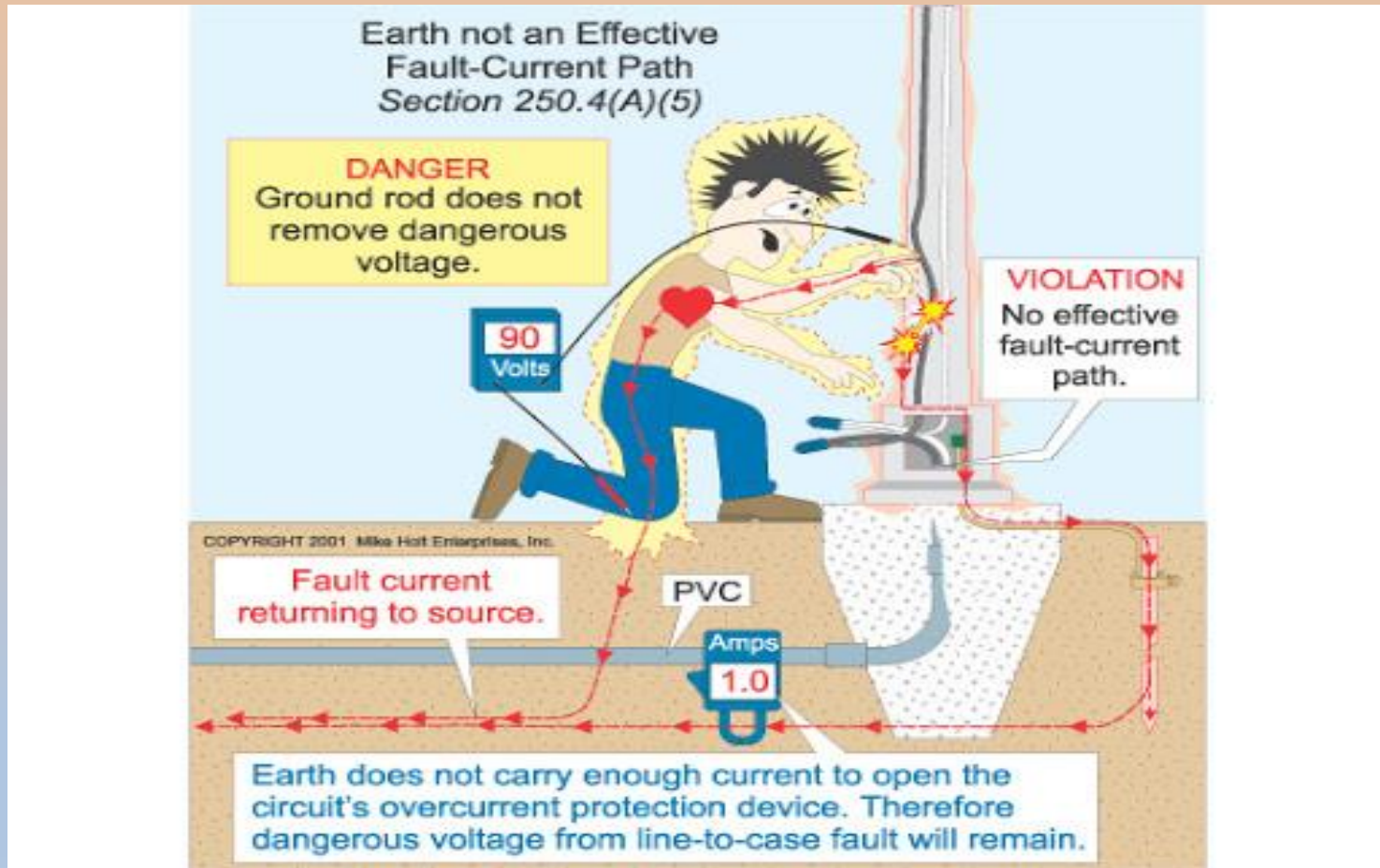
उचित सुरक्षा प्रणाली समन्वय



Regularly Inspect & Test Electrical Cords, Extension Cords, Electrical Gadgets & Electrical Circuits for Damage

नुकसान के लिए नियमित रूप से इलेक्ट्रिकल कॉर्ड, एक्सटेंशन कॉर्ड, इलेक्ट्रिकल गैजेट्स और इलेक्ट्रिकल सर्किट का निरीक्षण और परीक्षण करें

MAIN CAUSE OF DEATHS



EARTH VS UNEARTH



CEA SAFETY REGULATION (MRSES) 2023

CENTRAL ELECTRICITY AUTHORITY**NOTIFICATION**

New Delhi, the 8th June, 2023

No. CEA-PS-16/1/2021-CEI Division.—Whereas the draft of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2022 was published in six newspaper dailies, as required by sub-section (3) of section 177 of the Electricity Act, 2003 (36 of 2003) read with sub-rule (2) of rule 3 of the Electricity (Procedure for Previous Publication) Rules, 2005 for inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of forty-five days, from the date on which the copies of the newspaper containing the said draft regulations were made available to the public;

And whereas copies of the said newspapers containing the public notices and the said draft regulations on the website of the Central Electricity Authority were made available to the public on 14th June, 2022;

And whereas the objections and suggestions received from the public on the said draft regulations were considered by the Central Electricity Authority;

Now, therefore, in exercise of the powers conferred by clause (b) of sub-section (2) of section 177 and read with section 53 of the Electricity Act, 2003, and in suppression of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010, except as respects things done or omitted to be done before such suppressions, the Central Electricity Authority hereby makes the following regulations, namely: —

Chapter I**Preliminary**

1. **Short title and Commencement.** — (1) These regulations may be called the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.
(2) These regulations shall come into force on the date of publication in the Official Gazette.
- (3) **Scope and extent of application.** — These regulations shall be applicable to electrical installation including electrical plant and electric line, and the person engaged in the generation or transmission or distribution or trading or supply or use of electricity.



SP 30:2023



भारत की राष्ट्रीय विद्युत संहिता National Electrical Code of India 2023



भारतीय मानक बोर्ड
BUREAU OF INDIAN STANDARDS
The National Standards Body of India
Ministry of Consumer Affairs, Food & Public Distribution
Government of India

CONTENTS

		<i>Page No.</i>
INTRODUCTION		<i>i</i>
COMMITTEE COMPOSITION		<i>v</i>
PART 1	GENERAL AND COMMON ASPECTS	1
	Section 1 Scope of the National Electrical Code	4
	Section 2 Definitions	6
	Section 3 Graphical symbols for diagrams, letter symbols and signs	25
	Section 4 Guide for preparation of diagrams, charts, tables, and marking	38
	Section 5 Units and systems of measurement	43
	Section 6 Standard values	45
	Section 7 Fundamental principles	47
	Section 8 Assessment of general characteristics of buildings	56
	Section 9 Wiring installations	58
	Section 10 Protection for safety — Protection against electric shock	165
	Section 11 Protection for safety — Protection against thermal effect and protection against fire due to arcing	171
	Section 12 Protection for safety — Protection against over current and fault current	175
	Section 13 Protection for safety — Protection against voltage disturbance and measures against electromagnetic influences	180
	Section 14 Short-circuit and voltage drop calculations	191
	Section 15 Electrical aspects of building services	219
	Section 16 Selection of equipment	240
	Section 17 Erection and pre-commissioning — Testing of Installations	242
	Section 18 Earthing	269
	Section 19 Lightning protection	287
	Section 20 Power quality	310
	Section 21 Energy efficiency aspects	343
	Section 22 Safety in electrical work	352
PART 2	ELECTRICAL INSTALLATIONS IN STAND-BY GENERATING STATIONS AND CAPTIVE SUBSTATIONS	385
	Section 1 Electrical installation of stand-by generating sets	388
	Section 2 Electrical installations in captive distribution sub-stations	398
PART 3	LOW-VOLTAGE ELECTRICAL INSTALLATIONS - REQUIREMENTS FOR SPECIAL INSTALLATIONS OR LOCATIONS	403
	Section 1 Domestic dwellings	406
	Section 2 Locations containing a bath or shower	418
	Section 3 Swimming pools and fountains	431

	Section 4	Requirements for special installations or locations — Rooms and cabins containing sauna heaters	442
	Section 5	Construction and demolition site installations	445
	Section 6	Conducting location with restricted movement	449
	Section 7	Caravan parks, camping parks and similar locations	452
	Section 8	Marinas and similar locations	456
	Section 9	Medical location	466
	Section 10	Exhibitions, shows and stands	482
	Section 11	Furniture	487
	Section 12	Extra-low-voltage lighting installations	489
	Section 13	Community facilities and workplaces	493
	Section 14	Electrical installations in caravans and motor caravans	496
	Section 15	Supplies for electric vehicles	510
	Section 16	Operating or maintenance gangways	517
	Section 17	Temporary electrical installations for structures, amusement devices and booths at fairgrounds, amusement parks and circuses	526
	Section 18	Heating cables and embedded heating systems	532
	Section 19	Office buildings, shopping and commercial centres and institutions	537
	Section 20	Hotels	546
	Section 21	Sports building	557
	Section 22	Specific requirements for electrical installations in multi-storied buildings	565
Part 4		ELECTRICAL INSTALLATIONS IN INDUSTRIAL BUILDINGS	581
Part 5		OUTDOOR INSTALLATIONS	617
	Section 1	Public lighting installations	620
	Section 2	Temporary outdoor onstallations	650
	Section 3	Permanent outdoor installations	656
Part 6		ELECTRICAL INSTALLATIONS IN AGRICULTURAL PREMISES	673
Part 7		ELECTRICAL INSTALLATIONS IN HAZARDOUS AREAS	691
Part 8		SOLAR PHOTOVOLTAIC (PV) POWER SUPPLY SYSTEMS	719

भू-संपर्कन के लिए रीति संहिता
(दूसरा पुनरीक्षण)

Code of Practice for Earthing
(Second Revision)

ICS 91.140.50

© BIS 2018



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

विद्युत्तियी वायरिंग अधिष्ठापनों के
लिए रीति संहिता
(चौथा पुनरीक्षण)

**Code of Practice for Electrical
Wiring Installations**
(*Fourth Revision*)

ICS 91.140.50

© BIS 2019



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

**भारतीय मानक
Indian Standard**

IS/IEC 62305-1 : 2010
(Superseding IS 2309 : 1989)
(Reaffirmed 2015)
(Reaffirmed 2020)

प्रकाश-व्यवस्था से सुरक्षा

भाग 1 सामान्य सिद्धान्त

Protection Against Lightning

Part 1 General Principles

ICS 29.020; 91.120.40

© BIS 2015



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

March 2015

Price Group 15

Table 1. IEC 62305 series.

Document number	Title	Summary
62305-1	Protection against lightning - Part 1: General principles	Provides the general principles to be followed in the protection of structures against lightning including their installations and contents as well as persons, services connected to structure.
62305-2	Protection against lightning - Part 2: Risk management	Provides a procedure for the evaluation of risk assessment for a structure or for a service due to lightning flashes to earth.
62305-3	Protection against lightning - Part 3: Physical damage to structures and life hazard	Provides the requirements for protection of a structure against damage by means of a lightning protection system (LPS), and for protection against injuries of living being due to touch and step voltages in the vicinity of LPS, outside the structure.
62305-4	Protection against lightning - Part 4: Electrical and electronic systems within structures	Provides information for the design, installation, inspection, maintenance, and testing of LEMP protection measures system (LPMS) for electrical and electronic systems within a structure; able to reduce the risk of permanent failures due to lightning electromagnetic impulse.

**DONOT YOU THINK WE MUST
CONTRIBUTE TO ELIMINATE THE
ELECTRICAL ACCIDENTS**

.....

**LET US TAKE A
PLEDGE**



It's Not **The End,**

It's Just A

BEGINNING