

**LINEAR HEAT SENSING
TUBE BASED AUTOMATIC
SUPPRESSION SYSTEM**

42% fire incidents

are caused by faults, defects or use of non-standard electrical products leading to short circuits

13 Deaths

recorded every day in India due to electrocution and fire triggered by Electrical Short Circuits

8% of deaths in factories

are attributed to electricity

Source: Based on ICA's Analysis derived from multiple data points

**ELECTRICAL FIRE –
GRASPING THE MENACE!**

MAJOR CAUSES!

- **Harmonics**
How computers and other non-linear loads lead to heating of electrical network
- **Excessive Thermal Insulation**
Overload and excessive thermal insulation leading to fire
- **Voltage surges**
Difficult to notice but always at play in heating of cables, equipment in the electrical network
- **Addition of new loads**
Design inadequacies, wiring mistakes, health of equipment and more...causes of heating
- **Poor connections and Earthing**
Undoubtedly, the biggest and most common cause
- **Electrical Fire Risks from Renewable Systems**
Ensuring safety while pursuing sustainable operation to save the earth

Electrical Fire - Top Root Causes

Ageing Installations

No upgrades, significant modifications, poorly maintained

Poor Maintenance

Inadequate workforce, Outage based maintenance, Obsolete equipment or components

Poor Workmanship

Unskilled personell, Contract work with low price tag, non-compliance to standards

Inappropriate Design

Violation of codes, low awareness about standards and professional practices, Adequate sizing of wires and consideration to procure from reputed makes

Source: ICA and APQI Analysis

ELECTRICAL FIRE - CAUSES!

The relatively lower awareness, difficulties in spotting, understanding and correcting Power Quality issues and the sheer number of issues itself makes it challenging to pin poor Power Quality as a cause for electrical fire.

How to put out an electrical panel fire

There are several classes of fires, and electrical fires fall under the **Class C** category. In the case of a fire occurring in an electrical panel, **do not try putting it out with water**. Trying to put out the fire with water will only worsen the situation and puts you and others in more danger. **Water conducts electricity**, and dumping water on or near a power source can give you a **severe electrical shock**. It might even make the fire worse.

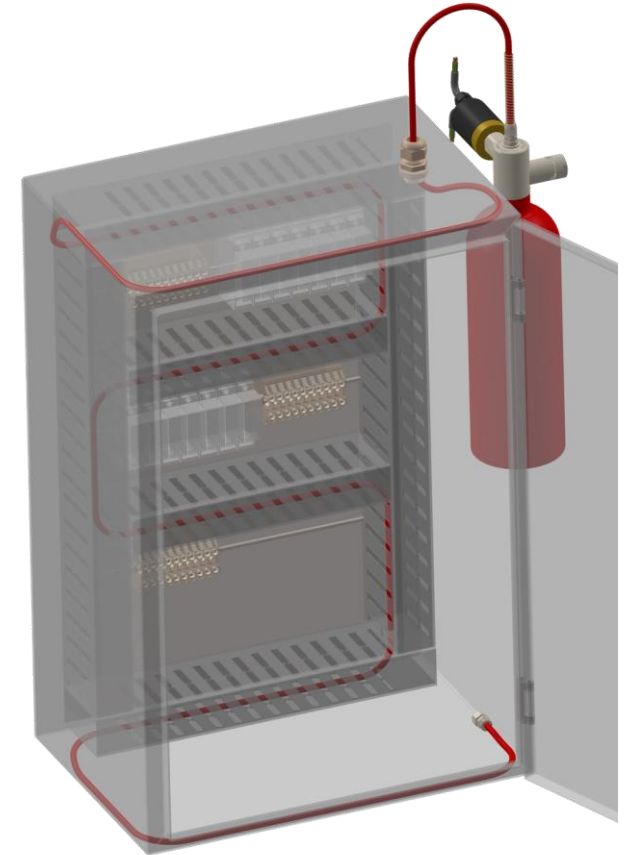
Two options to put out an electrical panel fire is a **handheld fire extinguisher** or an **automatic fire suppression system**. If using a fire extinguisher, make sure it has a rating to extinguish **Class C fires**. The drawback of using a fire extinguisher is that **a person must be present** when the fire starts. A person will need to **grab the fire extinguisher, open the electrical panel, and release the fire suppression agent from the extinguisher**.

This will rarely happen, as firstly the fire will only appear when it has spread and the temperature rise will make it impossible for anyone to open the panel so as to access the base of the fire to extinguish it.

How to put out an electrical panel fire

For **24/7 protection** for an electrical panel, an **automatic fire suppression system** is the ideal choice. The **linear heat sensing fire detection tubing** is routed through the electrical panel and connects to a cylinder that contains the fire suppression agent. In the event of a fire, the **tubing will burst automatically in case of fire or abnormal heating** and **deploy the agent to suppress the fire.**

For electrical panels, we recommend using a **clean agent**. The clean agent leaves **no residue and is not harmful to people**. It is **nonconductive and noncorrosive** and will **not damage the electrical panel.**



Tubing System Installation Drawing

NASA – TUBE BASED AUTOMATIC SUPPRESSION SYSTEM

This NASA system provides a simple and reliable fire protection solution for open and semi-enclosed server racks and electrical Cabinets. The Direct system utilizes pressurized NASA polymer Detection Tubing as both a fire detecting sensor and extinguishment delivery device. The specialized tubing is leak resistant, flexible, durable and temperature sensitive which allows it to quickly react when the heat from the fire is there and rupture will rupture when exposed to flame. The detection tubing connects to a custom engineered valve and a cylinder that contains the best UL Listed fire suppression agent for this particular hazard.

The flexible red Detection Tubing can be routed throughout a server rack, ensuring detection and suppression of a fire right at its source. The tubing is designed to burst at the point of highest heat, forming an effective discharge nozzle. The NASA Systems are also ideal for protecting cable trays. One system can be configured to protect up to a total of 35 Meters of cabling. Direct systems can be fitted with an optional pressure switch to shut down electrical equipment or activate local or building alarms and integrated into the fire detection system.



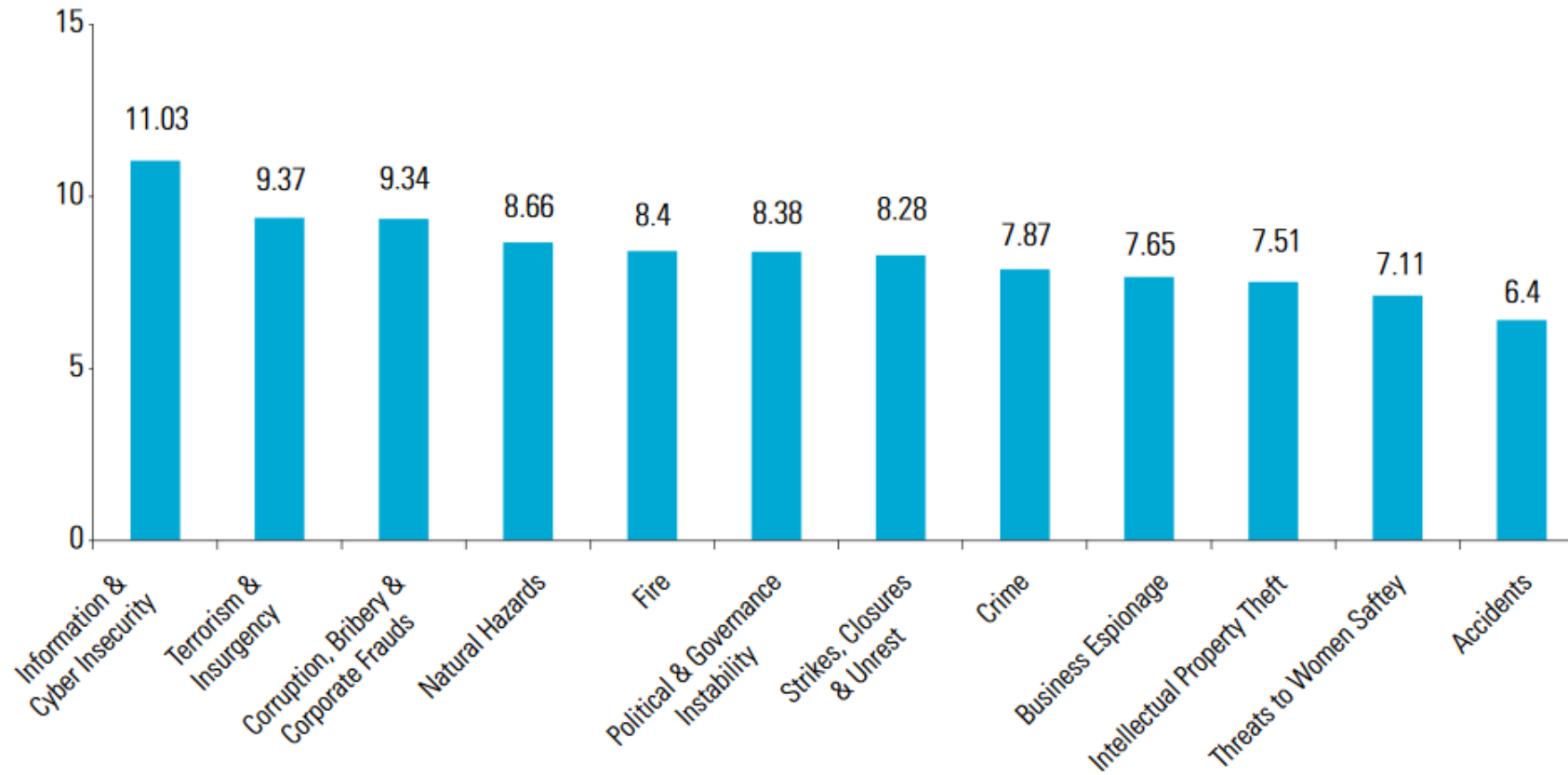
System Specimen

Advantages of Automatic Tubing System

- Fast, reliable fire protection without the damaging side-effects of water
- Suppresses a fire in seconds, reducing equipment damage and downtime
- Easy to install in any new or existing server rack or closet and requires no power to operate
- Clean suppression agents require no post-discharge clean-up
- Will not harm people, equipment or the environment
- System options expand peripheral capabilities
- Clean agents will not harm electronic equipment or magnetic media and also used on energized equipment
- Does not interfere with installation or maintenance of equipment

“Linear Heat Detection Tubing system is indispensable for detecting fire and is instrumental in averting fires, loss of property and lives.”

Overall Risk Rating for Businesses



As per the National Crime Records Bureau, about over 60 people die every day in India due to fire. Every year, about 25,000 persons die due to fires and related causes, in India.

Economic Loss due to Fire

While the Economic losses suffered due to these fires have not been calculated. However, some estimates and independent studies have come up. According to one, out of the major losses reported by the Indian Insurance Companies, about 45% of the claims are due to fire losses. According to another study, about Rs. 1000 crores are lost every year due to fire.

Fires have been rated as the 5th highest risk in the manufacturing industry.

What Next?

Prevention is always better than cure. Thereby, it is best to avoid Fire in the first place. Although, fire emergencies and disasters can strike anyone, anytime, anywhere. We can, at least, work towards minimizing the risks of fire occurrences. Also, prevent damage.

Fire prevention should be considered part of everyone's job. From the Topmost level to the lower step. All stakeholders must help to keep the work area clutter-free and safe from fire hazards. Extreme care must be taken at the time of working with inflammable chemicals. Whether solvents, gasoline, gases, and fuels.

And the best prevention for fire is knowledge and training.

Automatic Fire Suppression Systems which detect and suppress the fire automatically should be promoted to ensure minimum loss due to fire.

Why treat fire safety as an investment and not an expense?

When you invest in Fire Safety set-up for your business, you invest in people. It improves health, safety and well-being of the people connected with you and your business. A safe, healthy work environment is one of the most basic social rights. Providing protection of workers from Occupational Safety and Health risk improves goodwill. Besides being the humane thing.

Good Fire Protection systems and practices will be helpful because

- Employees will understand the **importance of safety**. It will **raise awareness of fire prevention and protection measures**.
- You would be able to reinforce personal safety through **good practice and working**.
- **Compliance** of rules and regulations.
- **Accidents won't happen at all**. Or at least there will be a **reduction** in the number of incidences.
- Good Fire Safety management **saves lives**. And it is crucial to protect workplaces. They must be made as safe as possible from fires.
- All Fires **impact the lives of people and communities** in which you operate. Additionally, a Fire would **affect people, your employees and you**.
- It will improve **staff morale**. Thereby **improving productivity**. And, therefore, the **Profits will be better**.
- You get **easier Insurance**. If all the necessary systems are in place. And a frequent check is undertaken. It will be easier to get Fire Insurance from several companies. Moreover, in the remote case, that Fire still occurs, it would be **easier to claim** and recover the losses.
- There are **Tax benefits** on placing proper Fire Safety management systems, from the government. The various Audits and Certifications of Being Fire Safe provide Tax exemptions, which are too immense to ignore.

Conclusion!

Are you ready to take the property loss and damage? Can your business afford to lose on the lost workdays? Do you have the time, money and effort to get entangled in the unnecessary and avoidable legal procedures? The reputation of your brand would get adversely affected, for sure. Several studies, one of them conducted by the UN, abroad show that there is at least a benefit of 2:1 Return on what the businesses have invested. These studies show strong evidence that fire safety investment should be better appreciated.

Investing in Fire Safety is, therefore, essential from a moral, legal and financial perspective.

“Therefore it makes utmost sense for all the stakeholders to invest in Automated Fire Suppression Solutions as fire is unpredictable and it needs to be suppressed before it grows big and only a system which works automatically and is present at the source can provide the best and optimal solution”

Technical Specs for System & Tube

Sr. No.	Item	Details
1	Extinguisher	Conforms to BIS Standards
2	Main container	S.S. 304 Cylinder with 1.2 mm thickness
3	Valve Body	Pressure Die-Cast Stainless Steel 304
4	Valve Characteristics	Leak Proof Mechanism
5	Extinguishing Agent	UL listed HFC 236FA UL Listed HFC 227EA UL Listed FK 5-1-12
6	Distribution and Delivery System	Plated Brass Fittings
7	Distribution System	Optional Multi-port manifold as per design
8	Automatic Delivery System	Polymer based low temperature automatic fire detecting tubing
9	Pressure gauge	Diaphragm type
10	Cylinder Pressure	14 bar
11	Test Pressure	28 bar
12	Range	Upto 36 Mtrs
13	Capacity	As per design
14	Conductivity	Certified non-conductive up to 100KV at ERDA Lab
15	Gas Shelf Life	10 years
16	Warranty	5 years* on Cylinder and Cylinder Fittings. 2 Years on Tube
17	Average discharge percentage	99±1%

Sr. No.	Item	Details
1	Material	Low Heat sensitive modified thermoplastic
2	Color	Red
3	O.D.	6 mm +/- 0.1mm
4	I.D.	4 mm +/- 0.1mm
5	Heat Sensitivity Temperature	120 deg. C – 150 deg. C
6	Flame Sensitivity Temperature	Around 100 deg. C
7	Minimum bend radius	30 mm
8	Working pressure	Up to 25 bars
9	Approval	CE/UL