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Copper Alliance

COVID – The +ve Reinforcement For Electrical Safety In India

ELECTRICAL SAFETY FOR THE “NEW NORMAL”

FEEDS WEBINAR to Commemorate FISUEL International Electrical Safety Days
– 20th October 2021



Lessons Learnt In India During Pandemic – Electrical Safety – 15 Mins

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SPEAKER

Mr. Manas Kundu – Director (Energy Solutions), ICA

What I mean is that only Covid has brought into surface the gaps in our electrical safety environment. During this pandemic quite a few actions initiated and completed too which we believe is going to help our National Electrical Safety landscape for future.

- **Electricity Sector – Background**
- **Energy Scenario in India – Building Perspective**
- **Electrical Safety –**
 - Statistics
 - Issues And Challenges
 - Government Vision Concerned To Electrical Safety
- **Electrical Safety –**
 - Buildings
 - Healthcare Facilities
 - Covid 19 – Trigger To Accelerate Act
- **Conclusion**

India Key Facts

Population	~1.39 billion	<ul style="list-style-type: none">• Growing at 1.2% annually
Urban Population	34% (2020)	<ul style="list-style-type: none">• Urbanization rate – 3% (2015-20)• Estimated Urban population – 600 mn by 2036
Housing Requirement	73.6 Mn shortage (Urban 27 Mn)	<ul style="list-style-type: none">• Construction sector expected to grow at CAGR of 10% in value from 2020 to 2025
GDP	US\$ 3.05 trillion	<ul style="list-style-type: none">• Expected to grow 9% in FY2022
Per capita GDP	US\$ 1900	
Power Scenario	<ul style="list-style-type: none">• Supply - ~1270 BU• Demand - ~1275 BU• Electrification rate – 100% (2021)	<ul style="list-style-type: none">• US\$ 1.4 Trillion for National Infrastructure and 24% to be invested in power sector in Year Plan (2019-2025)

Installed Generation Capacity Fuel Wise As On 31.08.2021

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Category	Installed Gen Capacity (MW)	% of Total	Remarks
Fossil Fuel			
Coal	2,02,805	52.6	
Lignite	6,620	1.7	
Gas	24,924	6.5	
Diesel	510	0.1	
Total Fossil Fuel	2,34,858	60.4%	
Non – Fossil Fuel (RES)			
Hydro	46,412	12	
Wind, Solar & Other RE	1,00,683	25.9	Solar 40GW
Nuclear	6,780	1.2	
Total Non Fossil Fuel	1,53,876	39.6%	

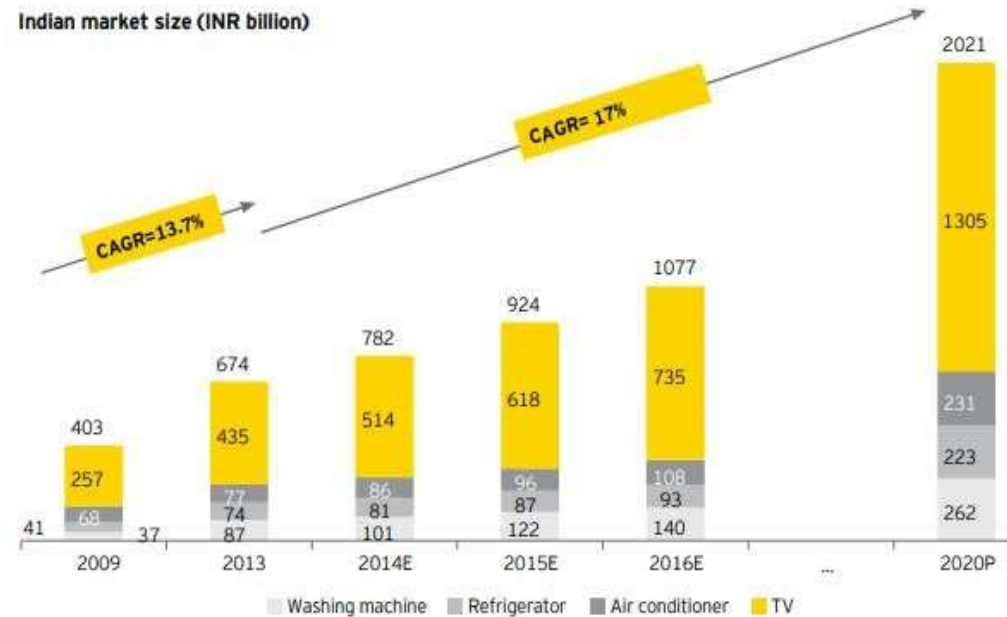
Open Access to Transmission / Distribution Systems

- De-licensing of power generation
- Trading in electricity permitted
- Liberal provisions for captive power generation
- Rural generation and distribution freed from licensing
- Expanded role for the Regulatory Commissions
- Regulatory Commissions to develop electricity markets.
- State Electricity Utilities – Thrust on ‘Reforms-based and Results-linked Scheme’ with Quality, Reliability and Sustainability in sharp focus
- India’s commitment to Climate Actions – huge push on Renewables

Increase In Load?

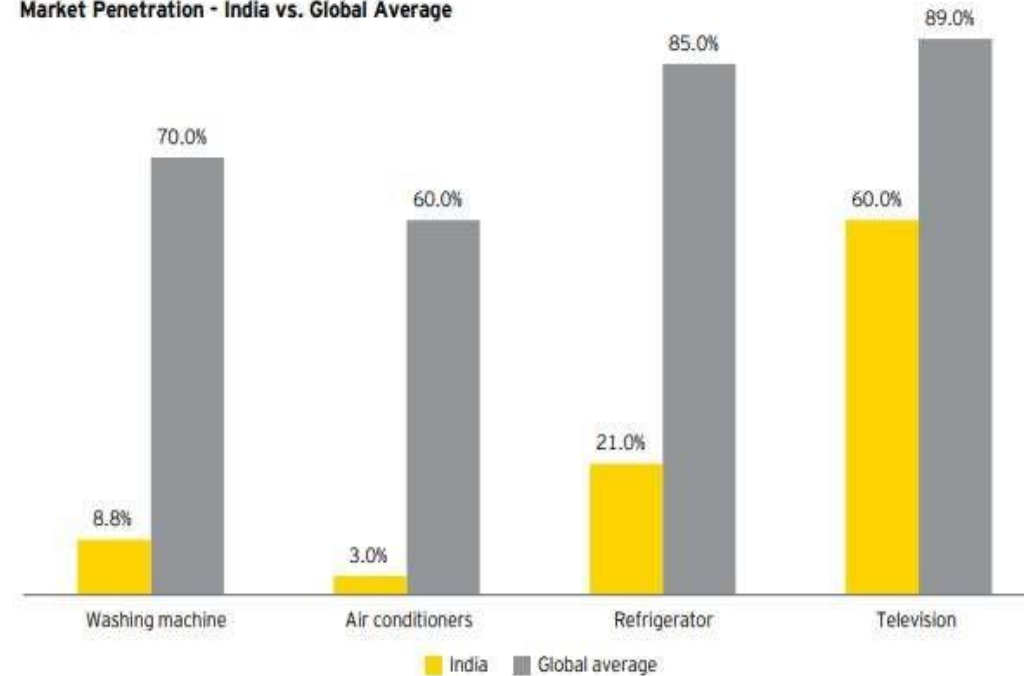
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The market for white goods* and televisions has been growing, but remains underpenetrated



Source: JP Morgan, TechNavio, Spark Capital estimates, EY analysis

Market Penetration - India vs. Global Average



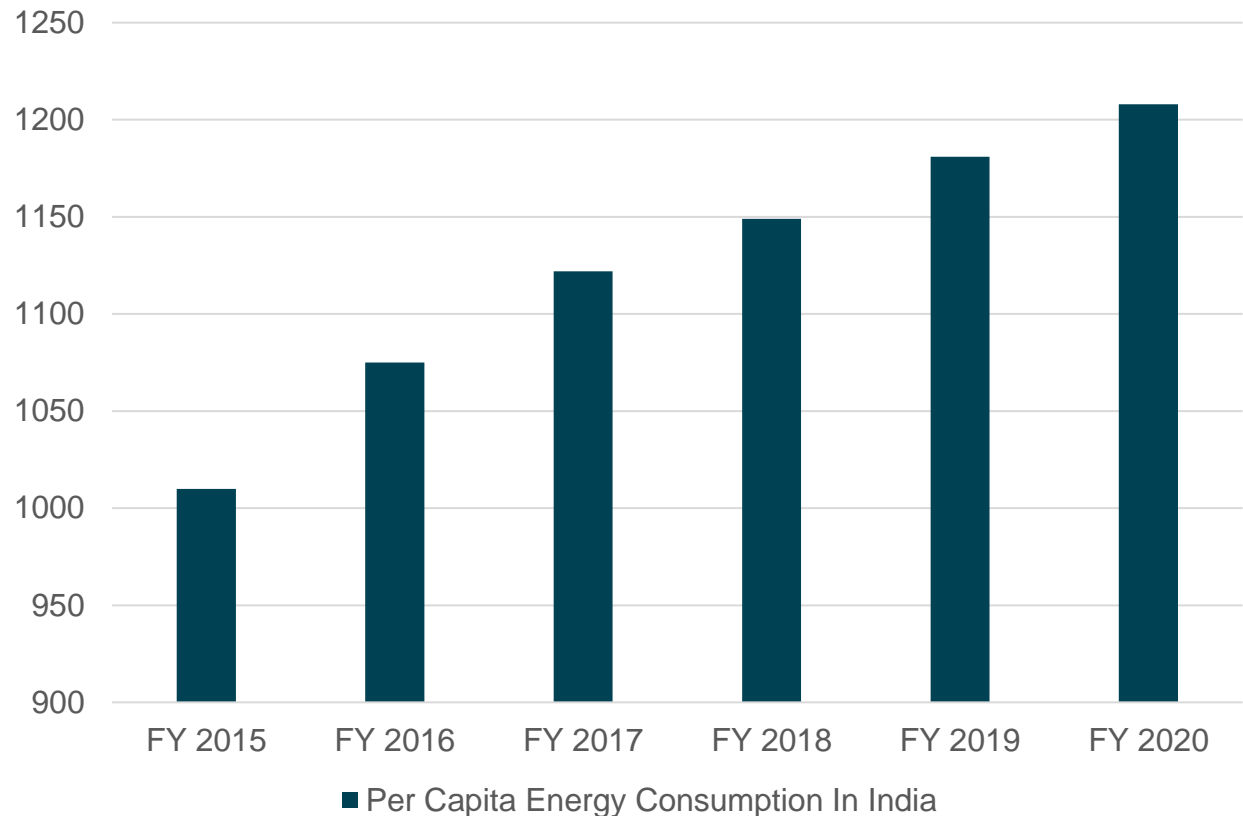
Source: JP Morgan estimates, EY analysis

Per Capita Energy Consumption In India

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In 2018-19, India's per capita power consumption was 1181 kWh as against the world average at 3,260 kWh.

Data shows wide variations across states and union territories. About 17 states/UTs report per capita consumption below the national average, while 19 recorded higher consumption in 2019-20. Dadra and Nagar Haveli topped the list with 15,517 kWh per capita consumption while Bihar was at the bottom of the heap with 332 kWh.

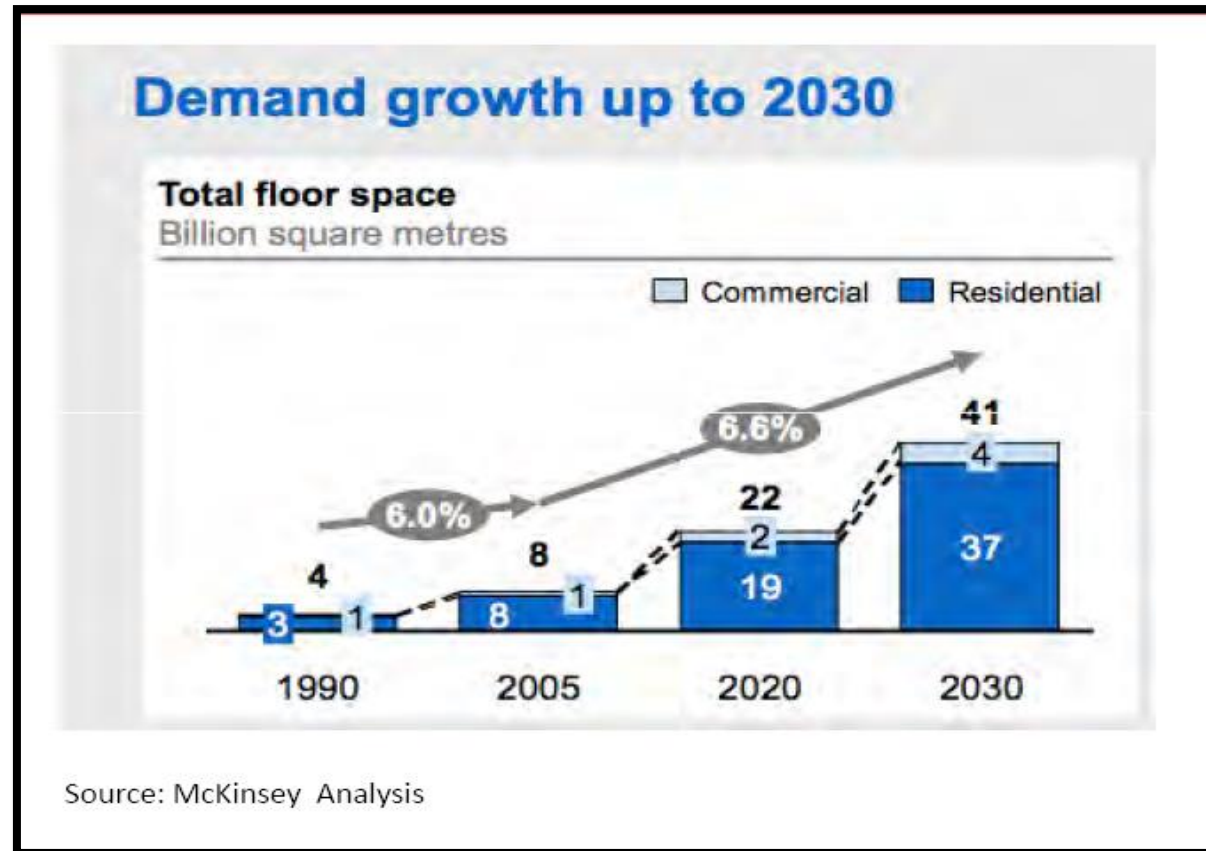


Source: Statista & Money Control

Construction Scenario In India – Building Perspective

Projected Growth in Buildings - India

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Government Stimulus To Boost Real Estate Sector – Covid 19 Impact

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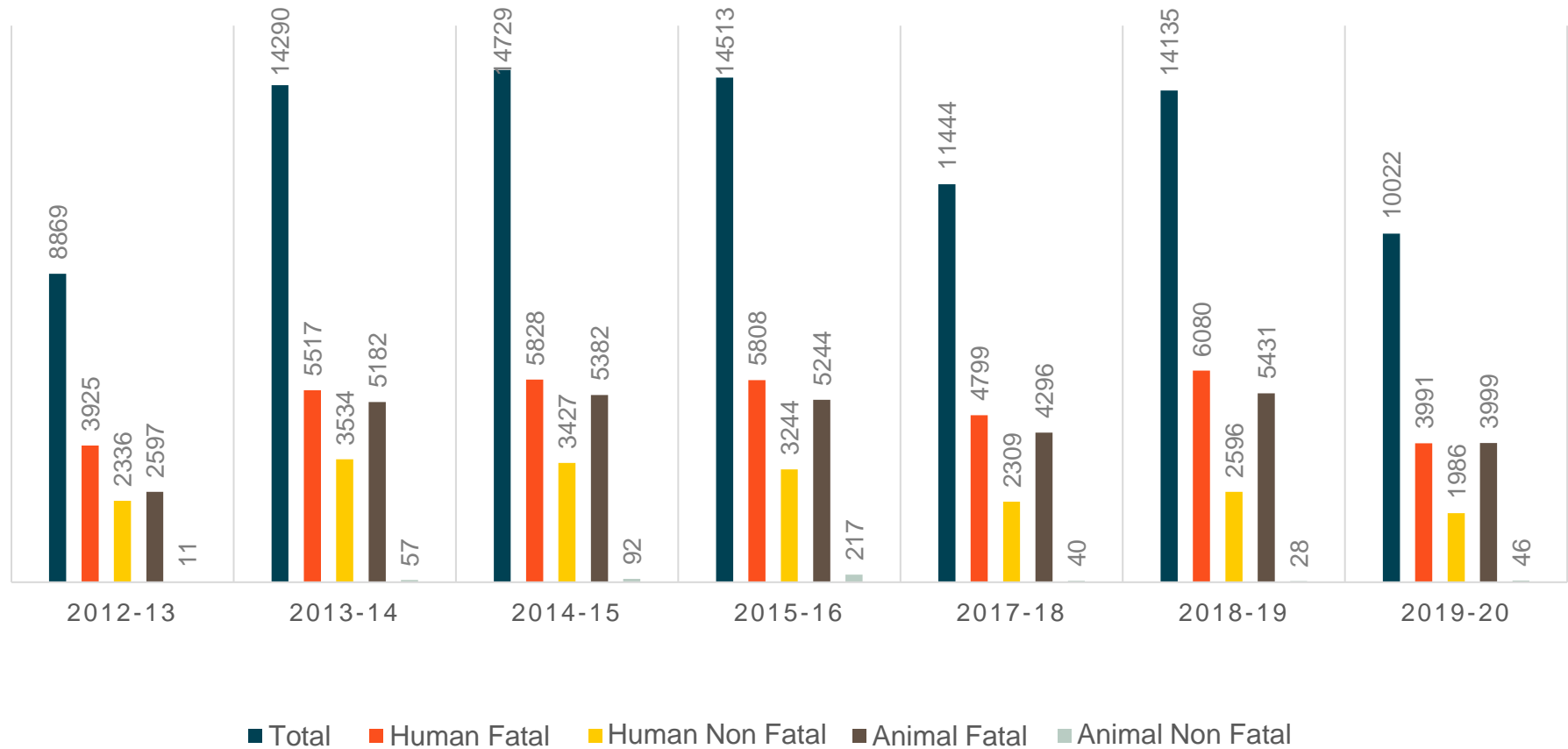
- Home loan interest rates at historic low
- Govt encourages states to consider reducing stamp duty
 - Maharashtra and Karnataka Govt reduced stamp duties and other states to follow
- No tax on rent to be paid by owner
- Additional \$2 bn additional outlay for urban housing scheme 'Housing for All'
- To help clearance of unsold inventory, developers allowed to sell at 20 % lower than the circle rate

Electrical Safety – Statistics



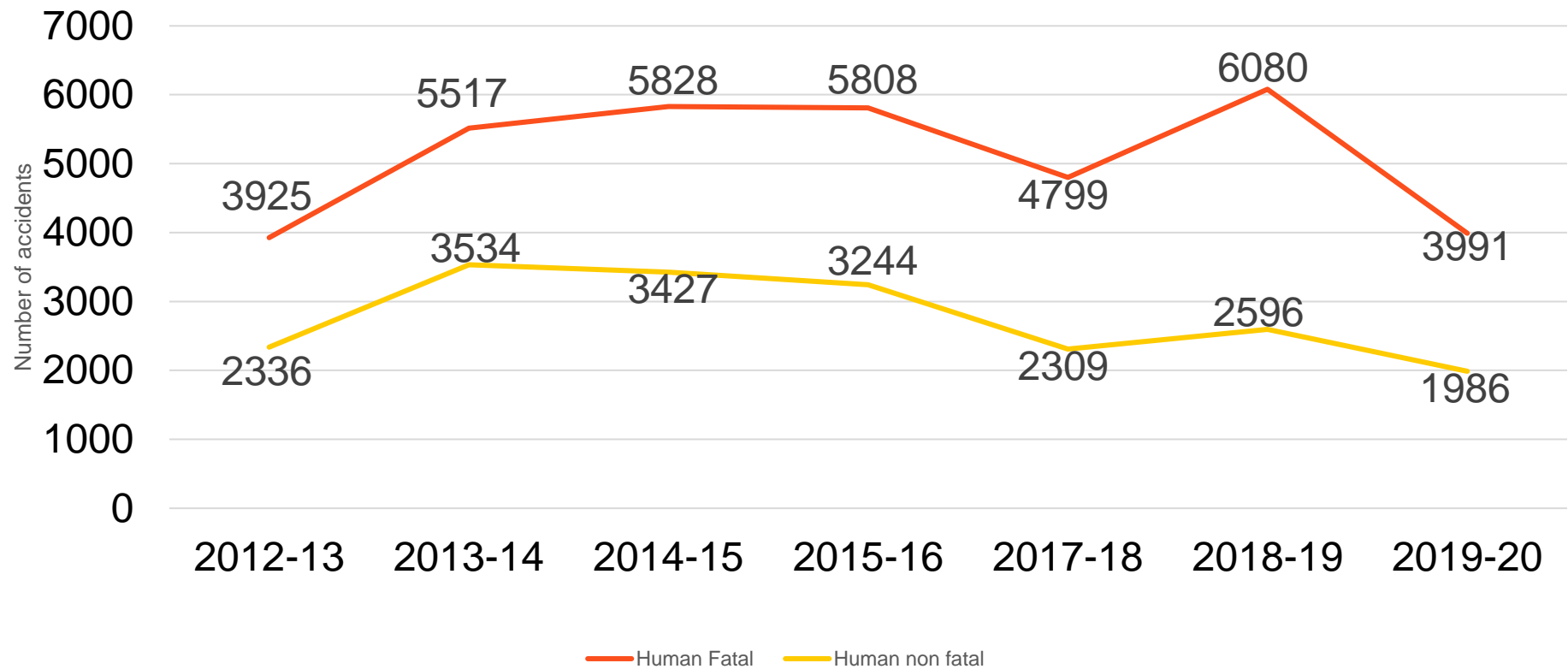
Electrical Accidents – Statistics

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Accident Cases Across India : Human

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Percentage Distribution Of Electrical Accidents Of Generation, Transmission & Distribution

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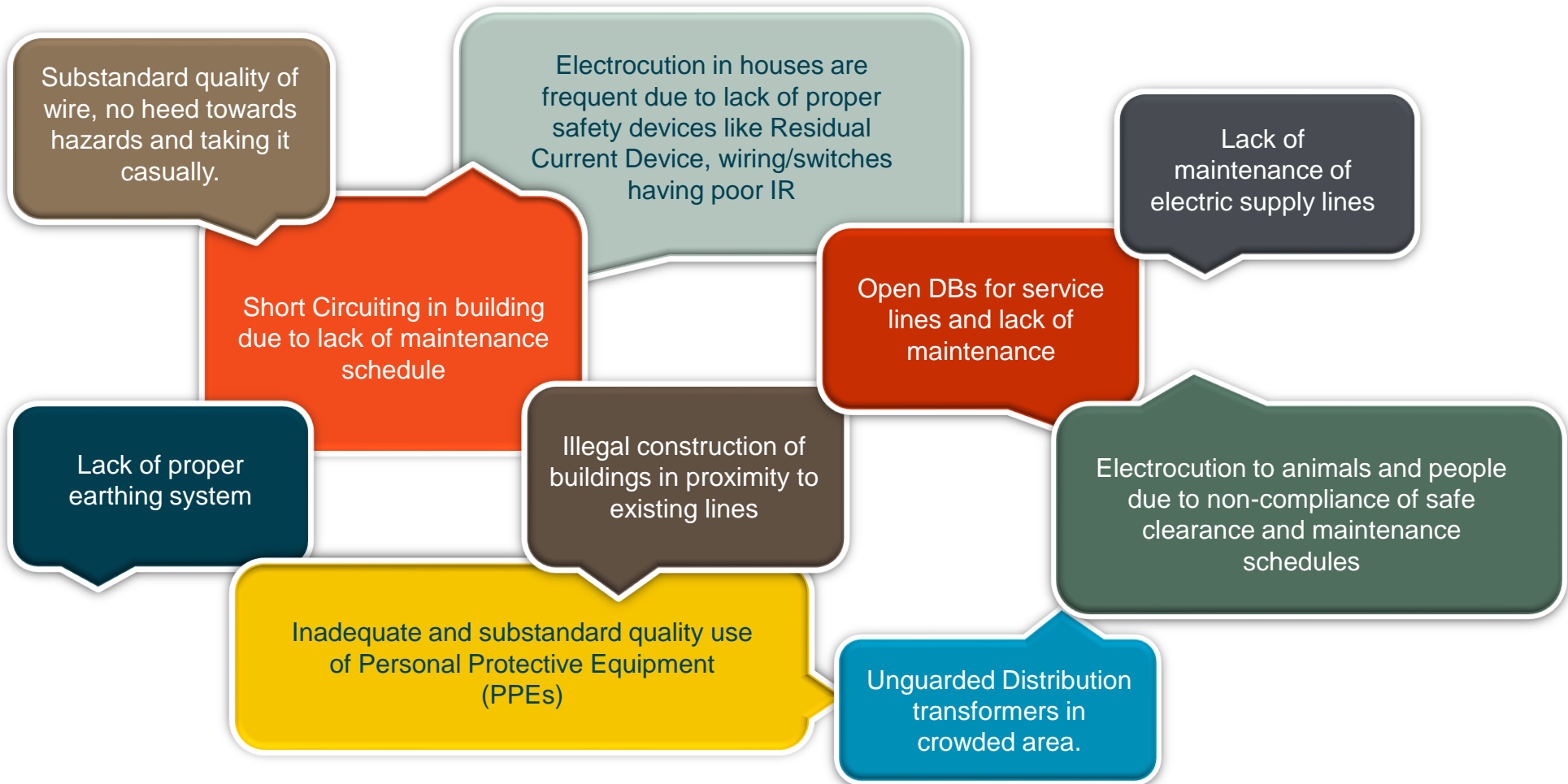
Causes Of Electrical Accidents Occurred During 2018-19

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What Are The Issues/Challenges In Our Country?

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ELECTRICAL ACCIDENT-FREE INDIA

Electrical accidents (no matter how small their number is) must be focused and addressed through systematic interventions.

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Measures to Curb Electrical Accidents

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01

Legal Framework

Codes and standards backed by strong regulations

02

Awareness

Safety awareness campaign for the consumers

03

Electrical Safety Officer

Electrical Safety Officer is designated at every Sub-Division who shall act in pursuance of regulation 5.

04

Compliance

Strict Compliance of safety Regulations by periodical inspection

05

Accountable

Where number of accidents increase as compared to the previous year shall be answerable and accountable for the same

Need To Be More SACHET (सचेत)

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Electrical Safety - Buildings

Various Causes For Electrical Fires

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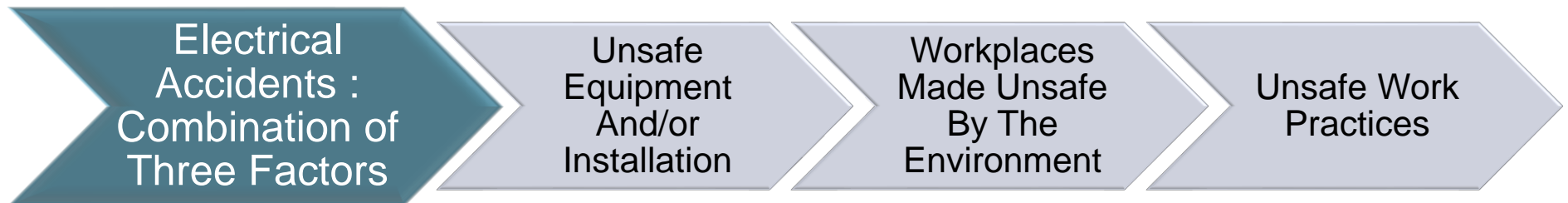




- Inadequate Wiring
- Exposed Electrical Parts.
- Overhead Power Lines.
- Wires With Bad Insulation
- Ungrounded / Uninsulated Electrical Systems
- Overloaded Circuits
- Damaged Power Tools And Equipment
- Wrong Tool
- Some On-site Chemicals
- Defective Ladders And Scaffolding
- Ladders That Conduct Electricity

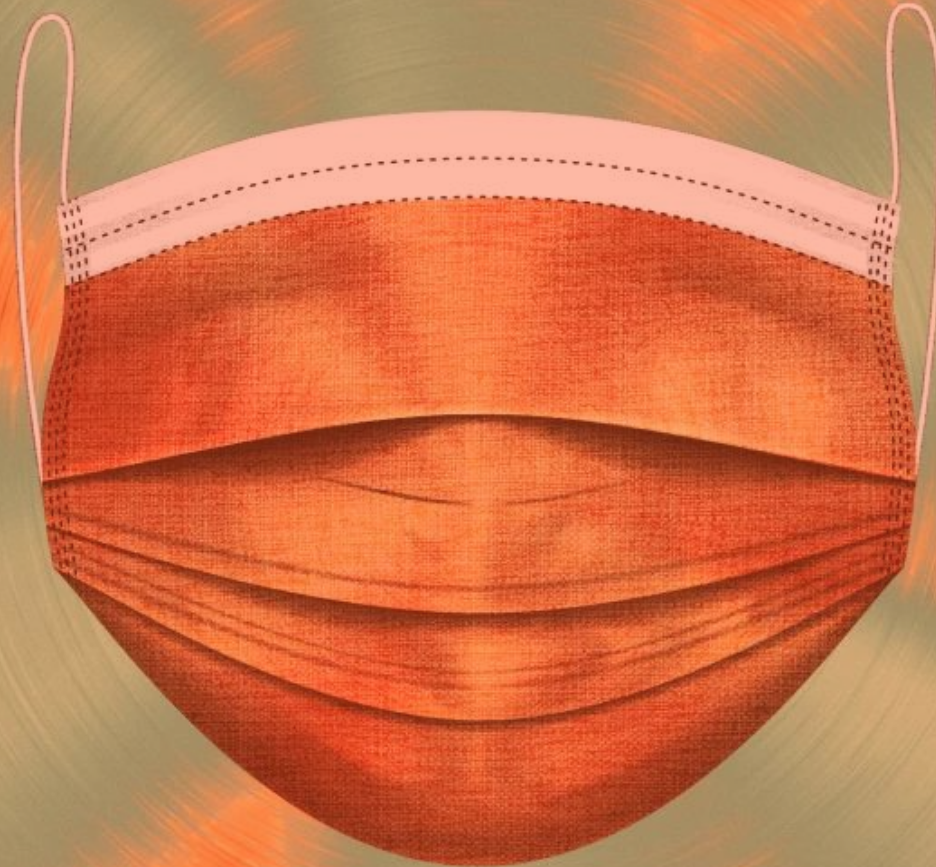
Common Hazards – Prevent Them

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- **Electricity is good servant but bad master.**
 - It can prove to be very dangerous if circuits are not properly protected.
 - **The major fault that appears in electrical network or equipment is termed as short circuit.**
 - In short circuit, the phase and neutral / earth is short circuited accidentally due to foreign metallic substance or due to overload thereby damaging the insulation resulting in short circuit i.e. directly connected resulting in heavy current flow called "short circuit current".
 - This high current heats up the terminations, switches, plugs & cable due to which temperature rises to such a high degree that it is sufficient to generate sparking which further leads to fire.

Covid As Reinforcing Force To Act In Area Of Electrical Safety – Healthcare Facilities



Fire On 08/09/20 At Vadodara Covid Hospital

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- Out of all fire deaths, **3/4** are caused by smoke inhalation.
Source: Hall, Jr. John R. NFPA Fire Analysis & Research, Quincy, MA. "Burns, Toxic Gases, and other Hazards".
- Approximately **57%** of people killed in fires are not in the room of the fire's origin.
Source: NFPA Fire Protection Handbook, 18th Ed. Table 1-1P. Pg. 1-15.
- Visibility - **47%** of survivors caught in a fire could not see more than **12** feet.
Source: NFPA Fire Protection Handbook, 18th Ed. Table 8-1P. Pg. 8-17.
- Smoke travels **120-420** feet per minute under fire conditions
Source: Estimate based upon ceiling jet velocity calculations for typical ceiling heights and heat release rates. 10/20/2021

Hospitals : Vulnerable To Fire And Elect Accidents

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Fire at AMRI in Kolkata
Fire at AMRI in Kolkata

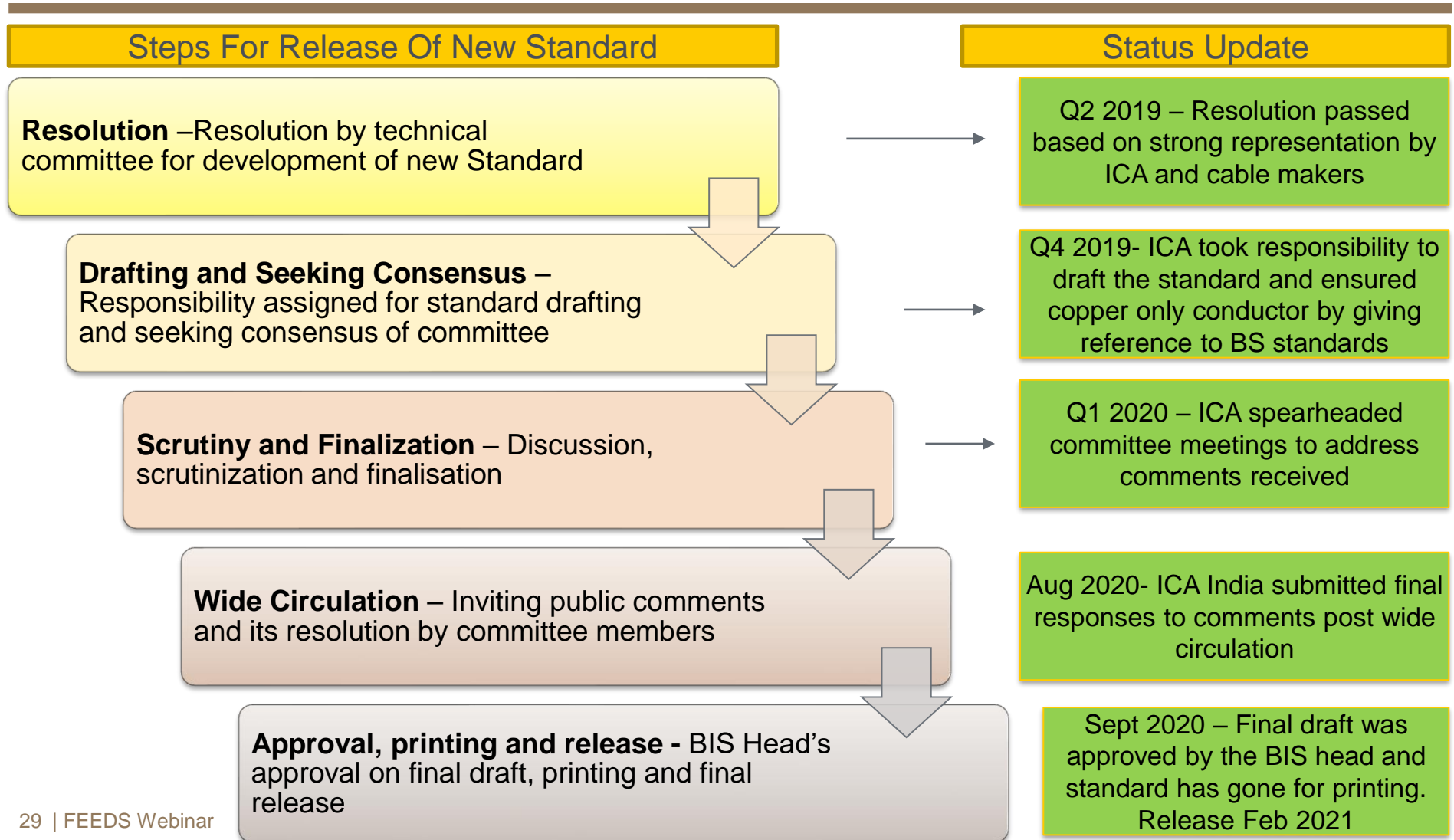


AMRI FIRE

10/20/2021

Bureau Of Indian Standard Release Fire Survival Cable Standard

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Standard Brought In As Quick Response

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IS 17512 : 2021 Requirements for Electrical Installations in Medical Locations

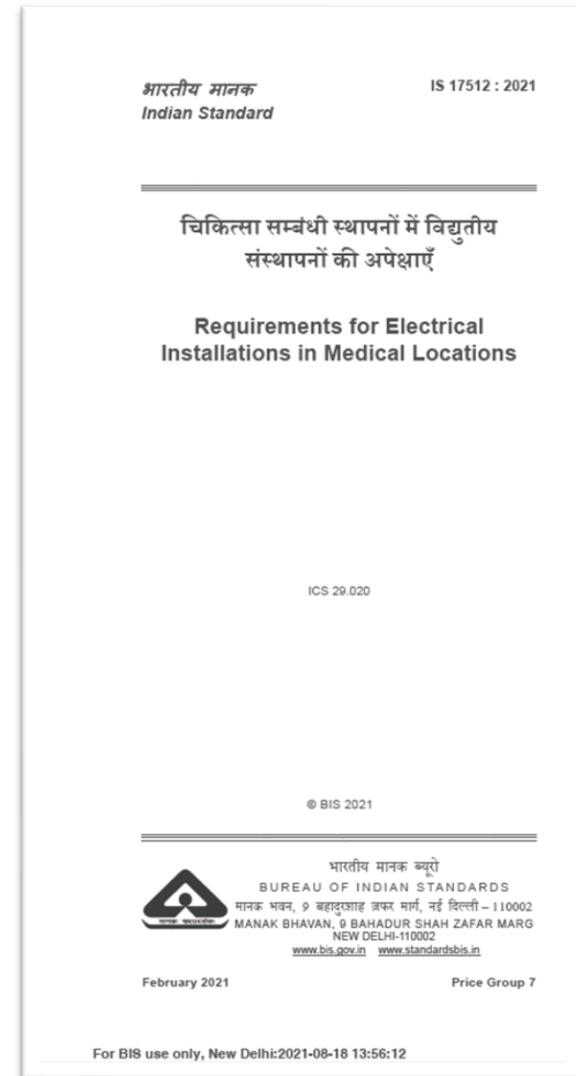
ICS 29.020 ETD 20 New Standard from Last Update.

1 SCOPE

- 1.1 The particular requirements of this standard apply to electrical installations in medical locations so as to ensure safety of patients and medical staff. These requirements, mainly, refer to hospitals, private clinics, medical and dental practices, health care centers and dedicated medical rooms in the workplace.

NOTES

1. It may be necessary to modify the existing electrical installation, in accordance with this standard, when a change of utilization of the location occurs. Special care should be taken where intracardiac procedures are performed in existing installations.
2. Where applicable this standard can also be used in veterinary clinics. The requirements of this part do not apply to medical electrical equipment.
3. For medical electrical equipment; refer to the IS 13450 series.



Action On Codes And Bringing Them Together

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Cu International Copper Association India Copper Alliance

Hospital Electrical Fire Safety - a preventable emergency

Hospital buildings at high risk



Hospital systems at risk....

Voice
Data and Communications
Hospital Management Systems
Patient Services
LED Lighting
HVAC
Energy Management
CCTV and Surveillance
Access Controls
Lifts and Escalators
PA System
Fire Protection
Cables
OTs
Diagnostic Equipment
Patient Monitoring
ICU/NICU



...Exposed by COVID-19 pandemic



Deep rooted underlying causes

Non Compliance to design standards

Faulty electrical installations in an oxygen-rich environment

Poor quality of wiring and cabling

Power Quality issues

Urgent interventions to prevent emergency

Fire Safe Cables Know the Difference

Types of Fire Safe Cables	Quality Tests / Systems	Notes
Fire Survival (FS) Cables	✓	✓
Low Smoke Zero Halogen (LSZH) Cables	✓	✓
Fire Retardant Low Smoke (FRLS) Cables	✗	✗

✓ Suitable for use as per standards. ✗ Not suitable for use as per standards.

Building a proactive approach to fire safety

Ensuring good Power Quality to prevent electrical fire

Wire your electrical networks right

F. No. VIII-110111/02 (Adv)/2020-DGCD (F)
Government of India
Ministry of Home Affairs
Directorate General FS, CD & HG
Fire Cell

East Block – VII, Level – 7,
R.K. Puram, New Delhi – 110 066
Dated 4th May, 2021

To
All the Chief Secretary in the States/UTs.

Subject: Fire incidents in Hospitals/Nursing Homes.

Sir,
Your kind attention is invited to this office letter of even number dated 21st December, 2020 and 28th November, 2020 on the subject mentioned above to prevent the recurrence of fire incidents in Hospitals and Nursing Homes including Temporary Covid Hospitals allowed to operate from temporary structures. However fire incidents have been noticed in recent past resulting in loss of human life and property.

2. As per the National Building Code of India hospitals and nursing homes come under the category of Institutional Buildings. Various fire safety measures have been mentioned according to the type, height and area at table number 7 (Part - IV- Fire and Life Safety). In addition "Recommendations for the Fire Precautionary Measures in Construction of Temporary Structures and Pandals" have been mentioned in IS 8758 (Copy enclosed) including materials, design, construction, fabrication of structure, resistance to fire, NOC from authorities, means of access, capacity, enclosure and exits, electrical arrangements, fire protection measures and firefighting arrangements.

3. You are, therefore, requested to issue necessary directions to the concerned authorities to ensure the followings:

- The permanent hospitals should implement all the provisions as stipulated in the National Building Code of India or as per Local Building Bye-laws/ Fire Service Act.
- The Temporary Covid Hospitals allowed to operate from temporary structure should implement all the provisions as stipulated in IS 8758 or as per Local Building Bye-laws/ Fire Service Act.
- Fire Services be asked to deploy Fire Tender, if feasible, in all Covid hospitals. Otherwise hospitals be asked to engage 24x7 trained fire safety officer with firemen to ensure the fire safety of Hospital.
- It is reported that major fire accidents in hospitals are due to the ignition of fire from electrical wiring and equipment. To ensure safety, final wirings in all temporary COVID hospitals shall be protected as per the recommendation in annexure in addition to the CEA regulations.

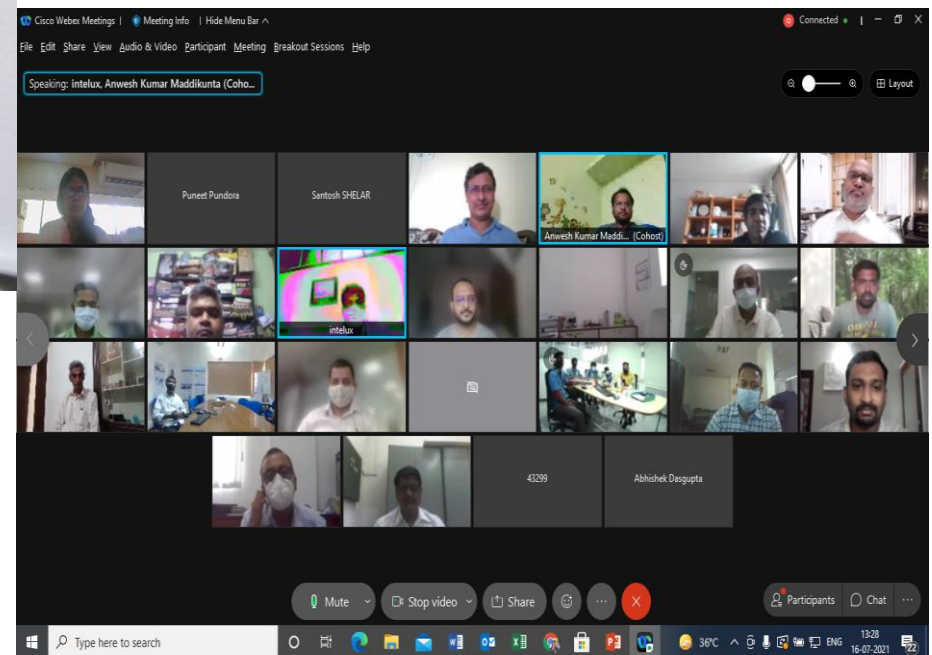
Yours faithfully,

(D K Shami)
Fire Adviser

10/20/2021

Using The Power Of WEB To Aid 'Work From Home And Learn At Leisure'

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National Electrical Safety Campaign 2020-21

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- To sensitize key authorities of the Central/State Govt. organizations and other Local Bodies on electrical Safety through programs at the State/District/Block level.
- To raise awareness among employees and peer groups about the hazards of working with electricity, and of Safe Working Practices.
- To educate Electrical Consultants, Contractors & Supervisors engaged in the Power sector about CEA (Measures relating to Safety and Electric Supply) Regulations and Electrical Installation Standards IS 732.
- To promote awareness and sensitize the community, particularly in remote and rural areas, on the causes of electrical accidents and its prevention by following safety measures.
- To encourage Public and Private Sector Organizations to organize Electrical Safety Awareness Programs at Village/Panchayat level.
- To sensitize public space owners (e.g. malls, high rise buildings, hospitals etc.) and facility managers to adhere and implement electrical safety measures at their establishments.

Campaign Performance

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TOTAL REGISTRATIONS

3645

ATTENDEES

1948

ENGAGEMENT TIME

23+ Hrs

CAMPAIGN REACH

7k+

?

10

Selected Sessions

?

3.64k

Registrants

?

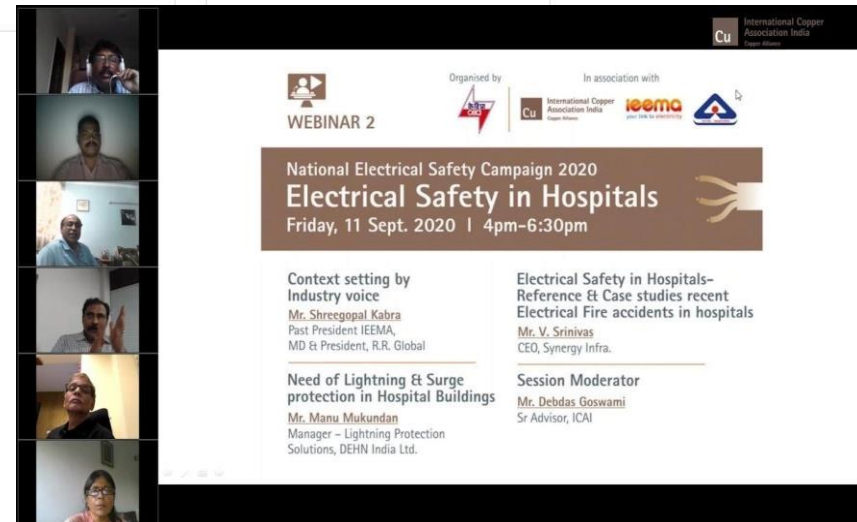
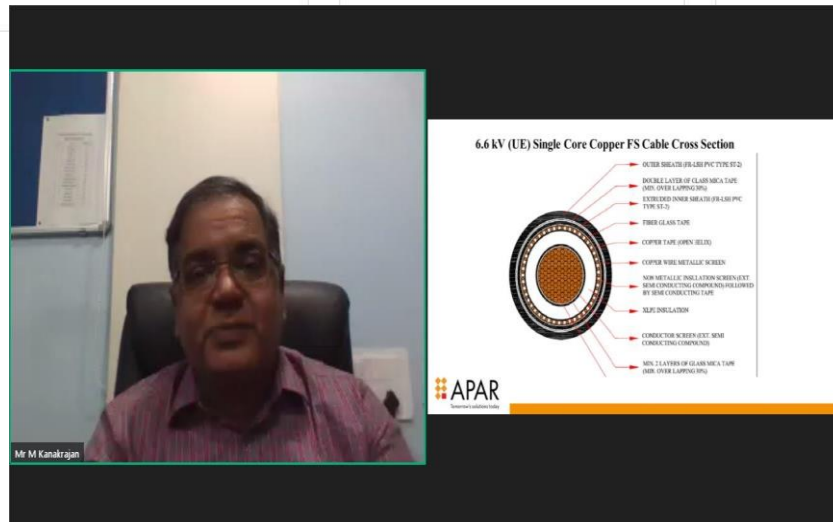
1.94k

Attendees

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53%

Attendance Rate



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35 | FEEDS Webinar

Conclusions And Future Outlook To Influence Governing Law, Rules And Regulations Concerned To Electrical Safety In Buildings

Conclusion Towards Safe Building Electrical Installations ..1/2

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- Installation is properly designed and carried out with safe material and in accordance with the latest national standards.
- All the prescribed protective measures are adhered to and implemented.
- The necessary plans, diagrams and descriptions are kept at the disposal of any person working or testing or supervising the installation and cover the electrical installation.
- An experienced contractor, who is qualified for this type of work, and who is fully aware of the importance of the safety of the electrical installation, carries out the installation.
- An experienced authorised inspector does a verification of the installation by carrying out a visual inspection and testing.

Conclusion Towards Safe Building Electrical Installations ..2/2

- A certificate is issued, based on a positive compliance report.
- The utility checks the validity of the certificate before connecting the electrical installation to the public grid and refuses to connect in absence of valid certificate.
- The owner/user of the electrical installation understands the hazardous aspects (cause of fire) of electricity. He should find it normal and logical that the electrical installation is well maintained and regularly inspected.
- The authorities support and supervise the whole chain by:
 - Making the Code simplified and Good Practice Guide widely available;
 - Ensuring the education at school level;
 - Statute the qualification and/or licensing of installers;
 - **Accord explicit statutory status to be accorded to Self / Third Party Certification**
 - Uphold sanctity for the system of certificates before connection to the public grid is possible;
 - Enforcing that the utilities only connect safe electrical installations to the public network.
 - Introduce measures to ensure periodic inspection of installations under statute

To Summarise

- Electrical Work, an important building service without which building cannot be complete
- Defects concern lives of innocent where survival rate is very less
- Fire caused by electrical faults are alarming
- Consumer is totally ignorant and getting cheated
- Promoters depend on appointed agencies

RERA – For Transparent Real Estate Electrical Aspects

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Projected Outcome If Implemented

- Most loopholes get plugged
- Consumer will get Quality Assurance through the published certification from website
- Publishing the information is very much within the ambit of existing provisions of the Act
- Responsibilities get assigned specifically to the concerned with proposed stagewise certifications
- Publishing certifications of works complying safety will become a credential of project

Thank you

For more information, please contact

Mr Manas Kundu

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