

Ministry of Higher Education and Scientific Research

Relizane University

Faculty of Sciences and Technology

Department of Electrotechnic and Automatic

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This course is intended for fifth year students of the Bachelor's degree in Electrical Engineering (Discoveries).

It is delivered in English, [a translation of the course to allow students to avoid them to translate (saving time) and assimilate well (understand) is attached].

It is presented in the form of a Question and Answer.

It should be noted that the exam will be in English and not in French.

CAUSES OF ELECTRICAL EQUIPMENT FAILURE

Part I:

What is the main cause of electrical equipment failure?

Wiring and connection problems :

Issues with electrical wiring, connections, and equipment components can cause electrical faults that lead to failure. Aging equipment is especially prone to such issues due to its natural wear and tear

What are the causes of electronic equipment failure?

Failures can be caused by excess temperature, excess current or voltage, ionizing radiation, mechanical shock, stress or impact, and many other causes. In semiconductor devices, problems in the device package may cause failures due to contamination, mechanical stress of the device, or open or short circuits.

What is the most common cause of equipment failure?

Regular wear and tear

It is the most common cause and happens in all types of equipment. Repeated use of machinery, even when following the best practices, will eventually lead to wear and tear (also known as 'metal fatigue')

What are the main causes of electrical faults?

Some causes of faults include:

- Lightning strikes, tree contact.
- Contamination, moisture ingress.
- Insulator or conductor damage.
- Transformer/switchgear failures.
- Overloading beyond ratings.
- Loose connections, abrasions.
- Human errors during maintenance.
- Cable insulation deterioration.

What is the most common electrical failure?

Since loose connections are the number one leading cause for electrical failures by contributing to over 30% of all electrical failures and are a major cause for power outages, we've devised a solution to monitor those failure points and prevent unexpected downtime

What are the four electrical failures?

These are the open circuit, high resistance, short-to-ground and short-to-power.

Understanding the customer concern and simple visual inspection can often narrow down which of the four failures you are dealing with

What are the four most common causes of failure of electronic circuits ?

Thermal stress that causes cracking of the encapsulation. Poor storage that allows moisture or humidity to penetrate. Metallization damage from heat, corrosion, or electrical overstress. Material defects, including impurities, may cause problems in the oxide layer or semiconductor crystals.

What are the major causes of system failure?

System failures can occur due to various reasons, such as hardware malfunctions, software bugs, power outages, network issues, human errors, or a combination of these factors. They can also result from insufficient system resources, inadequate maintenance, or security breaches

What is failure in electrical engineering ?

Electrical failures are failures where electricity or the distribution of electricity is suspected to have caused loss or injury. Typical failures would be electrical wiring, distribution panels, overloading and power lines.

What are the most common electronic components that fail ?

Passive Components

- Capacitors (shorted), especially electrolytic capacitors. The paste electrolyte tends to lose moisture with age, leading to failure. ...
- Diodes open (rectifying diodes) or shorted (Zener diodes).

- Inductor and transformer windings open or shorted to conductive core. ...
- Resistors open, almost never shorted.

How do you solve equipment failure?

Here are the five basic steps to troubleshooting equipment breakdowns :

1. Verify a Problem Actually Exists. The troubleshooting process begins with symptom recognition. ...
2. Narrow Down the Problem's Root Cause. ...
3. Correcting the Cause of the Problem. ...
4. Verify the Problem Is Corrected. ...
5. Prevent Future Issues By Following Up.

What is the most common cause for the failure of electrical equipment?

Overloading is one of the most frequent reasons for electrical system failure. When there are too many appliances or gadgets plugged into a single circuit or outlet, overloading occurs. This might trip the circuit, which would result in a power loss or perhaps a fire

What is the most common cause of electrical problems?

The circuit breaker tripping is one of the most common causes. This is an easy fix! Just find the switch that tripped and switch it off and on. Other issues that could be the cause are faulty, burned out, or half-hot outlets along with blown fuses or loose wires.

What is fault in electrical equipment?

In an electric power system, a fault or fault current is any abnormal electric current. For example, a short circuit is a fault in which a live wire touches a neutral or ground wire.

What causes electrical faults?

Some common causes of electrical faults include faulty wiring, damaged insulation, overloaded circuits, lightning strikes, power surges, and voltage fluctuations. The most common types of faults include open circuit faults, short circuit faults, and ground faults.

What are the common electrical problems and solutions ?

Most Common Electrical Problems At Home

- Electrical surges or dips. ...
- Flickering lights. ...
- Frequent light bulb blowouts. ...
- Warm outlets or switches. ...
- Tripping circuit breakers. ...
- Damaged extension cords. ...
- Dead outlets. ...
- Some lights are too dim or too bright.

What are the main causes of electrical cable failure?

What are the main causes of electrical cable failure?

- Application : If cable selected is not appropriate for the application it is more likely to fail in service. ...
- Mechanical failure: ...
- Degradation of the cable sheath: ...
- Moisture in the insulation : ...
- Heating of cable: ...
- Electrical Overloading: ...
- Rodent attack: ...
- UV exposure:

What are the three main causes of circuit failure?

Let's dig into the details.

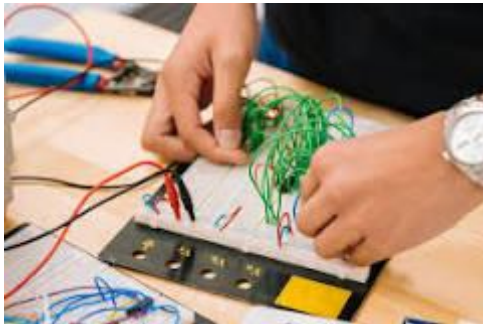
- Overload of Electricity. An overload of electricity in the circuit is the main and primary cause of a short circuit, with all other causes leading to it. ...
- Wear and Tear of Electrical Wires. ...
- Poor or Loose Connection of Wires. ...
- Manufacturing Fault in Appliance. ...
- Contact with a Lot of Water.

What are the 3 types of electrical problems?

Most Common Types of Faults

- Surges. A power surge is a sudden spike in voltage supplied to a circuit. ...
- Short circuits. A short circuit is when a Live wire comes into contact with a Neutral wire or an Earth Wire. ...
- Open circuits.

What are the main problems of electrical engineering ?



Typical Electrical Engineering Problems

- Circuit Design Challenges. Designing efficient and effective circuits can be a real headache. ...
- Power Quality Issues. ...
- Thermal Management. ...
- Signal Interference. ...
- Reliability and Maintenance. ...
- Safety Concerns. ...
- Energy Efficiency. ...
- Component Failures.

What causes electronics to fail ?

Failures can be caused by excess temperature, excess current or voltage, ionizing radiation, mechanical shock, stress or impact, and many other causes. In semiconductor devices, problems in the device package may cause failures due to contamination, mechanical stress of the device, or open or short circuits.

How do electronics fail ?

Component failures can occur due to several reasons, such as manufacturing defects, aging, wear and tear, thermal stress, mechanical stress, electrical stress, or environmental factors. Component failures can cause the electronic system to malfunction, behave unpredictably, or stop working altogether.

What are common cause failures due to ?

The explicit common cause failure is due to the failure of shared component/system leading to the failure of redundant components. The redundant pumps sharing a single power supply source is one such example. The explicit common cause failures can be modeled in system logic models such as fault tree.

What are the causes of service system failure?

Themes among those studies were categorized into six broader categories of causes of service failure; process failure, people failure, product failure, price failure, place failure, and physical evidence failure.