



Safety Studies

Multidisciplinary studies across fire, electrical, civil, chemical and process safety.

MLC
QEHs AT ONE PLACE

Safety Studies

Multidisciplinary studies across fire, electrical, civil, chemical and process safety.

Fire & Electrical

Process & Chemical

Civil & Workplace

MLC offers multidisciplinary safety studies across fire, electrical, civil, chemical and process safety, plus the wider workplace and emergency reviews below. Every study is scoped around your facility and operations, and reported with findings and recommendations your teams, authorities and insurers can act on. The current portfolio is listed below.

Fire Safety

Fire Safety Audit

7 KEY AREAS

FIRE SAFETY AUDIT

- Hazard Identification
- Detection & alarms
- Gas suppression
- Water firefighting
- Fire extinguishers
- Life safety
- Passive protection



Fire Load Calculation

Assessing potential fire severity



Fire load significance

Combustible energy



Building classification

Occupancy & use



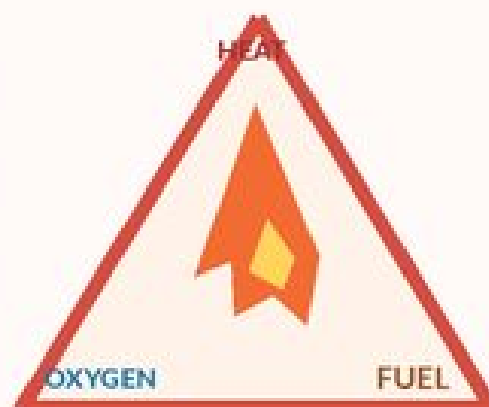
Calorific value

Fuel heat content



Fire prevention

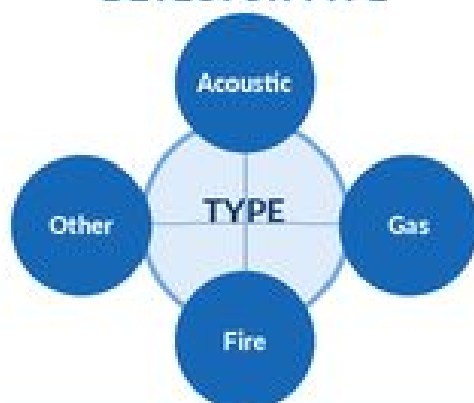
Risk reduction



Fire & Gas Detector Mapping

TYPE + LOCATION

DETECTOR TYPE



DETECTOR LOCATION





Fire Protection Systems

PASSIVE + ACTIVE



Business Process Re-engineering

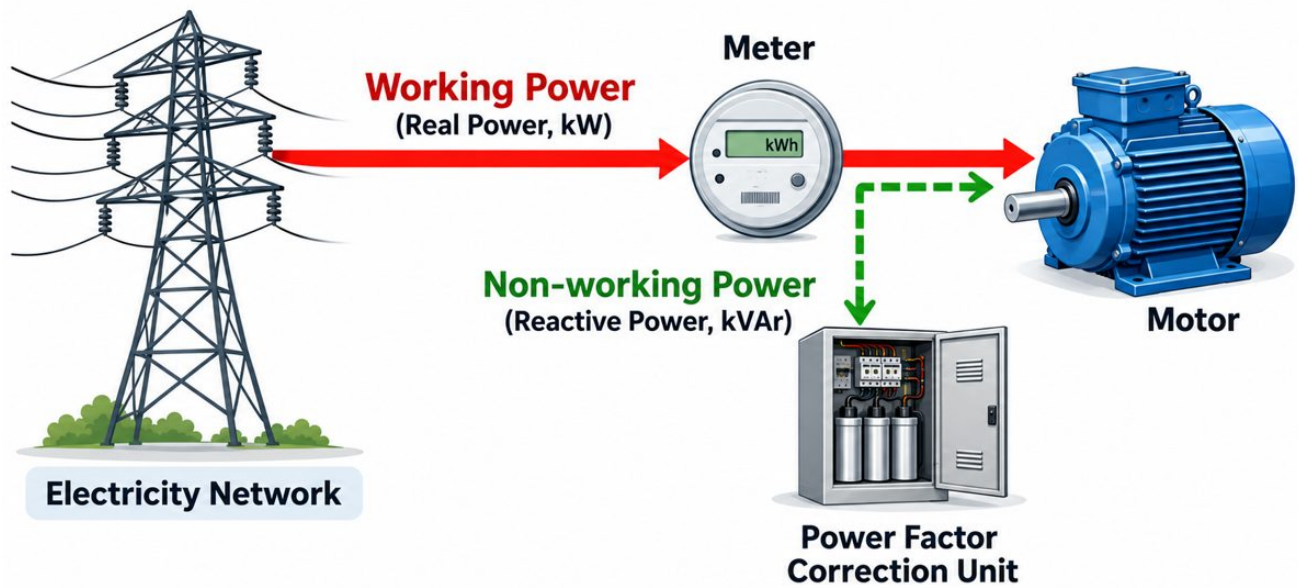
BPR

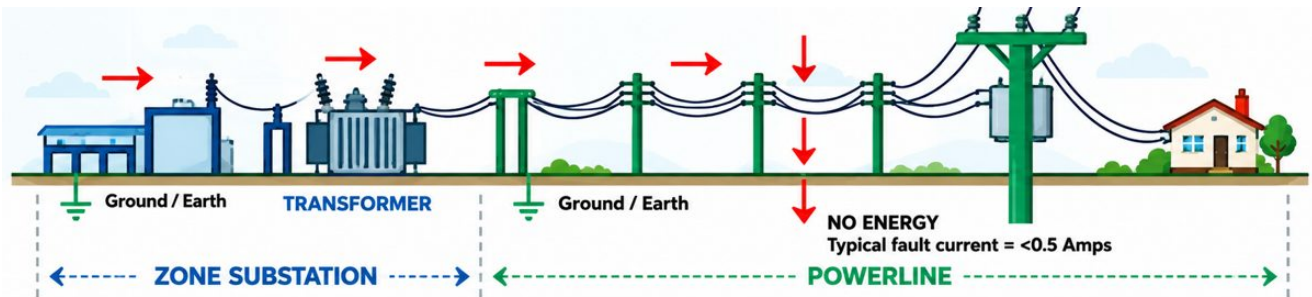


- Fire & Gas Detection Mapping Study
- Design Adequacy of Fire Protection System
- Business Process Re-Engineering
- Fire Load Calculations
- Fire Risk Assessment / Fire Safety Audit



Electrical Safety





Simple Method for **Short Circuit** Current Calculations

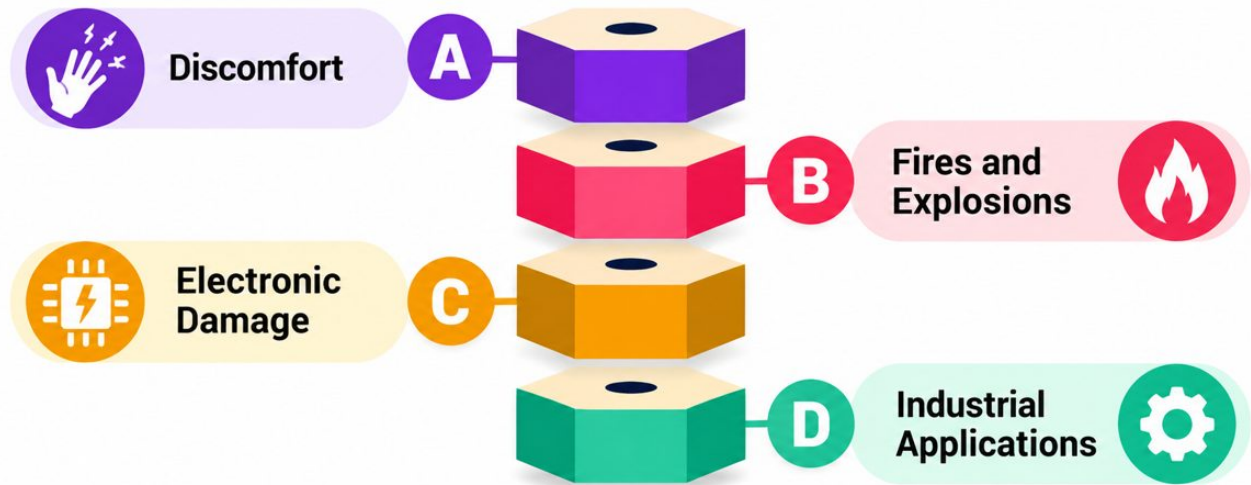


Thermography Testing is **Essential** for Electrical Maintenance

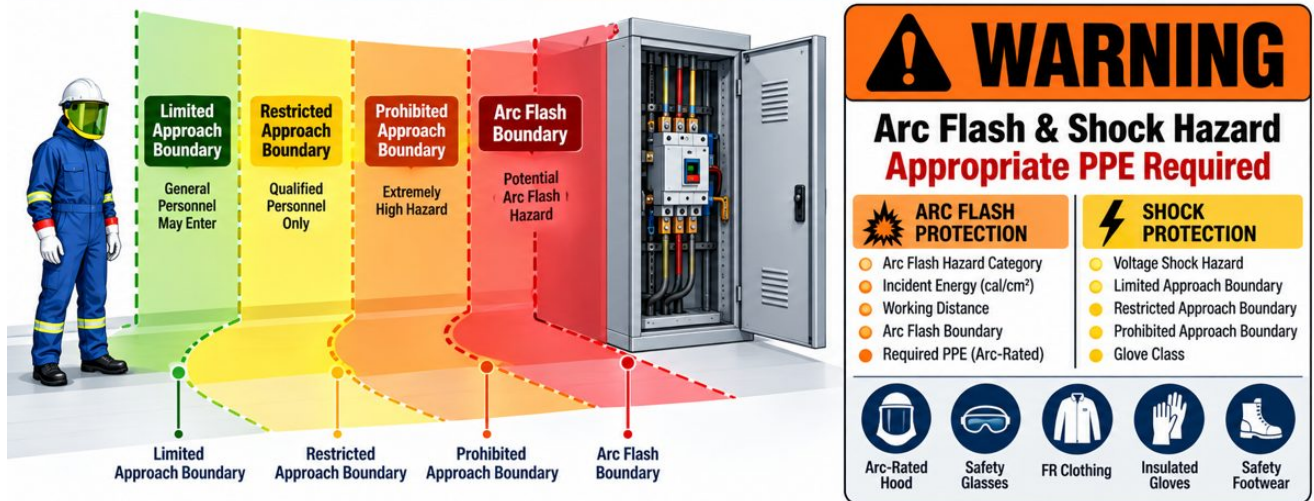




Effects of Static Electricity on Humans and Technology



Arc Flash Study





Electrical HAZOP



Classification of Electric Power Distribution Network

1 Generation

Electricity is generated at power stations using various energy sources (e.g., thermal, hydro, solar).

2 Transmission

High-voltage transmission lines carry electricity over long distances to transmission substations.

3 Distribution

Electricity is distributed through medium- and low-voltage distribution networks to local areas.

4 Transformer

Distribution transformers step down the voltage to a level suitable for consumer use (e.g., 400/230 V).

5 Residential Consumers

Electricity is supplied to homes, businesses and other consumers for daily use.



Power Station

Transmission Substation

Distribution Network

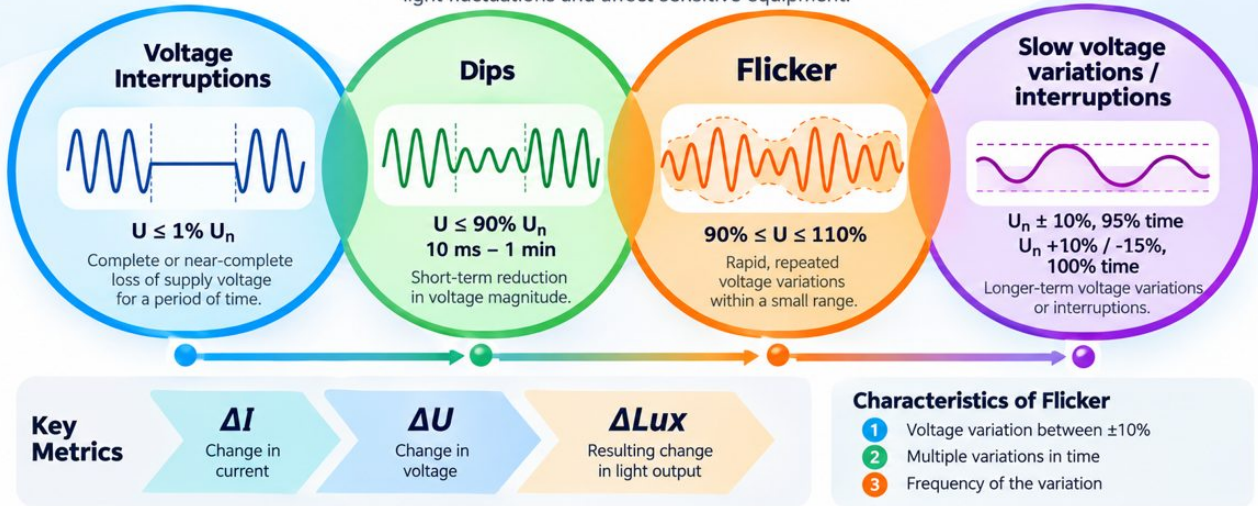
Distribution Transformer

Residential Consumers



What is Flicker?

Flicker is a rapid, repeated variation in supply voltage that can cause visible light fluctuations and affect sensitive equipment.



Earthing Audit

Ensure Electrical Safety, Compliance and Reliable Operation



Safety Assurance



Testing & Verification



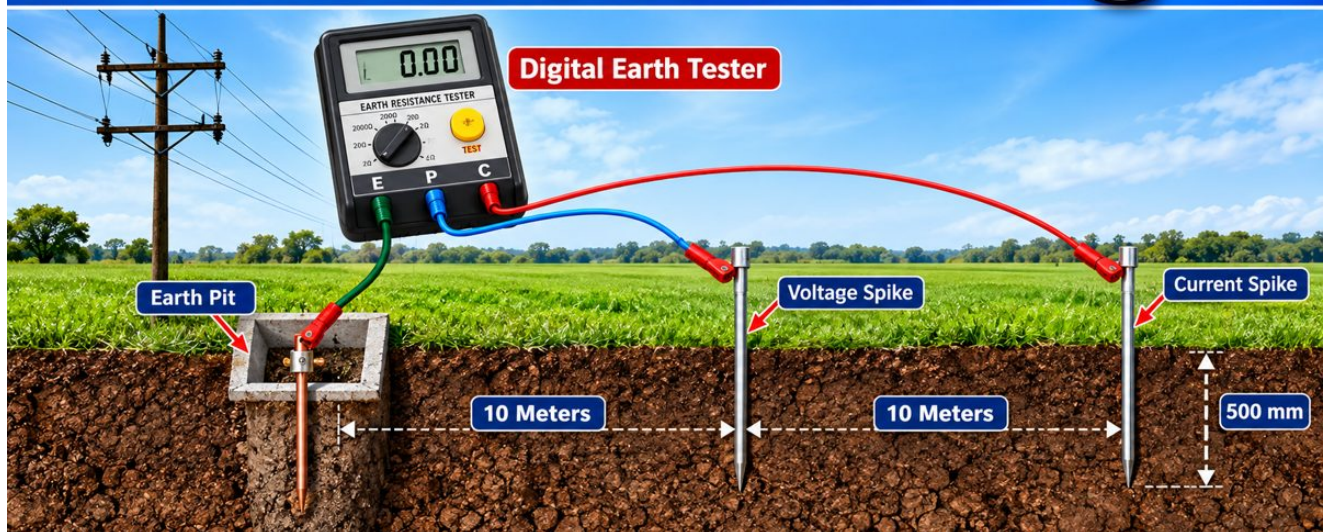
Compliance & Reporting





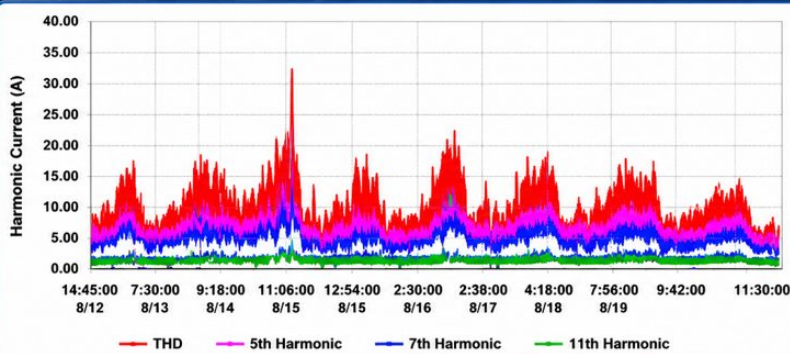
Lightning Protection Risk Assessment Calculator

Earth Pit Testing



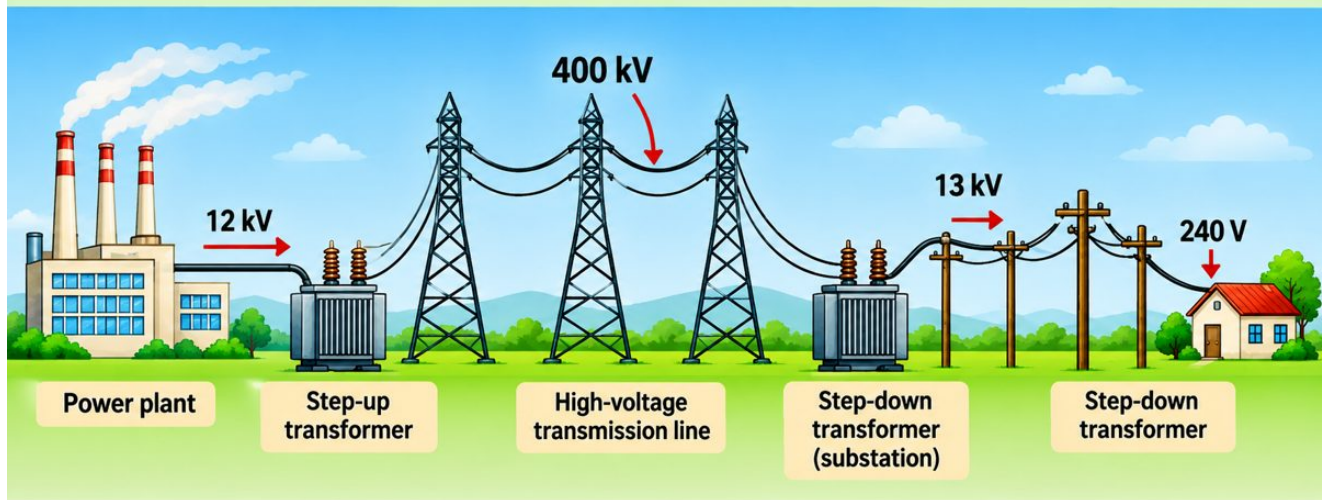


HARMONIC STUDY & ANALYSIS





LOAD FLOW ANALYSIS



- Arc Flash Study
- Lightning Risk Assessment and Design of Lightning Protection System
- Hazardous Area Classification (HAC) – ATEX Study
- Thermography
- Electrical Safety Audit
- E HAZOP
- Inspection of Flameproof Electrical Equipment's
- Static Electricity Study
- Energy Conservation Audit
- Electrical Thermography
- Mechanical Thermography
- Building Thermography
- Thermovision scanning in Cold Storage, Pharmaceuticals
- Medical Thermography
- Thermovision Scanning in Transmission lines
- Thermovision Scanning in Cement Boilers, refinery
- Thermography in Paper, Pulp, Printing, Packing
- Thermography in Hotel, food, beverage, Polymer, fiber, Glass, Milk dairy, Textile
- Power Quality services and Harmonic study
- Power Quality Analysis Audit Services
- Harmonic study
- Energy Audit
- Power Audit
- Power Factor Audit
- Transients Audit



- Load Flow Analysis
- Flicker Study
- UPS & Generator Study
- Earthing Audit and Insulation Resistance Measurement

Civil Safety





PROJECT RISK MANAGEMENT

Determining the level of risk assessment for a project

1 Level 1 Identification

- Focus on list of risks
- Helps communicate potential risks
- No assessment step

Limited time investment

Risk	Category
Complications in demolishing warehouse	Cost
Delay in completing the foundation	Schedule

2 Level 2 Qualitative

- Analyzing risk through a single-point estimate
- Impact & probability
- Provides prioritized list of risks to manage

Moderate time investment

	VL	L	M	H	VH
VH					
H					
M					
L					
VL					

3 Level 3 Quantitative

- Analyzing risk through a single-point estimate
- Impact & probability
- Provides prioritized list of risks to manage

Significant time + risk expert

Non-Destructive Testing



CONSTRUCTION SAFETY

AUDITS THAT HELP SAVE LIVES



Civil Safety



- Building Structural Stability Study
- Building Risk Assessment – using Non-Destructive Testing
- PHSER Study
- Project Risk Assessment
- Construction Site Safety Audit



Chemical Safety

Chemical Storage **Safety Measures** in Industry



Safety in Warehouse



Safe practices for storing
hazardous substances



Dos and Don'ts of handling
& storing of chemicals



Keeping field work safe with

JOB SAFETY ANALYSIS



Main Elements for Good Chemical Risk Management





Chemical Storage Safety measures In Industry



Safety in Warehouse



Safe practices for storing hazardous substances



Dos and Don'ts of handling & storing of chemicals



HAZARD AND OPERABILITY STUDY HAZOP

Purpose of HAZOP



01



To identify credible causes, consequences, and safeguards before INCIDENTS occur.

02



To define recommendations to minimize the HAZARD by eliminating or controlling the cause or providing "lines of defense."

03



Provide compatible information for subsequent Process Safety efforts (i.e., LOPA scenarios).

04

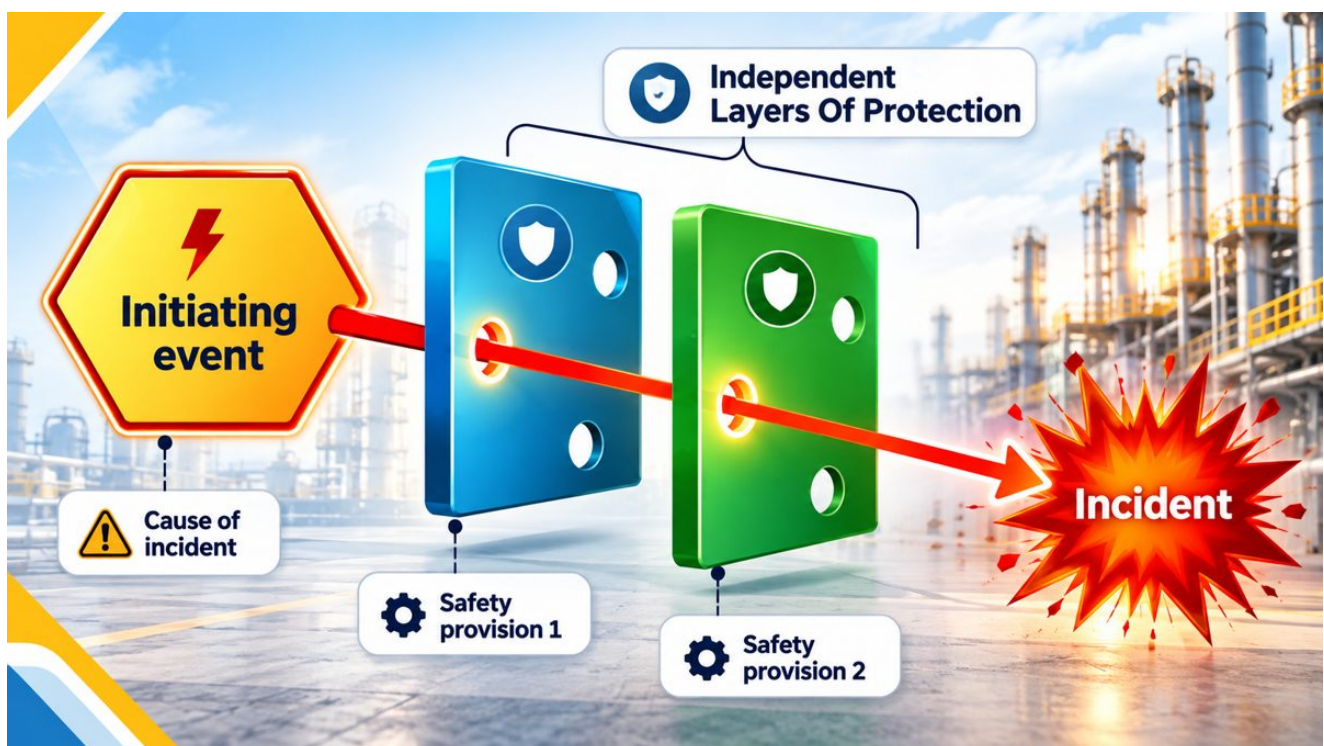


Comply with regulatory Process Safety requirements.





HAZOP Study Process





Minimum Ignition Energy (MIE)

Minimum Ignition Temperature (MIT Layer)



Pre-Startup Safety Review (PSSR)

Common Mistakes



Missing safety checks



Improper approvals



Can your share more?



PSSR Mistakes



Skipping the PSSR



Incomplete teams



Rushing the process

Quantitative Risk Assessment (QRA)



 Safety Integrity Level	 Risk Reduction Factor	 Probability of Failure on Demand
SIL 4 	100,000 to 10,000	10^{-5} to 10^{-4}
SIL 3 	10,000 to 1,000	10^{-4} to 10^{-3}
SIL 2 	1,000 to 100	10^{-3} to 10^{-2}
SIL 1 	100 to 10	10^{-2} to 10^{-1}

Frequency	5	SIL 3	SIL 4	X	X	X
	4	SIL 2	SIL 3	SIL 4	X	X
	3	SIL 1	SIL 2	SIL 3	SIL 4	X
	2	-	SIL 1	SIL 2	SIL 3	SIL 4
	1	-	-	SIL 1	SIL 2	SIL 3
		1	2	3	4	5
Severity of Consequence						

- Chemical Compatibility Study
- Respiratory Fit Testing
- Personal Exposure Study / Workplace Monitoring Study / VOC Study / Chemical Exposure Monitoring Study (IDLH, STEL, TLV)
- Dust Explosion Study
- Dispersion Modeling (Flare, SRV, Dump tanks, Scrubbing Vent Hazards)
- Minimum Ignition Energy Study
- Minimum Ignition Temperature Study
- Bulk Chemical Storage Risk Assessment



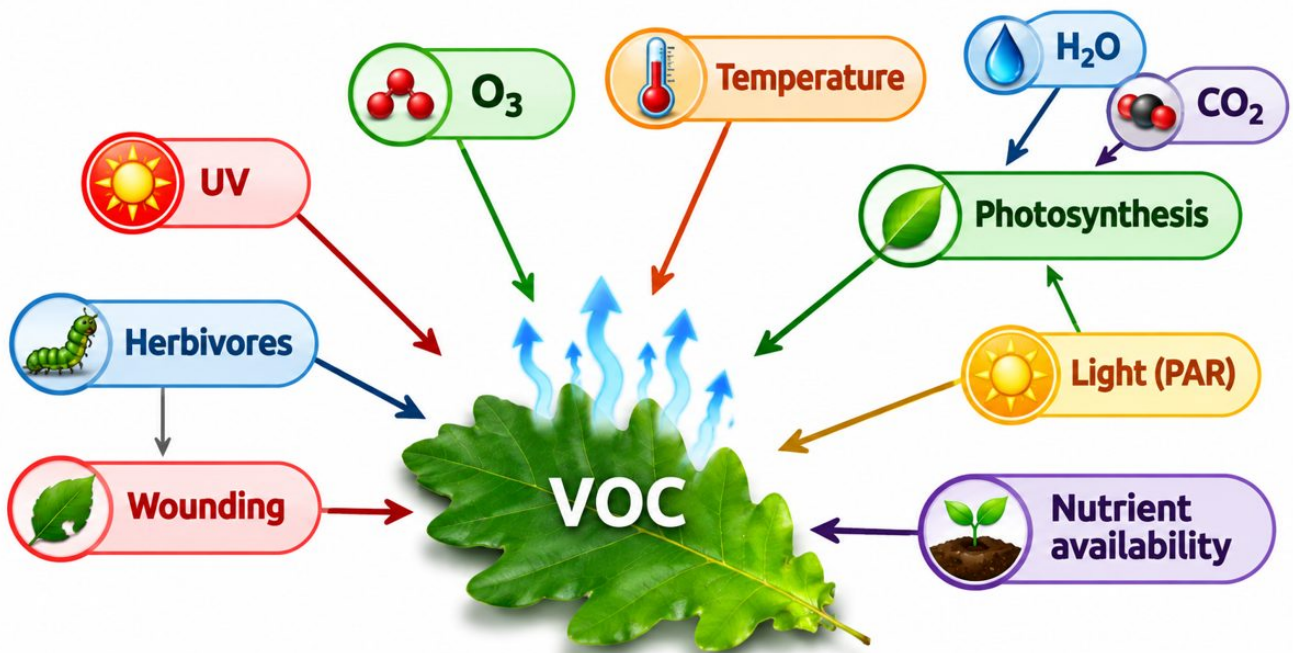
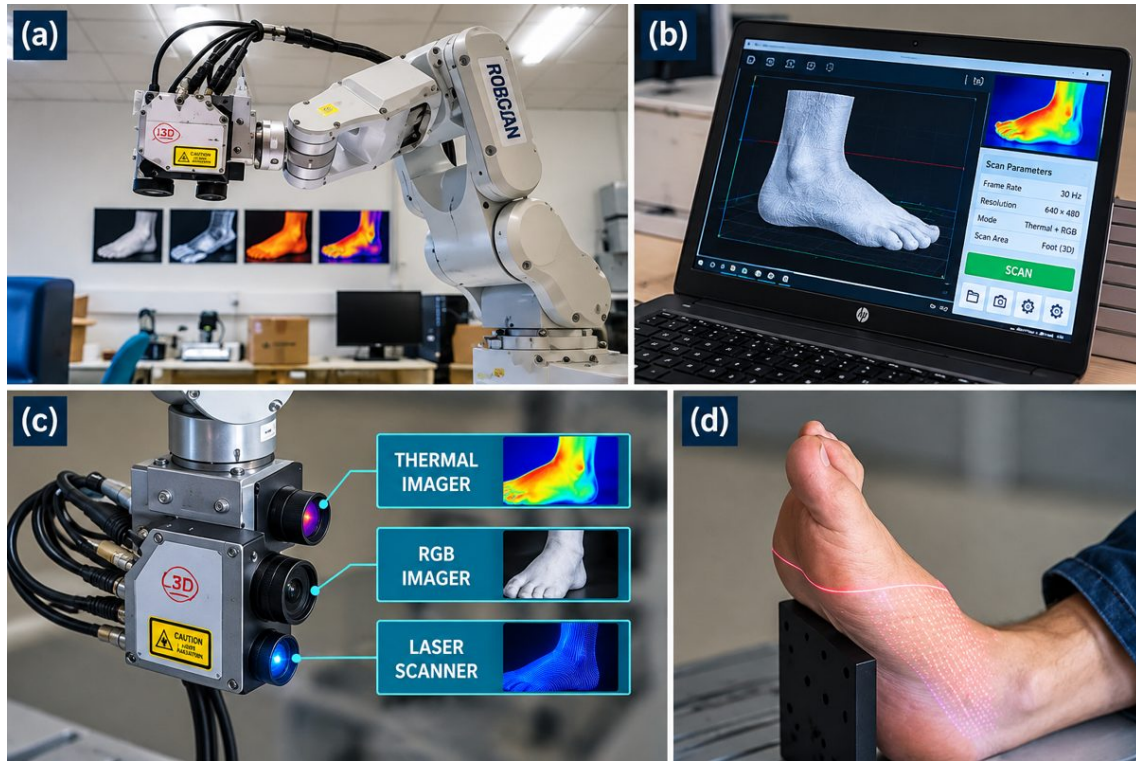
Process Safety

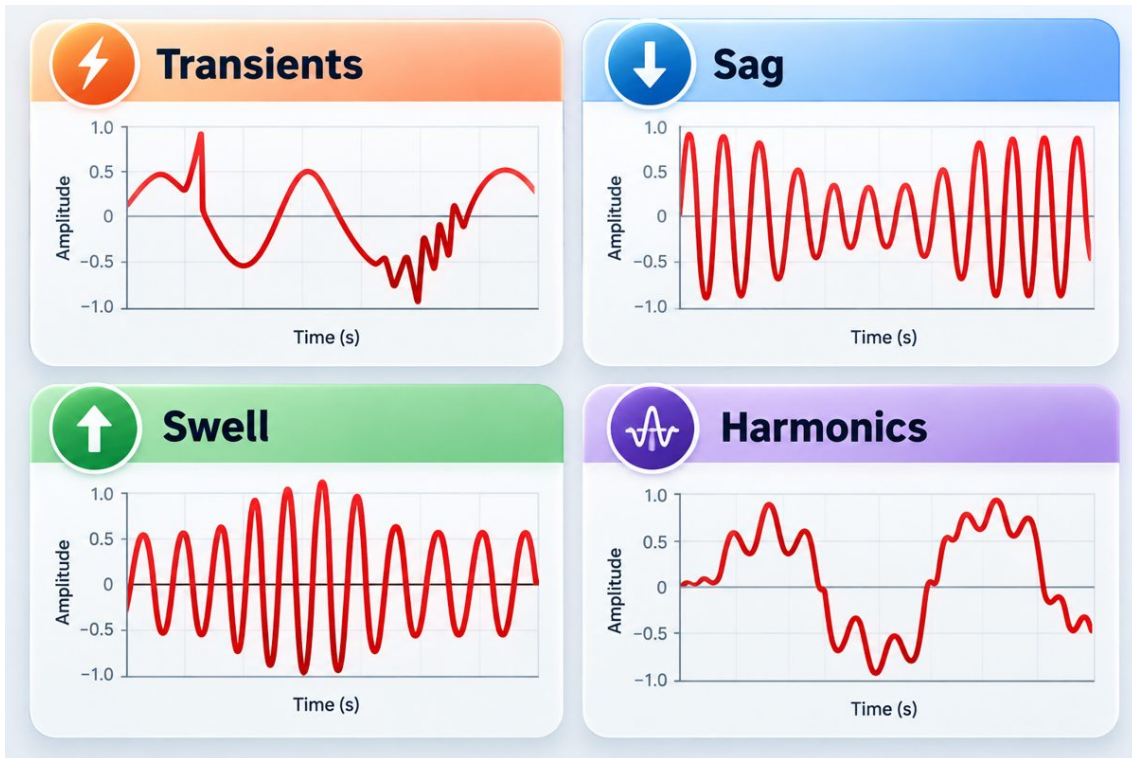


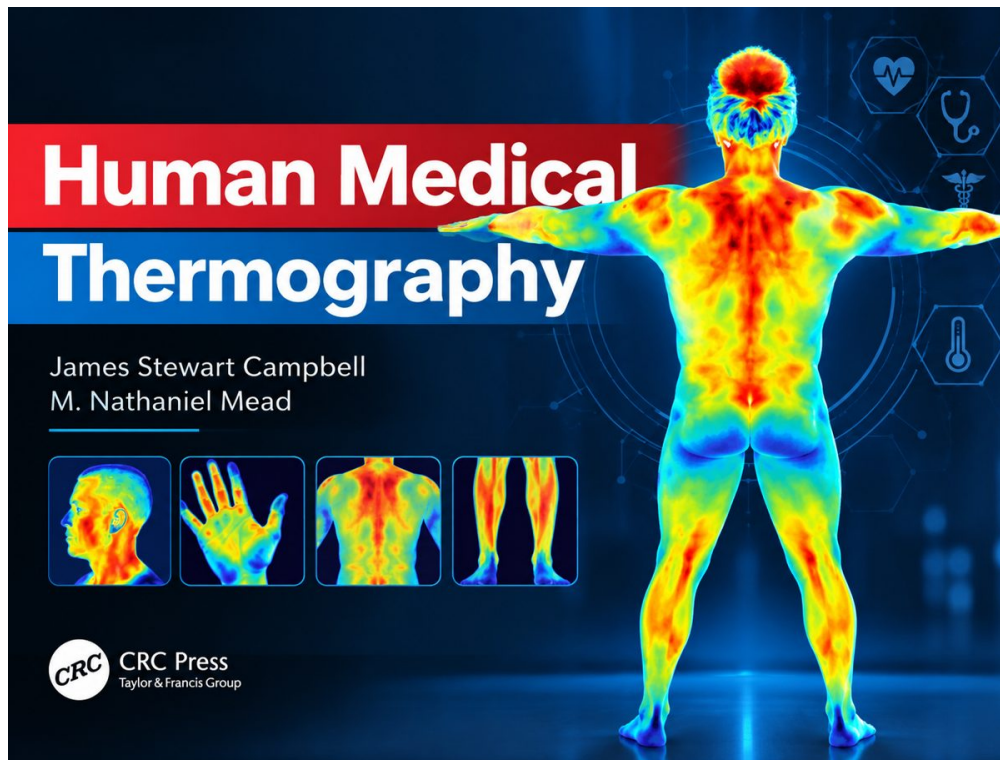


- PSM Gap Analysis
- Process Safety Management (PSM) Implementation
- Quantitative Risk Assessment (QRA)
- Safety Integrity Level (SIL) Study / LOPA / Functional Safety
- Hazard Identification and Risk Assessment (HIRA) / HARA / HAZID Study
- Hazard & Operability Study (HAZOP)
- Pre-Startup Review
- Business Process Reengineering
- Business Continuity Plan
- Process Hazard Analysis (PHA Study)
- Job Safety Analysis

Others









DON'T WAIT FOR FAILURE!

THE ULTIMATE GUIDE TO MECHANICAL THERMAL INSPECTION

-  Detect Overheating
-  Prevent Equipment Failure
-  Ensure Operational Safety

HAZID:

HAZID means (Hazard Identification)

It's a general **risk analysis tool** for early identification of **hazards or threats**, where the purpose is to identify possible **unwanted incidents** within a discipline, operation or area.





- Human Factor Engineering and Ergonomic Studies
- Statutory Safety Audit/Comprehensive Safety Audit
- Preparation or Vetting of On-Site Emergency Plan
- Preparation or Vetting of Off-Site Emergency Plan
- Pre-Occupancy Audit
- Behavior Based Safety / Safety Culture Survey
- Industrial Hygiene Monitoring Study
- Security Vulnerability Assessment (Security Audit)
- Machinery Risk Assessment
- Logistics Risk Assessment (inside or outside the plant truck movement)
- COPE and Probable Maximum Loss Study (PML) Study
- Inspection behalf of insurance & Brokerage firms (for underwriting or value addition or safety improvement) Training

FAQ

Q. What kinds of safety studies does MLC offer?

Studies across fire, electrical, civil, chemical and process safety, plus emergency planning, behaviour-based safety and security assessments.

Q. Which process safety studies are included?

PSM gap analysis and implementation, QRA, SIL/LOPA, HIRA/HAZID, HAZOP, pre-startup reviews, process hazard analysis and job safety analysis.



Q. What electrical safety studies are available?

Arc flash studies, lightning risk assessment, hazardous area classification, electrical safety audits, thermography, power quality and harmonic studies, and earthing audits.

Q. Can MLC prepare emergency plans?

Yes. MLC prepares or vets on-site and off-site emergency plans.

Q. Does MLC work with insurers?

Yes. MLC carries out inspections on behalf of insurance and brokerage firms, including probable maximum loss (PML) studies.

Useful details to share when you enquire

- Facility and process overview
- Study objective and areas of concern
- Available drawings, assessments and incident records

TALK TO MLC

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