

GEPCO HSE MANUAL

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MESSAGE

FROM THE WORTHY CHIEF EXECUTIVE OFFICER GEPCO, GUJRANWALA

It is beyond any doubt that the most important aspect of our job is the adherence to workplace Health and Safety practices. This implies ensuring that the working environment is in conformity with the accepted standards of safety and the employees fully understand their importance. Un-safe actions and Un-safe practices lead to fatal accidents which are always preventable.

There is Zero Tolerance Policy on part of Health and Safety of GEPCO employees.

CHIEF EXECUTIVE OFFICER
GEPCO, GUJRANWALA

FOREWORD

I would like to express my gratitude to NEPRA who gave us technical assistance and boosted us morally to work on this utmost necessary and long awaited document. I would also pay my gratitude to Operation Director/GM (Operations) GEPCO who has patiently given me a chance to work with him in this long process of preparation of GEPCO Health, Safety & Environmental (HSE) Manual work through helping me stay on track, critically evaluating my work and contributing to its completion. Moreover I feel it necessary to mention the commendable efforts made by my fellow colleagues and subordinates of HSE Department who worked hard in line to the required / requisite goals to frame this valuable comprehensive document. No doubt efforts have been made to prepare the manual in line with NEPRA Power Safety Code for Licensees but it is not a final as further suggestions and input received from all concerned will be highly appreciated and will also be considered to make part in next edition as there is always room for improvement.

Dated:

CHIEF HSE OFFICER
GEPCO HQ GUJRANWALA

Station:

PREFACE

This is an effort to compile the information scattered, lying in the personal files/drawers, or in the minds, undocumented, and unorganized by following the guide lines issued by NEPRA and improving the existing GEPCO Safety Code in order to prepare a comprehensive GEPCO HSE Manual.

Its purpose is to provide procedures, revised criteria, necessary definitions as well as tabulated information that are needed for the safety of employees, public, animals and company's property in the jurisdiction of GEPCO. I do hope the document will become reference to seek knowledge about Health, Safety & Environment and matters connected therewith.

Dated:

Station

GENERAL MANAGER (OP.)
GEPCO GUJRANWALA

1. Company Introduction

Gujranwala Electric Power Company Limited (GEPCO) provides electricity to six districts of Punjab Province which includes Gujranwala, Gujrat, Hafizabad, Mandi Baha-ud-Din, Sialkot and Narowal. It caters to the area of 17206 square kilometers and supplies electricity to all the industrial, commercial, agricultural and residential areas that come under its network. The organization serves more than4.0 million customers.

As per GEPCO HSE Policy, top management is obliged to ensure that its HSE policy is understood by its employees and that its procedures are always implemented and maintained. This HSE manual is in accordance with the requirements of NEPRA Power Safety Code for GEPCOs 2021. The HSE management system shall be periodically and systematically reviewed by management and checked by audit. Top management is responsible for the control of all matters pertaining to the implementation of operational HSE procedures.

1.1 Vision

To develop a deep-rooted culture of safety whereby all GEPCO employees and contracted staff consider safety as cardinal in their lives and aim for zero accidents and injuries, with or without oversight. Further to enable such a robust state of our electrical infrastructure so that we obviate any public casualties on its account.

1.2 Mission

To enable Distribution of electricity in a safe manner keeping in view Safety of our employees, contractors, their staff and public on priority. Further to promote HSE through awareness campaign among all.

1.3 Purpose

The purpose of GEPCO HSE Manual is to lay down management framework which serves as a reference to all those responsible for execution and implementation of the HSE management system. It provides direction to Managerial Officers for implementing Occupational Health, Safety, Environment and Fire Safety to achieve compliance of legal and statutory requirements.

It establishes an HSE management structure built upon HSE procedures and practices for Electricity Distribution especially focusing on electrical work related to high-tension and low-tension network.

1.4 Reference Standard and Guidelines

GEPCO HSE management system of electricity distribution is based upon NEPRA - Power Safety Code for Licensees-2021

2 Terms, Definitions & Abbreviations

2.1 Terms and Definitions

2.1.1 Act

The term "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power.

2.1.2 Annual

The period of one Fiscal year, starting from 1st July and ending on 30th June.

2.1.3 Acceptable Risk

Risk: that has been reduced to a level that can be tolerated by the organization having regard to its legal obligations and its own HSE policy.

2.1.4 Audit

Systematic, independent and documented process for obtaining "audit evidence" and evaluating it objectively to determine the extent to which "audit criteria'' are fulfilled.

2.1.5 Auditor

Person with the competence to conduct an audit.

2.1.6 Authority

i. The term "Authority" means the National Electric Power Regulatory Authority (NEPRA).
ii. GEPCO Management or any competent officer within GEPCO subject to control and direction of the BOD is entrusted with whole or substantially whole, of the powers of management of affairs of the company.

2.1.7 Building

A structure with a roof and walls.

2.1.8 Calibration

Calibration is the process of configuring an instrument to provide a result for a sample / reference within an acceptable range.

2.1.9 Communication

Any inquiry (e.g., question, concern, or suggestion) or response to an internal or external inquiry related to HSEMS or any correspondence within Authority and GEPCO entities regarding HSEMS.

2.1.10 Continual Improvement

Recurring process of enhancing the HSE Management System based on feedback, to achieve improvements in overall HSE performances, in line with the organization's HSE policy.

2.1.11 Corrective Action

Action to eliminate the cause of a detected non-conformity or other undesirable situations.

2.1.12 Contractor

External organization providing services to the GEPCO in accordance with agreed specifications, terms and conditions.

2.1.13 Contractor's Employee

Person employed by GEPCO's contractor or sub-contractor engaged in providing services for GEPCO on the company's worksites.

2.1.14 Competent Person

A medically and physically fit person, who is assigned, designated and authorized in writing by the GEPCO to perform a specific type of duty or duties or to be at a specific location or locations, having relevant professional qualification, training, competency, experience, technical knowledge, certification or license/ permit to perform assigned roles and responsibilities.

2.1.15 Distribution

The term "Distribution" means the ownership, operation, management or control of distribution facilities for the movement or delivery to consumers of electric power but shall not include the ownership, operation, management and control of distribution facilities located on private property and used solely to move or deliver electric power to the person owning, operating, managing and controlling those facilities or to tenants thereof.

2.1.16 Distribution Company

The term "Distribution Company" means an organized setup engaged in the distribution of electric power.

2.1.17 Distribution Facilities

The term "Distribution Facilities" means electrical facilities operating at the distribution voltage and used for delivery of electric power to consumers/end users.

2.1.18 Document

Information and its supporting medium, which can be a paper, magnetic, electronic or web based or in form of storage device.

2.1.19 Employee

An Employee is anyone who perform services for which the employer has the right to control what will be done and how it will be done regardless if the employer is given freedom of action. Employment can be permanent, temporary and regular.

2.1.20 Environment

Surroundings in which organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation.

2.1.21 Environmental Impact Assessment

Environmental Impact Assessment (EIA) is a process of evaluating the likelihood of environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse.

2.1.22 Environmental Aspect

An element of GEPCO activities, products and services that can and/or does interact with the environment.

2.1.23 Environmental Impact

Any change to the environment, whether adverse or beneficial, resulting from GEPCO activities, product and services.

2.1.24 Environmental Management System (EMS) Audit

A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether a company's EMS conforms to the EMS audit criteria set by the company, and for communication of the results of this process to management.

2.1.25 Environmental Objective

Overall environmental goal, arising from the environmental policy, that an organization sets itself to achieve, and which is quantified where practicable.

2.1.26 Environmental Target

Detailed performance requirement, quantified where practicable, applicable to the company or parts thereof, that arises from the environmental objectives and that needs to be set and met to achieve those objectives.

2.1.27 Environmental Performance

Measurable results of the EMS, related to an organization's control of its environmental aspects, based on its environmental policy, objectives and targets.

2.1.28 Exposure

Presence of hazard (Solid, Liquid, Gas or electric), or physical factors (noise, temperature, vibration, non-ionizing, and ionizing radiation) in an area where a person works.

2.1.29 Excavation

Any man-made cavity or depression in the earth's surface, including its sides, walls, or faces, formed by earth removal. This could be carried out manually, by power tools or mechanical excavator.

2.1.30 External Source

Customers, neighbors, government agency representatives, media representatives, or others who may be interested in company's environmental activities.

2.1.31 Facilities

Space or equipment necessary for doing an operation or process.

2.1.32 Fire

The combustion of any material and substance gives rise to a fire.

2.1.33 Generation

The term "Generation" means the ownership, operation, management or control of electricity generation facilities for delivery or sale of electric power and not solely for consumption by the person owning, operating, managing, and controlling those facilities.

2.1.34 Generation Company

The term "Generation Company" means an organize setup engaged in the generation of electric power.

2.1.35 Generation Facility

The term "Generation Facility" means the electrical facility used for production of electric power.

2.1.36 Goal

Goals are general guidelines that determine what needs to be achieved in the organization with management intervention, through of resources and support. Goals should be specific, measurable, attainable, realistic, and time-bound (SMART).

2.1.37 Guarded

Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to confine the likelihood of approach or contact by persons or objects to a point of danger.

2.1.38 Hazard

A source of potential harm, in terms of human injury, damage to health, property, impact to environment, physical resources and/or business.

2.1.39 Hazard Identification

Process of recognizing that a hazard exists and defining its characteristics.

2.1.40 Heavy Equipment

Any type of equipment used for, heavy lifting, crane, mobile elevation, mobile equipment or plant, construction equipment, and earth moving equipment, etc.

2.1.41 HSE Performance

HSE performance is related to the effectiveness of the prevention of injury and ill health to workers, provision of safe and healthy workplaces and prevention of impact and/or damage to the environment.

2.1.42 HSE Objectives

Goals, in terms of HSE performance, that an organization sets itself to achieve.

2.1.43 HSE Management System (HSEMS)

Health Safety and Environment Management System (HSEMS) overall management system that facilitates the management of the HSE risks associated with the business of the organization. This includes the organizational structure, planning activities, responsibilities, accountabilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the organization's HSE policy.

2.1.44 Ill Health

Identifiable, adverse physical or mental condition arising from and/or made worse by a work activity and/or work-related situation.

2.1.45 Internal Audit

Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the HSE management system audit criteria set by the organization. (In many cases, particularly in smaller

organizations, independence can be demonstrated by the freedom from responsibility for the activity being audited.)

2.1.46 Immediate Cause and Root Cause

An immediate cause (also known as a "Causal Factor" or “Direct Cause”) is a human error/ mistake or equipment failure that directly leads to the incident or makes the incident's consequences worse. A root cause (also known as a "basic cause") is an underlying reason why an immediate cause occurred and is virtually always a specific deficiency in a Management System. The root cause when fixed, will prevent (or significantly reduce the likelihood of) the incident recurrence.

2.1.47 In-charge

The person in-charge who holds a position for control and management of specific equipment, devices, activities, operations and performing, directing or authorizing tasks.

2.1.48 Incident / Accident

An unplanned event in which an adverse or undesirable consequence of workplace injury, fire, explosion, damage, or an environmental impact could occur.

2.1.49 Incident Direct Cost

Incident Direct Cost refers to cost of direct damages including human life either GEPCO employee or public, repairs or replacement, clean-up, material disposal and environmental remediation resulting from the incident.

Direct Cost does not include indirect costs such as operational loss, business opportunity loss, business interruption and feedstock/electricity losses, loss of profits due to equipment outages, cost of obtaining/operating temporary facilities.

2.1.50 Inspection

An examination of a product, process, service, or installation or their design and determination of its conformity with specific requirements or, on the basis of professional judgment, with general requirements.

2.1.51 Key Performance Indicator

A Key Performance Indicator (KPI) is a tangible measurable value that demonstrates how effectively an organization is achieving goals and objectives. Key Performance Indicators (KPIs) are in numbers for the goals and objectives to review and monitor its status for effective implementation.

2.1.52 Legal Requirements

National and provincial laws that could be act, rule, regulation, code, directive, ordinance, permit, license or other government authorization.

2.1.53 GEPCO

Gujranwala Electric Power Company.

2.1.54 Likelihood

Chances of occurrence of an event/incident.

2.1.55 Live Parts (Electrically Energized)

Any live, exposed, guarded or unguarded electrical conductors or components that are not placed in an electrically safe work condition.

2.1.56 Machinery

An apparatus using or applying mechanical power to perform a particular task.

2.1.57 Material

A raw material used in the primary production or manufacturing of goods.

2.1.58 Near Miss

Near miss is an incident which does not result in injury, illness or loss, but which has the potential for injury, or illness or loss.

2.1.59 Nonconformance (or Nonconformity)

Any activity or practice that does not support or is counter to the either Health, Safety or environmental policy or any relevant document or is in violation of an applicable state or federal HSE or environmental regulation or permit.

2.1.60 Objective

Objectives define strategies or implementation steps to attain the identified goals. They are more specific and outline the “who, what, when, where, and how” of reaching the goals.

2.1.61 Occupational Health & Safety

Intended to determine /explain the conditions and factors that affect, or could affect, the health and safety of employees, temporary workers, contractor personnel, visitors or any other person at the workplace besides considering recommendations and direction to counter such adverse effects.

2.1.62 On-job Fatality

An on-job injury or illness that results in death.

2.1.63 On-job Injuries or illnesses

On-job Injuries or illnesses should be categorized as follows:

2.1.64 First Aid Injury or illness

Minor on-job injury or illness requiring one-time treatment, subsequent observation and consultation post-injury during a visit to the medical facility.

2.1.65 Lost Time Injury or Illness

An on-job injury or illness that involves one or more days away from work beyond the day the injury occurred.

2.1.66 Organization

Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

Note **–** For organizations with more than one operating unit, a single operating unit may be defined as an organization.

2.1.67 Operational Control

A practice or procedure that is conducted to ensure that activities are in line with the environmental policy, and objectives and targets. The result of "operational control" is that impact to the environment is minimized and compliance with applicable regulatory requirements is demonstrated.

2.1.68 Prevention of Pollution

Use of processes, practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutants or waste, to reduce adverse environmental impacts

Note – The potential benefits of prevention of pollution include the reduction of adverse environmental impacts, improved efficiency and reduced costs.

2.1.69 Preventive Action

Action predict, analyze /assessed and to eliminate the cause of a potential nonconformity or other undesirable potential situation

2.1.70 Procedure

A specified way to carry out an activity or a result-oriented process.

2.1.71 Property Damage Incident

All safety incidents that result in damage to the GEPCO property/structure/equipment however exclude damage to the property/structure/equipment due to fire, or wear and tear. Property damage incidents may be caused by traffic crashes, cranes related incidents, forklift hitting or damaging equipment, resulting in direct cost as per criteria set by GEPCO.

2.1.72 Process

A series of actions/procedures or steps taken to achieve requisite well defined an end result.

2.1.73 Product

The goods or energy produced/generated/manufactured for sale.

2.1.74 Record

Document (soft and hard form) stating results achieved or providing evidence of activities performed.

2.1.75 Registered Person or Registered Entity

Its mean the persons or entities registered under applied Acts and Rules.

2.1.76 Risk

Combination of the frequency (likelihood) of occurrence of event/incident and the consequences (severity) of that event/incident.

2.1.77 Risk Assessment/Treatment

Overall process of Hazard identification, analysis, evaluation of risk level and application of controls.

2.1.78 Safety

Freedom from unacceptable risk of harm.

2.1.79 Safety Critical Protection Devices

Safety critical protection devices, limit or stop the abnormal condition in system or flow of current in the event of a ground fault, overload, or short circuit in the circuit/ wiring system, whose failure can result in serious injuries, significant property damage or environmental impacts.

2.1.80 Short Term Exposure Limit (STEL)

The maximum concentration to which workers may be exposed for a period of time up to 15 minutes continuously without suffering irritation, chronic tissue damage, or narcosis which may lead to accidental injury during working .

2.1.81 Severity

Level of consequences/outcomes of an event/incident.

2.1.82 Shall

The term “shall” indicate a mandatory requirement.

2.1.83 Should

The term “should” indicate a suggested/ optional recommendation.

2.1.84 Significant Near Miss

Incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury easily could have caused a major or fatal accident.

2.1.85 System

A set of things working together as parts of a mechanism or an interconnecting network.

2.1.86 Task

A piece of work activity to be completed or undertaken.

2.1.87 Task Steps

Each sequenced separate part of a work activity.

2.1.88 Time Weighted Average (TWA)

Time-weighted average concentration for a normal 8-hour working day, and a 40-hour working week, to which nearly all workers may be repeatedly exposed day after day, without adverse effects. Information about TWA is found in Material Safety Data Sheet (MSDS).

2.1.89 Tools

A device, one held in the hand, used to carry out a particular task.

2.1.90 Transformer

A static (stationary) piece of apparatus by means of which electric power in one circuit is transformed into electric power of same frequency in another circuit. It can raise or lower the voltage in a circuit but with corresponding decrease or increase in current.

2.1.91 Transmission

The term "Transmission" means the ownership, operation, management or control of transmission facilities.

2.1.92 Transmission Facilities.

A) The term "Transmission Facilities" means electrical transmission facilities including electrical circuits, transformers and sub-stations operating at or above the minimum transmission voltage but shall not include:

B) Electrical circuits forming the immediate connection between generation facilities and the transmission grid to the extent that those circuits are owned by a generation company and are directly associated with that company's generation facilities.

C) Specified facilities operating at or above the minimum transmission voltage which the Authority, upon an application by a GEPCO under Section 20 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, shall be owned and operated by a Distribution GEPCO.

2.1.93 Turnaround

Turnaround is a scheduled/ planned stoppage of part or all of a plant/ grid/ sub-station operations for maintenance, repair, improvement, replacement or upgradation of equipment.

2.1.94 Utilities

Useful facilities/Services such as gas, water, electricity and telecommunication, etc.

2.1.95 Vehicles

A thing used for transporting people or goods.

2.1.96 Visitor

Visitor means a person, other than an employee or contractor, permitted to enter a work area under permission by the authorized person bearing authorized document or written permission.

2.1.97 Waste

Wastes is generated during operation has no further use or consumption, required to be disposed.

2.1.98 Working on Live Parts

Coming into contact with the live electrical components with hands, feet, other body parts, tools, probes or test equipment, etc. urgently required utilizing relevant Personal Protective Equipment duly adhering HSE measures

2.1.99 Workplace

Place under the control of the GEPCO where a person needs to be or to go for work purpose.

2.2 ABBREVIATIONS

AEEA	Annual Environmental Excellence Award
ALAPR	As low As Practicably Reasonable
ALARP	As Low As Reasonably Practical
BAS	Behavior Assessment Safety
BAS Walks	Behavior Assessment Safety Walks
C&DF	Capacitance and Dissipation Factor
CPR	Cardio Pulmonary Resuscitation
CTC	Carbon Tetra Chloride
DCS	Distributed Control System
EIA	Environmental Impact Assessment
ELCB	Earth Leakage Circuit Breaker
EMS	Environmental Management System
EMS	Environmental Management System
ERP	Enterprise Resource Planning
FAS	Fire Alarm Systems
FFE	Fire Fighting Equipment’s
FMD	Facility Maintenance Department
GFCI’s	Ground Fault Circuit interrupters

GWP	Global Warning Potential
HCR	Hexa-Chloro Benzene
HIRA	Hazard Identification and Risk Assessment
HSEMS	Health Safety & Environment Management System
IEC	International Electro-Chemical Commission
IEE	Initial Environmental Examination
IHU	Independent Health Unit
IM	Inventory Management
JHA	Job Hazard Analysis
JSA	Job Safety Analysis
KPI	Key Performance Indicator
LDC	Load Dispatch Center
LOTO	Lock out / Tag out
MCP	Manual Call Point
MIS	Management Information System
MOC	Management of Change
MSDS	Material Safety Data Sheet
NGO	Non-Government Organization
OHSE	Occupational Health, Safety & Environment

P&ID	Process and Instrument Design
PAD	Public Accident Data Base
PAPP	Public Accidents Prevention Plan
PCB	Polychlorinated biphenyls
PEL	Permissible Exposure Limit
POP's	Persistent Organic Pollutants
PPE	Personal Protective Equipment
PRO	Public Relation Officer
PSC	Power Safety Code
PTG's	Portable Temporary Grounds
PTW	Permit to Work
PVC	Polyvinyl Chloride
RCA	Root Cause Analysis
RCCD	Residual Current Circuit Breaker
RCD	Residual Current Devices
RICE	Rest Ice Compress Elevation
RTC	Regional Training Center
SOB	Substation Order Book
SRL	Self-Retractable Lifelines

SWL	Save Working Load
T & P	Tool and Plants
TMP	Training & Manpower Planning
TPRE	Technical Process Re-Engineering
TRA	Task Risk Assessment
TSG	Technical Service Group
XLPE	Cross Linked Poly Ethylene

3. Health, Safety & Environment Management System (HSEMS)



3.1 Introduction

The Health, Safety, and Environment Management System (HSEMS) is a set of processes and tools that facilitate the best practices in proactive management of workplace Health, Safety, and Environmental (HSE) issues. GEPCO's Electricity Distribution HSEMS is developed according to requirements of NEPRA Power Safety Code for Licensees issued in June 2021.

GEPCO HSE has formulated the HSEMS, which is to be maintained and continually improved. The processes needed, and their interactions are also included in accordance with the requirements of national; Federal and Provincial standards, to enable its implementation by GEPCO Management.

3.2 GEPCO HSEMS PDCA Working Process

GEPCO's HSEMS is a process designed to systematically identify, asses and manage the operational risks to employees, contractors, stakeholders, business and the environment. The routine application of the HSEMS provides on-going identification, prioritization and control of these risks. Maintenance and continual improvement of the HSE Management System shall be pursued by performing Plan Do Check Act (PDCA) cycle.



Where,

i. Plan refers to assess the risk and identify control measures, i.e.

Identify hazards that could give rise to work-related health and safety risks.

- Prioritize work risks to decide which work risks to deal with and in what order.
- Engaging all the employees when identifying / assessing the risks and when making decisions about the ways to eliminate or minimize the risks.

ii. Do means to implement the control measures i.e.

- Implement control measures that effectively eliminate or minimize the risks.
- Give preference to control measures that simultaneously & collectively protect all the workers at risk.
- Personal Protective Equipment (PPE) should not be considered as first and only control measure.

iii. Check is to monitor the performance of control measures i.e.

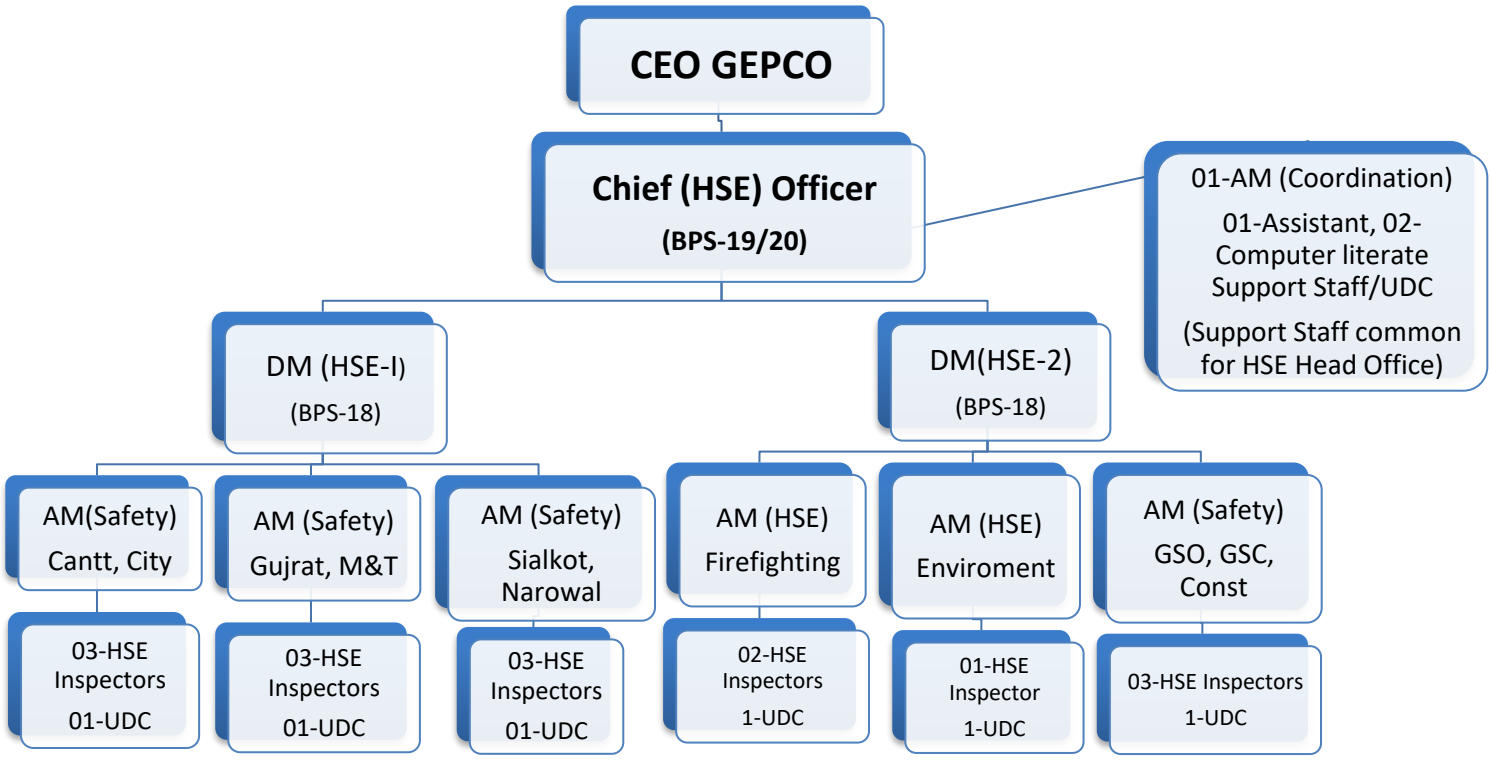
- Monitor workplace atmosphere and worker's health conditions so far as it is reasonably practicable.
- Implement appropriate means for ease of workers to report shortcomings in control measures which can cause near misses or health & safety concerns.
- Engage with workers when making decisions about procedures for monitoring.

iv. Act means to take actions on lessons learnt.

- Routinely view the effectiveness of control measures at scheduled periods.
- Review incidents or near misses and talk to your workers to check that the control measures are effectively eliminating / minimizing the risk or otherwise.

- Use the results of your reviews, investigations into incidents or near misses and monitoring results to continuously improve control measures as envisaged in Health Safety and Environment Management System.

3.3 Hierarchy of GEPCO HSE Directorate



3.4 HSE Management System Elements

3.4.1 Policy

Course / principle of action adopted / proposed by GEPCO for a better HSEMS as per clause 3.4.1.

3.4.2 Planning

It is a process of thinking, organizing, deciding and making arrangements in advance to fulfill all requisite requirements for efficient Management & Implementation of HSEMS.

3.4.3 Management System

The way of working, in which GEPCO manages its HSEMS.

3.4.4 Implementation& Procedures

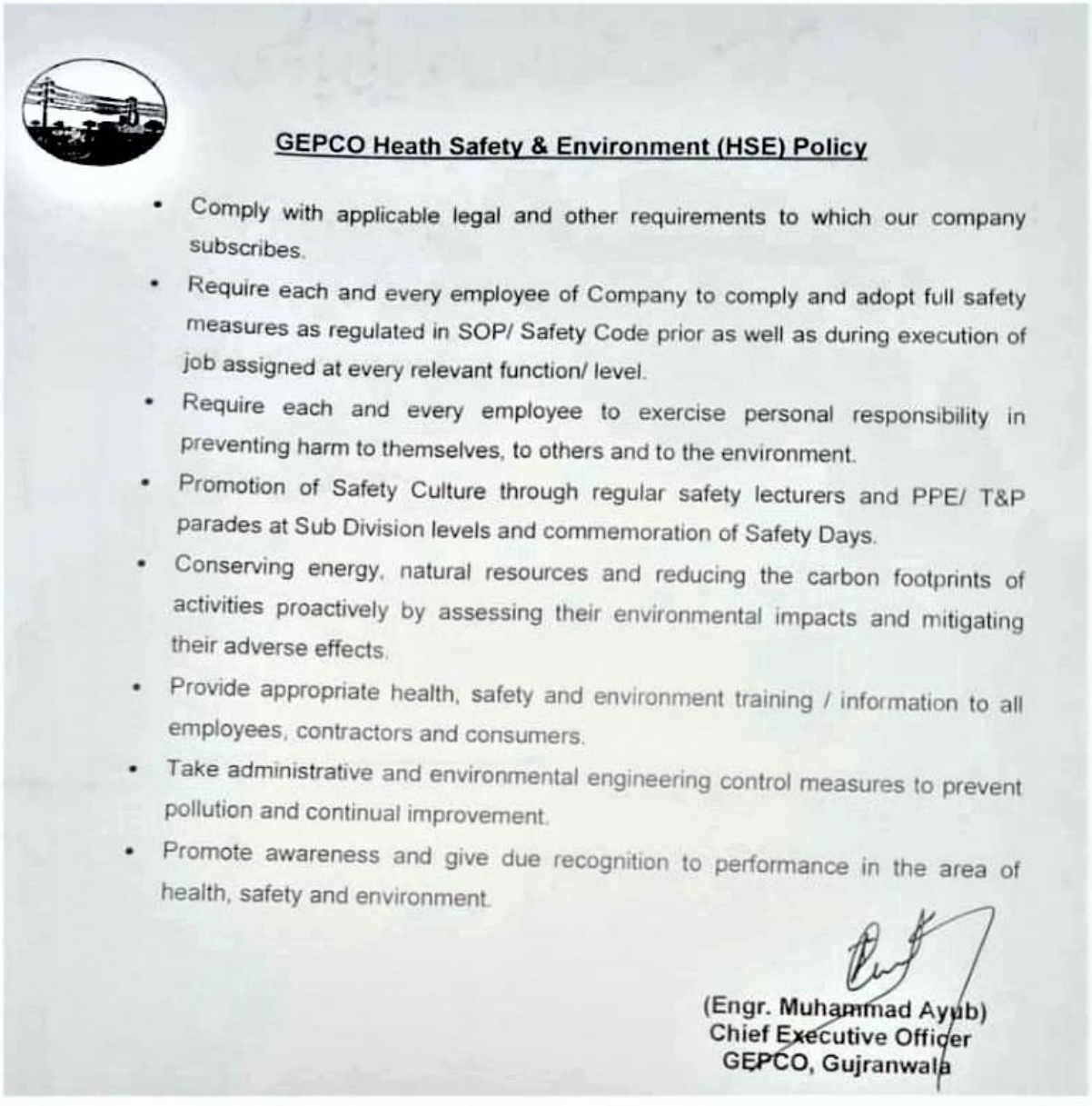
Implementation is the process of moving planned idea from concept to reality in HSEMS. Whereas, procedure is a way of working according to prescribed / pre-defined standards.

3.4.5 Monitoring and Evaluation

Observe and check the progress under systematic working and maintaining record of such processes to evaluate performance of HSEMS.

4. Policy

Commitment to provide safe and healthy working conditions, reduce HSE Risks for prevention of work related injuries, ill-health and damage of environment within national legal requirements by promoting awareness /capacity building among all concerned and giving due recognition to performance and reprimand on violations of Health, Safety & Environment Management System (HSEMS).



GEPCO Heath Safety & Environment (HSE) Policy

- Comply with applicable legal and other requirements to which our company subscribes.
- Require each and every employee of Company to comply and adopt full safety measures as regulated in SOP/ Safety Code prior as well as during execution of job assigned at every relevant function/ level.
- Require each and every employee to exercise personal responsibility in preventing harm to themselves, to others and to the environment.
- Promotion of Safety Culture through regular safety lecturers and PPE/ T&P parades at Sub Division levels and commemoration of Safety Days.
- Conserving energy, natural resources and reducing the carbon footprints of activities proactively by assessing their environmental impacts and mitigating their adverse effects.
- Provide appropriate health, safety and environment training / information to all employees, contractors and consumers.
- Take administrative and environmental engineering control measures to prevent pollution and continual improvement.
- Promote awareness and give due recognition to performance in the area of health, safety and environment.

(Engr. Muhammad Ayub)
Chief Executive Officer
GEPCO, Gujranwala

5. HSE Planning

5.1 Resources

As per NEPRA Power Safety Code for Licensees June 2021, GEPCO shall be responsible to utilize its own resources for the establishment, implementation, maintenance and continual improvement of the HSE system to avoid injuries to employee, contractor, visitor and member of general public, loss of equipment/property or adverse impact to the environment.

5.2 GEPCO HSE Management System Requirements

i. GEPCO shall establish, implement, maintain and communicate "Occupational Health, Safety & Environment (HSE) Management System/Manual" depending upon its own requirements, organizational needs, types of activities, processes, products, services and risks/ aspects. GEPCO shall cover all his operational sites and adopt industry's best practices and standards related to his work activities besides compliance to Power Safety Code and other requirements.

ii. HSE Management System/ Manual shall outline specific essential measures to be taken by GEPCO to prevent injuries to company employees, contractor personnel, visitors, general public, natural environment and damages to property.

iii. Roles and responsibilities shall be clearly identified and documented in HSE Management System/ Manual for all positions/ functions that are responsible for the control of system of construction, installation, operation, maintenance, testing, turnaround, and HSE critical activities. Roles and responsibilities shall be communicated to responsible and interested parties. It shall also cover operational interface or joint responsibilities of each job step by agreement, where required.

5.3 General Instructions Given in NEPRA Power Safety Code 2021 Regarding HSE

a. GEPCO shall ensure compliance with Power Safety Code, together with NEPRA Performance Standards Rules, Grid Code, Distribution Code and Consumer Service Manual and other applicable national and provincial legal requirements as necessary. The Safety Code enables GEPCO to operate in a manner that protects and promotes the health & safety of employees, contractors, the general public, visitors and protect the environment.

b. GEPCO shall establish, implement, monitor and maintain a system to identify Health, Safety and Environment (HSE) hazards and to reduce risks to "As Low as Reasonably Practicable" (ALARP).

c. GEPCO shall promote a HSE culture and provide safe and healthy workplace. The GEPCO shall ensure that safe working is integrated into every aspect and area of business. Safety culture shall be based on personal leadership, commitment, collaboration and active involvement.

d. The GEPCO shall foster openness and dialogue, and be open to the HSE concerns of employees, contractors and other interested parties. It shall also be ensured that HSE requirements are known, understood, implemented and applied at all levels.

e. The GEPCO shall treat all injuries, occupational illnesses and HSE incidents as preventable and set out goals for all of them as zero.

5.4 Compliance to the Legal and other Requirements

a. GEPCO shall prepare and maintain a legal compliance register for national, provincial legal and other requirements as applicable regarding Health, Safety and Environment (HSE), including this Code.

b. GEPCO shall comply with national, provincial legal and other requirements regarding Health, Safety and Environment (HSE) including this Code as applicable, such as but not limited to:

- Electricity Act 1910,
- The Boilers Act 1923,
- Regulations of Mines Act 1923,
- Factories Act 1934,
- The Petroleum Act 1934,
- Electricity Rules 1937,
- The Petroleum Rules 1937,
- Gas Cylinder Rules 1940,
- Civil Defense Rules 1951,
- West Pakistan Factories Canteen Rules 1959,
- The Workmen Compensation Act 1923 and Rules 1961,
- The West Pakistan Hazardous Occupation Rules 1963,
- Pakistan Nuclear Safety and Radiation Protection Ordinance 1984,
- Civil Defense Ordinance 1987,
- Pakistan Environmental Protection Act 1997,
- Pakistan Environmental Assessment Procedures 1997,
- Environmental Sampling Rules 2001,
- National Environmental Quality Standards November 26, 2010,
- Boilers & Pressure Vessel Ordinance 2002,
- Mineral and Industrial Gases Safety Rules 2010,
- Explosives Rules 2010,
- Hazardous Substance rules 2014,
- Building Code of Pakistan Fire Safety Provision 2016,
- Provincial legal requirements.

5.5 Hazard Identification, Risk and Impact Assessment

Identification, evaluation & registration of HSE risks & hazards are an important part of the safety management system. The objective of hazard identification process is to proactively control and manage potential risks to prevent recurrence. These include routine & non-routine activities. Based on the risk rating, appropriate controls and measures are put in place to reduce or eliminate these risks. This practice gives assessments to determine the potential risks to employees, contractors, visitors, general public, and impact to natural environment, by eliminating or reducing Safety & Health Hazards and Environmental aspects that arise from the GEPCO operations and activities, in order to ensure that all risks are identified in detail and reduced to As Low as Reasonably Practicable (ALARP) to avoid future incidents associated with:

i. GEPCO employees/ contractors/ visitors/ general public.

ii. GEPCO workplaces (hazardous locations).

iii. GEPCO materials.

iv. GEPCO equipment.

v. GEPCO operations, processes, maintenance, and activities.

5.6 Considerable / Potential Hazards, as applicable:

i. Potential fire and electrical hazards.

ii. Potential hazards that may be encountered from outside sources.

iii. Hazardous materials identification, handling and storage.

iv. Potential Hazards above ground level such as fall of a person from height, fall of objects from height, overhead power lines, loose sag, less clearance(ground, horizontal and vertical) from the houses/ buildings/ trees, poles, fuel, chemical, hazardous dust/ fumes, pressure vessels/ boilers and so forth.

v. Potential Hazards on ground level such as electrical wires, electrocution, flash over, patrolling of lines, trimming of trees, hazardous area classification, night time operations, failure of tools, failure of a plant, buildings, possible flood, adverse weather conditions, high wind, fog, rain, lightning or hazards from nearby plants or industry. Hazard created by building, facilities, workplaces, machinery, equipment, vehicles at workplace, tools, utilities, In-coming and Out-going material/ chemicals/ substances/ product/ waste, hazardous dust/ fumes routine/ non-routine and emergency activities or natural hazards.

vi. Potential underground hazards such as buried utilities(electric, gas oil and telecommunication), high water table, building foundations, underground

wastewater, unstable soil, chemical/ trash dump area, ash storage, voids in the earth (caves) and underground fuel/ chemical storage and hazardous dust/ fumes.

vii. Hazards related to movement of vehicles (ground settlement and road cracks aspects) from both inside and outside the facility of the GEPCO.

viii. GEPCO shall identify Environmental Aspects. All identified significant environmental aspects shall be treated and handled in compliance with applicable national and provincial legal requirements.

ix. GEPCO shall develop "Site Specific Environmental and Social Management Plan (ESMP)" in compliance with the Pakistan Environmental Protection Act 1997 and Pakistan Environmental Assessment Procedures 1997 for the effective management of the environmental impacts that could occur at the projects, during the facilities' operation and maintenance.

x. GEPCO shall identify existing preventive controls for each identified hazard and provide recommendation(s) for additional control(s) for high risks to reduce risk levels to As Low as Reasonably Practicable (ALARP).

xi. Risk/ Impact Assessments shall be reviewed by a competent team at least every three (03) years, or in case of a major emergency, or a change in equipment or process, or a chemical or new critical Risk/ Impact identified during study, or internal/ external audit recommendations, as deemed necessary.

5.7 Hazard / Risk Assessment Process



5.7.1 Job Briefing

Before commencement of any job / work the concerned Supervisor/ LS shall give a job briefing to line staff crew in which following points shall be discussed.

i. Hazards associated with the work and ways to eliminate or control such hazards.
ii. Assigning of duties to each crew member.
iii. Procedures to be used
iv. Any special precautions
v. Any special equipment required for the job.
vi. Control of electrical sources (requirement of PTW / installation of PTGs)
vii. Personal protective equipment (PPE) & Tools and Plants (T&P) required
viii. Any suggestion from members of the line staff crew to facilitate the execution of job.

5.7.2 General Provisions to Avoid Accidents

1) Accident prevention can be accomplished only through wholehearted cooperation of all members of the organization. Neither the management nor HSE Directorate can prevent accident, without the cooperation of every employee.

2) Workers having unsafe behavior and attitude are a danger to themselves, their fellow workers, the public, property, and the equipment & machinery of the organization. Due care and attention to all safety rules and devices is essential not only to prevent injury to the workers but also to protect GEPCO equipment & machinery.

3) Capable and mentally alert employees will avoid accidents, by learning all about their work, using proper safeguards and protective equipment and avoiding shortcuts and make-shift work methods.

4) GOOD OPERATION IS SAFE OPERATION. This is true both for employees and equipment. A job done safely is a job done efficiently.

5) Accidents do not "just happen". Accidents are the natural result of UNSAFE CONDITIONS OR UNSAFE ACTS, usually a combination of both.

6) Machinery and equipment are generally manufactured to perform safely within limits of design. In fact, statistics show that more than 90% of accidents are due to the human element, such as failure to use safety devices and observe safety rules and procedures.

7) Some examples of UNSAFE CONDITIONS, which may cause accidents, are:-

   a) **Improper Guarding** such as unshielded moving parts of machines, un-barricaded floor openings and excavations, unenclosed high voltage equipment, lack of protective equipment and insufficient warning signs etc.

   b) **Defective Material or Equipment** such as mushroomed chisels, split handles, deteriorated poles, poorly manufactured or weak equipment.

   c) **Hazardous Arrangements** such as those due to poor housekeeping at work locations, unsafe planning or inadequate working space.

   d) **Insufficient Light** unsuitable location producing glare or objectionable shadows.

   e) **Improper Ventilation** such as insufficient change of air or presence of harmful vapor, dust or gas.

   f) **Unsafe Clothing** that fits loosely and can become entangled in wires and machinery, and failure to use goggles, proper shoes and insulated gloves or sleeves.

   g) **Unsafe Design and Construction** due to deviations from standard design and specifications and poor workmanship.

8) Some examples of UNSAFE ACTS, which may cause accidents, are:

   a) **Operating Without Authority or Warning** such as closing switches without authority, operating hoists and trucks without warning, failure to place warning signs or signal man where needed, failure to block equipment against unexpected movement, failure to observe work clearance procedures.

b) **Operating or Working at Unsafe Speed** such as driving too fast, throwing material or tools to another worker, jumping from vehicles or platforms or running.

c) **Making Safety Devices Inoperative** such as removing guards from machines, using oversize fuses, blocking safety valves, bypassing interlocks and isolating fire protection etc.

d) **Use of Unsafe Equipment or Improper Use of Equipment** such as using dull cutting tools, mushroom-head chisels, and pipe extensions on wrenches not designed for them, or the wrong tool for the job, or using hands instead of hand tools.

e) **Unsafe Loading** such as overloading cranes and winches, carry load beyond limit.

f) **Placing or Leaving Objects** where they are likely to fall.

g) **Mixing Improper Packing** or combining chemicals to form a dangerous mixture.

h) **Taking Unsafe Position or Posture** such as working on live conductors from above instead of below, walking under suspended loads or too close to openings, lifting while in awkward position, entering areas where there are dangerous gases or fumes, passing on curves of hills, riding on running boards or other unsafe places on vehicles.

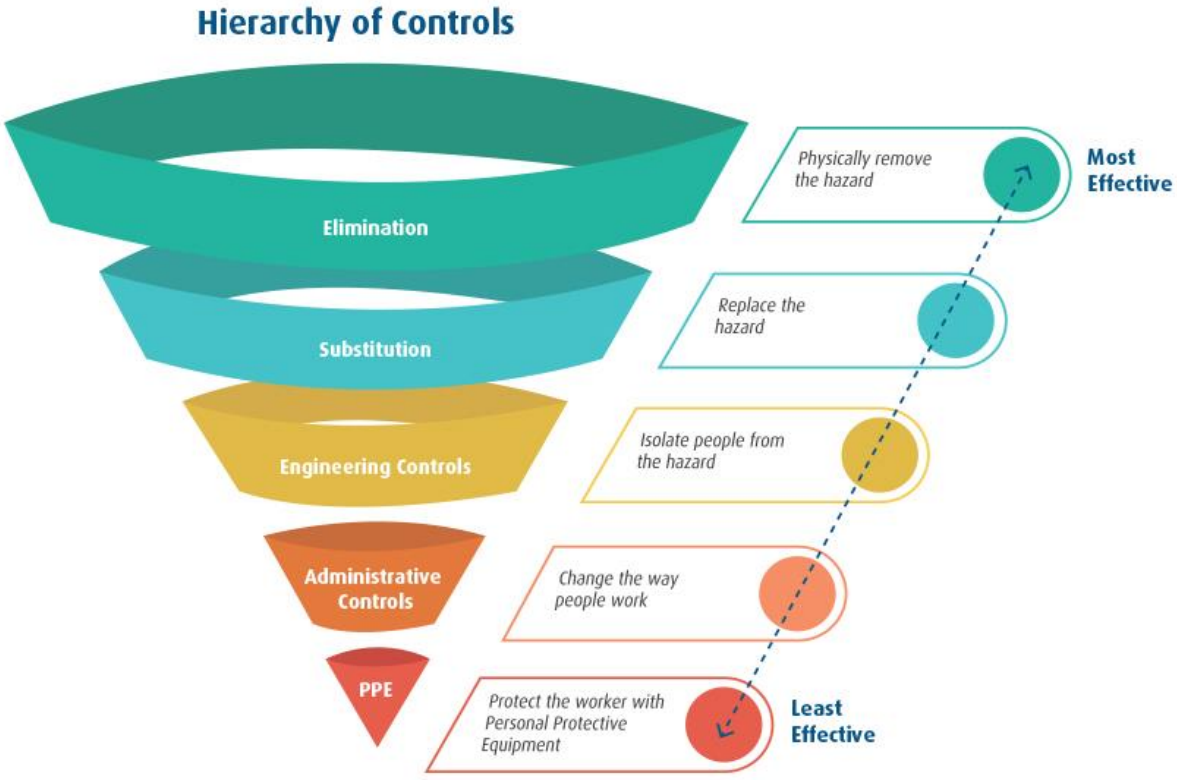
i) **Working on Equipment without Taking Proper Precautions** such as installing and removing temporary earth, cleaning, oiling or adjusting moving machinery, and working on or near live electrical equipment.

j) **Distracting, Teasing or Startling** such as practical joking, horseplay, quarrelling or annoying.

k) **Failure to Use Safe Clothing or Protective Equipment** such as failure to use insulated gloves, proper shoes, hard hat or goggles.

5.8 Risk Controls

Depending on the nature and scale of the hazard under assessment when determining controls, or considering changes to existing controls, consideration shall be given to reducing the risks according to the following hierarchy:



5.9 Task Risk Assessment/ Job Safety Analysis

A job plan or method statement shall be developed, agreed by site In-charge, permit to work issuer and receiver by considering to identify all known hazards, eliminates the hazards where practical, controls the hazards that cannot be eliminated, protects against injury if a hazard gets out of control, minimizes the severity of an injury if one takes place and identifies each worker's responsibilities.

a. GEPCO should apply Task Risk Assessment (TRA)/ Job Safety Analysis (JSA) or Job Hazard Analysis (JHA) as per job plan or method statement to all activities that are not covered by a standard operating procedure such as projects, modifications, repairs & maintenance, testing, inspection and shutdown /turnaround in the existing operational facilities. The TRA/JSA is a systematic approach to identify and analyze potential hazards in performing a specific maintenance job/ work activity to eliminate or reduce these hazards and the risk of a workplace injury or illness.

b. Typical examples of the jobs requiring TRA/JSA are:

- Confined Space Entry
- Cutting or Welding
- High risk activities involving crane lifts such as use of crane suspended man baskets, tandem lifts, night-time lifts, limited access situations, near

overhead power lines, etc.

- High risk material handling such as heavy product containers.
- Activities on pressure vessels, piping, or equipment that could not be depressurized.
- Activities involving use of new and/or potentially hazardous equipment, such as grit blasting, chemical cleaning, and high-pressure hydro-jetting.
- Activities where a person is required to use any fall arrest system, safety harness/ safety net.
- Activities involving multi-disciplinary groups on the same apparatus/ equipment or location.
- Simultaneous project works in the plants.
- Work involving electrical equipment and testing activities (repair, maintenance, troubleshooting or testing on electrical circuits, components, or systems, switching devices such as circuit breakers etc.).

c. TRA/JSA shall be conducted for:

- Tasks where the hazards and control measures need to be formally assessed.
- Tasks that have the potential for a serious incident.
- Tasks that have a history of incidents or near misses.
- Tasks that are not covered by a standard operating procedure or work instruction.
- Non-Routine Tasks or tasks that are being carried out in unusual or new circumstances.
- Tasks that is relatively complex.

5.10 Standard Operating Procedure (SOP)/ Work Instructions

a. GEPCO shall establish, implement and maintain "Standard Operating Procedure (SOP)/ Work Instructions" to describe Occupational Health, Safety, and Environment as per GEPCO operational risks to ensure GEPCO operations are carried out in a safe and environmentally responsible and protective ways; and to make safe and healthy work environment for employees and contractors.

b. SOP/ Work Instructions should provide a clear understanding of the detailed operating parameters and limits for safe operation, according to equipment manufacturer's manual, including an explanation of HSE consequences of operation outside the parameters and limits, and a description of steps to be taken to correct and/or to avoid deviations/ failure/ trip.

c. SOP/ Work Instructions should include following contents, as required depending upon GEPCO operations such as SOP Purpose, Scope, Definitions/ Abbreviations, Responsibilities, Operation Description, Potential Hazards, Safety, Health and Environmental Controls/ Precautions, Specific Administrative Controls, Specific Engineering Controls, Specific Personal Protective Equipment (PPE), Operation Modes (Temporary, Normal, Start-up, turnaround, Emergency), Operational Limits/ Parameters, Maintenance, Records and Check Lists/ Log Sheets.

d. SOP/Work Instructions shall be reviewed at least every three (03) years or, in case of a major incident or change in equipment, process or chemical or new critical risk identified, and/or internal/ external audit recommendation.

e. The GEPCO shall provide adequate training and supervision to ensure all employees and contractors understand the required steps as defined in the SOP/ work instructions and perform their work accordingly.

5.11 HSE Data Handling and Maintaining

Development of Safety MIS by GEPCO ERP to ensure single source of truth so that all Safety related data is available at single point and business intelligence can be extracted to take important steps for continual improvement in HSEMS of GEPCO

5.12 Personal Protective Equipment

a. Personal Protective Equipment (PPE)/ Tools & Plants (T&P) shall be in accordance to Hazard/ Risk Category and/or PPE/T&P Assessment study to provide protection from hazardous conditions.

b. Maintain list of approved Stock and Non-Stock Safety items including PPE/ T&P with material description and model number.

c. Maintain adequate amount of PPE/ T&P inventory at each site. Conduct visual inspection of PPE/ T&P before each use.

d. Identify task specific PPE/ T&P in Task Risk Assessment/ JSA/ Permit to Work.

e. PPE/ T&P shall be stored and maintained in a safe working condition after completion of work.

f. PPE/ T&P should include one or more of the following:

i. Insulated electrical tools.

ii. Non-conductive shoes, safety boots, or overshoes for wet service.

iii. Non-conductive Helmet for Head Protection with strap when working at height above 1.8 meter/confined space. Fully dielectric, no metal parts, non-vented, helmet material polyethylene/ polycarbonate, other plastic materials stabilized against degradation from ultraviolet radiation, 6 or 4 point suspension, adjustable type, helmet intended to reduce the danger of exposure to high voltage electrical conductors.

iv. Insulated Electrical Rubber Hand Gloves and Sleeves, Class 00 (Maximum AC 500V/DC 750V), 0 (Maximum AC 1000V/DC 1500V), 1 (Maximum AC 7500V/DC 11250V), 2 (Maximum AC 17000V/DC 25500V), 3 (Maximum AC 26500V/DC 39750V), 4 (Maximum AC 36000V/DC 54000V) for involved working voltage. Leather gloves shall be worn over insulated rubber gloves to provide the required mechanical protection. The gloves shall not be used when damp.

v. Flame Resistance Clothing Uniform.

vi. Arc Flash Kit for Arc Flash Protection such as Category 4 Arc Flash Resistant Suite, Arc Flash Hood Arc-rated Gloves and Arc-rated Fall Protection while working on high voltages (more than 420 V).

vii. Eye protection with non-conductive frames.

viii. Full Face Shield (polycarbonate or similar non-melting type) while

working in batteries/ handling chemicals.

ix. Hearing Protection (Noise more than 85dBA).

x. Full Body Harness with front work positioning belt (positioning lanyard) along with double lanyard for 100% tie shall be used at height more than 6 feet/1.8 meter above the ground when climbing poles, towers and structures including working through mobile elevated aerial platform, man-baskets, man-lift or bucket mounted vehicles. Full Body Harness with front work positioning belt is to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free. Use of a body belt alone for fall arrest is prohibited. Full Body Harness with PVC coated hardware should be used when working in explosive or electrically conductive environment. Anchor the safety harness lanyard on rigged anchorage point at height, having fall clearance safety factor three (03) feet from impact level or ground level.

xi. Suspension Trauma Strap especially for work at height for long hours, in case of emergency the worker can stand on his feet on it to prevent trauma till he is rescued.

xii. Use self-retractable lifelines (SRL) when working in elevated areas such as roof top.

xiii. Portable rubber insulated floor mat or insulated working support/ blanket or rubber plate or any other non-conductive object such as plywood.

xiv. Voltage Detector

xv. Insulated Hot Sticks for voltage measurement, operation of disconnection or cutouts, and application of grounding/ earthing, etc.

xvi. Other task specific PPE could be, grounding/ bonding set, air supplied helmet for chemical sprays or grit blasting, PVC Shoes, life line, portable gas detector, particulate masks, half or full face Respirator (cartridge masks as per MSDS, SCBA, supplied air breathing Apparatus), Bunker Gear, Ear Plugs/Muffs, Rain Coat, PVC Disposable Coverall, Rubber/PVC Apron, fire blanket, Face Shield, Safety Goggle, Welder's Shield, well-fitted gloves (Cut Resistance, Pinch Resistance, Heat Resistance, Cryogenic, Welder Gloves, Electrical Gloves, Chemical Gloves as per MSDS, Rubber or Plastic acid-resistant chemical gloves with elbow-length gauntlet), portable eye wash, Non-Sparking Tools, flame-proof light, explosion proof low voltage (24v) lighting, Aluminized suit for pyrophoric chemical handling, Long boots, Warning Tapes/ Cones, Warning Sign, non-conductive measuring tape/ stick and ruler, Reflective Vest for worker visibility, Lifejacket, etc.

g. Don't wear gloves/ loose clothes around moving machinery such as drill presses, mills, lathe, grinder, etc.

h. Workers should be trained in the adequate use of these PPE.

i. The GEPCO should establish clear instructions on when and where these PPE should be used and communicate these effectively to all relevant workers on its facilities.

5.12.1 Tools & Equipment

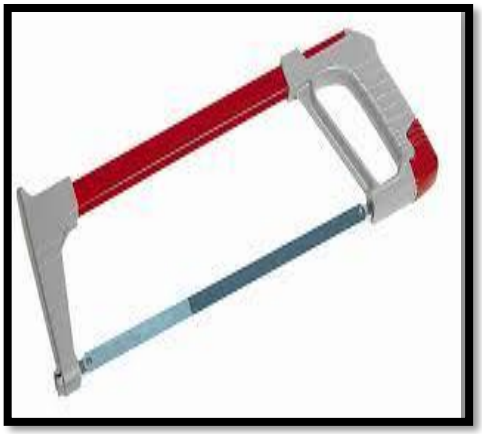
Standard tools and equipment **MUST BE** provided to working staff for efficient and safe working.

Description
HT Live Line Tester / Phase Tester
Blade Cutter
Cutter Pliers 6"
Screw Driver Set (Minus/Plain)
Hacksaw Frame with Blade size 12"
Emergency Light
LN Key Set
Measuring tape
Insulated Pliers size"
Screw Driver Set (Philip)
Torch with cell
Hand saw wooden 16"
Bolt cutter
Cold hand flat straight cut chisel 8" x ½", 10" x ½" & 12" x ½"
Filers (Flat, Round 12”, Half File, Triangular)
Hammers
Screw driver Phillip 10"

Box Panna (shroud panna) 42 mm
Crimping Machine
Fix spanner set
Adjustable Spanner Set
Table vice 12"
Wrench pipe steel 10", 14"& 18"
Torque Wrench / Spanner
Drill Machine (DC Operated with chargeable Battery)
Nose Pliers Size 8”
Neon Tester / Voltage Tester
Cable Cutter
Channel Lock 12”



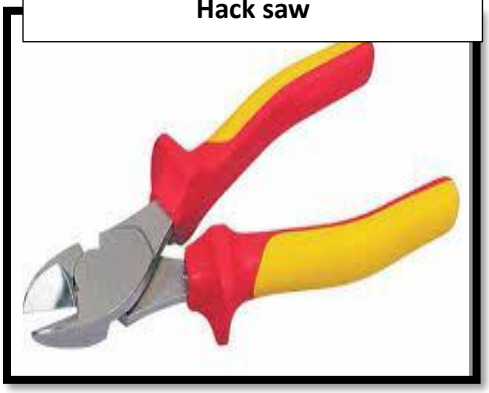
Blade Cutter



Hack saw



Measuring Tape



Cutter Plier



Emergency Light



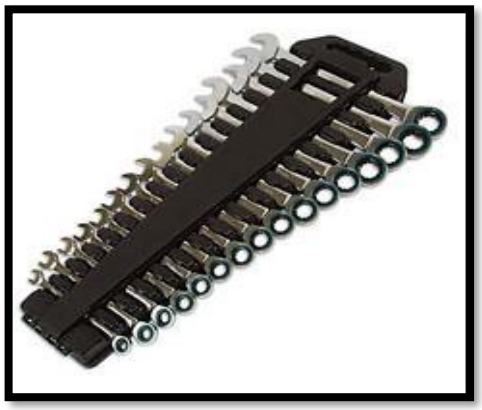
Manila Rope



L N Key



Plier



Spanner Set



Wooden Hand Saw



Torch



Nose Plier



Ring Spanner Set



Fuse Puller



Pulley



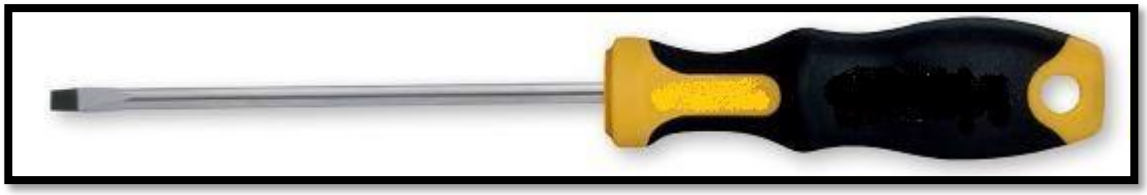
Channel Lock



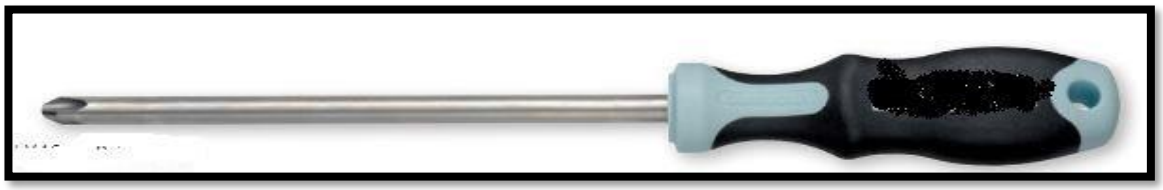
Drill Machine



Cable Cutter



Plain Slotted Screw Driver



Cross Slotted Screw Driver



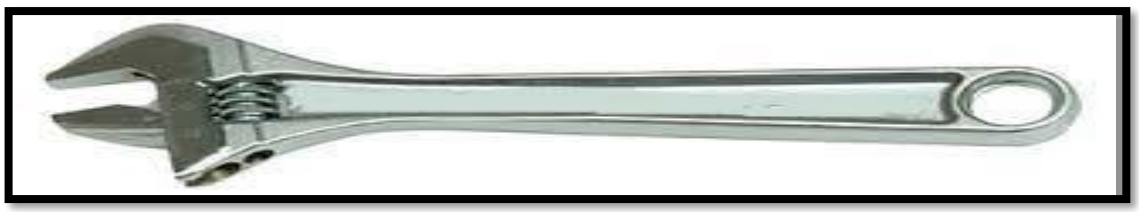
Bolt Cutter



Flat File



Torque Spanner



Adjustable Spanner

5.12.2 Sanps of Personal Protective Equipment

Sanps of Personal Protective Equipment



Safety Helmet



Uniform



Leather Gloves



Safety Shoes



Face Shield



Rain Coat



Gum Boot



Harness Belt

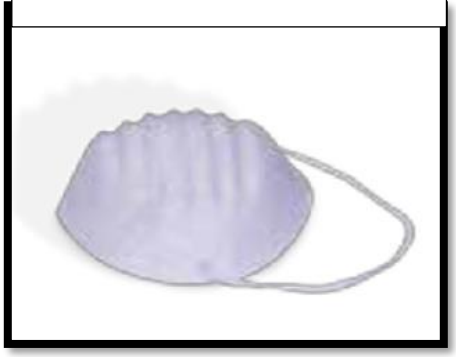




Live Line Tester



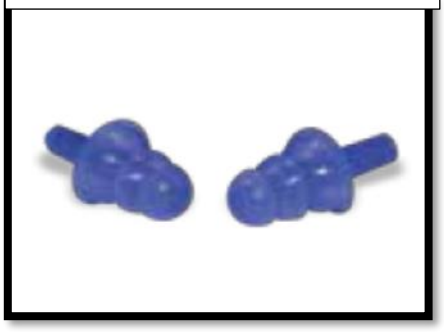
Rubber Gloves



Short & Ground kit



Mask

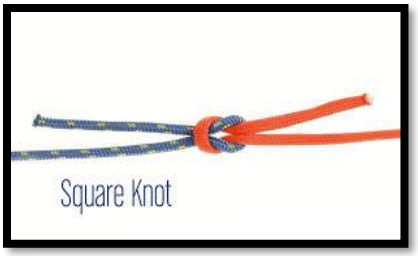


Reflective Jacket

Ear Protection Plugs

15.12.3 Dependable Rope Knots and Hitches

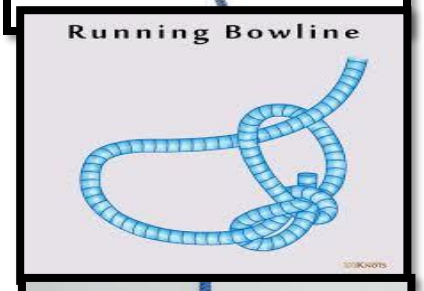
a) Square or Ref Knot for jointing ropes of the same size and kind



b) Bowling gives loop that will not slop under strain, and can be easily untied after strain is released



c) Running Bowling – passing long end of bowline through loop makes good slip knot



d) Bowline on Bight makes a comfortable emergency sling to sit on



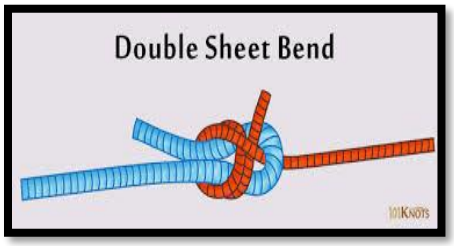
e) Timber Hitch and Half Hitch for lifting can be easily loosened after strain is released, but will not slip under pull



f) Rolling Hitch for hauling spar or large cable



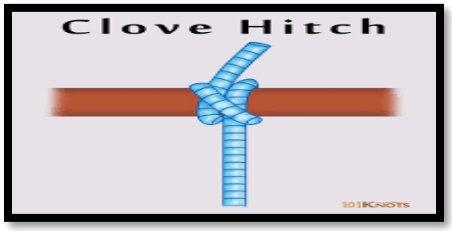
g) Double Sheet Bend for joining two ropes, especially those of unequal size, will hold new and wet ropes



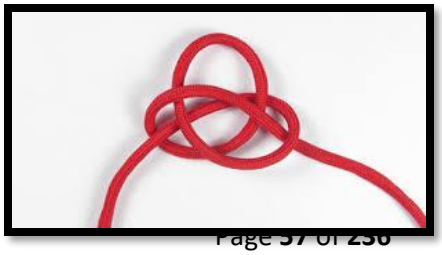
h) Sheep shank for shortening a rope or to by-pass spot



i) Clove Hitch for snubbing a line



j) Wall knot to prevent un-stranding and act as stopper



Note: Synthetic rope lines, when new, have a hard, smooth surface. As the rope is used the surface becomes rougher. For this reason, new synthetic rope lines may be slippery to hold by hand under tension, and to maintain control, a snubbing wrap may be required .Some knots if not properly tied and tightened, before the load tension is applied, may slip. To avoid this problem, allow the free ends of all knots to extend at least twice the distance that would be normal for natural fiber rope. In addition, check that knot is tied properly and pull the knot tight before tension is applied.

- Road barricading/ warning red & white tape
- Portable road obstruction signs/ boards, red cones
- Portable Panaflexes sign boards
- Construction work under progress,
- Road is closed,
- High Tension 11000 voltage Hazards warning sign
- Use alternate route

These all required for execution of works by GSC/GSO/Construction works/jobs

15.12.4SYNTHETIC WEB SLINGS

Fitted 	**Continuous** 
Straight Eye 	**Double Eye** 
Reverse Eye 	

Note: each synthetic web sling shall be marked or coded to show:

i) Name or trademark of manufacturer
ii) Rated capacities for the type of hitch
iii) Type of material

- **NATURAL AND SYNTHETIC FIBER ROPE AND SLINGS**

All splices in rope slings shall be made in accordance with fiber rope manufacturer's instructions.

In Manila rope, eye splices shall contain at least three full interlock, and short splices shall contain at least six full interlocks (three on each side of the center line of the splice).

In layer synthetic fiber rope, eye splices shall contain at least four full interlock and short splices shall contain at least eight full interlocks (four on each side of the center line of the splice).

Strands and tails shall not be trimmed short (flush with the surface or the rope) immediately adjacent to the full interlock. This precaution applies to both eye and short splices and all types of fiber rope. For fiber rope under 2.54 cm diameter, the tails shall project at least six rope diameters beyond the last full interlock. For fiber rope 2.54 cm diameter and larger, the tails shall project at least 15.24 cm beyond the last full interlock. In applications where the projecting tails may be objectionable, the tails shall be tapered and spliced into the body of the rope using at least two additional interlock (which will require a tail length of approximately six rope diameters beyond the last full interlock).

For all eye splices, the eye shall be sufficiently large to provide an included angle of not greater than 60^0 at the spliced when the eye is placed over the load or support.

Knots shall not be used in lieu of splices.

Synthetic rope lines used as an insulated tool must be dry and stored in areas protected from moisture. In addition, those lines must be clean and free of any contamination.

Chemical fibers used in some synthetic rope lines have rather low melting points compared to natural hemp fibers. These lines may retain their strength through considerable fiber melting and then part without warning. For this reason, synthetic rope used on capstans, or in other friction condition that will produce heat, should be carefully inspected before, during, and after use.

b. Safe Load on three strand Manila rope

Rope Diameter Nominal in CM	Nominal Wight per 30.5 Meters in Kg	Safe working Load (Kg)
0.95	1.9	111
1.11	2.1	143
1.43	4.8	281
1.59	6	358
1.9	7.6	439
2.06	8.8	530
2.22	10.2	630
2.54	12.2	734
2.7	14.2	856
2.86	16.3	978
3.17	18.9	1101
3.34	21.7	1223
3.81	27.1	1508
4.12	33.8	1835
4.44	41.5	2161
5.08	48.7	2528
5.71	66.1	3343

c. Safe Load on three strand Nylon Rope

Rope Diameter Nominal in cm	Nominal Wight per 30.5 Meters in Kg	Safe working Load (Kg)
1.27	2.9	317
1.43	3.8	385
1.59	4.8	498
1.9	6.6	679
2.06	7.7	815
2.22	9.1	951
2.54	11.8	1178
2.7	13.1	1359
2.86	15.4	1385
3.17	18.1	1812
3.34	20.4	2038
3.81	24.9	3539
4.12	30.8	3125
4.44	37.6	3715
5.08	43	4394

d. Safe Load on new polyester Rope

Rope Diameter Nominal in CM	Nominal Wight per 30.5 Meters in Kg	Safe working Load (Kg)
1.27	3.6	317
1.43	4.6	385
1.59	5.9	498
1.9	7.9	585
2.06	9.5	720
2.22	11.3	855
2.54	13.8	1035
2.7	15.6	1215
2.86	18.1	1395
3.17	21	1585
3.34	24	1812
3.81	30.3	2205
4.12	37.2	2700
4.44	44.5	3240
5.08	51.2	3780
5.71	61.2	4394

e. Safe Load on new polypropylene Rope

Rope Diameter Nominal in CM	Nominal Wight per 30.5 Meters in Kg	Safe working Load (Kg)
1.27	2.1	290
1.43	2.7	360
1.59	3.4	450
1.9	4.8	585
2.06	5.7	720
2.22	6.8	815
2.54	8.2	990
2.7	9.2	1125
2.86	10.7	1305
3.17	12.2	1485
3.34	13.8	1665
3.81	17.5	2115
4.12	21.5	2565
4.44	25.9	3060
5.08	31.3	3715
5.71	36.3	4394

5.13 COMPETENCE, SAFETY TRAINING AND AWARENESS

GEPCO HSE shall plan and prepare an annual GEPCO HSE training program, focusing on minimizing occupational health and safety incidents. Thus, safety training programs shall be implemented as per following plan,

5.13.1 HSE ORIENTATIONS

GEPCO HSE shall develop and conduct the HSE Orientation (Multi-Language), for all new employees and contractors to help them get familiarized with the GEPCO HSE Policy, HSE system, site specific hazards, response in case of an emergency, other important GEPCO safety and security requirements.

5.13.2 HSE Awareness Trainings

i. GEPCO shall provide information, instruction, training and supervision to all their employees and contractors as far as necessary, to understand processes and risks, as governed by the national and provincial legal requirements, to ensure the safety of all personnel at the work place, and for protection of equipment & the environment. HSE awareness training plan shall cover following HSE related trainings but not be limited to; work permit issuer & receiver training, electrical safety, isolation, PPE/T&P, fire watch, standby man, fire prevention, first aid, working at height, confined space and emergency & rescue, waste management, and environmental protection, etc.

ii. Refresher training should also be planned once in every two (2) to five (5) years according to the validity of the training and nature of competency/ skill/ work area.

5.13.3 Job Specific Trainings

i. GEPCO shall provide Job Skills Competency Training/ Activity Specific Training primarily for new employees or new contractor, or refresher training for those who have not been appointed as skilled, competent and authorized technician, electrician, wireman, or those who currently perform work beyond their obligatory scope of competence.

ii. The Job Skills Competency Training/ Activity Specific Training shall also comprise but not be limited to the following aspects as per job trade of a person:

5.13.4 Who Needs Training?

All employees need to know the health and safety policy, the specific hazards of relevant processes and how to control the risks.

5.13.5 Top Management (C. E and above)

A series of short presentations and /or training workshops for relevant topics on HSE management concepts.

5.13.6 Middle Management (AM to Manager)

Training emphasis shall depend on HSE related job responsibilities of executives, senior managers and operations managers and any gaps identified by the Management through "TRAINING NEED ASSESSMENT" process.

5.13.7 Lower & Non-Management (Below AM)

These modules are targeted for field operations supervisors and field staff.

5.13.8 3rdParty Contractual Staff

Safety Trainings for 3rd party contractual staff is to be arranged by the vendors at a neutral venue, in coordination with RTC GEPCO to enable requisite quality of training as per GEPCO standards.

5.13.8.1 New Entrants

The objective is to provide new entrants with basic awareness of hazards and knowledge to perform jobs in a safe environment to avoid incidents.

5.13.8.2 Crossover Trainings

People assigned to unfamiliar jobs or locations are recognized as a high-risk category as per "TRAINING NEED ASSESSMENT" principles. It is essential that such individuals are imparted a solid dose of classroom training as well as practical demos, as determined by RTC GEPCO in coordination with GEPCO HSE and GEPCO Management , to enable them to fulfill new roles and tasks in a safe manner. Before deployment in the field, the individuals ought to be tested and certified by RTC GEPCO for demonstrated skills and capability to perform the new jobs safely.

5.13.9 Benefits of HSE Trainings

i. Increase HSE awareness in departments
ii. Reduce incidents
iii. Increase productivity
iv. Enable implementation of health and safety measures in an efficient and cost-effective manner
v. Enable staff to carry out their duties without jeopardizing their and others health

5.13.10 Training Classification & Categories

For effective implementation of training plan, trainings are divided into different categories.

5.13.11 Training Need Assessment

Training needs can be assessed by analyzing three major human resource areas: the organization, the job characteristics and the individual needs as per their abilities. This analysis shall provide answers to the following questions:

a) Where is training needed?

b) Who needs to be trained?

5.13.12 Selection of Trainers

Trainers should be well versed in the subject of their training to properly and effectively deliver the trainings. Following categories have been made to explain in detail.

5.13.12.1 HSE Trainers

HSE trainers are well versed in their field of health, safety and environment. Being NEBOSH/OHSAS qualified they are well trained in delivering HSE trainings.

5.13.12.2 Departmental HSE Trainers

HSE representatives of any department are also trained HSE trainers. These trainers being a part of department can understand the associated job hazards and should also be accomplished OHSAS/NEBOSH Certification.

5.13.12.3 External HSE Trainers

External trainers should be hired on need base specific training contract just for training group of employees on certified courses related to HSE as no such arrangement is available in RTC GEPCO and till the arrangement at GEPCO level it must be imparted annually or biannual basis .

5.13.13 Training Administration

All classrooms and demo field training shall be undertaken at RTC GEPCO or at a location organized by RTC GEPCO under their arrangements in coordination with GEPCO HSE. On site HSE training is to be handled by GEPCO HSE where required. Having planned the training program properly, following points are important to be kept in mind.

a) Training schedule (timing & duration)
b) Location
c) Trainee accessibility & comfort
d) Training materials
e) Attendance (to be ensured by Safety Coordinators of respective trainee)

5.13.14 Training Venues at GEPCO

a) Regional Training Center (RTC GEPCO) at Manipur Gujranwala.
b) Circle Training Center (CTC) in all Operation Circles of GEPCO.

5.13.15 Documentation and Records

a) RTC GEPCO, GEPCO HSE, GEPCO TMP (Training & Manpower Planning) office, ERP and all safety coordinators, shall maintain appropriate HSE training records. These records include training need analysis, training plans, trainee nominations, trainee selection criteria, attendances, awards of certificates, academic evaluations/examinations etc.

b) Senior Engineer RTC GEPCO shall keep the track of records of all trainings for analysis, updating and improvement in collaboration of ERP GEPCO.

5.13.16 Training Reports

Training Report to be prepared and consolidated on a monthly, quarterly and yearly basis and shall be furnished to Higher Management.

5.13.17 Training Modules

a. Purpose of the Modules

Modules have been developed and can be used to teach workers from any workplace where basic health and safety information and training are needed.

b. Format of the Modules

Each module follows the same format and contains the following sections:

Goal: Defines overall teaching purpose of the module.

Objectives: The objectives state the minimum that trainees should learn from the module

Contents: This section outlines the contents of the module

Introduction: This section explains the background to the problem(s) presented in the module

Points to remember: After each main section of text, list points to remember. These are the "take home" messages for each segment, that is, an essence of the most important points contained in the section

Summary: This section provides a conclusion to the module

Exercises: Each module must have at least one exercise at the end of it. These exercises give trainees the opportunity to apply some of what they have learnt from the training and are required to reinforce what has been taught

5.13.18 Training Evaluation

As a basic principle, evaluation should jointly involve the trainer and course participants/trainees after completion of training. The objectives of course evaluation are:

a) To assess the suitability of the aims and objectives of the course program
b) To identify whether the course is meeting these aims and objectives
c) To enable the participants to measure their development and progress
d) To assess the adequacy of the organizational and administrative arrangements
e) To encourage the change and adaptation of materials and methods as a routine part of the training process

A test and evaluation procedure to certify that the individual has acquired the capability of performing the tasks in accordance with minimum objectives of training module.

5.14 Control of Visitors and Animal Access

i. Entry of unauthorized visitors and vehicles to the restricted and operational area shall be controlled.

ii. Visitors shall not be permitted access to the restricted and operational areas unless accompanied by a GEPCO employee.

iii. Visitors shall be in appropriate PPE all the time in restricted and operational areas according to the GEPCO HSE Policy requirements.

iv. Access of stray or street animals shall be controlled.

6 HSE Management System (HSEMS)

The HSE Management System shall be established and maintained to achieve given objectives and a description of authorities and responsibilities.

6.1 HSE Management Objectives,

i. Monitoring and meeting HSE objectives.
ii. New hazards are identified on an on-going basis and that all existing controls are effective and fully applied. This shall be done periodically by counter checking or auditing the effectiveness of already existing controls.
iii. Reward and motivation system created for HSE performance within the organization
iv. Monitoring and oversight of field HSE performance through surprise visits of workplaces.
v. All non-conformances, accidents / incidents / near miss / significant near miss are promptly reported, investigated and corrective actions taken promptly.
vi. Public accidents prevention plan is implemented.
vii. Implementation of an approved standard reprimand system to eliminate violations of HSE practices and standards.
viii. Ensuring that no Non-conformance Reports are pending, and corrective actions are taken without undue delay.
ix. Workplace Fire Safety, Housekeeping, Health & Hygiene and Environment related instructions are complied with prescribed standards and distributed to all concerned accordingly.
x. Robust system of HSE trainings is implemented in GEPCO RTC and CTCs.

6.1.1 Chief Security Officer/ Addl. Manager (Security)

1) Ensure incorporation of HSE & firefighting responsibilities in Job Description (JD's) in Urdu of all Security personnel deputed at GEPCO premises and 132kV Grid Stations.
2) Ensure to develop and implement Emergency Response Action Plan, Emergency Evacuation Plan and installation of fire detection, fire extinguishers and fire hydrant system in the GEPCO premises and 132kV Grid Stations.
3) Ensure to prepare duty roaster of firefighting personnel, nomination of shift in charge/ Team leader in each shift.
4) Ensure to conduct regular firefighting training to GEPCO employees, active firefighting teams to respond in each shift in case of Emergency.
5) Ensure to provide Personal protective equipment (PPE's) at each fire point.
6) Ensure periodic checking and maintenance of firefighting equipment and fire installations/ fire hydrants.
7) Emergency contact lists of all local government organizations will be displayed at prominent places.

8) To prepare red file comprising of emergency contact list, emergency evacuation plan, and emergency action plan should be displayed at prominent places.
9) Ensure color code marking of fire extinguishing system, fire class/ Types of fire and work instructions in Urdu how to operate during the emergencies.
10) Ensure 100% training of Security staff/ personnel in all GEPCO premises and maintain training record.

6.2 HSE Management Roles, Authority and responsibilities- command & Support.

6.2.1 GEPCO Management

1. Preparation and execution of departmental HSEMS plan
2. Defining departmental HSEMS goals &its implementation.
3. HSEMS activities within the department including Safety Parades, BAS Walk Reports, Engagement sessions and Safety committee meetings HSE trainings
4. Ensuring full availability and use of PPEs/T&Ps by all concerned
5. Ensuring Hazard Identification and Risk Assessment of all routine and non-routine activities
6. Accident prevention and risk mitigation plan
7. Implementation and finalization/closure of all recommendations of accident investigation reports, BAS Walk Reports and safety alerts
8. Arrangements to Maintain data for all accidents, incidents, near misses and other HSE related matters
9. Arrange safety trainings on developed modules as per "TRAINING NEED ASSESSMENT"
10. Ensure timely presence of all trainees for safety training sessions organized by GEPCO Regional Training Centre & Circle Training Centers.

6.2.2 GEPCO Health Safety & Environment Directorate

i. Facilitate and enable (Directorates/Circles) in all HSE matters
ii. Develop performance standards; monitor and evaluate performance against established standards

iii. Oversee compliance of promulgated HSE SOPs for HSE related activities, conducted in all over GEPCO and compliance of pertinent regulatory & legal requirements in collaboration with GEPCO Legal Directorate.

iv. Undertake surprise/periodic inspections of workers/jobs under execution through Behavior Assessment Safety Walks (BAS Walks)

v. Plan and conduct safety trainings and refreshers in RTC GEPCO Nandipur.

vi. Oversee and implement the safety reward system

vii. Get Developed an HSE MIS (Management Information System) from ERP GEPCO and get trend analysis for continual system implementation.

viii. Investigate incidents and accidents with Root Cause Analysis (RCA), suggest corrective/preventive actions to avoid recurrence

ix. Follow up recommendations of accident investigation reports till closure / implementation.

x. Plan and conduct internal HSE audits

xi. Introduction of contemporary safety equipment/devices and modification of existing equipment in coordination with concerned departments

xii. Recommend development of new SOPs by concerned departments based on gap analysis

xiii. Continually review current SOPs and develop new SOPs to address dynamic safety requirements

xiv. Issue safety alerts/advisories for emergent safety issues

6.3 Engineering and Construction Management

6.3.1 GEPCO shall establish, implement and maintain a section or unit for Engineering & Construction Management, which shall be responsible for managing Engineering documents, conduct detailed Engineering design, identify specifies requirements for the application of Standards, Specification, Rules, Regulations and Codes for Engineering & Construction works to avoid substandard construction and installation, specifies the protection devices and schemes, prescribes mandatory design bases and performance criteria of electrical power systems, specifies critical operational parameters, execution of electrical equipment and materials.

6.3.2 This unit shall Identify, install and maintain protective system/ distance relays for abnormal conditions (short-circuits, overloading, lines fall on rocks or any dry surface, which may cause damage to people or property, etc.) including grounding of circuits, apparatus and infrastructures. ELCBs (Earth Leakage Circuit Breakers), RCDs (Residual Current Devices) and RCCB (Residual Current Circuit Breakers) shall be used as per design in circuits in order to prevent fires and shocks in electrical installations.

6.3.3 Protective relays and protection schemes set points/ sizes should be sufficient for the current rating to immediately 'blow' the fuse or trip the circuit breaker within the specified time, in case of fault or overcurrent.

6.3.4 All design aspects/ design criteria shall be prepared and provided to NEPRA as and when required and complete record shall be maintained by GEPCO.

6.3.5 A safety corridor should be considered during design phase to protect the transmission systems from the windfall, trees and branches and other potential hazards that may result in damage to the system, power failures or forest fires.

6.3.6 Minimum clearance for overhead Low Tension/Voltage (400 Volts and below) lines from house/ building shall be:

- Vertical clearance above the roof top: 8 feet.
- Horizontal clearance from side of the building: 4 feet.

6.3.7 GEPCO shall install insulated conductors (aerial bundled cables/conductors) for new LT lines or while replacement of spoiled bare conductors, especially in narrower/ congested areas having less clearance from houses/ buildings. Insulated conductor will prevent accidental contact and can be stand in close proximity to trees/ houses/ buildings and will not generate sparks, if touched.

6.3.8 Minimum clearance for overhead High Tension/Voltage (11KV & 33 KV) lines from house/ building shall be:

- Vertical clearance above the roof top: 12 feet.
- Horizontal clearance from side of the building: 6 feet.

6.3.9 Minimum horizontal and vertical clearance for overhead High Tension/Voltage (66 KV) lines from house/ building shall be 15 feet:

6.3.10 Minimum clearance for overhead High Tension/Voltage (132 KV) lines from house/ building shall be:

- Vertical clearance above the roof top: 17 feet.
- Horizontal clearance from side of the building: 20 feet.

6.3.11 Minimum clearance for overhead High Tension/Voltage (220 KV) lines from house/ building shall be:

- Vertical clearance above the roof top: 20 feet.
- Horizontal clearance from side of the building: 25 feet.

6.3.12 Minimum clearance for overhead High Tension/Voltage (500 KV) lines from house/ building shall be:

- Vertical clearance above the roof top: 25 feet.
- Horizontal clearance from side of the building: 30 feet.

6.4 Asset Integrity Management System

6.4.1 GEPCO shall establish, implement and maintain Asset Integrity Management system for equipment and apparatus for inspection and quality control applied during the construction and maintenance activities to ensure equipment, instruments, devices, and systems remain in good physical condition and to avoid degradation due to mechanically, chemically, biologically, excessive vibration or corrosion.

6.4.2 Inspection and quality control shall address scope, minimum requirements, types and intervals, essential for equipment, instruments, devices, and systems whose deterioration and failure may adversely affect overall efficiency, and to assure safety, reliability and integrity of the system with reliable and efficient safe operation.

6.4.3 The Preventive Maintenance Plans should be scheduled based on inspection outcomes for each critical system/ equipment to increase their availability by reducing downtime caused by failure.

6.4.4 Safety critical protection devices, instrumentation, interlocks, protection relays, breakers, controls, safety relief valves, F&G detection system, software and components that are the last lines of defense and whose failure will result in a significant incident shall be reviewed to identify and establish a list. A Management of Change (MOC) Committee/ team shall be established to review and approve any change, modification, addition or deletion of safety critical protection devices, instrumentation, interlocks, protection relays, breakers, controls, software, components and its list.

6.4.5 A document shall be developed that specifies the suitable procedures, testing of equipment, frequency of testing, acceptable limits and passing criteria of the tests of

safety critical protection devices, instrumentation, interlocks, protection relays, breakers, controls, software and components.

6.4.6 Safety critical protection devices, instrumentation, interlocks, protection relays, breakers, controls, software and components shall be bypassed, isolated or taken out of service only for specified reasons such as repair and planned tests/ inspections, with formal documented approval for minimum possible time, and the work on these components shall continue uninterrupted till the system is back as normal on-line.

6.5 Management of Change/ Committee /Team

6.5.1 GEPCO shall establish, implement and maintain a Management of Change (MOC) program to manage and control the permanent or temporary changes in facility during design, construction and operation effectively through an established system.

6.5.2 MOC Committee/ team/ competent authority shall review and approve any change, modification, addition or deletion.

6.5.3 MOC program shall ensure that any change "Not In Kind" shall have safeguards in place to eliminate the possibility of hazards introduction as a result of changes to technology, operations, utilities, parameters, trips, set points, chemicals and equipment.

6.6 Individual Responsibilities Orientation.

6.6.1 General Manager (Operation)

1) Nominate HSE Coordinators under his jurisdictional area.
2) Ensure visibility, active commitment and treat HSE as a top priority
3) Ensure effective communication and engagement of the workforce in the promotion of health, safety & environment.
4) Ensure development of HSE objectives to achieve HSE goals
5) Ensure development of action plans so that Electricity Distribution maintains compliance in HSE areas
6) Coach all Managers and provide advice, practical support on HSE matters
7) Ensure identification of HSE training needs for employees.
8) Ensure implementation of recommendations of accident investigations and BAS walks
9) Ensure implementation of public accident prevention plan in all GEPCO entities as per plan
10) Ensure HIRA (Hazard Identification and Risk Assessment) activities are performed in GEPCO.

6.6.2 General Manager (Technical)

1) Ensure implementation of HSEMS within area of his responsibility to achieve safety of employees, contractor staff and public
2) Conduct periodic BAS walks to verify the compliance of safety procedures and take action on violations highlighted during all such walks and hygiene/housekeeping reports
3) Execute public accident prevention plan in area of responsibility
4) Take actions on implementation of departmental accident prevention plan
5) Ensure implementation of all SOPs related to timely reporting & investigation of all incidents, public accidents. Also, to ensure action on all investigation's recommendations
6) Ensure that system for hazard identification and risk mitigation is in place and functioning
7) Evaluate subordinate managers each year to make sure that they are carrying out their HSE responsibilities
8) Conduct / attend:

   i. Monthly HSE meeting

   ii. Employee engagement session

   iii. Safety hour

   iv. Safety parade

   Ensure attendance of all nominated employees for HSE workshops and trainings

6.6.3 Chief HSE Officer

1) Lead the Health, Safety and Environment Department in order to provide a Safety Management System to enable to achieve the target of Zero fatalities and injuries
2) Enhance visibility of Health, Safety and Environment in Distribution Division through senior leadership visibility in the field and in coordination with Marketing
3) Conduct meetings with segments of various Support Departments and also within the department to discuss safety related issues to improve upon SOPs and work practices to raise the level of overall work place Safety.
4) Validate and verify the investigation of incidents and ensure prevention of similar incidents or nonconformance through comprehensive root cause analysis and through disciplinary, technical and other remedial actions
5) Oversee preparation of various Safety standards and introduce ways to mitigate safety hazards

6) Ensure that all measures possible are being undertaken to prevent public fatalities through PAPP (Public Accidents Prevention Plan) Execution and Public Awareness & Conduct Internal Hearings
7) To monitor all Fire and Environment related activities to ensure safe working culture through conduct of fire drills, installation and maintenance of FAS (Fire Alarm Systems), routine inspections of field formation premises, green area developments to improve environment, removal of asbestos & PCBs (Poly Bi-phenyl Chlorides), hygiene inspections of complaint offices and work locations.
8) Ensure training requirements and needs are being adequately delivered so that employees have the necessary knowledge and skills to perform their tasks safely
9) Supervise the development of Safety MIS by ERP to ensure single source of truth so that all Safety related data is available at single point and business intelligence can be extracted to take important steps for continual improvement of Safety.

6.6.4 Deputy Manager HSE (I & II)

1) Ensuring that the HSE activities are carried out in accordance with the GEPCO policies and procedures in order to achieve objectives and targets
2) Arrange Safety Trainings through HR Directorate at RTC GEPCO.
3) Arrange Safety Seminars, workshops in collaboration with HSE Coordinators under various departments of GEPCO
4) Prepare schedule for monthly PPE/T&P Parades
5) Investigation of Fatal/Non-Fatal accidents with root cause analysis RCA and preventive measures to prohibit accidents in future
6) Follow up of recommendations against non-conformance and accidents / incidents
7) Inspection of PPE/T&P items in stores, field formations and at vendor premises.
8) Conduct PPE/T&P Parades.
9) Identification of Hazards in GEPCO Distribution System.
10) Conduct site inspection to verify the safety record presented during the desktop audits
11) Facilitate external audits and certifications
12) Reporting of non-conformances, if any, recommending remedial actions and performing follow ups
13) Conduct BAS Walks to detect non-conformance and breach of in vogue Safety SOPs.
14) Quarterly certification by Regional/Circle Heads/ to confirm the availability of requisite PPEs/T&Ps in /to concerned departments
15) Follow up on shortages of PPEs/T&Ps identified during the quarterly certification
16) Monitoring availability of PPEs in coordination with MM, Procurement
    Coordination with concerned departments for issuance of standard PPEs to all Supervisory & Line Staff throughout GEPCO

6.6.5 Senior Engineer Regional Training Centre GEPCO Nandipur.

1) Planning training sessions through a comprehensive process of competency criteria, training needs analysis, identifying training topics, training plans and their executions and measurement of post training effectiveness
2) Arranging basic and refresher HSE training to all employees
3) Making necessary improvements in training (plans, modules, frequency etc.)
4) Analyzing and maintaining feedback form to receive inputs from GEPCO formations.
5) Planning and coordinating awareness campaigns, safety days, workshops and seminars
6) Maintaining safety training records
7) Periodic circulations of newsletters/brochures through administrator
8) Arranging training on psychological mentoring and its refreshers.

6.6.6 Manager ERP GEPCO

1) Developing an MIS (Management Information System) for all safety related activities in Collaboration with GEPCO HSE Directorate, DM (E&S) PMU and all entities, Field Formations of GEPCO.
2) Generation of weekly & monthly performance reports of GEPCO HSE Directorate.
3) Collection of all requisite data for business activities related to safety
4) Dissemination of relevant information to all the departments in the company as per requirement
5) Promote business improvement and assess the effectiveness of the HSE management
6) Review of trend analysis data provided by each department for continual improvement
7) Data analysis, management and report generation

6.6.7 Deputy Manager (E&S) PMU GEPCO

1) This position manages workplace including Fire safety, employee health and Environment protection operations at GEPCO

2) Deploys team to collect information on the causes and consequences of staff and public incidents; Instructs for the medical investigation and assistance of accident victims

3) Conducts root cause analysis of the accident and identifies nonconformance with defined safety standards

4) Coordinates with team for preparation of the root cause analysis report

5) Devises preventive measures and control mechanism to mitigate reoccurrences; Validates comprehensive root cause analysis process

6) Identifies techniques for continuous improvement in accident investigation process

7) Communicate the result of such progressive report to all concerned stakeholders; Follows up and ensures implementation of recommended changes for efficient execution and consistent improvement

8) Recommends measures to mitigate reoccurrence of safety incidents

9) Arranges staff trainings and edifies workers on behavioral safety measures / HSE standards

10) Oversees the safety promotion marketing activities

11) Ensures the smooth functioning of the Fire and Safety precautionary measurements and a healthy environment at GEPCO.

12) Ensure productive work environment within the limits of organizational objectives and SOPs, departmental objectives and values, NEPRA Safety Power Code 2021.

13) Supervise quarterly audits to check departments' operations as per defined SOPs and tracks status of compliance with safety guidelines; Ensure maintenance of records of each department regarding Health & Environment.

14) Supervise and coordinate with Fire team for maintenance of fire system; Supervises fire safety related activities to ensure the safe working culture; Audits the entire system to check for any errors or loopholes impacting system efficiency

15) Supervise team to plan and organize the bi-annual audit plans of fire protection, health and environment.

16) Supervise and coordinate with ERP Department to develop MIS Data regarding activities against Health, Fire and Environment

17) Coordinate with RTC GEPCO to organize the training, workshops and seminars to fulfill internal / external training needs for staff

6.6.8 Departmental HSE Coordinators

1) Act as the primary resource person for coordinating HSE activities
2) Act as liaison with the GEPCO HSE on all matters pertaining to inspections, accident/injury investigations, personnel safety training and reports
3) Assist the concerned Head in implementation of a Health, Safety & Environment Programs
4) Conduct BAS walks of facilities, teams in field & equipment to identify unsafe conditions and practices at least once a week.
5) Ensure that all incidents are reported in time and are properly investigated with root cause analysis and recommendations
6) Ensure action on recommendations of accident investigation reports to avoid recurrence

7) Prepare and submit all safety rewards (Employee of month, team of month, safety suggestions and promotional activities) and reprimands (counseling's, warnings etc.) to HSE Directorate on monthly basis
8) Conduct "TRAINING NEED ASSESSMENT" based on lessons learnt and impart trainings on set frequency
9) Arrange monthly meetings chaired by head of department
10) Implement actions of departmental accident prevention plan
11) Ensure arrangement of employee engagement sessions
12) Act as a facilitator in HSE audits and assist HSE teams in conducting HSE audits
13) Disseminate safety procedures, circulars and guidelines down the line
14) Receive and handle internal safety-related complaints and suggestions and assist in their rectification
15) Expedite corrective preventive actions on identified deficiencies
16) Monitor implementation of Public Accident Prevention Plan in his area of responsibility
    Conduct HIRA (Hazard Identification and Risk Assessment) activities in his area of responsibility

6.6.9 Chief Security Officer

11) Ensure incorporation of HSE & firefighting responsibilities in Job Description of security staff.
12) Ensure supervision of Emergency Response Procedure and firefighting equipment's.
13) Ensure maintenance of HSE violators List
14) Ensure that all security personnel fulfill their responsibilities as outlined in the organizational policy, programs and monthly duty roaster.
15) Establish procedure for enforcing company security rules
16) Close liaison with GEPCO ERP for maintenance of fire alarms, smoke detectors.
17) Close liaison with PRO GEPCO for effective media campaign to spread Security Awareness among general public and employees.

6.6.10 Chief Peoples Officer

18) Ensure incorporation of HSE responsibilities in Job Description of employees
19) Ensure implementation of Reward &Reprimand Procedure
20) Ensure maintenance of HSE violators List
21) Ensure that employees fulfill their health and safety responsibilities as outlined in the organizational policy and programs
22) Establish procedure for enforcing company safety rules
23) Close liaison with GEPCO ERP for maintenance of HSE Reports, Records.
24) Close liaison with PRO GEPCO for effective media campaign to spread Safety Awareness in general public and employees.

6.6.11 Chief Financial Officer

1) Ensure financing the HSE requirements considering the requirements and sensitivity

2) Ensure that HSE requirements are processed on top priority
3) Ensure quick decisions are taken on HSE related matters

6.6.12 Head Procurement / Material Management

1) Ensure pre – qualification of contractors' services as per HSE requirements / demand
2) Ensure selection of right material as per HSE specifications &standards and technical evaluation
3) Ensure timely processing of HSE requirements as per the defined turnaround time in procurement manual
4) Ensure delivery of services and material on time
5) Ensure availability of multiple vendors rather than single vendor to avoid any undue delay of material and services.

6.6.13 Head Inventory Management (IM) / Deputy Manager Regional Store

1) Ensure that supplier shall provide material and equipment as per approved specs of GEPCO / NTDC/ WAPDA.
2) Ensure availability of HSE material & equipment stock as per user requirement
3) Ensure inspection of HSE material & equipment received in store as per defined protocol
4) Ensure optimum inventory availability as per user requirement with minimal risk of stock outs

6.6.14 Manager (Admin)

1) Ensure compliance of labor laws
2) Ensure timely implementation of reward & reprimand procedure
3) Ensure complete worker/family facilitation and financial help as per policy in case of accidents
4) Ensure via inspections that the Committees and the Contractor are adhering to the contract with reference to quantity, quality, and housekeeping

6.6.15 Manager Operation/GSO, PD Construction / GSC and other HODs

1) Ensure integration of HSE policies and HSEMS into every aspect and area of business for the safety and well-being of employees, contractor staff and public
2) Visibly demonstrate HSE commitment and communicate it as a top priority
3) Conduct periodic BAS walks to verify the compliance of safety procedures
4) Review, approve, and communicate departmental accident prevention plan down the line and monitor progress
5) Constitute HSE committee and conduct meetings on a set frequency
6) Use data to monitor the performance of the overall safety program and identify safety gaps

7) Plan/budget and arrange/advocate necessary resources to meet the departmental safety objectives
8) Recognize HSE achievements
9) Assign HSE responsibilities to lower formations and evaluate their performance in the Performance Management Framework, to make sure they are carrying out their functions as described
10) Ensure implementation of Public Accident Prevention Plan in his respective area
11) Ensure HIRA (Hazard Identification and Risk Assessment) activities are performed in his respective area
12) Ensure effective employment / deployment of Circle/department safety coordinator to implement the HSE management system in area of responsibility

6.6.16 Deputy Manager / Assistant Manager (Operation / Construction / GSC / GSO)

1) Assist Line Manager in performing HSE initiatives / activities
2) Conduct BAS Walks as per schedule
3) Assist in resolving HSE issues
4) Arrange periodic HSE training for employees
5) Guide the staff and encourage them for reporting near miss at site
6) Appreciate their staff and nominate them for safety reward
7) Support implementation of HSE procedures and policy
8) Execute public accident prevention plan in area of responsibility
9) Perform HIRA (Hazard Identification and Risk Assessment) activities with concerned safety coordinator in his area of responsibility

6.6.17 HSE Inspector

1) Ensure implementation of HSEMS in respective area of responsibility.
2) Conduct BAS Walks
3) Checking of complaint Centres
4) Surprise visit of Sub Divisions to check PPE/T&P stores, housekeeping, availability and issuance status of PPE/T&P items.
5) Conduct PPE/T&P Parades as per given schedule.
6) Surprise visit of Morning Assemblies to ensure promotion of HSE Culture.
7) Assist Deputy Manager HSE in investigation of near misses, incidents and accidents of GEPCO Employees / Public.
8) Spread awareness in line staff regarding utilization and importance of various PPE/T&P Items
9) Assist in resolving HSE issues.
10) Assist in implementing Reward and reprimand procedure.
11) Report the quarter concerned regarding implementation of Public Accident

Prevention Plan in his respective area.

12) Identify and report Safety Hazards

6.6.18 Responsibilities of ALM (Operation)/Associating Employees

1) He shall be present in the whole process of job execution like, huddle of job briefing, hazard identification, making plan to deal with the hazards and while the supervisor assign duties and share details of required PPE/T&P.
2) He shall ensure that the LM is utilizing his PPE and T&P.
3) He shall inform LS/SDO immediately in case LM violates safety SOP.
4) While the LM is working on site, the associating employee shall not go anywhere, stay vigilant and provide guidance to the LM regarding safety concerns, about which the LM is inattentive during execution of job.
5) He shall ensure that no work on LT line can be initiated unless the relevant distribution T/F disconnected and Portable Temporary Grounding (PTG) installed on each side of LT line near to workplace.
6) He shall ensure that no work near/on HT line can be initiated unless PTW obtained and PTG installed on each side of HT line near to workplace.
7) When required, if work is being done on busy road/street, road blocking cones / barricades shall be placed to divert/block the traffic.
8) He shall check the load bearing capacity of the Steel Structure / PC / Spun Pole to establish that whether it can sustain the load of Fiber Glass Ladder & LM. In case of deteriorated condition, he shall prohibit the LM from climbing up or placing the ladder against it.
9) He shall ensure that LM has LT Beeper/High Voltage Detector and (LM) shall test the line (to confirm line status i.e. ON/OFF) before installation of PTG at LT/HT line respectively.
10) In case, when work is required near/on HT line and LS is not present at site then the ALM shall ask the LM to show him copy of PTW (issued from Grid Station to work near/on certain HT line) before commencement of job at site. If the LM failed to do so, he (ALM) shall promptly contact to LS / SDO and report the violation.
11) He shall report any near miss incident.
12) He shall have necessary contact numbers i.e. Rescue Service, Ambulance Service, Police Station & Hospitals, to meet any untoward situation at workplace.

Note: *To make an ALM familiar / educated about the above mentioned responsibilities GEPCO Management is required to issue necessary instruction to RTC GEPCO to design such training curriculum in which all above aspects shall be covered and each ALM of GEPCO shall go through that training.*

6.6.19 Responsibilities of LM (Operation) / Authorized ALM (Operation)

Note: *Authorized ALM is an ALM who is authorized by Authority to work on lines*

1) Being the core component of GEPCO he shall be the most responsible person in every working condition. Hence he shall not proceed to any work until having clear orders from quarter concerned, for doing a specific job.

2) Before commencement of job at site, he shall accompany all his fellow line staff crew along with supervisor and physically assess the hazards / risks present at site. After estimating the risks, he shall ask a job briefing in which solutions to safely deal with risks shall be discussed, in presence of all line staff crew. At the same time, he shall ask the supervisor to arrange required PPE/T&P/Transportation/Road Barricades and any other material / manpower.

3) He shall have LT Beeper/High Voltage Detector to test the line (to confirm line status i.e. ON/OFF) before installation of PTG at LT/HT line respectively.

4) He shall not work on LT line without disconnecting the relevant distribution T/F and installing Portable Temporary Grounding (PTG) on each side of LT line near to workplace.

5) He shall not work near/on HT line without obtaining PTW and installation of PTG on each side of HT line near to workplace.

6) When required, if work is being done on busy road/street, road blocking cones / barricades shall be placed to divert/block the traffic.

7) He shall check the load bearing capacity of the Steel Structure / PC / Spun Pole to establish that whether it can sustain the load of Fiber Glass Ladder & LM. In case of deteriorated condition, he shall prohibit the LM from climbing up or placing the ladder against it.

8) In case, when work is required near/on HT line(s) then he or any other LM of same line staff crew shall accompany the LS to Grid Station where LM shall also sign the PTW (LS Copy), got rack out VCB trolley (ies), lock out the trolley (ies) in front of him (LM) and keep the lock keys with him (LS/LM). Along with copy of PTW the LM shall reach at site and display said copy to all line staff crew at site.

9) He is bound to report any shortcoming or deterioration in his PPE failing in which shall be considered as misconduct.

10) He shall not use cellphone while executing the job.

11) He shall not work in the area which is out of his duty jurisdiction without having consent of concerned authority i.e. SDO / XEN.

12) He shall have necessary contact numbers i.e. Rescue Service, Ambulance Service, Police Station & Hospitals, to meet any untoward situation at workplace.

13) He shall share his knowledge / information in Hazard Register, about new hazards / risk points he identified in GEPCO distribution system, for collective safety of GEPCO line staff and to avoid accidents.

6.6.20 Responsibilities of LS Feeder In-charge/ Work In-charge

1) A lineman is backbone of GEPCO and the LS is the person who can preserve the backbone from deteriorating.

2) He shall not proceed into any minor/major work without having hazard identification / job briefing in which all the concerned line staff should

participate. After taking considerable opinions of fellow line staff then he shall proceed keeping in view the line staff safety as first priority.

3) He shall arrange / provide necessary PPE/T&P and other required material at site before obtaining PTW to save /reduce the time of shut down.

4) If work is required near/on HT line, then the LS shall not proceed without PTW (i.e. making telephonic contact to Grid Station for switching of HT line, as this practice has claimed fatalities & serious injuries in the near past).

5) To obtain PTW he shall always bring LM (who has to physically work at concerned site) with him, to Grid Station who (LM) shall also sign the PTW and get rack out VCB trolley (ies) of relevant HT line, locked out trolley (ies) in his presence and keep the keys with him and hand over PTW copy to LM.

6) After obtaining PTW he shall be present with his line staff at workplace and before installing PTGs, he shall get the 11 KV line (s) checked with High Voltage Detector or by teasing method, to know the actual status of electricity in 11 KV line i.e. whether it is ON/OFF.

7) In his presence, after confirming that 11 KV line is OFF, then the PTGs shall be installed on each side of HT line (s) near to workplace.

8) He shall be present at site where work on HT line is required.

9) He shall stay vigilant to determine that the work under execution is being carried out as per prescribed Safety S.O.Ps. If he found violations committed by line staff, then he shall stop the work besides initiating written report against the violator (s) to hold him (them) accountable through taking disciplinary actions.

10) He shall stop the work if the weather goes unfriendly or due to other circumstances which can further lead to any unwanted situation.

11) He shall frequently check T&P and PPE to ensure the condition is healthy or otherwise.

12) He shall obtain PTW besides provision of PTGs for working on transformer substation either General Duty or independent.

13) He shall maintain Record of PTW, Maintenance, hazard points, & near miss accidents.

14) He shall maintain single line diagram of feeder and update it immediately if any change in the jurisdiction took place and convey the same to concerned line staff.

15) He shall conduct patrolling of feeder at least once a month and patrolling report with discrepancies shall be sent to XEN office.

6.6.21 Responsibilities of LS Complaint Centre In-charge (Operation)

1) He shall provide and ensure that no work is done without Complaint Number.

2) SJO (Sundry Job Order) book shall be with the complaint shift in-charge.

3) He shall maintain repeat fault register.

6.6.22 Responsibilities of LS Safety (PPE/T&P In-charge)

1) He shall conduct monthly PPE/T&P Kit Parade in which he and SDO concerned shall physically check all the issued items of PPE/T&P in lineman's tool bag.
2) He shall maintain record of PPE/T&P items drawn / issued / in stock/ serviceable & unserviceable.
3) He shall frequently contact / check the availability of T&P and PPE in Regional Store / Field Store, draw the available item without any delay and distribute accordingly.
4) He shall have knowledge of PPE/T&P placed at Complaint Centers, workplaces etc.
5) He shall prepare a realistic demand of PPE/T&P keeping in view the job description and quantity of line staff and submit the same to quarter concerned to avoid delay in availability of necessary PPE/T&P items in relevant stores.
6) He shall always invite the line staff through pasting a message on Notice Board at every instance when he draws PPE/T&P from store.
7) He shall submit written report to the SDO concerned about the line staff member(s) who found utilizing deteriorated PPE/T&P and failed to collect healthy ones despite availability in sub division stock. Disciplinary action shall be taken against such delinquents.

6.7 Continual Improvement

Distribution Leadership is always looking for ways to continually improve its products, processes, systems and services. Through the management review process, operational information and data is examined and improvement opportunities are presented. As an outcome, decisions are made to enact continual improvement initiatives. The results of continual improvement activities are recorded and communicated throughout the organization and to stakeholders via a variety of media, this include the following.

6.7.1 Safety Committees

Steer Safety committees and conduct top level safety reviews for continual improvement in HSEMS. To benefit from collective wisdom of our colleagues, following committees shall be formed to address various aspects of safety in GEPCO.

i. Leadership Commitment Committee
ii. Employee Participation and Effective Communications Committee
iii. Risk Assessment and Analysis Committee
iv. Mechanical Integrity Committee
v. Management of Change Committee

6.8 Centralized Management for Pre-Qualification of Private Contractors

To create a standardized system with company wide acceptance and adherence to deal with;

a) Prequalification and induction of Electrical Contractors for Distribution Services.
b) Contractual engagements punctuated by scope / terms of work, value and standardized rates that are viable and mutually acceptable.
c) Performance Appraisal system that duly acknowledges the increasing levels of performance with commensurate financial rewards.
d) Punitive actions and their financial extent to deal with situations warranting an action as per HSE and others relevant SOPs
e) To create cognizance and provide formal training to PQC resources to become trained Linemen and Supervisors to add value to GEPCO system.
f) The committee would endeavor to evolve systems worthy of being able to mitigate / eliminate relevant risks relating to materials to be issued to PQCs. Areas under review would include but not limited to following;

- Issued Material Exposure risk viz a viz stature of a PQC.
- Clear demarcation and visibility of issued vs consumed materials.
- Theft of material in PQC custody

7 Implementation and Procedures

7.1 Communication, Participation and Consultation

Communication, participation and consultation are key factors for the effective functioning of HSE management system. It ensures;

a) Involvement in the development and review of policies and procedures
b) Consult contractors / employees when there are changes that affect work place health, safety and environment
c) Employee involvement in HSE matters, hazard identification and risk assessment process, training programmes, employee engagement sessions, safety parades, involvement in incident investigations and workplace inspections
d) To facilitate efficient communication process, GEPCO shall establish and maintain documented procedure for internal communication between various levels and functions within the organisation

7.2 Communication Plan

7.2.1 GEPCO should establish, implement and maintain Internal and External Communication Plan with authorization and availability of nominated/ focal person for proper coordination and system control to avoid an incorrect, incomplete, inadequate or misleading communication, to communicate clear information message, to the right people at the right time, to control and monitor construction, installation, operation, maintenance, testing, turnaround and HSE critical activities.

7.2.2 Critical information/ message should be to the point, in a short, clear and simple manner. However, it should be ensured that information is received and completely understood by internal, external affected group, next shift personnel, contractors and end-user. All such critical communication shall be recorded in soft or hard form for a period of not less than one fiscal year.

7.3 Safety Enhancement Initiatives

To reiterate the importance of safety in our daily activities, GEPCO HSE in collaboration with Public Relation Officer shall initiate following on consistent basis,

a) Safety messages on posters and standees placed at the Circle, Division, Sub Division offices and Complaint Centres, to serve as a reminder to the employees that their lives are important for not only themselves but for their loved ones & adherence to safety protocols is a must in their daily activities. The posters are to be refreshed/redesigned from time to time

b) Broadcast of safety messages, safety videos and images via SMS & WhatsApp to the field staff

c) Publishing safety activities, events and other relevant contents in the Monthly GEPCO Magazine.

d) Broadcast of safety promotional messages, wallpapers and screensavers via intranet in coordination with GEPCO ERP and Public Relations Officer.

e) Safety sticker for helmets designed with safety messages to constantly remind the employees to adopt safety measures

7.4 HSE Committees Meeting

The purpose of this meeting is to provide guidelines for management of different HSE committees. This procedure suggests an open forum for discussion and resolution of HSE issues (including conflict regarding the same) by encouraging all members to adopt a positive, proactive approach towards continuous improvement in HSE and appropriate feedback.

Also, to monitor HSE performance by tracking HSE practices, and to develop and lead actions ensuring HSE objectives are met as under,

- Review previous minutes of meeting.
- Review the implementation and compliance of this Power Safety Code.
- Review Annual HSE Goals, Objectives and KPI's for effective implementation.
- Discuss HSE Performance and Statistics.
- Discuss Near Miss/ Incident Alert as lessons learnt.
- Discuss critical Near Miss or Safety Suggestion, if any.
- Review training plan and records.
- Discuss safety issues related to operations, contractors, tools, equipment, work environment and work practices with proper resolution for mitigation.

7.4.1 Attendance record shall be maintained for the period of one fiscal year.

7.4.2 Meeting minutes shall be recorded, distributed and posted at notice board and at GEPCO HSE Dashboard within three (03) working days.

7.5 Employee Engagement Session

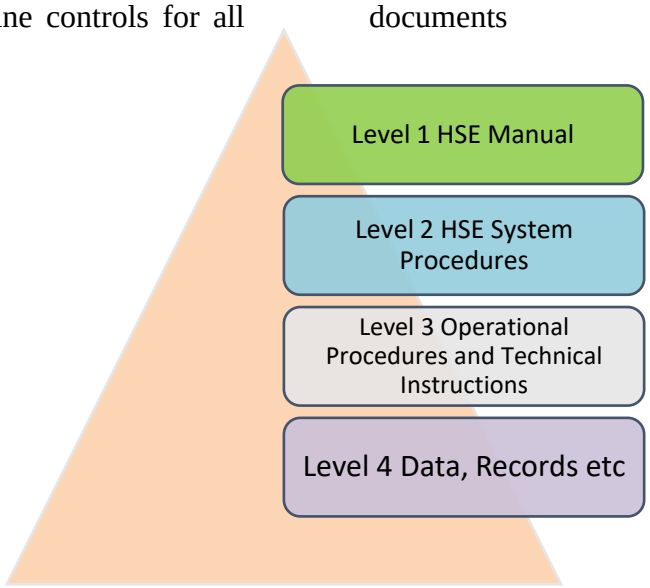
The purpose of this Initiative is to provide guidelines to departmental heads to arrange open forum for discussion and resolution of HSE issues on monthly basis as to encourage all the employees share their issues and opportunities for HSE improvement.

7.6 Confidential Reporting of HSE Matters

The purpose of confidential reporting is to provide a forum for employees and interested parties to voluntarily report any health safety and environment concerns related to Electricity Distribution. A confidential reporting is a mechanism which allows problems in HSE to be reported in confidence. This allows events to be reported which otherwise might not be reported through fear of blame or reprisals against the reporter. Analysis of the reported incidents can provide insight into how those events occurred, which can spur the development of measures to make the system safer.

7.7 Documents and Record Control:

GEPCO shall establish a systematic written procedure for control of documents and records. This procedure shall define mechanism and responsibilities for control of documents and records. The procedure shall define controls for all documents and records used in HSE system.



Core elements of the system procedure shall be:

a) Identification of the document
b) Classification of document access.
c) Legibility and retrieval of the document
d) Indexing of the document
e) Availability of the document
f) Creation and modification of the document
g) Retrieval and retention of the obsolete document
h) Record control
i) Disposition of records

All documents and records related to HSE performance of the company to comply the legal and other requirements shall be maintained by each designated coordinator including the record of;

a) HSE Inspections/BAS Walk Reports and closure of observations
b) Accident/Incident investigations
c) Closure of accident/incident investigation corrective actions
d) Training records
e) Records of Safety Meetings, engagement sessions, safety parades and safety hours
f) Reward and Reprimand records etc.
g) Fire safety records
h) Line Staff Periodic Health Check records

i) Environment records

7.8 Database Management (ERP Based Data and Recordkeeping)

A systematic approach to digitization of all HSE related document and record shall be in place under which all building blocks of GEPCO HSE management system shall be converted to ERP based work flows and databases. Under the GEPCO ERP digitizing initiative, following processes be identified for development of digitized database.

a) GEPCO HSE BAS Walk Management System
b) GEPCO HSE Incident Database
c) Public Accident Database
d) Last Time Accident
e) GEPCO HSE Dashboards
f) Monthly Trend Analysis Portal
g) Safety Rewards Portal
h) Monthly Fire Safety and Housekeeping Checklist Portals
i) GEPCO HSE Training Record Management
j) GEPCO HSE Employee Safety Profiles
k) GEPCO HSE Audits
l) GEPCO HSE Procedures, Documents and Reports
m) PPE/SPE Portal
n) Line Staff Periodic Health Check Reports

A pragmatic view to safety performance of the Electricity Distribution through analysis of the digitized data and records is to be automated by use of dashboard with multi view providing opportunity to view HSE performance.

7.9 Environmental Management System

7.9.1 Environment:

Environment encompasses the interaction of all living species, climate, weather, and natural resources that affect human survival and economic activity. Environmental management comprises of actions that can strengthen our environmental reporting and monitoring systems. These actions include identification of environmental objectives, establishment of environmental management structure, identification and monitoring of environmental parameters, coordinating with regulatory bodies, NGOs and environmental consultants. It also includes developing adequate environmental trainings, National Electric Power Regulatory Authority (NEPRA) in business operations when & where required.

For new distribution projects, environmental compliance is to be ensured and IEE (Initial Environmental Examination) to be carried out.

7.9.2 Aims & Objectives

a) Ensure compliance with applicable environmental laws

b) Achieve, enhance and demonstrate sound environmental performance built around the principle of continual improvement

c) Motivate people for active participation to protect environment or reduce negative impact of their activities and improvement by raising environmental awareness through trainings

d) Avoid / Eliminate environmental liabilities

7.9.3 GEPCO HSE Environment Functions

a) To identify, document and review all legal and other requirements including international best practices relevant to activities annually (to accommodate modifications in laws, if any)

b) To ensure environmental monitoring of all distribution operations and activities in coordination.

c) Relevant interaction with external agencies, monitoring and regulatory bodies, NGOs and lender institutions

d) To develop awareness / skills among employees for active identification and development of solutions to environmental problems

e) Identification of environmental issues (such as PCBs, Asbestos etc.) through third party surveys when required

f) Development and review of environment related procedures as per the activities.

g) Annual Environmental Excellence Award will be introduced to recognize sustained and improved environmental performance by the allied departments during a calendar year

h) The performance shall be evaluated at the end of a calendar year. The awards will be presented to winners in a ceremony presided over by the CEO or his representative thereof

i) AEEA Criteria has been divided into two parts:

- Onsite Audit - 65% Marks
- Desktop Audit - 35% Marks

j) HSE environment team shall conduct both onsite and desktop audits. Onsite audit will comprise on three surprise visits of each location. Desktop audit will be conducted at the end of audit year accompanied by a sample-based visit of any two locations

k) The criteria for the award shall be communicated and allied departments at the start of the year. Auditors from HSE shall conduct both announced audits and surprise visits

7.9.4 GEPCO Field Office Functionality for a Better Environment

a) Establish and maintain green and healthy environment including but not limited to;

i. Plantation
ii. Office ambiance

b) Ensure good housekeeping at their respective locations

c) Ensure waste management

d) Ensure resource conservation practices in place and conduct environmental promotional activities

e) Ensure storage facilities for staff;

i. Lockers for personnel items
ii. Tools and equipment's

f) Carryout environmental aspects/impacts assessment and mitigation measures in their respective circle.

g) Monitor environmental inspection results conducted by HSE and ensure compliance of the identified gaps

h) Provide environment related information to HSE as and when required

i) Submit audit closure to HSE

Timely report environmental accidents/incidents

7.9.5 Vaccination

Vaccination of all GEPCO employees against Hepatitis-B from a certified reputable medical institution as approved by GEPCO management.

7.9.5.1 Importance of vaccination program

a) Enables in distribution operations to provide vaccination against various dangerous and deadly diseases especially Hepatitis B.

b) Protects the employees from the various effects of this viral infection like Fibrosis of liver and liver cancer

c) Curtails the heavy cost of treatment to the victim who suffers from Hepatitis-B

7.9.6 Hygiene Card Examination

Hygiene card examination is mandatory for those employees who come under factories act 2015 and occupational safety and health Act GEPCO Employees should be performed Bi-annually and is mandatory.

a) Each worker should be provided with a hygiene card in which entries are required to be recorded twice a year i.e. Jan & July by doctor of HSE to ascertain that the worker is not suffering from any contagious or communicable disease.
b) If a worker is found to be suffering from any such disease, he shall not be allowed to work under section 25 sub section (1) Chapter III (Health& Safety) of Factories Act 2015 and section 15 sub section (1) (2) Chapter II (Provisions about safety and health) till he is treated and declared free from such disease from medical department
c) Act as an enabler in distribution and support service operations for early detection of communicable disease and refer them to the medical department and save others from being affected

7.9.7 First aid & CPR Training

Act as an enabler in distribution and support operations to train the employees to deal with minor accidents, injuries, cuts and wound by providing basic first aid to the victims on site and shifting them to health facilities

a) The purpose of first aid and CPR trainings is to create safety awareness in the workers and enable them to give timely assistance to victim of accident
b) The topics covered during first aid and CPR trainings are such that employees would be able to apply bandage, control bleeding, first aid on a victim of burn and electric shock, apply splints in cases of fractures to arms and legs and provide CPR in case of unconscious victim
c) Provide refreshers to the employees so that they are aligned with international standards adopted regarding first aid provision

7.9.8 First aid box and items replenishments

Act as an enabler in distribution and support operations to provide first aid box and items to deal with minor cuts, wounds, burns and small injuries incurred during work and minimize hospital stays

a) First aid boxes should be provided to all sub Divisions throughout GEPCO.
b) The first aid boxes in GEPCO distribution/Support services contains all required items (including first aid box itself) which are meant to provide first aid to the employees who come across any sort of injury like scratches, abrasions, cuts, burns, fractures or foreign body to the eyes
c) It is also helpful to control bleeding and provide oral rehydration solution in case of dehydration
d) Make user department accountable for proper maintenance of first aid box and usage of items, their record keeping through provided instructions

7.9.9 Hygiene inspection of workplaces including canteens

a) Act as an enabler to create awareness and improve hygiene standards across Electricity Distribution and Support services premises by implementing health and hygiene standards under Factories Act-2015 Chapter-III (Health and Safety) Sections 15-24.
b) Performing the hygiene inspections of work places including canteens regularly and maintaining a hygienic work environment free from hazards
c) Improving the working capability of our employees at one hand, protecting them from different diseases.

7.9.10 General Instructions for Provision of First Aid

By administering immediate care during an emergency, you can help an ill or injured person before Medical/Ambulance services arrive. You may be able to help save a life, however, even after training, remembering the right first aid steps – and administering them correctly can be difficult. In order to help you deliver the right care at the right time follows these basic First aid steps any time any where

A) Pause and looks at the scene for the following things.

- Is the scene safe to enter?
-What happened?
- How many people are involved?
- What is my initial impression about the nature of the person's illness or injury? Does the person having any life-threatening conditions, such as severe, life-threatening bleeding?
- Is anyone else available to help?

b) If the person is conscious take the following steps.

-Obtain consent: Tell the person your name and what you plans to do and asks permission to provide care.
- Tell a bystander to get the first aid kit: Point to a bystander and speak out loud.
- Use appropriate PPE: Put on gloves, if available.
- Inquire the person using sample questions to gather more information about signs and symptoms, allergies, medications, pertinent medical history, last food or drink and events leading up to the incident
- Check head and neck, shoulders, chest and abdomen, hips, legs and feet, arms and hands for signs of injury.
- Provide care consistent with knowledge and training according to the conditions you find.

c) If the person is Unconscious take the following steps,

-Shout to get the person's attention, using the person's name if it is known. If there is no response, tap the person's shoulder (if the person is an adult or child or the bottom of the person's foot if the person is an infant) and shout again, while checking for normal breathing. Check for responsiveness and breathing for no more than 5-10 seconds

If the person is breathing:

- Call the local Emergency Number
- Proceed with gathering information from bystanders
- Conduct a head-to-toe check.
- Roll the person onto his or her side into a recovery position if there are no obvious signs of injury.

If the person is not breathing:

-Call the local Emergency Number
- Ensure that the person is face-up on a firm, flat surface such as the floor or ground.
- Begin CPR (starting with compressions)
- Continue administering CPR until the person exhibits signs of life, such as breathing, an AED becomes available,

7.9.11 Hemorrhage:

-Hemorrhage is defined as large amount of bleeding in a short time. It is classified as may be external or internal

7.9.11.1 External Hemorrhage:

Refers to large amount of blood coming from an open wound.

First aid steps include:

- Put pressure directly on an outer wound with a sterile bandage, clean cloth, or even a piece of clothing.

- If nothing else is available, use your hand

- Maintain pressure until the bleeding stops.

- Elevation of the injured bleeding part is always useful

7.9.11.2Internal Hemorrhage

It is a loss of blood that occurs from the vascular system into a body cavity or space.

First aid steps include:

-If the bleeding is from the lungs, the blood will be bright red and frothy, and will be coughing up. If the bleeding is from the stomach, the blood will look like coffee ground and is vomited.

-Call Ambulance once, keep the victim lying on his back as flat as possible. Turn the head to one side for both vomiting and coughing. Keep the victim perfectly quite. Move the victim only when absolutely necessary and then keep the victim in a lying position. Keep the victim warm and reassured.

7.9.12 NOSE BLEEDING:

-Have the victim lean slightly forward

-Ask the person to use thumb and forefinger to pinch the nose firmly but gently and apply pressure on the upper lip just below the nose

-While they are pinching, apply a cold compress to the nose and surrounding area.

-After 10 minutes, slowly release the nose pinch, if bleeding reappears. Repeat the steps

-Seek medical attention if bleeding continues for more than 15 minutes



7.9.13 PHYSICAL/ELECTRIC SHOCK:

- Look first. Don't touch. The person may still be in contact with the electrical source. Touching the person may pass the current through the first aider.

- Turn off the source of electricity if possible. If not, move the source away from you and the affected person, using a non-conducting object made of cardboard, plastic or wood.
- Check for signs of circulation (breathing, coughing or movement). If absent, begin cardiopulmonary resuscitation (CPR) immediately.
- Prevent shock, lay the person down and if possible, position the head slightly lower than the trunk, with the legs elevated.

7.9.14 SUN STROKE, HEAT STROKE/HEAT EXHAUTION:

- Sun stroke and heat stroke have the common symptoms but the cause may be slightly different. Sun stroke results from excessive direct exposure to the sun rays, while exhaustion is caused either by direct exposure to sun rays or indoor heat.
- Symptoms and treatment are entirely different for sun stroke or heat stroke and heat exhaustion as indicated below :-

SUN STROKE OR HEAT STROKE	HEAT EXHAUSTION
Cause : Exposure to Heat, particularly sun rays	**Cause** : Exposure to Heat either sun rays or indoor
Symptoms Red face, hot and dry skin: no sweating, strong rapid pulse, very high temperature, headache usually unconscious	**Symptoms** Pale face: cool moist skin, profuse sweating, weak pulse, temperature near normal, often faint

Treatment Call a doctor, lay down the victim with head elevated, cool body with bath or cold application, do not give stimulants	**Treatment** Keep victims head low, give salt solution, 1 teaspoon full per glass of water then medical care if required.

7.9.15 FAINTING:

- Lay the victim on their back
- Ensure they are getting plenty of fresh air
- Apply cold compress to the forehead also elevate the legs of the victims
- Most victims will regain consciousness almost immediately. If not seek doctors' advice



7.9.16 BROKEN BONES

i. Control the bleeding by keeping sterile cloth/ cotton pad with a firm pressure
ii. Don't try to move a person, only do if necessary to avoid further injury
iii. Apply ice packs to limit the swelling, wrap the fractured part with a towel and apply ice packs on to it, never apply ice packs directly to the fractured part.
iv. A splint helps to immobilize the bone before professional medical attention can take over
v. A sling can help to stabilize the arm that is broken
vi. After the initial First aid, move the person to a hospital facility for complete treatment.

7.9.17 TRANSPORTATION/ SHIFTING OF VICTIM:

- Do not hurry into moving an injured person always be careful in handling and transportation of the injured. Improper methods frequently increase the severity of injury and may even cause death. Acquaint yourself with the various safe carrier and careful and efficient methods of transporting injured victim
- For stretcher cases, three people are necessary to place the victim properly on stretcher – one person to lift the head and shoulders, second to lift the hips, the third to lift the legs. Place the stretcher alongside the victim, helpers should kneel on one knee at side of victim away from the stretcher, and simultaneously lift first to their bended knees, then gently on stretcher.

7.9.18 Proper Lifting Method to Avoid Back Injuries

Follow These Steps Whenever Lifting Material.

1. **Protect yourself**

   Wear the proper gloves and supportive work shoes.

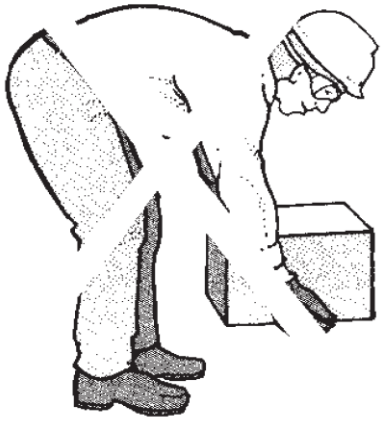
2. **Examine and evaluate the load**
   - Is the load too heavy or awkward for one person?
   - Is anything protruding from the load, such as nails, splinters, sharp edges, or rough strapping?
   - Is my path flat and clear of obstructions?

3. **Get ready to lift**
   - Establish solid footing.
   - Center your body weight over your feet.
   - Keep your back straight.
   - Don't slouch.

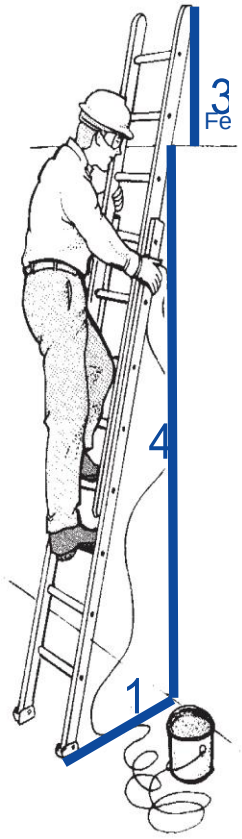
4. **Lift the object properly**
   - Get a good grasp on the object.
   - Pull the object close to your body.
   - Lift with your legs, not your back.
   - Move your feet when turning; never twist your back.



- Keep your back straight.
- Center your weight over your body.



- Pull the object close to your body.
- Lift with your legs, not your back.

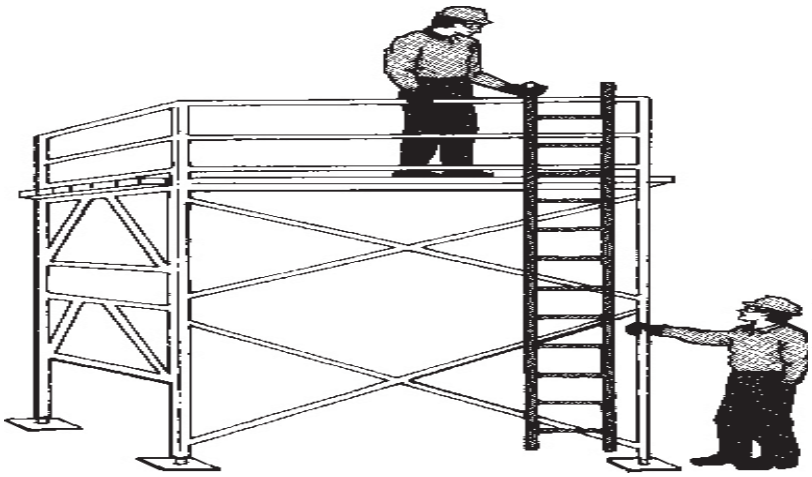


7.9.19 Proper Using of Ladder to Avoid Injuries

- Make sure the top of the ladder extends three feet above the ladder's support point when using an extension ladder to gain access to a higher level.
- Follow this rule: Only one person is ever permitted on a ladder at any time.
- Always face a ladder when working from it.
- Overlap extension ladders by at least three feet.
- Use both hands while climbing up and down a ladder.
- Place the foot of the ladder approximately¼ of its length away from the vertical plane of its top support.
- Use a hand line to raise and lower tools and materials.
- Make sure the ladder rests on a solid and stable base

Following protection must be used when using ladder

- Hardhats required
- Protect employees below
- Always inspect ladders for any defects before each use.
- Never use a ladder with broken or missing rungs or damaged side rails.
- Do not paint ladders except for periodic color coding for inspection, numbering, or identification purposes.



- Use ladders only according to the manufacturer's recommendations
- Keep the area around the top and bottom of the ladder completely clear of any materials

7.9.20 WOUNDS:

7.9.20.1MINOR WOUNDS

i. Clean the wound with soap and clean running tap water

ii. Apply continuous firm direct pressure to wound until bleeding stops

iii. Cover the wound with sterile Gauze and dressing of the wound to be done

7.9.20.2MAJOR WOUNDS

i. Immediately call for medical help.

ii. Apply continuous firm, direct pressure to wound until bleeding stops

iii. If the bleeding soaks through the bandage, do not remove the original bandage apply more pressure and bandages on it.

iv. Transfer the person to a nearby hospital facility for further treatment of the wounds.

v. Monitor and treat for shock if present.

7.9.21 SPLINTER OR FOREIGN SUBSTANCES IN THE BODY:

i. Remove the foreign body/splinter on the body as much possible

ii. If the splinter breaks off, sterilize the tweezers/ forceps to remove the foreign body

iii. Do not cut into the skin.

iv. After the foreign body has been removed, induce some bleeding by gentle pressure above the wound.

v. After the bleeding has stopped, apply a sterile compress

vi. If the foreign body is deeply buried, apply a sterile compress and take the victim to a doctor.



7.9.22 FIRST AID FOR ANIMAL BITES

7.9.22.1DANGERS OF ANIMAL BITES

i. Animal bites are dangerous because severe infection may follow the bite of any animal.

ii. Animal bites to the head and face are especially dangerous.

7.9.22.2GENERAL FIRST AID TREATMENT FOR ALL ANIMAL BITES

i. Wash the bite thoroughly to remove saliva.

ii. Rinse the bite with clean running water.

iii. Apply mild antiseptic.

1. Allow to dry.
2. Cover with sterile gauze compress.
3. Consult a doctor at once.

7.9.23 SNAKE BITE:

- Poisonous or Nonpoisonous, a snake bite should be given medical attention. A snake bite victim should be taken to a medical facility as quickly as possible, even in case when snake bite is only suspected.

- Get the victim to a hospital as quickly as possible. Meanwhile, take the following general first aid measures:

  - Keep the victim calm as possible, preferably lying down
  - Keep the victim from moving forward
  - If a medical facility can be reached within 4-5 hours and no symptom develop, this is all that is necessary

- If you are bitten by a poisonous snake or below stated symptoms develop, call your local emergency number immediately, especially if the area changes color and begins to swell or is painful. Many emergency rooms stock ant venom drugs, which may help you.

- If possible, take these steps while waiting for medical help:

  a) Remain calm and move beyond the snake's striking distance.
  b) Remove jewelry and tight clothing before you start to swell.
  c) Position yourself if possible, so that the bite is at or below the level of your heart.
  d) Clean the wound, but don't flush it with water. Cover it with a clean, dry dressing.

Caution

- Don't use a tourniquet or apply ice.
- Don't cut the wound or attempt to remove the venom.
- Don't drink caffeine or alcohol, which could speed your body's absorption of venom.
- Don't try to capture the snake. Try to remember its color and shape so that you can describe it, which will help in your treatment.

Symptoms

Most snakebite occurs on the extremities. If the bite is from a nonvenomous snake, typical symptoms are pain and scratches at the site.

Usually, after a bite from a poisonous snake, there is severe burning pain at the site within 15 to 30 minutes. This can progress to swelling and bruising at the wound and all the way up the arm or leg. Other symptoms include nausea and a general sense of weakness, as well as an odd taste in the mouth.

7.9.24 DOG BITE:

Even when it comes to a very small dog the truth is that all dogs could potentially bite at some point. We could be bitten by a dog in countless occasions and especially if working with animals where we are not familiar with their behavior.

HOW ARE DOGS PROVOKED

- It may bite when feeling cornered or threatened
- After a physical assault
- Following attempts to use training techniques which are unsuitable.
- It may redirect its aggression towards us in a moment when it is fighting with another dog (serious consequences of stress)
- Dominance and control of their 'possessions'
- Out of fear (if it has never dealt with people)

FIRST AID MEASURES IN CASE OF A DOG BITE

- Wash the wound with clean water
- Apply pressure if the bite area is actively bleeding
- Cover the wound with a sterile dressing or a clean pad of bandage
- Go to a nearest medical facility for further medical treatment and anti-Rabies vaccine

7.9.25 ELECTRICAL BURNS:

- Do not touch the person, until contact with the electrical source is eliminated
- Eliminate contact with the electrical source immediately: Turn the switch off or turn off the circuit breaker or using a non-conducting material, such as a wooden plank, firm cardboard, or a piece of plastic item (or even a piece of furniture, like a chair), as a conduit, push the person away from the electrical source

- If the electrical source is a high voltage line, avoid approaching the affected individual, only the electric power company can turn off high power lines; but, you may try to push the person away from the electrical source, using a non-conducting material (made of wood, plastic, or cardboard), if it is available
- If the individual has trouble (or stopped) breathing, perform cardiopulmonary resuscitation (CPR) immediately
- Prevent shock, by making the individual lay down with legs raised above their heart-level
- Cool minor external burns with running water (and NOT ice), or soak for 10 minutes, until the burnt area cools down. Then cover the affected area with a sterile gauze or cloth
- Monitor vital signs until medical help arrives
- Do not attempt to remove pieces of cloth or any other material stuck to the burnt wound, until medical help arrives
- If available cover the victim with warm blanket to keep them warm

7.9.26 EYE INJURIES

- Do not irrigate an injured eye except in the case of a chemical burn or a foreign object present
- Do not put medicines in the injured eye
- Do not remove blood or blood clots from the eye
- Do not try to force an eye lid open unless you have to wash out chemicals or foreign object
- Have the victim lie down and keep quiet
- Limit use of uninjured eye, it is usually best to patch it along with injured eye
- Give the victim nothing by mouth in case general anesthesia is required at the hospital
- Every victim with an eye injury must be evaluated by the physician.



7.9.27 SPRAINS / STRAINS

- Strains and sprains are common injuries which affect the soft tissues around joints – the muscles, tendons and ligaments.
- They happen when the tissues are stretched, twisted or torn by violent or sudden movements, for instance if someone changes direction suddenly, or falls and lands awkwardly.
- A sprain is when a ligament has been twisted or torn.
- A strain is when the muscle has been overstretched and has partially torn. (A rupture is when a muscle or tendon is completely torn).

CONTROL SWELLING WITH R.I.C.E THERAPY

RICE stands for:

- **Rest** the sprained or strained area. If necessary, use a sling for an arm injury or crutches for a leg or foot injury. Splint an injured finger or toe by taping it to an adjacent finger or toe
- **Ice** for 20 minutes every hour. Never put ice directly against the skin or it may damage the skin. Use a thin towel for protection.
- **Compress** by wrapping an elastic (Ace) bandage or sleeve lightly (not tightly) around



the joint or limb. Specialized braces such as for the ankle, can work better than an elastic bandage for removing the swelling.
- **Elevate** the area above heart level if possible.

7.9.28 BRUISE

- A bruise is caused by a blow, which breaks the small vessel in the tissue just under the skin
- Ice or cloths out of very cold water, if applied immediately will help to prevent discoloration, minimize the swelling and relieve pain.

7.9.29 FROST BITE:

Frostbite is an injury caused by freezing of the skin and underlying tissues. First aid in Frost bite

i. Move the victim to dry area if possible.

ii. Remove wet or tight clothing

iii. Don't rub affected areas

iv. Gently place affected areas in warm water.

v. Seek medical attention immediately

7.9.30 HEIMLICH MANUEVR:

The Heimlich maneuver was developed by Dr. Henry Heimlich, to help victims of food choking where medical assistance is not available

Important Do not to consider

i. Do not mistake food choking for a heart attack

ii. Do not try to give artificial respiration before blocked food is removed from windpipe

iii. Do not wait for an ambulance or doctor

iv. Do not offer water to a chocking victim

v. Do not slap adults or adolescent on the back. However a small child can be held upside down and slapped sharply between the shoulder blades to dislodge the food

Procedure of Heimlich maneuver

a) Victim Standing and Sitting

i. Stand behind the victim and wrap your arm around the victim's waist

ii. Allow victims head, arms and upper body to hang forward

iii. Grasp your fist with the other hand

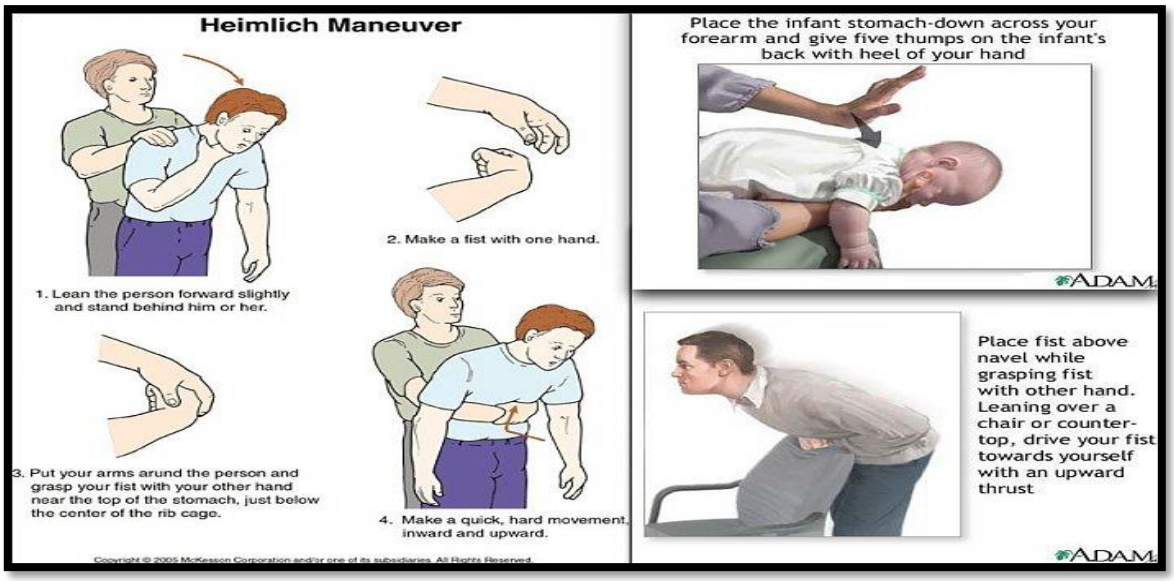
iv. Place fist against victim's abdomen below rib cage, slightly above navel

v. With quick upward thrust, press your fist forcefully into the victim's abdomen

vi. Repeat several times if necessary

b) Victim Alone

If you choke on food and are alone you should attempt to perform the Heimlich maneuver on



yourself by pressing your fist upward into the abdomen.

7.10 HSE SIGNS

i. GEPCO HSE Directorate shall develop, implement, install and maintain HSE Signs at all sites as required, for specific hazardous conditions, to warn employees, contractors, visitors and general public.

ii. The fixed "Danger Sign" shall be installed at places where an immediate hazard/ danger exist such as grids, substations, transformers, etc.

iii. The fixed "Caution Sign" shall be installed at places where it is required to warn against potential hazards or to caution against unsafe practices.

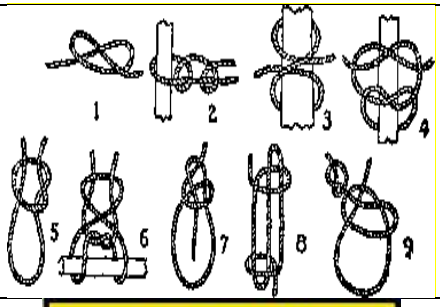
iv. Safety "Instructional Sign" shall be installed at places where permanent Safety requirement need to be installed such as HSE requirements or Personnel Protective Equipment required, etc.

v. Signs shall be placed as close to the area or equipment of coverage as possible and within buildings to assist personnel to escape. Signs shall be clear, easy to understand, consistent throughout the facility and placed for optimum visibility. Pictorial signs with consistent color codes are preferred. These "Signs" shall be understandable to employees/contractors/visitors and the sign words shall be in Urdu, English and/or in a language understood by locals and workers. The signs shall be readable at a minimum distance of 5 feet.

vi. "Caution Tag" shall be used for temporary purpose for an existing hazard to avoid an incident, such as Do Not Operate Tag, Danger Tag and Caution Tag shall be developed and made available at each site. The tag shall have a hole on the top to run a thread that shall be used to tie the tag with the equipment. The tag and the thread should be made of weather resistant material. The installation and removal of tags is restricted to authorized employees/ contractors and they shall only install or remove. All Tags shall be dated and signed in the designated places prior to installation. Special instructions covering operation of equipment is to be noted on "Caution Tag".

vii. HSE Signs should cover the following, such as:

Sr. No.	HSE Instruction	Signs
1	Dangerous Operation	
2	High Noise Restricted Areas	
3	Sign for Locations/ Places.	

4	Signs for smoking areas	
5	Signs for personal protective equipment and its location	
6	Signs for useful knots	
7	Signs for safe working load of lifting equipment and Rope	
9	Signs for safe working of cranes	

10	Road/ Traffic signs	
11	Signs for access/ egress/ Exit	
12	Signs for clearances from electrical equipment and hazardous material	
13	Signs for strengths and weight of material	
14	Signs for operation and maintenance Information	

15	Signs for fire or emergency equipment and its location	
16	Signs for Pedestrians	
17	Signs for conversion tables	
18	Signs for allowable factor of scaffolding safety	
19	Signs for Permit to Work (PTW) requirements	
20	Signs for employees/ contractors/ visitor's motivation	
21	Signs for Preventive Maintenance and Inspection schedules	
22	Others required as per equipment manufacturer or engineering	

	standards, etc.	
23	Signs for HSE instructions for employees/ Contractors/ Visitors	
24	Tension lines from house/building	
25	Signs for minimum horizontal and vertical clearance for overhead Low/High	

7.11 Health Management System

Health and Safety performance is part & parcel of any Company productive performance. It reduces overhead cost and keeps the employees moral high. GEPCO is strongly committed to develop, implement and maintain effective health and safety system. It remains an important key performance indicator (KPI) in Company's overall goals of Gujranwala Electric Power Company (GEPCO).

GEPCO is fully committed to provide safe and healthy working environment to all its employees in offices and residential colonies. In compliance to existing national laws, statutory and regulatory requirements, GEPCO will ensure the following control measures in work place:-

- Provision of clean healthy drinking water facility to all employees as per World Health Organization (WHO) standards.
- Testing of existing drinking facilities(s) will be carried out. In case if it found unfit to use then water filtration (RO) plants will be installed. Old/ obsolete/ rusted water pipelines will be replaced in existing all GEPCO office buildings and GEPCO colonies.
- Noise monitoring will be carried out in high noise areas like yard area of 132kV Grid Stations. If noise level exceeds permissible limits i.e. 85db (a) 8 hours of working as per National Environmental Quality Standards (NEQS) then appropriate engineering control measures to be designed and implemented. Provision of ear plug, ear muff to those employees working in high noise areas.
- Annual medical eye test, hearing test, Hepatitis, Diabetes screening of all employees will be carried out.
- Only those LM/ALM staff will be allowed to work in field/ operations that shall qualify medical fitness test and issued a Medical Fitness Certificate.
- Monitoring of blood pressure and blood cholesterol of employees aging above 45 to minimize risks of Stroke and Cardiac Arrest.

  Stress Management Program
- Good physical and mental health/ well beings of employees will certainly improve the work performance and also boost employee's moral. As part of stress management program 05 days of Compulsory Recreational Leave (bi-annually) will be granted twice in a year on rotation basis to all GEPCO serving employees.
- HSE Directorate in coordination with HR& ADMN GEPCO will plan and conduct annual extracurricular activities like Annual Safety Days, World Environment Day, Family and Fun Days etc.
- HSE Directorate GEPCO will conduct stress management workshops/ seminars and communicate health & safety techniques/methods to all employees through trainings and social media/ apps.

  Annual essential capacity building programs for both Officers and officials will be started at Regional training center Nandipur and GEPCO H/Q.

Training Modules on WAPDA Safety Policy, Behavior Based Safety, General Principals of Safety, PTW, Hazards Awareness Program, Stress Management, Biological Hazards like Coping with Cold & Heat Stress, First Aid, CPR, Disaster Management, Environment Awareness sessions, Climate Change, Coping with Covid-19 pandemic/ Typhoid/ Seasonal Flu as well as on SOP Environmental & Social Safeguard and Safety Code etc.)

Environment & Safeguard Officers GEPCO, WAPDA Doctors/ Para-medical staff will be engaged in RTC, CTCs to conduct specific trainings.

Two weeks compulsory/ mandatory Health, Safety and Environment (HSE) Orientation & Induction Program to be started for all newly inducted GEPCO employees (both Officers and Officials) in RTC and CTCs.

Plantations

- As part of PM Clean Energy Campaign, plantation of trees will be carried out in GEPCO territory/ region to provide safe and healthy working environment to all employees. It is now mandatory as part of Environmental Approval/NOC for provision of plantations at least 5000 No of trees for construction of each project facility like New 132kV Grid Station or Construction of New 132kV Transmission line whether inside premises of Grid Station or in GEPCO residential colonies.

House Keeping

- GEPCO to ensure safe disposal of leakage/ spillage of distribution transformers oil in M&T workshops as well as power transformers oil in yard areas, avoiding oil seepage/ leakage in natural ground water acquirers and land contamination. Self-containments/ pallets will be used to contain seepage/ leakage oil.
- Provision of Solid Waste Management in all field Op. offices, especially M&T offices, GEPCO colonies and H/Q office building. All functional heads/ head of departments shall maintain clean, tidy and healthy working environment in their respective offices and civic facilities.
- Cutting of overgrown herbs and shrubs will be carried out inside 132kV Grid Stations as well as colonies. Concerned GSO staff and XEN Civil works will keep the aesthetic values of grid station and residential colonies.

7.12 Fire Prevention Management System

GEPCO HSE fire prevention and management system shall involve fire safety planning, organization, practices, drills, training, awareness, investigation, building construction, safe operations, provision and testing of mitigating systems.

GEPCO HSE shall adopt a decentralized fire protection system, to timely and effectively prevent fires, reduce the impact of uncontrolled fires to save human lives and assets. In buildings, the location owners / occupants are responsible to maintain their facilities in compliance with GEPCO's own initiatives and regulatory requirements.

Fire safety and housekeeping awards (trophy with prize money) are conferred on best location owners in three categories of small, medium and high-density group of locations in recognition of their sustained fire safety and housekeeping performance throughout the year.

GEPCO LS staff will be trained on fire fighting and first aid. Fire Fighting and First Aid Teams will be constituted/ formed in all operational Sub Divisions(s)/ Division(s)/ Circle(s) and HQ. Firefighting and first aid nominated teams will be provided with red and yellow specific color jackets.
Following procedures have been formulated and communicated to all concerned to achieve desired fire prevention and housekeeping level and to manage fire or related emergencies at GEPCO facilities;

a) Fire Prevention & Management System
b) Fire Safety & Housekeeping Award Procedure
c) Emergency Response Procedure
d) Work in Confined Space Procedure
e) Fire Protection System Management, Installation, Maintenance, Inspection & Testing

7.12.1 Regulatory Requirements / Referenced Publications

a) NEPRA Power Safety Code
b) Building Code of Pakistan, Fire Safety Provisions-2016
c) Building By-laws of Cantonment Boards

d) The Civil Defense (Special Powers) Rules, 1951 (The Civil Defense measures for dealing with outbreak of fire order 1987)

7.12.2 Aims and Objectives

a) To advise management on fire prevention and firefighting measures for safety of employees and preservation of GEPCO assets

b) Make plans and proposals for Electricity Distribution fire safety organization, installations and equipment

c) Implement agreed proposals and ensure the function of GEPCO fire protection is properly organized with efficient procedures, adequate equipment and trained staff

7.12.3 GEPCO HSE Fire Team Functions

a) To monitor and provide all necessary assistance to Circles/Divisions/Sub-Divisions (field offices) in ensuring that their respective fire safety arrangements are functional and organized

b) To aid in procurement of appropriate firefighting equipment and sourcing out maintenance function for the respective GEPCO distribution facilities

c) To provide necessary fire safety training to general employees, fire wardens, fire team members and others including practical/demonstration on the usage of fire extinguishers

d) To assist in developing emergency response plan and conducting mock drills at GEPCO distribution locations to familiarize all concerned of their roles / responsibilities in case of fire and related emergencies

e) To identify and procure the appropriate fire extinguishers as and when required based on the nature of the operation and applicability

f) To arrange replenishment of fire extinguishers on defined frequency or on need basis

g) Communication, coordination and consultation with nominated fire wardens of respective departments for smooth achievement of goals and keeping them abreast with the related developments

h) To carry out biannual fire safety and housekeeping audit of all Electricity Distribution locations to identify the deficiencies and opportunity for improvements

i) To conduct fire safety inspection / surprise visit of identified locations

j) Proper and appropriate tagging and marking of firefighting equipment for better traceability of equipment

k) To conduct fire incident investigations, RCA and recommendations to avoid recurrence

l) Vetting of fire protection plans of new or existing buildings submitted by PID and Real Estate & Works Department

m) Provide technical support and advice to Works department for working out system requirements of FAS for new locations and expansion for addition to existing buildings; subsequent system acceptance, maintenance and technical advice or FPS or FPS vendor selection

n) To conduct pre-hiring HSE visit of buildings along with RE & Works team

o) To maintain data base for refilling, maintenance, procurement, drills, trainings, audits, competency, list of location owners and fire wardens etc.

7.12.4 GEPCO Field Offices Functions for Fire Prevention and Protection

7.12.4.1 Fire Safety Organization

A fire safety organization comprising of nominated location owner, emergency controller and fire wardens is to be developed at each location. In addition, designated fire teams shall also be formed at locations occupied by more than 250 occupants / category-I locations.

All nominated fire wardens of the respective operation center/department/workshop shall be given appropriate firefighting training including the use of associated equipment. However, immediate response to any untoward incident shall lie with the respective operation center, department/workshop, while necessary backup shall be provided by the city fire brigade of the locality.

7.12.4.2 Substation Fire Safety

Operation centers shall maintain a list of substations falling within their area of responsibility for emergency response, fire prevention and maintaining good housekeeping. They shall also maintain a list of the nearest fire station to each S/S and phone numbers of the same shall be displayed at important locations. Emergency phone numbers of both area fire brigade and respective GEPCO center shall also be displayed outside the substations. Updating and knowledge about the same shall be the responsibility of respective centers. Likewise, communication with other departments shall be maintained.

All departments shall follow the same process to prevent any untoward fire accident in their area of responsibility.

7.12.4.3 Replenishment & Training

All Circles shall maintain firefighting equipment placed at their locations by the HSE Fire Team. Replenishment of equipment and training to personnel shall be carried out by HSE.

However, formation of team members and requirement of training shall be forwarded by Circle concerned.

HSE shall ensure that trainings to all nominated fire wardens are undertaken in a phased manner and all fire extinguishers are replenished at necessary intervals.

7.12.5 GEPCO Management Required Actions for Fire Safety

a) To nominate appropriate fire wardens for their respective centers / departments for effective performance and communicate names to the HSE fire team

b) To maintain log book with identification number for periodic internal inspections and traceability of firefighting equipment in their respective area of authority

c) To coordinate with HSE fire team for replenishment of fire extinguishers on need basis

d) To conduct regular internal assessment / audits for identification and removal of fire hazards

e) The location owners shall conduct monthly self-fire safety & housekeeping inspection of their respective location and share the checklist with HSE fire section through portal before 5th of subsequent month

f) To highlight any deficiency in firefighting equipment for continual improvement

g) To ensure all fire equipment are in good operable condition and free of any obstacles

h) To ensure that means of escape are accessible and free from obstructions

i) Monthly duty roster of fire team where developed, shall be maintained and posted on notice boards for communication to all

j) To ensure that emergency response plan of the location prepared and communicated to all concerned

k) To ensure that biannual fire evacuation drills are regularly conducted and record maintained

l) To ensure timely response to the fire incident site

m) Close liaison with the nearest public or private fire department for quick and timely action to prevent the fire incidents or to minimize the loss as low as reasonably practicable (ALARP)

n) To arrange regular servicing and maintenance of fire alarm systems through facility maintenance department / people connect to ensure their serviceability (Detailed

instructions for maintenance of fire alarm system provided in the procedure fire protection system management, installation, maintenance, inspection &testing

o) After working hours / holidays, duty personnel shall be informed of contacts to be approached in case of any eventuality

p) Provision of "Material Safety Data Sheets" (MSDS) both in English and Urdu of all chemicals list including SF6 gas, other gases, Persistent Organic Pollutants (PoPs). Safe handling, use of PPE's and storage of chemicals. Leakage/ spillage control instructions of Power Transformers in yard areas, distribution transformers in M&T workshops.

7.12.6 Real Estate& Works

a) To ensure that all necessary passive and active fire protection measures are incorporated in new construction or alteration, modification, and renovation of existing buildings in compliance with regulatory requirements

b) Responsible for selection, installation and maintenance of new systems (with HSE input) up to warranty period and preserving central data base of fire protection and fire alarm systems

7.12.7 Facility Maintenance Department (FMD)

a) To initiate maintenance contract for preventive and corrective maintenance of fire protection and fire alarm systems installed at Electricity Distribution locations

b) Update regular MIS of FAS maintenance status and other related matters for visibility of all stakeholders

7.13 Permit to Work

a) GEPCO shall apply Permit to Work System and the work shall be carried out only when there is a valid permit to work issued for corrective and preventive maintenance activities, etc.

b) The Permit to Work System shall be applied when;

i. The hazards associated with the activities can result in immediate danger to life or health (i.e., lost time injury, disability or death) of personnel involved in work and/or other personnel in or around the facility.

ii. Damage to company assets or property i.e., physical damage, fire/explosion damage, loss.

iii. Significant impact on the environment by way of toxic release, or pollution, etc.

iv. Permit to Work shall be applied for all critical activities such as but not limited to; welding, cutting, grinding, maintenance and repair electrical

apparatus, de-energized/ energized activities, hydro-jetting, lifting, work at elevated areas, confined space entry, excavation and any other activity as defined by GEPCO.

v. Permit to Work shall be issued and received only by trained and authorized Permit to Work Issuer & Receiver. GEPCO shall establish specific training requirements for these functions as well as maintain a list of staff that is authorized to act as a permit to work issuer or receiver.

vi. Permit to Work shall cover all hazards, PPE/T&P requirements, Exact Work Location, Apparatus/equipment number, Job/Work Order Number, Work Description, Joint site inspection by Issuer & Receiver, Isolation/Lockout/Tagout application, Barricade at job site, job briefing with all involved person including discussion of any job-related hazards. A Permit to work is only valid for the time and date as specified on the permit.

vii. All internal and external affected parties shall be informed in writing or get counter signature on permit to work for necessary precautions before issuing permit to work.

viii. Permit to Work Receiver shall obtain a copy of the Permit to Work and shall keep it at the work site.

ix. Permit to Work Receiver shall remain at work site continuously when the job activities are in progress to adequately supervise the work till completion of the work, however, if Receiver must leave the job site for any reason, for example to obtain additional tools or equipment, tea/ lunch/ washroom break, etc., then an another Receiver that is certified and authorized can be delegated to carry out the responsibilities of the Receiver during the remaining part of the job or the job shall be stopped till break time and all workers shall be out of designated job site/barricaded area. The delegated Receiver shall write his badge number and sign the Permit to Work.

x. When job is complete, housekeeping shall be conducted, all tools, waste shall be removed and staff members withdrawn before removal of temporary earth connections, removal of Isolation and LOTO.

xi. Energizing and operation shall be carried out after verification by Issuer & Receiver at the time of Permit to Work closure.

7.14 Tools, Portable Power Tools and Heavy Equipment

7.14.1 All heavy equipment, machinery, power driven tools and other hand-held portable equipment shall be periodically inspected and frequency shall be clearly defined as per manufacturer's recommendation. An inspection tag shall be pasted on each heavy equipment, machinery, power driven tools and other hand-held portable equipment. Instrument/ equipment which is regularly calibrated and a calibration certificate is available, shall be considered as inspected.

7.14.2 All equipment inspection tags for validity shall be checked at main gate prior to entering the facility. No equipment shall be permitted for use without inspection tag within the facility.

7.14.3 Employee/ Contractor who use tools must be properly trained and authorized to use, adjust, store and maintain tools properly. Electrical hand tools shall be properly grounded or be of the double insulated type. All tools shall be free from defects and maintained in good condition.

7.14.4 The number of accidents involving the use of tools can be reduced by following basic safety principles:

i. Keep all tools in good condition with regular maintenance.

ii. Calibration of testing equipment shall be arranged on time as per manufacturer's manual.

iii. Use the right tool for the job.

iv. Inspect each tool for damage before use.

v. Operate according to the manufacturer's instructions.

vi. Provide and use the proper Personal protective equipment (PPE).

vii. Safety guards and face shield shall be used while operating power-driven rotating tools.

7.14.5 Examples of Non-Powered Hand Tools; Hand tool is any tool that is powered by hand, rather than a motor. Categories of hand tools include wrenches, pliers, cutters, striking tools, struck or hammered tools, screwdrivers, vises, clamps, snips, saws, drills and knives. Portable power tools are not hand tools.

7.14.6 Pliers, wrenches, etc., whether insulated or not, shall not be used without rubber gloves while working near live parts.

7.14.7 A Power-driven tool is a tool powered by an electric, hydraulic, or pneumatic power or by an internal combustion engine such as grinder/ grinding machine, disc cutter, electric drilling machine, welding machine, hydro-jetting machine, bench grinding machine, air compressor, cutting machine, blowers, sand/grid blasting machine, jack hammer, hydraulic jacks, and battery-operated drill machine, etc.

7.14.8 Examples of heavy equipment are; heavy lifting, elevating, and mobile equipment, bulldozers, skid mounted support equipment, excavators, cranes (all types), tractor-scrapers, riggers, graders, below the hook lifting devices, wheel loaders, wheel dozer (soil compactor), forklift, backhoes, personnel platforms/ man-baskets/ man lift/ bucket mounted vehicles, elevating equipment, aerial platforms, side boom tractors, overhead hoists, etc. including insulated aerial bucket, that successfully passed dielectric testing of the insulated portion of the boom and bucked.

7.14.9 All Heavy Equipment drivers/ operators shall possess a government license, valid for the type and size of the Heavy Equipment being operated.

7.14.10 When mobile plant or heavy equipment is working near a live/ energized power line, following minimum distance shall be maintained:

Line Voltage	Minimum Safe Distance
Up to 50 Kilovolts (KV)	3 Meter (10 Feet)
50 to 250 Kilovolts (KV)	6.1 Meter (20 Feet)
Over 250 Kilovolts (KV)	7.6 Meter (25 Feet)

Note: Distances listed are for standard conditions, extra care must be taken, if standard conditions do not exist.

7.14.11 Use non-conductive insulated measuring stick to verify clearance distances.

7.15 Operation and Maintenance

7.15.1 All critical high risk activities including boiler/ turbine operations, turnaround/ start-up, access to high voltage system and high voltage switching operations, high voltage capacitor discharge, working in grid, substation, feeder, panels, transformer, overhead lines, regulator, single or multiple circuit, dead apparatus/lines, working at height,

solvents cleaning, handling of toxic or hazardous materials, fiberglass thermal insulation, explosives, radioactive material, pressure vessels, underground man-holes shall be performed safely in compliance to GEPCO Operation/ Maintenance Procedure, SOP, or Manufacturer's manual.

7.15.2 GEPCO shall implement all necessary precautions to avoid any leakage of electrical current or hazardous energy from its system/ infrastructure to harm human life.

7.15.3 Bonding and grounding conductors shall be provided where needed to dissipate static charge accumulations.

7.15.4 Operation and maintenance activities shall be carried out by experienced, trained and authorized employees/ contractors. Alternatively, workers can work under the direct supervision of experienced, trained and authorized employees/ contractors, to gain the necessary training and experience.

7.15.5 GEPCO shall ensure effective coverage of critical high-risk activities under close and direct supervision to reduce incidents/ near misses. Chance of incident is higher during shutdown and start-up of plant/ equipment during maintenance due to short cuts by employee/ contractor to finish jobs.

7.15.6 Voltages testing including Hi-pot tests (AC/DC), power frequency, impulse voltage withstand tests and high current tests shall be performed safely in compliance to GEPCO Operation/ Maintenance Procedure, SOP, or Manufacturer's manual.

7.15.7 Protections/ controls/ interlocks shall be intact and shall not be by-passed or modified without approved Management of Change (MOC).

7.15.8 Isolation shall be done for maintenance activities, whenever required.

7.15.9 Switching operations for isolation of the transmission network shall be well coordinated with relevant control center.

7.15.10 Safe working of remotely and automatically controlled equipment shall be established.

7.15.11 Combustible and flammable materials shall be removed from the area.

7.15.12 Gas Testing shall be conducted as per Task Risk Assessment/ JSA/ Permit to Work at same elevation and above/ below elevation to test oxygen deficiency and/or for flammable or toxic gases and vapors.

7.15.13 Gas cylinders shall be secured in an upright position with proper labels and a safety cap shall be installed when not in use.

7.15.14 Use cylinder trolleys, material baskets, cylinder racks, and other proper types of equipment to transport cylinders.

7.15.15 Use approved pressure-reducing regulators with a check valve connected to the cylinder valve on all cylinders.

7.15.16 Always close the cylinder valve before attempting to stop leaks.

7.15.17 Inspect cylinders for safe condition before use. Inspect all gauges, valves, regulators, hoses, and cylinders for damage and valid hydro test date.

7.15.18 Protect cylinders from direct flame, sunlight, and other heat sources.

7.15.19 Place flashback arrestors at O_2, acetylene/other fuel type cylinder regulators.

7.15.20 Properly identify and label empty and full cylinders.

7.15.21 All power-driven tools, equipment and heavy equipment shall be inspected before use.

7.15.22 Every part of electric generators, turbines, motor or rotary converter, fly wheels or transmission machinery shall be securely guarded and fenced unless they are safe by position or construction.

7.15.23 Crane operation activity should be supervised by experienced, trained and authorized Crane Rigger against approved Permit to Work.

7.15.24 Crane lifts shall not be allowed at wind speeds above 32 km/h (20 mph-17.4/ knots- 9 meters/second).

7.15.25 Crane Lift Plan should be prepared by experienced, trained and authorized Crane Rigger.

7.15.26 Any crane, working near energized power-lines, a designated signal-man shall ensure the following minimum distances are maintained:

Line Voltage	Minimum Safe Distance
Up to 50 Kilovolts (KV)	3 Meter (10 Feet)
50 to 250 Kilovolts (KV)	6.1 Meter (20 Feet)
Over 250 Kilovolts (KV)	7.6 Meter (25 Feet)

Note: Distances listed are for standard conditions, extra care must be taken, if standard conditions do not exist.

7.15.27 Use non-conductive insulated measuring stick to verify clearance distances.

7.15.28 All lifting equipment shall have a certified safe working load (SWL) and be inspected prior to the lift. The SWL shall not be exceeded during the lifting operations and equipment that is damaged shall not be used.

7.15.29 Crane operator shall possess a government license, valid for the type and size of the crane being operated and shall be certified and trained for the equipment he/she operate.

7.15.30 Crane Rigger shall ensure that no one shall be under a suspended load.

7.15.31 All electrical equipment and portable lighting including flashlights shall be inspected.

7.15.32 Use proper wiring within conduit along with Ground-Fault Circuit Interrupters (GFCIs) in wet areas to prevent shocks at construction sites or while using portable electrical tools, etc.

7.15.33 The confined space shall be provided with illumination of not less than 50 lux. The contractor can increase numbers of lights to get enough lux level. Where flammable or potentially explosive atmospheres are likely, extra low voltage lighting (typically less than 25 Volt) shall be used.

7.15.34 Visitor access should be controlled.

7.15.35 Day and Night shifts representatives shall ensure proper hand over, information of all on-going critical activities/ issues in writing and verbally to avoid any confusion.

7.15.36 Permit to Work system shall be followed for all activities.

7.15.37 Barricading and warning signs shall be provided, when required.

7.15.38 Fire protection system shall be provided, inspected and maintained.

7.15.39 Full Body Harness with front work positioning belt along with double lanyard for 100% tie shall be used at height more than 6 feet/1.8 meter above the ground when climbing poles, towers and structures including working through mobile elevated aerial platform, man-baskets, man-lift or bucket mounted vehicles. Full Body Harness with front work positioning belt is to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free. Use of a body belt alone for fall arrest is prohibited. Full Body Harness with PVC coated hardware should be used when working in explosive or electrically conductive environment. Anchor the safety harness lanyard on rigged anchorage point at height, having fall clearance safety factor three (03) feet from impact level or ground level.

7.15.40 Use self-retractable lifelines (SRL) when working in elevated areas such as roof top.

7.15.41 PPE shall be in good condition. PPE should be inspected before use. Remove and dispose defective PPE from the job site.

7.15.42 Employee/ contractor should be familiar with the nearest manual call point (MCP), safety shower, fire extinguisher, nearest safe escape route and assembly point.

7.15.43 Employee/Contractor shall be familiar/ trained in incident reporting.

7.15.44 Housekeeping shall be conducted regularly.

7.15.45 HSE observations, unsafe conditions/ acts and violations shall be corrected immediately at site and necessary action shall be implemented for preventive action to avoid reoccurrence.

8.1.1 Work in confined Spaces (Under Ground Chambers) and Operational premises

Provision of monitoring of atmospheric oxygen level checking it through instrument to safeguard employees while working in confined spaces, trenches.

8.1.2 Working with Vassals that contain oil or flammable liquid.

There is variety of material weather liquid or gases commonly used in GSO systems which pose toxic and explosive properties. Such material should be handled carefully to avoid damages to works and public property. These materials may consist of:

- Cleaning solvents.
- DC Batteries Electrolytes (Acids and alkalis).
- Adhesive Compound
- Gases-Acetylene, SF6, Hydrogen, Nitrogen, Oxygen etc.
- Insulating oil – Mineral or synthetic oil

The general safety guidelines for handling such materials are:

1) For general cleaning purposes, the only approved solvent shall be used.
2) The use of Carbon Tetra Chloride (CTC) and Benzene for cleaning purposes is strictly prohibited.
3) Smoking, open flames, welding or any source of potential ignition shall not be permitted enclosed vicinity to the storage area of explosive gases and liquid.
4) Adequate ventilation must be provided to avoid inhalation of toxic vapors and fumes.
5) Suitable Eye protection, Gloves clothing must be used to avoid contact with acid and other Poisonous materials.
6) Containers and bottles having dangerous gases and liquid shall be clearly marked and labeled.
7) Liquid, Solid and Gases having POPs (Persistent Organic Pollutants) shall be handled and disposed in accordance with the special rules and regulations.
8) Fire Fighting Equipment shall be intact.

8.1.3 Access to and work in fire protected area

For access to and work in fire protected area, qualified and trained workers shall be allowed to work. All safety precautions already described in section 2.3 & 3.14 shall be applicable. Automatic CO2 or other chemical fire extinguishers shall be made inoperative and the equipment put on manual control before access to or execution of work in any enclosure.

A caution notice to this effect shall be attached and recorded in P.T.W. The automatic control shall be restored after withdrawal of workers from the protected enclosure.

8.1.4 Climbing of poles, towers and structures.

1) Plan each climbing carefully.
2) Before climbing poles, ladders, scaffolds, towers or structures they shall be inspected to be sure they are safe to climb. When there is doubt, they shall not be climbed until made safe by guying or bracing.
3) Approved body belts, with safety straps or lanyards, shall be worn by employees working on poles, towers or other structures, or in aerial devices.
4) Wire hook shall not be attached to body belts or safety straps.
5) Body belts, safety straps and lanyards and other personal protective equipment shall be inspected carefully before use to determine that they are in safe working condition.
6) All ladders shall have a suitable piece of light rope at the top end to tie them to the pole or structure by means of this rope.
7) Use a ladder whenever possible instead of climbing structures.
8) Ladders shall not be set up on any moveable object, which may be started while an employee is working from them, unless satisfactory precautions have been taken.
9) Ladders shall not be set up in a pathway or roadway exposed to traffic, unless an employee is stationed at the foot of the ladder to warn the traffic.
10) Unmanned support alone shall not be relied upon.
11) Before removing or adding wires, cables or guys to poles, towers or other structures , additional guying or bracing shall be used, where necessary, to take the additional strain.
12) Wooden cross-arm/braces or other pole attachments shall not be relied upon to support a worker's weight.
13) Workers shall not stay on poles/structures that are being plumbed, straightened.
14) All light weight plant and tools, to be used aloft, shall be raised and lowered by means of hand-line and canvas bucket, or other suitable container.
15) Tools and plants shall neither be thrown from the ground to the workers working aloft, nor shall workers throw tools and material down to the ground.
16) Taglines and hand-lines, used near energized lines and equipment, shall be of non-conductive material.
17) Taglines shall be used to control loads being hoisted, where it is necessary to prevent hazards to workers or damage to equipment or material.
18) Hand axes shall not be used on overhead work.
19) All power tools used in work aloft shall be equipped with approved switches or other control devices.
20) Tower, structure members or sections shall be adequately supported, and guyed.
21) Conductors being installed or removed shall be kept under positive control, to prevent accidental contact with energized lines or equipment.

22) Conductor, reels and load bearing hardware shall be of adequate strength or capacity, and shall be periodically inspected for defects.

23) In handling wires on a pole with other energized conductors , shall be raised or lowered with a dry hand-line and extreme care exercised to prevent them from coming in contact with live lines and equipment.

24) All wires, after being placed on cross-arms shall be considered energized at full voltage, unless they are positively known to be dead.

25) Workers shall not lean on or pass through unprotected wires, and shall protect themselves against the possibility of falling into energized conductors.

26) Employees working aloft shall avoid positioning themselves on the supporting cross-arm or directly under a conductor or pulling line, while it is in motion during stringing or removing operations.

27) When workers are engaged in work over or near water and when danger of drowning exists, suitable protection shall be provided.

28) When working along streets or highways, workers shall exercise care to keep hand-lines from blowing into the line of traffic.

29) When stringing wires across streets and highways, avoid interference with vehicular traffic or pedestrians. When necessary, signal workers shall be provided.

30) When working at night, portable lights for emergency lighting shall be provided.

8.1.5 Access to high voltage apparatus and conductors.

1) While accessing to energized high voltage apparatus and conductors, the safe limits of approach shall be considered (Refer to Data Section).

2) All circuits and equipment shall be considered energized at full voltage, until de-energized and earthed. Caution notices, duly filled in, shall be placed on all switch-gear and control panels controlling the electrical circuits, tie points, and apparatus, upon which men are about to work. These notices shall be placed by the person in-charge of the circuits or apparatus. The presence of person in-charge of working parties shall be essential, when the notices are completed and signed. To prevent their being torn or dropping off the apparatus or lines guarded, caution notices shall always be placed in the wooden holders.

8.1.6 High voltage switching operations.

1) No high voltage switching operation shall be performed without instructions of the chief operating office - NPCC/ RCC.

2) All operating orders and messages shall be exchanged in accordance with approved procedures of NPCC/RCC.

3) All switching operations shall be reported to the control engineer/shift engineer.

4) Energizing or de-energizing the circuits/equipment through signals/code messages or pre-arranged understanding of certain time intervals is not allowed.

8.1.7 Use of voltage/potential testing devices.

1) Only voltage testing devices approved by GEPCO and in proper working order shall be used when testing electrical circuits.
2) Potential testers shall not be used beyond the voltage limits for which they are designed and used only in accordance with the approved procedure.

8.1.8 Procedure to follow when excavating near live cables.

1) The proposed excavation area shall be clearly marked.
2) All trenches and excavation in which employees are exposed to danger from moving material or more than 1.5 meters deep shall be guarded by a shoring system, proper sloping or other equivalent means.
3) Site conditions such as surface water drainage and vibration from traffic or machinery shall be considered in planning the excavation.
4) Trenches and excavations, in which employees are working, shall be inspected daily.
5) Excavated and other material shall be kept at least 0.75 meter from the edge of any trench or excavation in which employees are required to enter.
6) When employees are required to enter in a trench or excavation 1.5 meters deep or more, approved ladders of proper length shall be used.
7) Heavy machinery or material should not be placed near the edge of excavations unless necessary precautions are taken to prevent a cave in.
8) Before and during an excavation, every effort shall be made to discover the position and prevent unwanted damage to underground installations, such as pipe lines, storage tanks and cables etc. Proper measures shall be taken to protect employees from hazards, resulting from exposed installations.
9) Help from the local utility be sought to identify if there is any underground line in or near the area of proposed excavation.

8.1.9 Use of mobile cranes and machinery in the grid stations or near overhead lines.

1) For using a mobile plant or moving a loaded or unloaded crane in close proximity to the live equipment in the grid station or near overhead electric lines, the boom or load shall be lowered sufficiently to provide safe clearances as given below:

Below 50 KV	1.25 meters
50 KV-230 KV	3 meters
Above 230 KV	5 meters

2) Chain hoists, derricks, cranes and other hoisting equipment shall be inspected at regular intervals.
3) Any hoisting equipment found defective shall be immediately tagged as unsafe and not used until repaired.
4) Before the load is lifted, a strain should be taken on the cable and the hitch and slings rechecked.
5) When there is a danger of the load being suddenly released, the hooks shall be snubbed with wire or shackles.
6) Before operating crane, derrick or other hoisting equipment, the operator shall sound warning and accept only one person's signal to start raising, lowering or swinging load. However, the operator shall stop immediately upon signal from anyone.
7) When making heavy lifts, outriggers shall be used to prevent overturning. The outrigger shall rest on a secure and firm surface.
8) Extreme caution shall be taken when working near cables or ropes under tension. The workers should never place themselves within the angle formed by ropes or cables, under tension.
9) Employees shall familiarize themselves with the proper knots, ties and hitches, safe working loads for ropes, cables, slings and fittings and proper methods of hooking and slinging required in the work.
10) Special care shall be exercised to see that cables, chains, and other hoisting equipment are not unduly stressed by improper use.
11) Chains shall not be spliced or joined by makeshift means such as open links, bolts, or wire. New links shall be inserted by some competent person.
12) Wire ropes or cables should not be allowed to kink as it weakens them.
13) The rating of hooks, rings, clevises and other fittings used on chains or cables shall exceed the carrying capacity of the chain or cable.

8.2 Safety Precautions for work on or near high voltage system.

8.2.1 General safety principles.

No work shall be done on any electrical power apparatus, mobile or stationary equipment, or mechanical equipment or systems, which may possess electrical potential or dynamic energy unless safe conditions are ensured such as:

Elimination of the hazards

- The apparatus or equipment is isolated and de-energized in accordance with the Work Protection Code.
- The apparatus is physically removed from the immediate vicinity of any source of electrical potential or dynamic energy with no ready means of connection.

Protection against the hazards

- Protection is provided by the use of approved work practices and approved personal protective equipment.

- Safe limits of approach shall be followed (Refer to Data Section).

8.2.2 Methods of isolation, discharging and earthing high voltage equipment and transmission lines.

1) Isolation.

- When taking lines or equipment out of service, it shall first be de-energized by an appropriate switching device, such as disconnect switch/isolator, circuit breaker, fuse or re-closer. For work on equipment, disconnect switches, on both sides of the equipment, shall be opened. For work on lines, the line shall be disconnected from the system by a visible isolation, from all possible sources of supply.
- When removing or inserting draw-out type switchgear, it must be ensured that the contacts are in open position and that the fuses in the control circuits have been removed.
- Disconnect switches, which have been opened, shall be checked visually to ensure that their blades are fully open and their operating mechanism is locked.

2) Discharging and Earthing.

- Maintenance work on electrical equipment at grid stations and transmission lines must be performed when it is isolated and earthed. Earthing is accomplished by installing Portable Temporary Grounds (PTG) on both sides of the equipment to work on.
- A properly installed PTG provides the following protections, both to the worker as well as to the equipment.
    - Positive proof of isolation.
    - Drained off induced potential.
    - Guard against the danger of accidental energization.
    - Surety that non-current carrying metal parts of equipment and structure are at earth potential.
- Once the PTGs are installed properly, a low resistance ground path is provided around the worker.
- When applying PTGs, first connect to ground and then to line while for removing PTGs, first remove from line and them from the ground. Insulated stick/rod shall be used for applying and removing the PTGs.
- When lines or equipment that may get energized from any source rated 230/400 volts or more, have been removed from service to perform work on them, all phases shall be earthed. Before earthing the phases, a check or test for voltage shall be made with approved potential tester.
- While earthing lines and apparatus, an approved temporary earth rod shall be driven if earth point is not already available. The earth wires shall be connected to the temporary earth rod.
- The temporary earthing cable shall be flexible stranded conductor, of sufficient current carrying capacity to activate protective devices, without damaging it if accidently

energized. Conductor size of cable shall be 2 AWG for distribution system and 4/0 AWG for HV system.

- A system neutral or an earth wire shall not be opened, until the proposed opening has first been jumpered or bypassed. An earth may be temporarily opened provided proper protection equipment is used.
- Earth switch, provided with the isolator, shall be operated only under the instructions of NPCC/RCC and before the apparatus is returned for service.
- The capacitors shall be discharged & grounded.

8.2.3 Procedure for approaching live high voltage conductors and their supporting insulators.

1) For work in close proximity to live high voltage conductors and insulators supporting them, or in the vicinity of such apparatus, the person in-charge shall discuss with the work crew the hazards of the work and give instructions, regarding the use of any precautions, procedures or protective equipment, necessary to perform the work safely.
2) While working near live high voltage apparatus , proceed as under:-

- Workers shall not go or take any conductive object within the following approach distances from any exposed energized conductor or equipment.

Nominal Voltage (Phase to Phase) KV	Minimum approach distance- Meter
3.0 to 11	0.64
11.1 to 33	0.71
33.1 to 66	0.92
66.1 to 132	1.07
132.1 to 220	1.53
220.1 to 500	3.36

- While operating manual disconnect switches, the worker shall use approved PPEs

Nominal Voltage (Phase to Phase) KV	Approved Equipment	
	Insulating Gloves Protective foot ware	Insulated Working Support
400 V	Required	-
11,000 V	Required	Required
up to 33,000 V	Required	Required

- When working within reach of line or equipment energized at from 230/400 volts to 33,000 volts each worker shall wear insulating protecting equipment as follows:

- When erecting metal towers, using mechanical or manual hoisting equipment, adjacent to energized high tension lines, adequate clearances should be maintained or the lines shall be de-energized and earthed.
- When operating mobile lifting or hoisting equipment, near energized lines or equipment in grid stations, the mobile equipment shall be effectively earthed and an observer designated to assure that proper clearances are maintained.
- When lifting or hoisting equipment such as a truck crane or a portable aerial frame is being used in close proximity to energized lines or equipment, safe working clearances must be observed. The possible effects of the electric field should be considered when equipment is near voltages of 220KV and above. Workers supposed to work near the live equipment shall use insulating protective footwear, in addition to other required protective equipment.
- When raising or lowering poles/structures in close proximity to energized lines or equipment, all workers shall use insulating protective equipment and dry non-conductive hand-lines.
- Wire being strung, removed or sagged close to energized lines or equipment shall be considered energized and handled with insulating protective equipment, dry non-conductive hand-lines, barriers or other necessary protective equipment.

8.2.4 Procedure for work in substations and switching stations containing exposed live high voltage conductors.

1) All apparatus, capable of being made dynamically alive or charged, shall be treated as alive, for work in substations and switching stations, containing exposed live high voltage conductors unless:-
    a) The apparatus is isolated and de-energized in accordance with the work protection code or.
    b) The apparatus is removed physically from all sources of potentials or dynamic energy with no ready means of connections.
2) No work shall be done on any apparatus without permission of the authority in-charge of the equipment.
3) All the applicable safety rules shall be followed pertaining to the nature of job.
4) Work qualification categories such as un-qualified, qualified and specially qualified workers shall be considered while assigning jobs to the work crew. The minimum safe working clearances in this regard are given in Data Section.

5) The precautions recommended by the manufacturer of the grid station equipment, should also be considered while working on or handling the equipment.

6) The equipment safety instructions, given in the training procedure, must also be followed.

8.2.5 Permit to work.

1) Permit to work (PTW) means a form of declaration, signed and given by one authorized person to another in-charge of work, to be carried out on any electrical apparatus, aerial line or cable indicating the apparatus or lines made dead and earthed at the Sub-station end.

2) PTW is a legal document of GEPCO issued in the name of an authorized person, to perform maintenance work on grid station equipment and transmission lines. A PTW has two copies double side printed; one copy handed over. To the person in whose name it is issued and the second left in the PTW book as office copy. The PTW holder will return it back, duly signed to the issuing authority, after doing the work or when he wishes. The station operator cannot make any switching operation on the equipment, under PTW, until cancellation of the PTW (Specimen of PTW is given in Data Section).

i. Application for PTW

- The applicant for a Work Permit shall be responsible for identifying hazards in the work area and for providing the following information with his application to the issuing authority.
- A description of the work/tests to be performed.
- The equipment to be isolated/de-energized, including the equipment required for working clearance.
- Identification of the hazards in the work area to be covered by the use of Approved Work. Practices, including hazards associated with the surrounding apparatus.

ii. Issuance of PTW

- The issuing authority is the person responsible for preparing, establishing, making effective and terminating work protections and condition guarantees.
- The issuing authority (usually the shift in-charge), after his satisfaction and in accordance with the instructions of controlling authority i.e. NPCC/RCC, will isolate the equipment as demanded in the PTW application.
- Hazards known to the issuing authority of the work permit and not eliminated by the work permit shall be indicated by the issuing authority on the work permit.
- If applicable, the issuing authority will provide PTGs on the equipment under PTW or will ask the PTW holder to provide the same before starting work.
- When PTW is issued to two or more persons, each PTW holder must agree to the terms of issuance.

iii. Receipt of PTW

- The work permit holder will receive the PTW duly signed by him after making requisite entries in the PTW form.

- Prior to commencement of work, the work permit holder shall inform his group regarding the apparatus which is isolated and de-energized and will provide necessary barriers and other safeguards such as warning signs and exit signs etc. around the work area.
- The work permit holder shall be available to his work group to provide help on any safety aspect of. The job that may arise after the work group has been assigned their work.

iv. PTW Clearance.

- After completion of the work, windup of all the tools, test equipment and safeguards, the work permit holder shall instruct every member of his crew to get clear and stay clear of the apparatus.
- For surrendering the PTW, its holder will make necessary entries in the PTW form, under his signatures, before the issuing authority.

v. Cancellation of PTW

- The issuing authority (shift in-charge) will cancel the PTW, after his satisfaction, on receipt of clearance from the PTW holder and making necessary entries in the PTW form under his signatures.
- After cancellation of PTW, the shift in-charge will inform NPCC/RCC for further instructions towards normalization of the equipment, on which PTW was issued.

8.2.6 Sanctions for tests.

All types of testing of grid station equipment, protective relays and transmission lines shall be carried out in accordance with the approved instructions, proper authorization, procedures and SOP. Testing, under work permit, is prohibited if it requires operation of the device guaranteed for another work protection or would energize apparatus isolated for another work protection.

i. Responsibilities of control engineer/shift engineer.

- The Control Engineer will develop and issue work program regarding the testing work to be carried out.
- The Control Engineer will identify the hazards and unsafe conditions/acts related to the testing job and will brief the person in-charge for elimination of the identified hazards.
- The Control Engineer will also identify regarding the repetitive and consecutive nature tests, if involved in the job.

ii. Responsibilities of person in-charge of testing

- The person in-charge after having received the work program will follow the prescribed procedure for obtaining PTW and other safety related rules. He will also ensure the use of P.P.Es by all the workers under his charge.
- The person in-charge will perform the testing job in accordance with the prescribed work procedures.
- Deficiencies in the test procedure or any abnormal response of the test equipment shall be reported to the Control Engineer for his notice and advice.

- The test set should be used only by the trained and qualified personnel, who recognize potential hazards.
- Do not work alone on high voltage testing**.**
- Do not touch high voltage testing leads while energized.
- Locate all hazardous potential sources and accessible points before making test connections, as voltage may appear unexpectedly in faulty equipment.
- While using multi-meter, do not change function switch or range switch while the circuit is energized. A mistake can result into damage to the meter and also an injury to the employee.
- Do not change lead connections while the test is going on.
- The test equipment & its accessories must thoroughly be checked for any defect before use.
- Check the input power switch position (ON/OFF Switch) and connections before applying power to the test equipment.
- For high voltage testing such as AC or DC Hi-pot, C&DF test, Insulation Resistance test etc., the test equipment shall be self-tested and calibrated. The out-door equipment under test, mainly the bushings, must be thoroughly cleaned before applying high voltage.
- While using Clip-on Ammeters, take care of its correct range and withstand voltage rating.
- Manual interlock key of high voltage test equipment should remain in the custody of its user.
- The safety precautions, recommended by manufacturer of each test equipment, must be followed.
- Earth resistance testing should not be carried out during rainy weather, winds and dust storms.
- During high voltage testing such as C&DF test, the employees should stand clear of the bushings and test leads as the body capacitance may influence test results.
- At the termination of all high voltage tests, the apparatus tested should be properly discharged through grounding switches or by portable temporary grounds.

8.2.7 Limits of approach to energized electrical equipment.

For safety of employees and GEPCO equipment, safe limits of approach, in respect of different work categories and conditions, have been specified and given in Data Section which must be followed.

8.3 Work on particular items of plant, apparatus or conductors.

8.3.1 General safety precautions.

In addition to the safety precautions already outlined in the previous text, the manufacturers specified safety instructions in respect of the particular items of plant, apparatus or conductors shall be followed. These particular items may be:-

1) Use of cleaning solvents.
2) Handling of toxic or hazardous materials.
3) Glass fiber thermal insulation.
4) Explosives, radio actives and radiations.
5) High voltage testing.
6) Leak checking.
7) Pressure vessels/cylinders.
8) Underground man-holes.

8.3.2 Remote and automatic controlled equipment.

1) For handling remote and automatic controlled equipment, prescribed procedures by the NPCC/RCC should be followed. Workers shall not start the work on any equipment unless instructed to do so by the person in-charge. Each worker shall be satisfied of the identity of the equipment and authority of the other person.
2) Before work is carried out on remote or automatic controlled apparatus, all remote control and automatic features shall be made inoperative and their operating switches shall be tagged.

8.3.3 Withdraw able apparatus

When removing or inserting draw-out type switchgear, it shall first be determined that the contacts are in the open position and that the fuses in the control circuit have been removed. When apparatus has been withdrawn from its normal live position, its conductor shall be discharged.

8.3.4 Bus-bars, bus-bar spouts and bus-bar connections of multi-panel switch boards.

1) Before doing work on bus-bars and bus-bar spouts, it should be shut down and properly disconnected from the power source.
2) Keep in mind the identification of the particular apparatus to work upon and back-feeding chances from Potential Transformers.
3) Out-door and overhead tubular bus-bars are not designed to directly climb. Always use scaffold devices and ladders for the purpose.
4) For out-door and overhead flexible bus-bars, qualified persons shall be allowed to climb and work.
5) Personnel should not climb insulator stacks of bus-bars as there is always possibility that the insulators may be broken in some way i.e. loose caps or pins

and hair line cracks etc. Moreover, serious damage can be done to the good insulators by heavy boots, nails or sand on boots.

6) For cleaning/washing insulators, corrosive solvent should not be used.
7) Live line washing of bus-bar should be done only under special instructions and by the qualified crew.
8) PPEs should always be used while using solvents for cleaning/washing the insulators.
9) Hazards in handling and storage of bus-bar insulators must be identified and eliminated.
10) As the security of station bus work depends on the integrity of clamps and connectors, so they must be of proper size and rating.
11) The isolating arrangements shall be locked.
12) When practicable the bus bars shall be checked by means of an approved voltage indicator/detector to verify that they are not live.
13) Caution notices shall be attached at all points where the bus bars can be made live.
14) Danger notices shall be attached where applicable.

8.3.5 Spouts and connections of feeders, voltage transformers and single panel bus-bars.

1) Before doing work on feeder spouts, feeders should be identified, shut down and temporarily earthed. Keep in mind the back-feeding chances from distribution transformers.
2) Workers shall not short-circuit the secondary circuits of potential transformers when these are connected on primary side. Keep in mind the back-feeding chances from P.Ts.

8.3.6 High voltage apparatus and plants operated by or containing compressed air, hydraulic oil or gases.

When using compressed air, hydraulic oil or gases in electrical equipment either for dielectric purpose or for operating purpose, the air or gas shall be supplied through a moisture accumulator, and an insulating hose with proper nozzle. Goggles shall always be used when cleaning with compressed air. For working on pressurized system, it should be de-pressurized before starting work. All other related safety rules shall be applicable.

8.3.7 Transformers.

1) The application of heat inside a transformer tank for such work as repairing coils shall be treated with all possible cautions and only under certain authority.
2) Any transformer which has been removed from service due to internal trouble may contain poisonous and explosive gases. Therefore, extra care shall be exercised while ventilating it for work.
3) Tanks containing gasoline or other flammable liquids shall, In addition to being adequately ventilated, be purged by an approved method before any worker is permitted to enter.
4) Transformers which have been shipped or stored gas-filled must be purged by an approved method before entering in their tanks. Such tanks must be suitably identified.
5) Before starting work on transformers, the possibility of unplanned back-feed, abnormal voltage, or other dangerous conditions shall be eliminated. All transformer windings (HV/LV/MV) shall be earthed as close as possible to the bushing.
6) Insulated sticks shall be used when operating cutouts and disconnects that are meant for such operation. Whenever possible, fused cartridges should be installed or removed with fuse sticks or tongs.
7) Whenever transformers are replaced, new transformer shall be checked for proper voltage before connecting to secondary. Phase sequence must be checked.
8) Only approved equipment, such as potential transformers voltage detectors, or voltmeters, shall be used in phasing out circuits and transformers and in testing for potential.
9) Take care while working on slippery surfaces on power transformer top cover.
10) For safe operation of transformers due care must be taken to their loading, voltage regulation and oil / winding temperature rise.
11) The routine and diagnostic test results should be carefully interpreted. As the values of winding resistance, C&DF and Insulation Resistance (Meggar test) etc. vary with temperature, the same should be corrected by applying necessary correction factor (75°C for winding resistance test and 20°C for Dissipation Factor), by using the standard formula/table.

8.3.8 High voltage static capacitor banks.

1) All high voltage capacitors, whether a single unit or a bank, shall be de-energized and grounded at their terminals before starting work.
2) The discharged time constant of capacitors is given in the name plate data, which must be considered to discharge the capacitor for safe working.
3) All capacitors, regardless of voltage, shall be considered energized, after being disconnected, until discharged by shunting with jumper. After disconnecting a

capacitor from a line, it should not be shunted until 5(five) minutes have elapsed. Capacitor terminals shall always be shunted, while being worked on & at all times while in storage.

8.3.9 High voltage cables

No doubt cables are insulated to withstand the operating voltage with a good factor of safety, still there is a tendency for workers to be misguided about the hazardous aspects while handling high voltage cables. The following safety measures shall be followed while working on power cables in addition to the specific instructions of their manufacturer.

1) Live cables should not be handled unless it is sure they are safe to touch.
2) Ensure healthy connections of sheath grounding as per the cable laying scheme.
3) Moving or binding of energized cables can be dangerous and should only be done when specially authorized.
4) In order to work safely on de-energized open laid or under- ground cables, it must be positively identified, checked as de-energized, tagged, and finely grounded. Phase marking and polarity must be considered while handling cables for new connections, maintenance and testing.
5) Cable man-holes should not be entered without proper safety.
6) The Hi-pot test voltages for cables are much higher than their operating voltages. Therefore, it is most important to disconnect other equipment from the cable and protect such equipment during cable testing.
7) Hi-pot test should not be performed if the cable has failed in insulation resistance test. It is necessary to perform insulation resistance test on the cable before and after Hi-pot test.
8) Specific safety instructions pertaining to the types of cable such as XLPE cables, PVC cables, Oil filled cables etc. shall be considered while working on them.

8.3.10 Circuit Breakers.

1) The switching operations of circuit breaker should be preferably carried out from remote. However, if local control is involved, the employees should stand clear from the circuit breakers at sufficient distance to remain safe from the burst porcelain hazards.
2) Never operate circuit breaker when:-
   - There is no oil in the breaker or the oil level is low.
   - There is no SF6 Gas in the circuit breaker or Gas pressure is below the minimum permissible limit.
3) The spring-charged mechanism of circuit breakers should never be operated without coupling with the circuit breaker.
4) When SF6 is used in high voltage switchgear, decomposition products of varying toxicity are formed as a result of electrical discharge and arcs. These

products can irritate mucous membranes, the respiratory tract, as well as other unprotected skin surfaces. Personnel must, therefore, observe the following safety measures at all times when working on open switchgear:-

- Eating, drinking, smoking and storage of food is absolutely prohibited in rooms containing SF6 systems. This applies particularly to maintenance work when gas compartments are open.
- Do not touch parts in the vicinity of the insulating gas without proper protective clothing and/or equipment.
- Do not stir up the powdery decomposition products.
- Make sure the room is well ventilated when working on indoor breakers.
- Use only the minimum number of personnel absolutely necessary for performing the work.
- Wash the body thoroughly after completion of work.
- Appropriate protective respiratory equipment such as a full-face respirator (gas mask) or a respirator plus gas¬ tight safety glasses should be used.
- Oust-tight protective suit made of non-woven material (disposable coveralls), rubber gloves or disposable gloves, rubber boots or disposable boots etc. should be used.
- After work is completed, clean the respirator, safety glasses, rubber boots, and rubber gloves with water. Collect the waste. Dispose of both the waste and the protective covers separately.
- Pole columns are shipped at a gas gauge pressure of approximately 0.05 MPa (0.5 bar). If handled improperly, the support porcelains may burst and cause damage to persons and property. To minimize the consequences of porcelain breakage, never move the pole columns, if the pressure exceeds the shipping pressure.

5) For safe operation of circuit breakers the routine and diagnostic test results should be carefully interpreted. Open/close timing values and contact resistance values should not exceed the allowable tolerance values.
6) While filling and checking SF6 gas pressure, the gauge pressure reading should be corrected as 20 C by using the standard formula / table.
7) While filling SF6 gas purge the hose pipes with SF6 gas into atmosphere, to remove any air from the hose pipe to avoid the chances of undue contamination of gas in the circuit breaker.

8.3.11 DC station batteries.

1) While working on batteries, P.P.Es such as rubber gloves, apron and goggles should be worn.
2) Tools being used should be insulated.
3) If acid touches the body, flush thoroughly with water and seek medical service.
4) Do not work on battery, while it is on equalizing charge or gassing heavily.
5) Before entering battery room, put the exhaust fan ON.
6) There should be no sparks, smoking or open flames in battery room.
7) While preparing electrolyte for lead acid battery, always add acid to water. Never add water to acid.
8) For safe operation of station batteries, due care must be given not to exceed the electrolyte temperature more than 45 C, while charging and discharging the battery.
9) For routine and diagnostic testing / checking different test values, such as AG Capacity test, Impedance test and specific gravity measurements, due care must be given while interpreting the test results. Temperature correction factors must be applied to AH capacity test result and specific gravity test result.

8.3.12 Disconnect switches/isolators

1) The operation of any switches shall be performed, with the knowledge and consent of the controlling authority, except in the case of emergency.
2) The order to operate shall be exercised in accordance with the requirement of the work, protection code and approved instructions/procedures.
3) Portable ground gradient control mats shall be used for the operation of switches.
4) The ground connections of the operating mechanism shall be examined before each operation to make sure connection is intact.
5) All switches to be operated shall be properly identified and checked according to sequence of operation. After the operation, all phases/poles shall be checked to ensure that they are in the desired position.
6) Isolators/disconnect switches shall not be used to interrupt load currents in any case.
7) The open position of the circuit breaker, in series with a disconnect switch, must be confirmed before operating the disconnecting switch.
8) If a disconnecting switch has been closed wrongly, it shall not be opened unless it is sure that no dangerous arc will occur upon its opening.
9) If a disconnecting switch has been opened wrongly, it shall not be closed without ensuring safe operation. If it is obvious that the switch is being opened in error and the arc is not yet broken, the switch shall be closed immediately.

10) Switches used for interrupting current shall not be operated in a hesitating manner. They shall be closed, by using sufficient force, to make a full contact of blades with one movement, and shall be opened with a quick and firm movement.

11) Only approved switch-sticks, in good condition, shall be used for the operation of switches.

12) Employees involved in the energizing or synchronizing of the lines must follow approved instructions/ procedures.

13) Neutral ground switches or connections shall not be opened under load.

8.3.13 Instrument transformers (CTs, PTs and CVTs)

1) Body ground of instrument transformers shall not be disconnected or disturbed during its normal service. All instrument transformer secondary circuits should always be connected to ground.

2) Spare cores of secondary windings of CTs should not be left open-circuit. Short-circuit the spare cores at the terminals in the secondary terminal box.

3) No current transformer should be left with its secondary circuit open. If done so, it will pose a serious hazard to the personnel & will also endanger the winding insulation. Thus, the secondary winding of current transformers should always be short circuited before disconnecting the burden.

4) The secondary circuit of the potential transformers shall not be short circuited, when these are connected on primary side.

8.3.14 Insulating oils, oil tanks, SF6 gas and gas cylinders.

Work on Insulating Oils and SF6 Gas shall be governed by the precautions meant for work in confined spaces. Health hazards involved in handling mineral insulating oils or synthetic oils with or without PCBs (Poly Chlorinated Biphenyls) such as skin problems & environmental pollution must be given due consideration and care. The bye-laws of Pakistan Environmental Agency (Government of Pakistan) are also applicable in this regard.

8.3.15 Environmental Protection

Role of oils, pesticides and industrial chemicals.

- Certain persistent organic pollutants (POP) such as Pesticides (Previously used in agriculture and household) and chemicals (used in transformers, hydraulic oil, thermal oil, etc.) seriously degrade the environment & adversely affect human health and wildlife. They harm aquatic life and become a part of the food chain. They can also cause cancer. Their production, import, sale and use are banned and now their environment- friendly alternatives are in use.

Following POPs are identified and circulated for awareness of employees:-

- Aldrin ,Endrin, Chlordane, Heptachlor, DDT, Mirex, Dieldrin, Toxaphene , Hexachlorobenzene (HCB). Industrial Chemicals such as Polychlorinated Biphenyls (PCBs), Dioxins, Furans.

i. Role of SF6 Gas

SF6 gas is a greenhouse gas (GHG) and it has global warning potential (GWP). The other greenhouse gases are carbon dioxide (CO2), Methane (CH4) and Nitrous oxide (N2O).

The greenhouse effect is the rise in temperature that the Earth experiences because of certain gases in the atmosphere (water vapors, carbon dioxide, nitrous oxide and methane), trap energy from the sun. Without these gases heat would escape back into space and earth's average temperature would be about 60°F colder. Because of how they warm out world, these gases are referred to as greenhouse gases.

Global warming refers to an average increase in the earth's temperature, which in turn causes changes in climate. A warmer earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

In order to minimize the greenhouse effects of SF6 gas insulated switchgear, or other electrical equipment, (either through leakages or for disposal purpose); maintenance personnel should pay due attention while handling SF6 gas (Filling/evacuating) and working on SF6 gas insulated switchgear or other electrical equipment.

8.3.16 Safety precautions for testing high voltage apparatus.

In addition to the conventional safety measures for testing high voltage apparatus i.e. de-energization, isolation, having proper work authority/procedure, use of PPEs, safe limits of approach etc. the following safety precautions must be followed:-

1) All high voltage testing including Hi-pot tests (AC/DC), power frequency, impulse voltage withstand tests , high current tests etc. shall be conducted in accordance with approved work procedures.
2) The voltage, current test values and time durations should be in accordance with the factory test values/relevant IEC standards.
3) Limitation of test voltage values, for new and repaired high voltage apparatus, should be considered as and when applicable.
4) Do not work alone on high voltage testing.
5) Do not touch high voltage testing leads while energized.
6) Locate all hazardous potential sources and accessible points, before making test connections, as voltage may appear unexpectedly in faulty equipment.
7) For high voltage testing such as AC or DC Hi-pot, C&DF test, Insulation Resistance test etc., the test equipment shall be self-tested and calibrated. The out-door equipment, under test, mainly the bushings must be thoroughly cleaned before applying high voltage.
8) Manual interlock key of high voltage test equipment should remain in the custody of its user.
9) The safety precautions, recommended by manufacturer of each test equipment, must be followed.
10) During high voltage testing such as C&DF test, the employees should stand clear of the bushings and test leads, as the body capacitance may influence test results.

11) For correct interpretation of test results, temperature compensation multiplying factors must be considered, as and when applicable.

12) At the termination of all high voltage tests, the apparatus tested should be properly discharged, through grounding switches or by portable temporary grounds.

8.3.17 High voltage overhead deadlines or partially dead multiple circuit lines - single or multiple circuits - with all conductors dead or one circuit live.

To work on de-energized overhead lines in close proximity to the energized overhead lines, whether single or multiple circuits, only trained and qualified workers should be allowed to work. For taking lines out of system, follow the prescribed procedure (Refer to section 4.2.2). Prescribed safe limits of approach (Refer to Data Section) both for the workers and mobile plants shall be considered. For climbing poles, towers and structures, follow the prescribed instructions (Refer to Section to 4.1.4).

8.3.18 Voltage Regulators

1) Voltage regulators shall be placed in the neutral position & the control circuit be put off before they are by-passed.
2) In grid stations, voltage regulators may be mounted on pads, platforms or steel bases to achieve a safe minimum height to live parts.
3) On distribution feeders, regulators may be mounted above ground on platforms or directly on poles, depending on their size.
4) By pass arrester & line-to-ground lightning arresters, shall be mounted at the voltage regulator terminals, for safety from high voltage surges.
5) Regulators must be by-passed on the neutral positions only. Bypassing at any other tap position causes an extremely high circulating current in the series winding & may damage, destroy, or completely blow up the regulator.
6) When placing a regulator on the line, the operation of three switches I.e. source switch, load switch & by-pass switch shall be carried out as per operation manual.
7) To take the regulator out of service, the operation of these switches shall again be as per operation manual.
8) Certain single - phase regulator connections may be unsafe & as such three basic phenomena i.e. 3rd harmonic, system line surge & line faults shall be considered as per manual.
9) The usual application of a regulator is to boost the voltage. Consequently, care must be taken in establishing its location; since its action is to boost the voltage, received at the point, where it is installed.

8.4 High voltage overhead live-line work.

8.4.1 Authorization requirements.

Live-Line work shall only be performed where practicable and necessary to avoid interruption in the system. The work shall be performed by specially trained crews in accordance with the Live-Line Work Manuals. Necessary approval of the competent authority shall be obtained as per prevailing procedure to carry out live-line work after obtaining "HOLD OFF" from the concerned grid station shift in¬ charge.

8.4.2 Live-line tools and equipment and arrangementsfor keeping them in good condition

1) List of live-line tools and equipment.

i. Complete package of T&P (hand tools and machine tools).
ii. Extension ladder fiber.
iii. Adjustable strain pole.
iv. Non- Conductive shoes.
v. Non- Conductive suit (Socks, gloves, trousers, shirt etc.)
vi. Capstan Hoist
vii. Trunnion Nut.
viii. Trunnion Ratchet Wrench.
ix. Strain link stick.
x. Hot-end suspension yoke.
xi. Cotter key pusher.
xii. Shepherd hook.
xiii. Strain pole carrier.
xiv. Moisture eater.
xv. Abrasive cleaning pad.
xvi. Hot-stick wiping cloth.
xvii. Cargo boom.
xviii. Hot-stick tester.
xix. Hi-Test Insulator Tester.
xx. Generator 5KW.
xxi. Live-Line Rope.

2) Care and storage of live- line tools and equipment.

Since the safety of live-line tools depends upon the electrical insulation and mechanical condition of the tools, great care shall be taken to ensure their proper storage and maintenance as mentioned below:-

i. Live-line tools shall not be altered or repaired except by those authorized to do so.
ii. The tools such as non-conducting suit, rope, sticks etc.

shall be inspected regularly to check cracks etc. by the supervisor or a qualified employee delegated to such a duty. Auxiliary equipment, such as blocks, shall be included in this inspection and shall be maintained in good condition.

iii. Insulating quality of sticks must be maintained. Maintenance of insulation shall not be attempted in the field except for touch-up of minor scratches.

iv. Special attention shall be given to the channel for the operating rod of the tie cutter and clamp stick. It must always be kept thoroughly clean and dry.

v. Live-line tools shall not be left lying on the ground where they might absorb moisture or otherwise be subject to misuse.

vi. Live-line tools shall not be dropped from aloft, but shall be raised and lowered by means of hand-line.

vii. Live-line tools shall be carried and stored only in an approved container and kept in a dry location. The rubber supports and seals of these containers shall be maintained in good condition at all times.

viii. Live-line tools shall be tested and inspected by TSG department.

ix. Live-line tools shall be securely packed. Material and tools, which are not part of the set, shall not be carried in live-line tool trailers or boxes unless special provisions are made, so that the live-line tools do not get damaged.

3) Care and use of live-line rope

i. The rope is adequate for a working load of 1500 lb. (682 kg). However, the working load is limited by the rating of the block to a maximum of 1000 lb. (454 kg).

ii. The rope is to be used with a Sherman and Reilly GTA-358 block, with safety hook and swivel eye. This assembly permits a maximum working load of 1000 lb. (454 kg).

iii. A tarpaulin shall be spread on the ground at the work site to prevent the rope from contacting the ground and picking up contamination or moisture.

iv. Clean gloves shall be used to handle the rope and the rope blocks must be kept clean Care must be taken to prevent pick up dirt.

v. The rope is not to be used in rain or foggy weather. If these conditions develop while work is in progress, the rope must be

removed from the line as soon as possible. A second dry rope can be used, if required, to complete the work when weather conditions improve.

vi. There shall be two live-line ropes on the job so that a second rope is available if the first one gets wet.

vii. It is recommended that when splicing HI D Orange rope, four full tucks be taken, followed by two further tucks, using 213rd of the rope yarns in the strand, and finally two more tucks using 113rd of the yarns.

8.4.3 General safety precautions

1) Work shall be carried out on a live circuit only, by the use of live-line tools or other approved live-line techniques.
2) Only approved tools, techniques and equipment shall be used for live-line work.
3) The supervisor or person in-charge shall plan the work carefully in advance and shall brief his workers the details, before the work is started.
4) The supervisor shall be responsible for ensuring that live- line tools and equipment are tested, in accordance with the requirement of the Live-Line Work Manual.
5) The supervisor and each worker shall be responsible, at the beginning of each working day, for the inspection of all live-line tools and associated equipment to be used.
6) Close co-operation must be obtained from every worker on the job. Each person shall observe closely the progress of work performed by fellow workers and shall look to the safety of his fellow workers, as well as his own.
7) Haste, inconsistent with safety, shall not be permitted.
8) Live-line work should not be carried out during adverse weather conditions. Tools may be left on the line until weather is improved, or overnight, if work conditions do not permit removal of the tools. However, it is the responsibility of the worker to ensure that the tools are dry and safe to handle, when work is again undertaken.
9) When Live-line work is carried out at night, adequate lighting must be provided.
10) The electrical and mechanical safety limits of live-line tools shall be observed.
11) Clearance from live line conductors, consistent with safety and efficiency, shall be maintained by the workers handling live-line tools.
12) Live-line connectors shall be operated alive, in accordance with Live-Line Work Manual.
13) Pulling an unsupported conductor, away from the work area, with line sticks is prohibited, where failure of the support will endanger the personnel.

14) Either live-line tools shall be used to handle unsupported springy conductor ends, in close proximity to live conductors, or the unsupported length of conductor shall be limited to the prescribed safe limit of approach.

8.5 Safety Precautions and Procedures applicable to Low Voltage Systems.

8.5.1 General requirements for work on dead low voltage apparatus and lines

1) No work shall be done on lines or equipment, where Load Dispatch Centre's or Operator's clearance is required, until clearance has been obtained to proceed in accordance with existing operating procedures.

2) When taking lines or equipment, out of service, requiring the Load Dispatch Centre's clearance, it shall first be de-energized by an appropriate switching device, such as disconnect, interrupter, circuit breaker, fuse or recloser. For work on equipment, isolating disconnecting switches on both sides of the equipment shall be opened. For work on lines, the line shall be disconnected from the electric circuit by a visible disconnecting means and any other possible source of energy including customer owned generating facilities.

3) When lines not under control of Load Dispatch Centre are taken out of service, the fuses, if any, shall be removed from their holders and the line properly tagged at all possible source points. If the line is controlled by an automatic breaker, it shall be opened, made inoperative and tagged. The disconnecting device, if any, shall be opened and tagged.

4) When removing or inserting draw-out type switchgear, it shall first be determined that the contacts are in the open position and that the fuses in the control circuit have been removed.

5) Disconnects and air breaks which have been opened shall be checked visually to be sure that all blades are in full open position, and when equipped with locks, they shall be locked open. The motor mechanism of motor operated switches shall be disconnected from the switch or the motor circuit shall be opened.

6) When lines or equipment that may become energized from any source rated 230/400 volts or more, have been removed from service, to perform work on them, all phases shall be earthed. Before earthing the phases, a check or test for voltage shall be made. Earths may be removed for equipment testing purposes. Work on the equipment, not associated with test, shall be stopped until earths are replaced.

7) Whenever possible, an earth shall be placed at the point of work. When earthing at the point of work creates congestion and is a hazard to workers, earths shall be placed on each side as near as possible to where the work is being performed.

8) When earthing lines and apparatus, an approved temporary earth rod shall be driven, preferably 6 meters away from any area, where anyone is likely to be. The earth wires shall be connected to the temporary earth rod.

9) When earthing lines or equipment, the earthing cable shall be connected at the earth end first and to the equipment last. When removed, the earthing cable shall

be disconnected from the equipment first and from the earth last. Insulated tools shall be used for making and removing the connection to lines or equipment.

10) The temporary earthing cable shall be flexible-stranded conductor of sufficient current carrying capacity to activate protective devices without damage to the cable, but not less than 36 sq.mm aluminum or copper equivalent. They shall be equipped at both ends with clamps that apply firm pressure, one of the clamps being of a type that can be applied with live line tools.

11) On metal structures, conductors shall be considered as bonded together and earthed when each is separately earthed to the structure.

12) A system neutral or an earth wire shall not be opened until the proposed opening has first been jumpered or by-passed. An earth may be temporarily opened provided proper protective equipment is used.

13) Earths under the control of the Load Dispatch Centers shall be removed only under their instructions and before the apparatus is returned to service.

14) All workers shall be a safe distance away from conductors and equipment on which work is done, and all tools, plants and earths removed from the job before giving up the Load Dispatch Centre's or Grid Stations Operator's clearance.

8.5.2 Additional Precautions for work on dead low voltage cables.

1) Before making an opening in or removing a part of the sheath or sleeve of cable, the line shall be grounded, at the first possible grounding point, on each side of the work location.

2) When a high tension cable is to be cut, a short section of the shielding, if any, completely around the cable shall be removed and tests made with two statoscopes or other approved testing devices to determine whether or not the cable is de-energized. If no Indication of a live cable is obtained, the employee may proceed with the work.

3) When opening a joint or splice in a high tension cable, the sleeve of the Joint shall be cut completely around near the wipes and then cut lengthwise and removed from the joint. No effort shall be made to remove the compound. The employee shall then test over each conductor with two statoscopes or other approved testing devices. If no indication of a live cable is obtained, he shall cut through the joint until the saw touches one of the conductors. Before sawing further a' statoscope test shall be made on the blade of the saw.

4) When cutting or opening joints on low tension cables, the same procedure as outlined above, for high tension cables, shall be followed, except in testing. To determine whether the conductor is energized, the insulation shall be cut away to the conductor and tests made with an approved tester. On multiple conductor cables, only one conductor shall be cut at a time and tests made on at least two conductors, before proceeding with work.

8.5.3 Additional Precautions for work on dead low voltage overhead lines.

1) Approved safety belts with safety straps or lanyards shall be worn by employees working on poles, towers or structures.

2) Wire hooks shall not be attached to body belts or safety straps.

3) Body belts, safety straps and lanyards shall be inspected before use each day to determine they are in safe working condition.

4) Before climbing poles, ladders, scaffolds, towers or structures, they shall be inspected to be sure that they are safe to climb. When there is doubt, they shall not be climbed until made safe by guying or bracing.

5) All ladders shall have a suitable piece of light rope at the top end, and they shall always be tied to the pole or other structure by means of this rope.

6) No ladder used on a pole / structure shall reach above the lowest cross arm, and sufficient clearance shall be obtained to allow line work to be done from the cross arm. One's head and shoulders shall not project above the line worked upon. Under no circumstances shall an employee stand or sit on a cross arm, when live low tension (L.T.) or high tension (H.T) lines are above or below him.

7) Ladders shall not be set up on any moveable object, which may be started while an employee is working from them, unless satisfactory precautions are taken.

8) Ladders shall not be set up in a pathway or roadway exposed to traffic, unless an employee is stationed at the foot of the ladder to warn the traffic.

9) Unmanned pole or beam alone shall not be relied upon to support a pole/ structure, while a worker is on it.

10) Before removing or adding wires, cables or guys to poles , towers or other structures, additional guying or bracing shall be used, where necessary, to take the additional strain.

11) Safety straps, on the lineman's belt, shall not be placed above the cross arm when it is at the top of the pole.

12) Cross arm braces or other pole attachments shall not be relied upon to support a worker's weight.

13) Workers shall not climb on poles/structures that are being plumbed, straightened or tamped.

14) All light weight tools & plants, to be used aloft, shall be raised and lowered by means of handline and canvas bucket, or other suitable container.

15) Tools and plants shall not be thrown from the ground to workers working aloft, nor shall workers throw tools and material from above to the ground.

16) Taglines and handlines, used near energized lines and equipment, shall be of non-conductive material.

17) Hand axes shall not be used on overhead work.

18) All power tools used in work aloft, shall be equipped with approved switches or other control devices.

19) Towers / structures members or sections shall be adequately supported, and guyed.

20) Conductor, being installed or removed, shall be kept under positive control, to prevent accidental contact with energized lines or equipment.

21) Conductor, reels and load bearing hardware shall be of adequate strength or capacity, and shall be periodically inspected for defects.

22) All wires, after being placed on cross arm shall be considered energized at full voltage unless they are positively known to be dead.

23) In handling wires on a pole, with other energized conductors, shall be raised or lowered with a dry handline and extreme care exercised to prevent them from coming in contact with live lines and equipment.

24) Workers shall not lean on or pass through unprotected wires, and shall protect themselves against the possibility of falling into energized conductors.

25) Employees working aloft shall avoid positioning themselves on the supporting cross arm or directly under a conductor or puling line while it is in motion, during stringing or removing operations.

26) When workers are engaged in work over or near water and when danger of drowning exists, suitable protection shall be provided.

27) When working along streets or highways, workers shall exercise care to keep hand lines from blowing into the line of traffic.

28) When stringing wires across streets and highways, avoid interference with vehicular traffic or pedestrians. When necessary, signal workers shall be provided.

29) When working at night, portable lights for emergency lighting shall be provided.

8.5.4 Precautions for work on live low voltage apparatus & overhead lines.

1) Live overhead linesupto5000 volts, phase to phase or phase to ground shall be worked with rubber gloves and other rubber protective equipment. Wearing two pairs of rubber gloves does not increase protection.

2) Normally, at least two linemen should be on the job, when work is done on live overhead lines. Experience shows that one lineman using proper methods plus approved tools, adequate lighting, protective devices can perform the following jobs safely:

    a. Routine opening or closing of manually operated disconnects.

    b. Replacement of primary fuses.

    c. Replacement of street light lamps.

    d. Checking of earths.

    e. Removal of small and medium tree limbs.

    f. Disconnection of live low voltage (400V) lines from source.

3) Experience shows that safety rules must be observed while working on poles and structures.

4) Do not stand on or touch unnecessarily messengers, telephone lines or cables, transformers cases, ground wires or guy wires.
5) Safety straps should pass around the poles as low as possible, never above the top cross arm. Always make sure that straps are properly engaged.
6) Use material bags to raise and lower all small material and tools (except those in loops on the belt). Do not throw material up or down poles or structure.
7) Make sure that tools and material cannot fall from the pole or structure.
8) Handle installed lighting circuits, docks and regulators only with rubber gloves.
9) Use protective devices when they are necessary.
10) Know the voltage of the line being worked; if in doubt, find out.
11) Do not trust your weight on span wires, guy wires, pins or braces.
12) Do not rely on weather-proofing as insulation.
13) Before climbing any structure, satisfy yourself that it is strong enough to sustain your weight.
14) If performing work on a distribution transformer in service, assume that the transformer is energized from the secondary and work it accordingly until the transformer is proved to be de- energized by test.
15) Do not lean over or crowd through unprotected wires.
16) Do not work above live, unprotected primary conductors.

8.5.5 General precautions.

1) Procedures and safety rules shall be followed in all switching operations, affecting the transmission system and high voltage lines, as well as the issuance of "Permit to Work"
2) All capacitors, regardless of voltage, shall be considered energized after being disconnected until discharged by short circuiting with a jumper. A capacitor should not be short circuited until 5 minutes after disconnecting, in order to permit part of the current to drain off, through the discharge resisters inside the capacitor.
3) When lines or apparatus are de-energized for work, they should be tested to verify that they are de-energized; then short circuited and grounded, with approved grounding equipment, at the location where the work is to be done. If the line is to be opened, the line shall be grounded on both sides.
4) The grounding cable shall be connected to an effective ground before clamps are applied to the conductors.
5) The clamps, sticks and cable of the grounding equipment shall be raised to the working position by means of a hand-line. The workman shall stand well below the circuit when attaching the ground clamps. The conductor nearest to the workman shall be grounded first & then next nearest. The clamps shall be removed in the reverse order.

6) Manually operated air break switches shall be opened or closed by a man wearing rubber gloves.

7) A disconnect switch, in series with an oil switch, must not be opened until the oil switch has been opened.

8) Energized switches or fuses must be handled with rubber gloves, insulated sticks or tongs.

9) Precautions in respect of current & potential transformers shall be taken as already explained in this HSE manual.

10) Verbal and telephoned messages / orders, concerning the operation of lines or equipment, are to be repeated back and each party must secure the full name of the other party.

11) When working on one section of a substation or compartment, adjacent to other sections or compartments, where there are energized circuits or apparatus, the section or compartment being worked on, shall be conspicuously marked with ropes and/or barriers to designate the working area.

12) Employees shall not carry metal articles on their shoulders, near energized electrical equipment.

13) All non-current carrying metal parts of energized equipment, that are not properly grounded, shall be considered as being energized, at the highest voltage, to which they may be subjected .

14) A shirt with full-length sleeves, rolled down, shall be worn when working on poles, structures, or near energized lines or equipment.

15) Jumpers to connect dead circuits to live circuits, shall be attached first to the dead parts and then to the live and they shall be removed in the reverse order.

8.5.6 Underground lines and power cables

1) Safeguarding manholes, vaults and other working areas:

i. Warning devices, barriers, barricades & guard rails shall be placed to adequately protect the public and employees before manhole covers or gratings are removed or other work operations are begun, and they shall not be removed until the manhole covers or gratings are replaced.

ii. While work is in progress in a manhole, an employee shall be stationed on the surface in the immediate vicinity of the opening, when deemed necessary.

iii. Trucks, tool carts and other equipment shall be so placed as to present the least impediment hazard to traffic, consistent with a safe working area for the employees. If possible, trucks or equipment shall be placed between the working area and on-coming traffic.

iv. Where soil or other conditions are such that there is any danger

of a cave-in, the sidewalls of the excavations shall be adequately shored.

v. All dirt removed from trenches and other excavations, shall be plied at least 18 inches from the edge of the excavations, preferably on the side next to traffic.

2) Entering manholes or vaults

i. Manhole and service-box covers shall always be removed and replaced by means of approved hooks or hoists.

ii. A blow torch or other open flame shall never be used to melt ice around a manhole or vault cover.

iii. Where there is evidence of flammable poisonous gases, the manhole or vault shall be purged, before it is entered, by forcing a current of fresh air into the enclosure. While work is in progress, periodic checks shall be made to determine if gas is accumulating. If gas is accumulating, purging shall be continuous. (Caution: When using a blower, it shall be so placed, that it will not pick up and re-circulate the flammable or poisonous gases, back in to the manhole or vault).

iv. If, in an emergency, it becomes necessary for an employee to enter a manhole or vault, where gas is present, he shall use an approved gas mask and a safety belt, to which there is attached a line, attended by another employee, stationed at the manhole or vault opening.

v. If there is any question, regarding the flammability of a liquid, found in a manhole or vault, it shall be tested by on approved method. If the liquid is found to be flammable, it shall be removed before other work is performed.

vi. A ladder shall always be used in entering or leaving a manhole or vault. Climbing into or out of manholes or vaults by stepping on cables or hangers is forbidden.

vii. Upon first entering a manhole or vault, the employee shall make a careful inspection for unsafe conditions such as cracks or other defects in the roof, walls, floor, ducts, sumps and for evidence of sheath cracks and leaks in the cables. Presence of warning signs and tags should also be observed. Any unsafe condition found shall be reported to the proper supervisor immediately.

3) Identification

Before any work is done on a cable, it shall be identified and confirmed to be dead by on approved method. If there is any doubt, work shall not be started until it is checked, identified and confirmed to be dead by the proper authority.

4) Work on energized cables

i. All underground cables and apparatus carrying current at voltages above 415 volts shall be de-energized before work is done on the conductor, or before the cables are cut or spliced.

ii. Before any work is done an energized cable, other cables and all grounded equipment, with which contact can be made, shall be covered with rubber blankets or approved insulating shields.

iii. Because of the characteristics of a low voltage network system, when work is performed on cables or apparatus carrying less than 415 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearance and using proper tools in order to prevent short circuits.

iv. Employees shall wear rubber gloves, with leather protectors, and stand on rubber mats of insulated stools while cutting into and removing sheathing or sleeves and while testing an energized cable.

v. After removing a section of lead sheath or sleeve on an energized cable, the lead on each side of the opening shall be covered with insulating tape for a distance of at least 9 inches.

vi. When cutting an energized multiple conductor cable, a piece of fiber or wood shall be placed, between the conductor being cut, and the other conductors , and a cut shall be made directly over the shield.

vii. Immediately after each conductor of an energized multiple conductor cable is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one un-insulated Conductor shall be exposed at any one time.

5) Pulling Cables

i. Employees shall not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves etc.

ii. Employees shall not remain in a manhole or vault during pulling operations, involving heavy pulling strains, unless they can take a position clear of the pulling line**.**

8.5.7 Precautions for work on live low voltage overhead lines

When working within reach of lines or equipment energized at from 230/400 to 33,500 volts, each worker shall wear insulting protective equipment as follows:-

Nominal Voltage (Phase to Phase) KV	Approved Equipment	
	Insulating Gloves Protective foot ware	Insulated Working Support
400 V	Required	-
11,000 V	Required	Required
up to 33,000 V	Required	Required

When erecting metal towers using mechanical or manual hoisting equipment adjacent to energized high tension lines, the lines shall be de-energized and earthed or the clearances specified in as above shall be maintained.

8.5.8 Precautions for work on live low voltage cables

1) Personal protective equipment should be worn by the staff that has to perform work.
2) Grounding/ earthing of the transformer should be checked.
3) Goggles must be worn to avoid any kind of electrical flash.
4) Special precautionary measures should be adopted while working in cloudy /rough seasons.

8.5.9 Testing of low voltage apparatus

1) All types of testing of low voltage apparatus & circuits shall be carried out in accordance with the approved instructions, proper authorization, SOPs & other approved procedures, as applicable. Testing under work permit is prohibited, if it requires operation of the device, guaranteed for another work protection, or would energize apparatus, isolated for another work protection.
2) The PTW should be issued by authorized employee after approval from competent authority, so that testing works can be performed in a safe manner.
3) The testing area shall be properly safe guarded & the persons operating test equipment should be well trained to ensure the safety of the personnel & integrity & security of the system.
4) Only voltage testing devices approved by Design Department /GEPCO & in proper working order shall be used when testing electrical apparatus & circuits.
5) Potential testers shall not be used beyond the voltage limits for which they are designed.

8.6 Traffic Control

8.6.1 Traffic Control / Management Plan involves the safe access and movement of all vehicles (such as Cars, Pickups, Trucks, Tankers, Coaster and Buses), heavy equipment (such as Forklifts, Cranes) and Pedestrians within, through and around sites where work is carried out.

8.6.2 GEPCO shall establish, implement and maintain Traffic Management Plan for vehicles operating within premises and outside, address authorized driver requirements, usage of company vehicles, safe routes including rest times and locations and implement a monitoring system that includes an incentive program for safe driving and a penalty and disciplinary actions for unsafe driving.

8.6.3 GEPCO should employ only experienced, trained and authorized employees/ contractors as drivers of motor vehicles. GEPCO drivers shall have government driving license for the type of vehicles they are driving. All GEPCO drivers are expected to drive in a defensive manner and maintain control of their vehicles at all times. All drivers must follow the posted speed limits and traffic signs. The driver shall wear seat belts at all times. Vehicles must be in good condition.

8.6.4 The GEPCO driver is responsible for transporting materials properly and ensuring that the load does not exceed the manufacturer's design load capacity. All loads shall be properly secured and tied down. Materials should not extend over the sides of the truck. Loads extending beyond the front or rear shall be marked with a red flag.

8.6.5 Driver shall perform a 360 degree walk-around before getting into the vehicle or before reversing to check any obstruction, kids or manhole etc. at front or rear side.

8.6.6 Driver shall inspect the vehicle’s safety equipment (e.g., spare tires, toolkit) before using the vehicle.

8.6.7 Driver shall maintain vehicle in a safe condition and maintain tire pressure as per the manufacturer’s specifications.

8.6.8 All vehicles shall be parked correctly and/or in designated parking areas. Parked vehicles shall not obstruct other vehicles, roadways, access-ways or fire equipment.

8.6.9 GEPCO driver shall report unsafe condition or motor vehicle accident, no matter how slight, immediately to his supervisor/ in-charge.

8.6.10 GEPCO Traffic Management Plan should also address following:

a. Pedestrian Routes,

b. Traffic Routes,

c. Traffic Movement,

d. Bicycle/Tricycle Movement,

e. Interaction or potential interaction between pedestrians and vehicles,

f. Parking requirements,

g. Bus arrivals or departures,

h. Vehicles reversing and maneuvering,

i. Maintenance activities and movements,

j. Loading/Unloading,

k. Traffic existing control and the type of additional controls required,

l. Site requirements for special vehicles such as crane (over-dimensional vehicles),

m. Hitching or unhitching of Trailers/ Tankers,

n. Mounting or dismounting of refuse container from vehicles,

o. Safe access to site Fire & Safety Equipment,

p. Maximum driving hours and rest time,

q. Safest routes for the journey outside the facility,

8.7 Emergency Support Services access. De-Energized Circuits and Apparatus

8.7.1 Only electrically experienced, trained and authorized employees/ contractors shall perform electrical work against approved Permit to Work.

8.7.2 Install and maintain earthing /grounding system (i.e., equipment, exposed steel structure/ pole along with stay wire).

8.7.3 Earthing/grounding resistance shall be as per design or manufacturer's instruction. In the absence of grounding instruction, the earthing resistance for HT/LT structures/ poles shall be not more than 5 Ohms and Distribution transformer shall be not more than 2.5 Ohms to determine the integrity of the grounding path to ensure protection from shock hazards. The earthing resistance for Grid Station/ Substation/ switchyard equipment shall be not more than 2 Ohms.

8.7.4 Verify integrity of fixed earthing/grounding by continuity test and resistance measurement. In general, this cycle can range from 6 months to 3 years, depending on conditions and criticality. Wet locations testing should be 12 months and critical care shall be 6 months. Provide name plate/tag to all structures/ poles/ equipment's with numbers for tracking of earthing/grounding testing record, etc. Original record of testing with structures/ poles/ equipment's numbers shall be retained and preserved by GEPCO for three (03) years.

8.7.5 Before working on circuits and apparatus, identify task specific PPE/T&P in Permit to Work.

8.7.6 Insulated stick/rod, tools and PPE/T&P shall be used for applying and removing the earthing connection to lines or equipment.

8.7.7 Maintain an appropriate minimum distance from energized power lines at all times, while working nearby:

Line Voltage	Minimum Safe Distance
Up to 50 Kilovolts (KV)	3 Meter (10 Feet)
50 to 250 Kilovolts (KV)	6.1 Meter (20 Feet)
Over 250 Kilovolts (KV)	7.6 Meter (25 Feet)

Note: Distances listed are for standard conditions, extra care must be taken, if standard conditions do not exist.

8.7.8 Use non-conductive insulated measuring stick to verify clearance distances.

8.7.9 When it may not be possible to maintain the appropriate minimum distance between power lines and equipment, it shall be requested to de-energized lines and equipment.

8.7.10 When working on the lines, de-energize the lines, test all phases by beeper/ voltage detector and provide grounding set of same voltage level.

8.7.11 When circuits and apparatus are de-energized for work, they shall be grounded with grounding equipment on all sides of the location where the work is to be done, regardless of whether or not there is more than one source of supply.

8.7.12 Before the grounding clamps are applied, check to determine that the circuit or apparatus has been de-energized, also check health of the grounding cable.

8.7.13 The earth wires shall be connected to the temporary earthing rod, and should be placed preferably 6 meters away from the point of work, inside the barricaded area, where no one is present or able to touch it.

8.7.14 When working on the earthing lines or equipment by use of Portable Temporary Grounds (PTG) kit, first connect to temporary earthing rod and then to lines or equipment, while for removing Portable Temporary Grounds (PTG), first remove from lines or equipment and then from the temporary earthing rod.

8.7.15 Grounding cable shall be capable to conduct the same voltage level as the protective device supplying the conductor.

8.7.16 The GEPCO shall implement and document a system to verify that all established requirements in this paragraph are met. If it is observed that deviations and/or violations are present, the GEPCO shall determine and implement adequate actions to prevent and rectify these deviations and/or violations.

8.8 Emergency Management System

8.8.1 Emergency Management System is in place to reduce losses caused by emergencies in order to limit and control the consequences of incident.

8.8.2 Emergency drill is conducted at least once every three (03) months.

8.8.3 Drill is arranged in collaboration with local authorities.

8.8.4 The record of each drill is retained and preserved for period of one fiscal year.

8.9 Working on Energized Conductors and Apparatus

8.9.1 Only electrically experienced, trained and authorized employees/ contractors shall perform electrical work against approved “Permit to Work” under the continuous direction and supervision of the job in-charge.

8.9.2 Work on or handling of any energized electrical conductor, bus bar, etc. shall not be permitted without an approved insulated tool, instrument or handle unless one of the following conditions is met:

a. The employee is insulated or guarded from the energized part. (Insulated gloves with sleeves rated for the voltage involved shall be considered for insulation of the employee from the energized part.) Don't only wear leather (non-insulated) gloves when working on energized lines. Insulating sleeves shall be worn with insulating gloves in case exposing the employee elbow and upper arm to contact with other energized parts.

b. The energized part is insulated or guarded from the employee by portable rubber insulated mats or insulated working support/ blanket or any other non-conductive object such as plywood barriers that prevent accidental contact.

8.9.3 The hazard of falling/ touching of tools on live circuits/ breakers shall be understood by all concerned and appropriate precautions shall be taken.

8.9.4 If work is to be done on energized electrical conductor, bus bar, etc., effective supervision of site senior in-charge shall be ensured.

8.9.5 Hazards and appropriate protection for work on live circuits shall be effectively communicated to all concerned involved in the job.

8.9.6 The GEPCO shall implement and document a system to verify that all established requirements in this paragraph are met. If it is observed that deviations and/or violations are present, the GEPCO shall determine and implement adequate actions to prevent and rectify these deviations and/or violations.

8.10 Safe Practices for Transformer and Capacitor Installations

8.10.1 Only electrically experienced, trained and authorized employees/ contractors shall perform electrical work near energized equipment against approved Permit to Work.

8.10.2 Whenever physical protection is required because of close proximity, electrician's rubber protective equipment should be utilized to cover exposed electrical terminals such as transformer bushings, fuse cutouts, buses, etc. An alternate approach is to install portable rubber insulated mats or insulated working support/ blanket or any other non-conductive object such as plywood barriers that prevent accidental contact.

8.10.3 Work on Energized Transformer:

a. Every possible attempt shall be exercised to avoid working on energized equipment.

b. Job Safety Analysis shall be carried out before carrying out the job.

c. Appropriate personnel protective equipment to be used for the work.

d. When replacing fuses on the high voltage side of transformer, all possible secondary load shall be removed.

e. Insulating tongs, similar to insulated switch sticks shall be used to remove and install fuses.

f. Fuse cut-outs shall be opened or closed in a sure, positive manner by an experienced, trained and authorized employees/ contractors.

8.10.4 Work on De-Energized Transformer:

a. Dry Type Transformer.

- Job Safety Analysis shall be carried out before carrying out the job.
- Power transformer shall be de-energized, isolated and grounded.

b. Liquid-Immersed Transformer.

- Insulating oil shall be handled and stored where it will not be exposed to temperatures approaching the ignition point.
- Static charges can be developed when transformer oil flows in pipes, hoses, and tanks. Oil leaving a filter press may be charged to over 50,000 volts. Filter press, metal hoses, and tanks shall be grounded during oil flow into any tank to accelerate dissipation of the charge in the oil.
- All windings of a de-energized transformer that is having its oil circulated through a filter press or similar equipment shall be grounded for at least an hour after the oil flow has been completed.
- After any oil filtration work, the accumulated air on the transformer shall be released by opening the Buchholz relay vent after the transformer is cooled down.
- Terminals shall not be touched before they are adequately grounded.
- When any quantity of oil is added to a transformer it should remain de-energized for a period of at least 8 hours after filling is complete except while topping up transformer already filled with oil up to conservator or if the unit is filled under vacuum the time period can be shortened to 1 hour, and when small quantities of oil are added in such a way as to eliminate the formation of air bubbles.
- Precautions shall be taken to avoid developing static charges from oil flow in pipes, hoses, and tanks.
- Transformer should not be energized until oil cools down to ambient temperature

after oil circulation/ filtration.

8.11 Electrical and Mechanical Isolation

8.11.1 GEPCO shall ensure the electrical and mechanical isolation before any employee/ contractor performs any servicing or maintenance on machinery or equipment or any electrical apparatus, where the unexpected energizing, start up or release of any type of energy (electrical, kinetic, potential, thermal, chemical) could occur, cause damage to equipment, injury to personnel and/or environment can be adversely impacted.

8.11.2 All electrical circuit conductors and circuit parts shall be considered energized until the source(s) of energy is (are) removed, electrical energy discharged and de-energized through a mechanically secure connection to an effective ground potential. Electrical conductors and circuit parts that have been disconnected, but not under isolation, tested and grounded (where appropriate) shall not be considered to be in an electrically safe work condition, and safe work practices appropriate for the circuit voltage and energy level shall be used. Isolation requirements shall apply to fixed, permanently installed equipment, temporarily installed equipment and portable equipment.

8.11.3 In situation where it is not possible to lockout or chain off an isolating device, isolation may be accomplished by removal of fuses, disconnection of electrical cables, or physical removal of component of the system supplying energy to the equipment. The point of physical interruption should be identified with installation and securely fastening of "Danger Card/ Tag – Do Not Operate or Remove Tag" with purpose/ reason of installation, date and time of installation, isolating location/ equipment, Card/ Tag installer name, his badge number, contact number and signature. No individual shall attempt to remove Danger Card/ Tag except installer, after verification when it is safe to do so.

8.11.4 Up-to-date drawings shall be considered a primary reference source for isolation location. When up-to-date drawings are not available, the company shall be responsible for ensuring that an equally effective means of locating all sources of energy is employed.

8.11.5 All personnel who are required to actually do the electrical isolation shall wear proper PPE to ensure safe switching Off & On and applying isolation.

8.11.6 No individual shall attempt to start, energize, use, or operate a piece of equipment that has been isolated. The GEPCO shall implement lockout/ tag out (LOTO) systems to prevent any accidental energizing of equipment.

8.11.7 Isolation is completed only when no associated control device, such as a push button, control interlock or automatic start-up control circuit, shall have the capability of energizing equipment.

8.11.8 Verification test shall be conducted on each isolating device and on each piece of equipment isolated.

8.11.9 Sometimes de-energized circuits may become energized because of the following reasons:

- Switching errors,
- Unusual conditions which may bring an energized conductor into electrical contact with the de-energized circuit,
- Back feeding of current from any generating source i.e. Generator or UPS,
- Lightning strikes (All work on or near apparatus where a lightning strike may cause personal injury should be suspended immediately),
- Stored charges from capacitors, cables, transformers, motors, and generators.

8.11.10 Mechanical isolation of Vessels & Pipes can be achieved by any of the following:

- Valve closure with use of blinds at Inlet and Outlet.
- Removal of pipe spool with the use of blind flange.
- Double block & bleed with use of blind.
- Removal of mechanical couplings.

8.11.11 The blind shall be of the manufacturer recommended thickness and material.

8.11.12 The blind rating must be equal to the pressure setting of the pressure relief valve protecting the line or equipment.

8.11.13 If there is no pressure relief valve, then the rating must be equal to lowest rated equipment in the system (most likely pipe flange).

8.11.14 Each blind must have a handle that can be easily identified.

8.11.15 Prior to blind installation, the following documents need to be prepared:

- Blind list and the blind register.
- Marked Process and Instrument Drawing (P&ID) reflecting numbered locations of blinds.

8.11.16 Operation staff is responsible for identifying physical locations of blinds.

8.11.17 Permit to Work issuer and receiver shall cross check between the Process and Instrument Drawing (P&ID), blind list and the blind register before installation of blinds.

8.11.18 GEPCO shall establish and maintain systems to prevent the accidental removal of safety systems that would lead to unsafe situations. These systems include the implementation of lock out/ tag out (LOTO) systems.

8.11.19 When the job or task is completed, appropriate tests and visual inspections shall be conducted before electric circuits or equipment are re-energized to verify that all tools, mechanical restraints and electrical jumpers, short circuits, and temporary protective grounding equipment have been removed, so that the circuits and equipment are in a condition to be safely energized. All workers involved in these activities shall acknowledge that they have completed their work and understand that the system will be energized.

8.11.20 Operation staff shall physically verify the removal of blinds in field and update the blind register accordingly.

8.12 Scaffolding

8.12.1 GEPCO shall ensure minimum safety requirements for the erection, inspection, working and dismantling of scaffolding structure at site against approved Permit to Work.

8.12.2 Scaffolds shall be designed and constructed according to Good International Industry Practices. As a minimum a scaffold shall be equipped with safe access to all working floors, work floors that are covering the whole accessible area and are free of openings; protection to all sides where a fall hazard of more than 6 feet exists by a top-rail and a mid-rail.

8.12.3 All scaffold materials shall be inspected prior to use. Damaged material shall be removed from site.

8.12.4 Scaffolds shall be constructed by qualified scaffolds, which are trained in the right work methods as well as familiar with working at height requirements. Scaffolds will always be provided with fall protection with double lanyards when working at levels higher as 6 feet above the ground. They shall follow the 100% tie off rule.

8.12.5 Prior to the use of a scaffold, the scaffold shall be inspected by a qualified scaffold inspector. The inspection result shall be clearly marked at the entrance of the scaffold. Only qualified scaffolds are allowed on a scaffold that is not inspected or where the inspection results show the scaffold is not safe to use.

8.12.6 At least once every two weeks a scaffold will be re-inspected to verify it is still safe.

8.12.7 All scaffolds that are not inspected, show visible damage, are modified or have other safety concerns shall be closed-off for general workers until hazards have been rectified by scaffolds and the scaffold has been inspected.

8.12.8 The scaffold shall be protected from electrical hazards. Electrical conductors shall be de-energized and electrically grounded. Scaffold and platform shall not be less than 10 feet (Minimum Safe Distance) from energized electrical conductors, even greater distances are required at very high voltages.

8.13 Ladders

8.13.1 GEPCO shall ensure the inspection of all ladders before use and remove defective ladders. Ladder shall be properly secured at the top and provide stable footing while being used. Ensure ladders extend a minimum of 1 m (3 ft.) above the top landing point. In general, set ladders at a 4:1 slope. When climbing up or down any ladder, face the ladder and maintain three points of contact with hands free of materials. Metal ladder shall not be used when working on or near electrical equipment or conductors; use only non-conductive ladders.

8.13.2 All poles, towers and structure shall be carefully inspected before climbing to assure that they are in a safe condition for the work to be performed and that they are capable of sustaining the additional or unbalanced stresses to which they will be subjected. The types of abnormalities that should be checked are cracks, damages, and deteriorations in poles, towers and structure and its foundation.

8.13.3 If poles, towers and structure are unsafe for climbing, they shall not be climbed until made safe by guying, bracing or use mobile elevated aerial platform, man-baskets, man-lift or bucket mounted vehicle instead of ladder.

8.14 Excavations

8.14.1 Excavation shall be done against approved Permit to Work.

8.14.2 GEPCO shall establish proper excavation techniques including sloping/shoring as per soil type to minimize the risk of the cave-in and damage to the underground services (Utilities). Piping and cable detector should be used. When underground piping or electrical installations are suspected, mechanical excavators shall not be used until all obstructions have been exposed by manual digging.

8.14.3 As-Built underground utilities drawings should be considered to identify electrical cables/pipes. Appropriate parties shall be notified to isolate identified utilities before beginning any excavation in the area.

8.14.4 If electrical live cable de-energization is not feasible, the suitable protection measures should be applied such as, providing a wooden box around the cable, providing protective sleeve for the cable, insulating personnel and equipment from possible electrical contact. Insulation of hand tools. Adopting test trenches excavation method by using hand tools to unveil underground pipes and electrical cables, etc.

8.14.5 Ensure proper communication done with local authorities for road closure. Where there is a likelihood of public, vehicles or equipment falling into an excavation, suitable barriers shall be erected including fencing of the excavation area, supervision, flag-men, traffic control and other measures required to ensure the safety of public at all times. Blinking warning lights should be used during dark to mark the limit of the work.

8.14.6 Restrict the movement of heavy machinery or vehicles in surrounding of excavated area, to avoid any collapse.

8.15 Welding and Cutting

8.15.1 GEPCO shall ensure safety while performing welding and cutting work at site against approved Permit to Work.

8.15.2 Welding and cutting booth shall be covered with fire blanket to contain sparks during activity. Sufficient lighting to be provided once working at night.

8.15.3 Welding and cutting sparks shall not fall on gas cylinders, flammable materials or operating equipment.

8.15.4 Combustibles around the welding and cutting work area shall be removed.

8.15.5 Gas Testing shall be conducted as per Task Risk Assessment/ JSA/ Permit to Work at same elevation and above/ below elevation to test accumulation of explosive mixture.

8.15.6 Arrange trained Fire watch with adequate number of fire extinguishers.

8.15.7 Provide proper grounding during welding.

8.15.8 Use appropriate PPE for the job such as Welder Face shield, Mask, Leather Gloves and Welding Shade Number.

8.16 Hydro-jetting

8.16.1 Hydro-jetting activity for equipment cleaning:

a. All workers performing hydro-jetting job shall be trained and experienced for high pressure water jetting job and shall have the required certificate.

b. Provide and use task specific PPE for hydro-jetting activity such as helmet with strap, face shield over mono-goggles, cut-resistant suit, respiratory protection (when require for confined space), gloves for hydro-jetting grip, metatarsal boots and hearing protection (Noise more than 85dBA). Use specialized ultra-high pressure PPE suit for Ultra High pressure (40K Psi) for hydro-jetting job.

c. There are two levels of high pressure washing, based on the water pressure used:

- High pressure water blasting from 5,000 to 30,000 psi
- Ultra-high pressure jetting – greater than 30,000 psi

d. Ensure proper working of Dead Man handle of the hydro-jetting equipment before start of work.

e. Before attempting to inspect or adjust any component of the hydro-jetting machine, the Foot-Control Valves (dump valves) must be not pressed.

f. The anti-withdrawal device must be used on all flex lances, rigid lances and line moiling activities. The anti-withdrawal device must be securely attached to the equipment being cleaned.

g. Make arrangement for saddle holder for smaller equipment hydro-jetting, to prevent wrong holding of hydro-jetting gun.

h. Cover all sides completely by trampoline to avoid high pressure water jet escaping during hydro-jetting work.

i. Hydro-jetting shall be done against approved Permit to Work.

8.17 Ionizing Radiation

GEPCO shall establish, implement and maintain a program to ensure safe use, handling, managing, processing, operation, storage, transport and monitoring of radioactive materials, equipment and its waste such as gamma rays, X-rays, alpha particles, and beta particles, or indirectly such as neutrons, used for industrial purpose in compliance with applicable national and provincial legal requirements to protect people and the environment from harmful effects of ionizing radiation. GEPCO shall regularly monitor radiation workers, who are likely to receive an effective dose of radiation, for corrective and preventive actions.

9 GENERAL PROVISIONS

9.1 Scope & Application

This HSE manual primarily covers the electrical safety aspects of an electrical utility. However, there are several other work-activities, which are necessary for the smooth running of the system, and need certain precautions and safety guidelines. The same are included in this section.

9.2 Details of other Safety Rules, related documents & procedures

Among instructions supplementary to these rules, which contain information pertaining to safety are:-

1) Management Guide Lines.
2) Standing Instructions.
3) Work Procedures/SOPs.
4) Specifications.
5) Training Manuals.
6) Any other authorized departmental or local instruction.
7) Distribution Code.
8) Grid Code.
9) Manufacturers operating and maintenance instructions/ procedures.

9.3 Arrangements for the provision of information, instructions & training

1) All segments of GEPCO will be responsible for organizing and administering a safety program to develop safety culture among employees. The HSE directorate shall promote and monitor safety programs, safety drills & crash program in GEPCO on Regional, Circle and Divisional levels even at Sub Divisional level.
2) Management shall provide the employees adequate training, information and instructions, in phases so that they should become well acquainted to execute the assigned work safely. If any technical aspect / instruction regarding any equipment changes, it shall be conveyed in writing, as well as in seminars & safety workshops.

9.4 Arrangements for any variation to the HSE Manual

HSE rules express the minimum requirements of the employees and public safety. A variation in the Safety rules may be incorporated by the competent authority. These variations can be due to change in Government Policy, change in working and environmental conditions and review / feedback from employees, consumers, contractors, and suppliers & other reliable sources.

9.5 Provision for workers to object to do work on safety grounds

In situations where adherence to the safety rules is impractical, authorized departures or objections may be approved provided:

1) The authorizing authority has complete authority & accountability for issuing any departure or entertaining any objection from the HSE Rules.
2) The protection afforded will be equal to or greater than that intended by the HSE Rules, for each case.
3) A copy of the letter giving authorization to depart from the HSE Rules is forwarded to the next authority for record and possible revision.
4) The conditions, which may compel the workers, to object to do work on safety grounds are:
    i. Lack of knowledge of employees.
    ii. Non availability of proper T&P or defective T&P.
    iii. Unfavorable working atmosphere/conditions
    iv. Health problems of workers.
    v. Any flaw in the work procedures.
    vi. Emergency.

9.6 Accidents /Incidents Reporting (requirements, procedures and arrangements).

All the accidents/incidents whether major or minor, fatal or non-fatal, involving equipment or transport vehicles, related to GEPCO property, must be treated seriously as they result in loss. Accidents should be reported within 24 hours, analyzed and investigated to look for their causes and taking corrective measures to control and minimize their re-occurrence. The requirements, procedure and arrangements of reporting accident/incidents for development of a safe working culture are given hereunder:-

9.6.1 Requirements

1) Awareness of the employees regarding safety aspects of their routine work is the basic requirement of an effective and safe work program. Adherence to safety rules and follow up of safe work procedures will be very helpful to control and minimize accidents.
2) Education and training of employees, job planning, safety meetings and job safety analysis are the main areas of focus for identification of unsafe acts and conditions to promote safe working culture.
3) Every employee who suffers an accident during work is required to report such accident to the person in-charge.
4) Negligence to report accident, is punishable under Electricity Act of Pakistan and the service rules of the company.

9.6.2 Procedures

1) A proper reporting system should be developed, at all levels of supervision and management, comprising of the following:-

i. Standard format of reporting proforma (Refer to Data Section).
ii. Telephone nos. of rescue agencies i.e. Ambulance Services, Police Stations, Fire Brigade Stations, Hospital Emergencies, Blood Banks etc.

2) In cases, where the accident results or is likely to result in loss of life, the person in-charge of the apparatus / workplace (shall promptly convey the incident occurrence report telephonically via proper channel (through AM, DM & Manager concerned) and the same shall reach to the Chief HSE Officer without loss of time. However written report from the formation where accident occurred, shall reach to Chief HSE Officer within real time mode (as soon as completed) but the delay should not exceed 24 Hours. Upon receiving of such incident report either telephonically or written the Chief HSE Officer after due deliberation, will update to Chief Executive Officer GEPCO and all quarters concerned.

3) All accidents to the private public, caused by GEPCO personnel, vehicles or equipment, shall be promptly reported to the concerned Manager and Chief Engineer by the person in-charge.

4) Accidents/incidents which do not result in personnel injury should also be promptly reported to the person in-charge and appropriately investigated.

9.6.3 Arrangements

1) Adequate arrangements for prevention of accidents and incidents must be made for both the routine and emergent jobs. These arrangements include:

i. Use of portable temporary grounds on the apparatus to work upon.
ii. Use of barriers on the work area to avoid interference of un-authorized persons.
iii. Availability of first aid kits with all the working crews.
iv. Every accident shall be investigated to determine its causes and actions be highlighted to prevent its recurrence. It shall be the responsibility of the person in-charge to obtain complete information of the accident, immediately after its occurrence and ensure timely submission of the investigation reports to the respective authorities.
v. Because of the possibility of rabies, all animal bites shall receive immediate medical treatment and reported to the higher authority.

9.7 Use of personal protective equipment (P .P.E) and wearing of protective clothing

Suitable personal protective equipment (P.P.E) to provide head protection, ear protection, eye protection, foot protection, hand protection and body protection shall be used. All the P.P.E should be as per standards, specifications and design, duly approved by GEPCO, such as safety hat, goggles, cotton gloves, leather gloves, insulated rubber gloves, ear muff, dangri, overall coat, apron, safety belt/ parachute harness etc.

1) For **head protection**, approved and suitable non-conducting hard hats shall always be used, by the workers, while working in switchyards and overhead transmission lines, against falling objects and direct head striking with doors, windows, panels, steel structures etc.
2) For **protection of ears**, approved ears muffs shall be used by all the workers, when working on air blast circuit breakers and other severe noisy areas.
3) For **eye protection**, approved safety goggles shall always be worn, wherever there is danger of exposure of the eyes to flying particles, acids, caustic substances, harmful light/ rays, electrical flash, or any condition, considered hazardous by the employee or the person in-charge. Some of the work activities / operations which require the use of eye protection are:
   a. Oxy-Acetylene welding or cutting.
   b. Electric welding or flash.
   c. Chipping and grinding.
   d. Drilling, cutting or breaking masonry.
   e. Handling or using acids or caustics.
   f. Handling molten metal or slag.
   g. Cleaning with compressed air.
   h. Closing fused cutouts.
4) For **foot protection**, approved insulated safety shoes, with steel/ hard plastic toe, shall be used by all workers against direct hit from material or falling objects, to avoid injury.
5) For **hand protection**, approved cotton gloves, leather gloves and insulated rubber gloves shall be worn, against direct electrical contact and other injurious elements, such as heat, chemical and mechanical energies etc.
6) For **body protection**, approved dangri, overall coat, apron etc. shall be used while on work in switchyards, workshops and transmission lines. Where protective clothing is not specifically required, employees' personal clothing shall conform to accepted standards of safety. "Sandals" and "Shalwar Kamiz" shall not be acceptable for working aloft and on rotating machines.
7) Wearing of conducting material made wrist watches, ring, bangles, optics should be avoided when working on electrical wiring or other low voltage installations to eliminate the chances of short circuits / electrical contact.

8) While working aloft in the switchyard or transmission lines, approved safety belt / parachute harness shall be used for protection against falling hazards and travel restrictions.

9.8 Physical fitness and personal conduct of the workers before and during the job

9.8.1 Physical Fitness

1) An employee is responsible for maintaining a level of physical fitness, appropriate to the requirement of the job.
2) Employees who are unable to perform their duties safely, due to illness or other disability, shall promptly report their condition to the person in-charge.

9.8.2 Personal conduct

1) Employees are expected to be alert and business-like in their work & courteous and considerate in all their contacts.
2) Employees shall not perform any work while under the influence of the substance like alcohol, drugs or narcotics etc.; which affects their ability to work. The person in-charge shall not permit an employee to go to work who is under the influence of such substances.
3) Practical joking or horseplay, while on the job, is prohibited.
4) No employee shall distract the attention of other workers from their jobs, until it is definitely determined that no danger will result.
5) Employees shall not ride on cranes, tractors, bulldozers, forklift trucks or other mobile equipment except in the discharge of their duties.
6) Employees shall not ride on a vehicle with any part of the body exposed outside the vehicle. All employees shall be seated.
7) Compressed air or gas shall not be blown at fellow employees, nor be used for dusting clothing or any part of the body.

9.9 Arrangement and procedure of job planning before start of work

Prior to undertaking any job, it is necessary to plan it so that the execution may take place in a safe and productive manner. Jobs are executed more efficiently and effectively when planned well and all concerned know what is expected. Following are the various steps for proper job planning:-

1) Follow work program.
2) Arrange maintenance procedures.
3) Arrange equipment manuals and drawings.
4) Arrange previous maintenance record.
5) Arrange adequate spares.
6) Arrange the required T&P and test equipment.

7) Estimate and arrange to meet the expenditure involved.
8) Estimate the man hours and the time required to complete the job.
9) Arrange co-ordination of other work groups (P&I, T/L etc.), if needed.
10) Arrange outage of the equipment, if needed.
11) Inspect the job site to look for:
    a. Hazards.
    b. Equipment to be de-energized for safe working clearances
    c. Isolation points and grounding facilities.
    d. Aerial devices such as scaffold, bucket truck, ladders and cranes etc.
    e. Availability of enough room/space for aerial devices and ground conditions to permit their fixing and movement.
    f. Approach roads condition.
    g. Any other information necessary for execution of the job.
12) Conduct a tailboard conference.

9.10 Procedure and arrangement for reporting Hazard s which can cause accidents

"ELIMINATION OF UNSAFE ACTS AND UNSAFE CONDITIONS IS THE ONLY SURE WAY TO MINIMIZE ACCIDENTS"

1) When employees receive a report on a hazardous condition of apparatus, they shall obtain from the informant his name, location and all available information relating to the hazardous condition and report this information to the controlling authority. The controlling authority may isolate the apparatus in question or have the important or anyone else stand guard over it, until the hazard is removed, or other suitable arrangement made, and may guarantee reimbursement for this service.
2) In the event of an employee requesting informant to stand guard over the hazardous condition, shall be positively warned not to touch any conductor, guy etc. under any circumstances.
3) When trouble is reported by non-employees, such report shall be recorded in the Substation Order Book. However, due care must be taken for identification and elimination of the hazards by following the guidelines given below:-
    i. Elimination of unsafe acts and conditions is the only sure way of preventing personal injuries and accidents and danger to property.
    ii. Every employee shall watch for any unsafe condition or practice and take corrective action by reporting each instance to the person in-charge. Examples of some hazardous conditions are as under :-
        - Broken phase wires
        - Damaged or faulty insulators.
        - Burns on conductors, insulator pins, iron work or pilot cable.
        - Damaged cross arms.

- Broken strands of stranded conductors or ground wires.
- Uneven sagging of line.
- Leaning towers/poles.
- Ground disturbance at or adjacent to tower and pole foundations.
- Dangerous branches of trees.
- Loose stay wires.
- Dead birds near route.
- Construction of new roads, buildings, or other structures near the line.
- Erection of new telephone, telegraph or other lines by other departments near GEPCO lines.

4) Where a hazard cannot be removed or corrected immediately, adequate safety precautions shall be taken. If possible, substitute less harmful alternative for the hazardous process. Isolate the hazards to prevent it from expending.

9.11 Requirements to safeguard the public and property when work is in progress

1) Every effort shall be made to protect the public at all times when GEPCO work is in progress, by the use of signs, barricades or personal warning.
2) When work is conducted along public streets or highways, pedestrians and vehicular traffic shall be warned in compliance with applicable standards.
3) Where necessary, open manholes, ditches and excavations shall be barricaded or substantially covered to prevent pedestrians, animals or vehicles from falling into them.
4) During the night and in all dark locations, lights or torches should be in place at any obstruction, excavation or opening which is likely to cause injury to employees or to the public and property.
5) When working on customer's premises or public property, every effort shall be made to avoid hazards to customers or public and their property. Tool, excess material & scrap shall be removed when the job is completed.
6) No employee should smoke or use matches or open flames on customer's premises unless it is positively known that such action does not conflict with the customer's rules, wishes &safety.

9.12 Requirement for housekeeping in operational premises for safe working conditions

All GEPCO premises in the interest of safety, fire prevention and hygiene shall be kept clean and orderly at all times like our own houses. The following instructions should be followed:-

1) Walks, aisles, stairways, fire escapes and all other passageways shall be kept clear of all obstructions.
2) Any floor or wall opening shall be guarded with standard railings and toe boards. Other means of temporary protection may be used only with an observer present.
3) Tools and Plants shall not be placed where they may cause tripping or stumbling hazard, or where they may fall and strike anyone below.

4) Adequate measures shall be taken to overcome slipping hazards which may exist.
5) Nails in boards, such as those removed from scaffolds, forms and packing boxes shall be removed. The boards shall be carefully stacked or stored.
6) Work areas and vehicles shall be neat and orderly at all times.
7) Scrap bins (dust bins) should be provided and used for broken glass, insulators, sheet metal scraps, used pressurized containers and other waste material.
8) Scrap material of salvage value should be properly stored until disposed of.
9) Dirty and oily waste rags shall be deposited in approved metal containers provided for the purpose, and be disposed of as soon as possible to avoid fire hazard.
10) To avoid strain from improper handling of boxes and bundles of office supplies, ledgers, portable filing cases and office machines, lifting should be done with back erect by using more powerful leg muscles.
11) Large boxes or bundles of supplies shall be moved by a hand truck, or unpacked and delivered in smaller parcels. Bulky objects shall not be carried in such a way as to obstruct the view ahead or interfere with free use of handrails on stair ways. Get help where necessary.
12) Conservative shoes should be worn to prevent slipping on floors or tripping on stairways.
13) Water, oil or other liquid spilt on floors presents a dangerous slipping hazard, and shall be cleaned up at once.
14) Loose objects such as matches and pencils shall not be left on stairs or floors.
15) Unprotected extension cords shall not be strung across aisles or walkways where people may slip or fall over them.
16) Desk or file drawers of desk slides shall not be left open.
17) Standing on chairs, boxes and other makeshift supports shall be avoided. Only approved ladders or equipment shall be used to reach the objects overhead.
18) Doors should be opened slowly to avoid striking anyone on the other side.
19) Running in aisles, corridors, and on stairways is prohibited. Use the handrail when going up or down stairways.
20) In walking, particularly at blind corners, employees should always keep to the left.
21) Use extreme care in opening file cabinet drawers. Opening of over- loaded upper drawers, particularly more than one at a time, may slip over the cabinet. Where several tiers of cabinets are used at one location, they shall be fastened together.
22) While using power operated office machines, avoid touching any earthed metal object such as a radiator or water pipe. Defects in the cords or machines shall be reported and promptly repaired.
23) Pins shall not be used to fasten papers together. Use paper clips or stapling machine.

24) Pointed objects, such as uncapped fountain pens, pencils, knives or scissors should not be carried with the point exposed in the pockets, attached to the clothing, or through congested aisles or working areas.

25) Gummed strips of envelopes should be moistened with suitable device, not with the tongue. Avoid opening envelopes with fingers and sliding hands along edges of paper.

26) Except in proper holders, safety-razor blades shall not be used for cutting paper, sharpening pencils or other cutting operations. Do not keep razor blades or other sharp instruments loose in desk drawers.

27) Used pressurized containers, broken glass or other sharp objects shall never be placed in waste baskets, but should be safely wrapped, identified and left beside the waste basket for removal.

28) Keep finger away from cutting edge of paper cutters. The cutting knife on hand operated cutter shall never be left raised while unsupported; it shall always be closed when not in use. Machine operated cutter shall be properly guarded to prevent accidental contact with the cutter.

9.13 Requirements & arrangement of fire protection.

Fire prevention requirements of GEPCO properties shall be governed by local GEPCO firefighting provisions, specific instructions of the equipment manufacturers, government and municipal by-laws. All fire hazardous areas such as Battery Rooms, Oil Stores, and Welding Shops etc. shall be kept under strict vigilance to prevent the possible fire outbreak activities.

9.13.1 Requirements of fire protection

1) All fire exits shall be properly marked and kept clear.

2) All fire protection and• firefighting equipment such as fire

3) Extinguishers, sand buckets, fire doors and dampers, exit lighting etc., shall be maintained in proper operating condition. Sand/water buckets shall be kept filled. Recharge and return fire extinguishers and fire buckets to their position as soon as possible after use.

4) Never use a fire bucket, fire hose or fire sand for any purpose other than firefighting.

5) Good housekeeping shall be practiced in all buildings and vehicles to prevent the accumulation of flammable and/or combustible material.

6) Flammable liquids shall be kept in approved cans and identified by proper labels.

7) Open flames and smoking are prohibited in all areas where flammable liquids or gases are stored or being used. Such areas shall be pasted with appropriate warning signs.

8) Avoid use of matches or open flames. Prevent electric sparks in areas where combustible gas may exist such as gas-filled electrical equipment, or in manholes, vaults, battery rooms, in proximity to batteries, transformer or oil circuit breaker tanks etc.

9) Never use defective electrical equipment, which can cause short circuits or arcing during use.

10) Never wear defective protective clothing.

11) Never enter a smoke-filled compartment or building without breathing apparatus and an attendant standing by.

12) Never leave idle electrical equipment without disconnecting it or switching off at the main.

13) Never throw a lighted match or cigarette end away. Put it in proper receptacle.

14) Never interfere with the wiring and fittings of the equipment.

9.13.2 Arrangement for fire protection

1) All employees shall be familiar with the location and proper use of fire extinguishers in their work area.

2) To extinguish fire:

   i. For ordinary combustible material such as paper, rubber, textile, wood or rubbish, use approved Type "A" extinguisher.
   ii. For gasoline, oil, petrol, alcohol, grease or other liquids, use approved Type "B" extinguisher.
   iii. For burning gases, acetylene, propane, butane, methane etc. use only approved Type "C" extinguisher.
   iv. For combustible light metals such as lithium, sodium, magnesium, calcium etc. use approved Type "D" extinguisher.
   v. For electrical plant fires, use only approved Type " E " extinguisher

3) Fire doors and dampers shall be identified and shall never be tied, blocked in the open position, or otherwise made inoperative.

4) Access to fire extinguishers and other fire protective equipment shall not be obstructed.

5) Each GEPCO vehicle shall be equipped with an approved fire extinguisher. It shall be the duty of the driver of the vehicle to ensure that such extinguishers are in good condition and are refilled immediately after use.

6) At grid stations, offices and other buildings suitable fire and smoke protection systems should be installed.

7) Use of fire resistant or fire retarding materials shall be encouraged.

8) On main and costly equipment at grid stations such as power transformers, automatic fire detection and water sprinkling system should be installed.

9) In order to reduce the danger to life and assets, to the minimum, an emergency plan should be prepared & ensure its availability and updating of knowledge / training of the employees. It will be most appropriate if emergency fire protection and rescue rehearsals / drills are exercised at regular intervals.

10) Fire and smoke detectors should be checked / tested at regular intervals to ensure their correct functioning.

11) Indication bulbs of fire/ smoke detection system must always be kept in order.

9.14 Use of tools, plants, material and care in their storage, lifting and carrying

9.14.1 Ladders and scaffolds

1) All ladders shall be inspected at regular intervals and maintained to conform to the requirements of applicable standards.
2) The strength of ladders made of fiberglass epoxy or other synthetic material shall be equal to or exceed that of approved wooden/bamboo ladders.
3) Portable metal ladders should be grounded before use.
4) Wooden/bamboo ladders should be given a suitable protective coating such as clear varnish or linseed oil. Metallic paint shall not be used on ladders. A paint which hides the grain shall not be used because it hinders detection of defects.
5) When a ladder has fallen or been struck, it should be carefully examined for possible damage before reuse.
6) Damaged ladders shall be tagged "DANGEROUS - DO NOT USE" until repaired or cut to shorter length.
7) All portable ladders shall be securely held in place by tying or by person at the base of ladder.
8) The base of a ladder should not be placed less than ¼ of its working length from a wall or supporting surface and not farther than 1/3 of the working length unless securely held.
9) Stepladders shall not be used in a partially opened position.
10) Ladders placed near doors or in passageway shall be protected against being struck by doors or traffic.
11) The minimum overlap of sections of an extension ladder shall be
    - On ladders up to 12 meters - 0.9 meter overlap
    - On ladders 12 to 18 meters - 1.5 meters overlap.
12) While going up or down a ladder, always face the ladder and use both hands for climbing. Use each rung.
13) Use the correct size ladders for the job. Ladders should not be climbed higher than the third rung from the top on straight or extension ladders, the second step from the top on ordinary stepladders.
14) Ladders used to gain access to roofs or platforms shall extend at least 1 meter above the roof or platform.
15) Footwear should be free of grease, and/or other slippery substances when climbing or descending a ladder.
16) Ladders should not be stored in the area subject to excessive heat or moisture.
17) Scaffolds shall be of sound material, securely fastened and be capable of supporting four times the maximum intended load which may be placed on them. Wire synthetic or

fiber rope used for scaffold suspension shall be capable of supporting at least six times the maximum intended load.

18) Wood planks used in scaffolds should not be less than 25.4cm wide and 5 cm thick and shall not extend beyond the outer supports more than 31 cm nor less than 16 cm. All scaffold planking shall overlap a minimum of 31 cm or be secured from movement.

19) Guardrails and toe boards shall be installed on all scaffolds which are 3 meters or more in height, and those immediately adjacent to excavations, deep water, machinery, or other sources of danger.

20) Where persons are required to work or pass under scaffolds, the scaffolds shall be equipped with a screen between the two board and guardrail.

21) When working from swinging or suspension scaffolds, the following precautions shall be observed:

i. Inspect all ropes, slings, hangers, platforms and other supporting parts before installation and periodically during use.
ii. In addition to required guardrails and toe board, each worker shall be protected by a safety belt attached to a lifeline secured independently of the scaffold.
iii. Never overload a scaffold.
iv. Use only bolts and hitches which are in good conditions and properly secured.
v. Always tie the fall lines to the scaffold itself, never to any part of the structures.
vi. When using acid or caustic solutions use only treated or protected ropes and take every precaution to keep the chemical from getting on scaffold ropes.
vii. Do not perform welding, burning or open flame work from scaffolds supported by fiber or synthetic rope.
viii. Do not jump onto or off scaffolds or climb or slide down suspension ropes.
ix. Remove all loose objects from scaffolds when stopping work for longer duration.
x. Be sure to lash the scaffold to some permanent support so that in case of storm it may not swing violently.

22) Slippery conditions on scaffolds shall be eliminated as soon as possible.

9.14.2 Painting works

1) Employees using paints, lacquers or thinners shall avoid inhaling the vapors or getting paint into the mouth. Wash hands carefully before eating.

2) Do not use or go near open flames, while wearing clothing contaminated with paint or thinner.

3) Painting rooms or any place where spray painting is being done shall be well ventilated by exhaust systems and protected against all sources of ignition.
4) Smoking, welding, burning or other open flame is prohibited where spray painting is being done.
5) Approved mask and eye protection shall be worn during spray painting.

9.14.3 Storage

1) The material shall be stored in such a way that its weight is evenly distributed and not top-heavy.
2) All materials stored in tires shall be racked, stacked, blocked, interlocked or otherwise secured to prevent sliding, falling or collapse.
3) Designated aisles and passageways shall be kept clear to provide free and safe movement of material handling equipment or employees.
4) Sand, gravel, lime, cement and other heavy materials shall not be stored above ground level.
5) Poles, pipe, lumber and similar material should be stored on suitable racks and safely blocked to prevent their movement.
6) Poles/structures shall never be stored with cross arms, steps or hardware attached.
7) Poles/structures stored along highways shall be placed in a safe position away from the edge of the roadway, and blocked, if required, to prevent their movement.
8) Barrels, drums and tins shall be stored on end or securely blocked to prevent rolling.
9) Paints, varnish, lacquers and thinners are highly flammable and shall be stored only in designated areas away from all possible sources of ignition.
10) No materials or equipment shall be stored under energized lines, or near energized equipment.

9.14.4 Manual lifting and carrying loads

1) Employees shall not attempt to lift loads beyond their capabilities.
2) Before attempting to make a lift, the conditions under foot shall be checked to determine soundness, slipperiness and freedom from trip hazards.
3) Free style method of lifting means lifting light loads in a way best suited to the individual's physique, against the conventional straight back & bent knees method used for heavier lifts.
4) When lifting or lowering heavy objects, the back should be kept close to vertical and the lifting or lowering done with the leg muscles.
5) Bulky loads should be carried in such a way as to permit a clear view ahead.
6) When two or more workers are lifting or pulling together one worker shall give the signals for the group.
7) Pipes, conduits, reinforcing rods and other conducting material should not be carried on the shoulders or raised over the head near exposed live electrical equipment/conductors.

8) Hand lines or hoists shall be used for raising or lowering tools and material to another level, which is beyond reach.

9.14.5 Handling Poles, Towers & Structures etc.

The following safety guidelines shall be considered while handling poles, towers, structures and conductors.

1) When unloading or loading poles / structures, workers shall work at the ends of the poles/ structures, wherever possible.
2) Poles/ structures placed on piles or racks shall be securely blocked to prevent movement.
3) Poles / structures loaded on trailers or vehicles shall be securely bound together and also to the trailer or vehicle before toeing.
4) Auxiliary safety chains shall be used at all times between truck and trailer being towed.
5) Poles / structures being transported along streets & highways, shall be plainly marked, at the rear, with red flags by day and lights by night. Regulations, covering the movement of loads upon streets and highways, shall also be observed. Precautions shall be exercised to prevent blocking of roadways or endangering other traffic.
6) When setting or removing poles / structures in energized lines, care shall be taken to keep the pole / structure from coming in contact with live conductor.
7) Pole I structure holes and trenches shall not be left unattended or unguarded in areas, where they present a hazard to the employees or public.
8) All trenches, including pole/ structure holes, into which the employees are to enter, shall conform to the guidelines for excavation.
9) GEPCO drivers, officials will observe defensive driving practices, follow road speed limits, adhere traffic signals/ signs and traffic rules. Vehicle, cranes fitness certificates to be ensured by respective Circle(s)/Division(s)/ Division(s).
10) GEPCO drivers, officials will observe defensive driving practices especially during unsafe environmental conditions e.g. during raining, fog, smog, thunder storms, earthquake and at night hours.
11) To assure the stability of mobile cranes, their work site shall be graded and leveled for firm foundation.
12) No one shall be permitted to stay under a metal tower, structure, or transformer, which is in the process of erection or assembly, except as required to guide or secure the section being set. The hoist line shall not be detached from the tower or structure section, or transformer, until the section has been adequately secured.

9.15 Procedure and reporting requirement of foot patrolling of lines

The objective of foot patrolling of transmission & distribution lines is to identify the mechanical & electrical defects and point out other problems that require further attention and corrective measures, for smooth and reliable performance of lines.

9.15.1 Procedure for foot patrolling

1) Foot patrolling shall be done at least twice a year on all transmission & distribution lines
2) Line patrolling should be performed with caution. Patrollers shall be alert to avoid walking into fallen wires or metal fences that may be energized.
3) Patrollers should be alert and avoid stumbling hazards, poisonous plants and snakes.
4) Patrollers shall break all matches and crush all discarded smoking tobaccos lying in the vicinity of lines.
5) The report of line patrolled shall be made on patrol books as per transmission & distribution lines maintenance package

9.15.2 Points to be noted during line patrolling

During line patrolling, shortcomings/defects in the following important areas should be identified and noted by the patrollers:

1) Towers / structures - footings, stubs/base plates, counterpoise, towers/ structures members/braces, anti-climbing devices, step bolts, nuts & bolts, painting, warning and identification signs (such as number plates, danger plates and phase plates), guys end fittings, guy wire, anchor rods and other transmission & distribution lines hardware.
2) Careful check of alignment & plumbing / grouting of structures & poles.
3) Careful check of leaning of structures & poles & backfilling.
4) Healthiness of the line conductors and their safe clearances from ground, phase to phase and from surrounding structures, trees and buildings etc., throughout the line length. Careful check for broken or burned strands, improper conductor joints, abnormal spans, foreign items & dead - end points etc.
5) Construction of near roads, buildings or other structures near the line.
6) Healthiness of insulators in all respects.
7) Erection of new telephone, telegraph or other lines by other departments near the GEPCO lines.
8) Healthiness of cross arms in all respects.
9) Careful check for earth connections of poles / structures, transformers, capacitors & lightning arresters etc.
10) Healthiness of distribution transformers in all respects (specially "rora" fuses / improperly rated fuses, earthing, oil leaks, chipped or damaged bushings, loose connections etc.).
11) Healthiness of capacitors, voltage regulators, recloser, sectionalizes etc. in all respects
12) Any other defect noted by the patrollers.

9.16 Procedure for tree trimming.

1) Branches and limbs shall not be dropped outside the barricaded area on streets, highway and sidewalks.
2) If a tree is to be climbed, ladder shall be used whenever possible. When climbing trees, workers should inspect the limbs to make sure they will hold their weight.
3) Employees working in trees shall always use safety harness, saddle or belt with life line attached in such a way that, if they lose their footing, they will fall away from electric conductors or other hazards.
4) Axes shall not be used aloft when trimming trees.
5) All tools shall be raised and lowered by hand-lines in such a way as to avoid touching energized conductors.
6) Parts of trees in contact with energized conductors shall be handled as energized conductors.
7) Before cutting down a tree, all limbs shall be cut off for a sufficient height to avoid striking electric conductors. Ropes shall be used to control the direction of the fall when necessary.
8) The trees in the vicinity of any energized lines should be trimmed carefully.
9) During tree trimming the line should be de-energized and portable temporary grounds applied.
10) The tree trimming area shall be marked and proper barriers be applied.
11) For disposal of brush, fire shall not be started in locations where smoke may interfere the traffic on road. Fire shall not be started in locations where the heat may damage power and communication equipment.

9.17 Common protective devices and equipment used for safety purposes

The commonly used protective devices and equipment are as given below:

A. SWITCH YARD

a. **10 MVA Power Transformer & Below**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	Chemical Foam(Trolley Mounted)10Gallon	1		1
ii.	Sand Container with covered and shovel	1		1
iii.	Sand Fire Bucket (06No. In one stand)stand for1-3 Power Transformers including Connected C.Bs	2		2
iv.	Sand Fire Bucket (06 No. In one stand) stand for 4-5 Power	4		4
v.	Sand Fire Bucket (06 No. In one stand) stand for 6-7 Power Trans	6		6

Not applicable for 132KV-----

b. **ABOVE 10MVA POWER TRANSFORMER**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	Chemical Foam(Trolley Mounted)10Gallon	2		2
ii.	Sand Container with covered and shovel	1		1
iii.	Sand Fire Bucket (06 No. In one stand) stand for 1-3 Power Transformers including Connected C.Bs	3		3
iv.	Sand Fire Bucket (06 No. In one stand) stand for 4-5 Power	5		5
v.	Sand Fire Bucket (06 No. In one stand) stand for 6-7 Power Trans	7		7

Not applicable Item "iii & v" at 132kV -----

c. **CIRCUIT BREAKER**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	Chemical Foam 10 Gallon for 3-C.Bs	1		1
ii.	Sand Container with covered and shovel for 2-C.Bs	1		1
iii.	Sand Fire Bucket (06 No. In one stand) stand for each C.B	1		1

d. **BULK OIL CIRCUIT BREAKER**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	Chemical Foam (Trolley Mounted) 10 Gallon for 3-C.Bs	1		1
ii.	Sand Container with covered and shovel for 2-C.Bs	2		2
iii.	Sand Fire Buck et (06 No. In one stand) stand for each C.B	1		1

Not applicable for 132KV-----

e. **POWER TRANSFORMERS & CIRCUIT BREAKER**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	Foam type (Trolley) 10 Gallon Capacity for 1-3 Power Transformers including connected circuit breakers. other than bulk oil CBs.	2		2
ii.	Foam type (Trolley) 10 Gallon Capacity for 4-5 Power Transformers including connected circuit breakers other than bulk oil CBs.	3		3
iii.	Foam type (Trolley) 10 Gallon Capacity for 6-7 Power Transformer including connected circuit breakers other than bulk oil CBs.	5		5
iv.	Foam type (Trolley) 10 Gallon Capacity for 02No. Bulk Oil Circuit Breakers.	1		1
v.	Foam type (Trolley) 10 Gallon Capacity for more than 02 No. Bulk Oil Circuit Breakers.	2		2

Not applicable Item "i, iii, iv & v" at 132kv-------

B. CONTROL ROOM BUILDING

a. **11KV SWITCH ROOM**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	CO2 Trolley Mounted Twin Cylinder 20KG each Capacity 40KG	1		1
	or			
	CO2 Trolley Mounted Twin Cylinder 10KG each Capacity 20KG	2		2
ii.	Chemical Foam 02 Galion Capacity	5		5
iii.	Portable CO2 Capacity 5kg to 7kg for each Incoming	1		1

iv.	Sand Container with covered and shovel	2		2
v.	Sand Fir Bucket (06 No. In one stand) stand	1		1

Item at No. "V" Not applicable for 11KV room as per instruction------

b. **66KV & 132KV CONTROL ROOM**

No.	Fire Extinguisher Type	Quantity in No		
		Actual	Present	Require
i.	CO2 Capacity 5kg to 7kg	3		3
ii.	Chemical Foam 02 Gallon Capacity	3		3
iii.	Sand Container with covered and shovel	1		1
iv.	Sand Fire Bucket (06 No. In one stand) stand	1		1

Item at No. "iv" Not applicable for 132kV room as per instruction ------

9.17.1 Protective Equipment

- Goggles.
- Hard Hat.
- Leather Gloves.
- Insulating Rubber Gloves.
- Safety Shoes.
- Dangri, Overall Coat, Apron etc.
- Cotton Gloves.
- Safety Belt/Parachute Harness.
- Ear Muff.
- Ladders.
- Operating Rods.
- Insulated Pliers.
- Scaffolding.
- Hand Lines.
- Potential Testers/ Detectors.

- Portable Temporary Grounds.
- Earth Resistance Testers.
- Continuity Testers.

9.17.2 Care of insulating protective equipment

1) All insulating protective equipment shall be of approved material, carefully inspected and properly stored.
2) When not in use, insulating protecting equipment shall be shielded from sunlight, heat, water and oil.
3) Protective equipment shall be visually inspected before its use. In addition, an air test shall be performed on insulating rubber gloves prior to use.
4) Protectors furnished for use with insulating gloves shall be used only with insulating gloves and at no other time.

9.18 Ropes used in Rigging

There are two types of ropes commonly used in rigging; fiber rope and wire rope.

9.18.1 Fiber Rope

Fiber ropes are made from either natural or synthetic fibers. The natural fibers come from plants and include manila, sisal and hemp, while the synthetic fibers include nylon, polypropylene and the polyesters. The strength of these ropes depends on their size, the fiber used and the type of stranding.

1) **Natural Fiber Rope**

The most commonly used natural fiber ropes are manila and sisal. However, No.1 grade manila rope is considered most suitable for rigging.

2) **Synthetic Fiber Rope**

The most commonly used synthetic fiber ropes are nylon and polypropylene rope. Synthetic ropes are stronger than natural fiber ropes. Nylon has strength about 2.5 times that of manila**.**

3) **Safe Working Load {SWL) of Manila Rope**

The safe working loads of different types of fiber ropes are generally recommended by the manufacturer. However, the following rules work well for new manila ropes to compute their SWL in pounds when load tables are not available.

- Change the rope diameter into eighths of an inch.
- Square the numerator and multiply by 20

Example:

a. 1/2 inch manila rope,
SWL=4x4x20=320Ibs = 4/8 inch diameter

b. For 5/8 inch manila rope

SWL = 5x5x20 = 500Ibs = 5/8 inch diameter

c. 1 inch manila rope
SWL = 8x8x20 = 1280Ibs = 8/8 inch diameter

4) **Factor of safety**

Fiber ropes have a factor of safety to account for loading over and above the weight being hoisted and for reduction in capacity due to:-

1. The reduced capacity of the rope below its rated strength due to routine usage, wear, broken fibers, broken yarns, aging, variations in size and quality.
2. Extra loads imposed by acceleration and inertia (starting, stopping, swinging and jerking of the load).
3. Increase in line pull due to friction of the rope passing over sheaves.
4. Inaccuracies in the weight of the load.
5. Reduced strength due to bending over sheaves.
6. Reduced strength because of drying out, mildew and rot.
7. Severe strength reductions caused by knots in the rope.
8. Weakened yarns due to ground in dirt and abrasives.

There may be other factors which describe why the safe working loads must never be

$SWL = \frac{\text{Breaking Strength}}{\text{Factor of Safety}}$
For example, a rope rated at 1500 lbs. breaking strength, will have a safe working load of 300 lbs. $\frac{1500 \text{ lbs.}}{5} = 300 \text{ lbs}$

exceeded. The factor of safety does not give you extra usable capacity.

The factor of safety for all fiber ropes is 5 and when used to hoist or support personnel it is 10.

9.18.2 Wire Rope

Wire rope consists of many individual steel wires laid into a number of strands which are, in turn, laid around a center core. The type and size of wire used, the number of wires in the strands, and the type of core determine the strength of a wire rope of the given size.

1. **Safe Working Load (SWL)**

   The safe working loads of different types of wire ropes are generally recommended by the manufacturer. However, the following rule applies for new wire ropes to compute their SWL, in tons, when load tables are not available.

SWL = 8 d^2 Where d = Rope diameter

Example

a. For½ inch diameter rope SWL = 8 x $(1/2)^2$ =2 tons.
b. For 5/8 inch diameter rope SWL = 8 x $(5/8)^2$ = 3.125 tons.
c. For 1 inch diameter rope SWL = 8 x $(1)^2$ = 8 tons

2. **Factor of safety**

   To guard against failure of a wire rope in service, the actual load on the rope should only be a fraction of the breaking load. To account for all the stresses placed on a rope during a hoisting operation and to provide the margin of strength necessary for safe handling of loads and guard against accidents, it is necessary for the rope to have a "Factor of Safety".

$$\text{Factor of Safety} = \frac{\text{Catalogue Breaking Strength of the Rope}}{\text{Maximum safe Working Load}}$$

For rigging ropes, the minimum acceptable factor of safety is 5, and when used on equipment that is intended to carry personnel, it should be considered 10.

Breaking Strength

SWL= ----------

Factor of safety

EXAMPLE: If thewireropecataloguegivesthebreakingstrengthoftherope10tons, the maximum safe working load:

10Tons

SWL= ---------- =2Tons.

5

Too often the factor of safety is treated as reserve strength and used for additional capacity, but it is not correct.

The factor of safety accounts for:

- Reduced capacity of the rope below its stated breaking strength due to wear, fatigue, corrosion, abuse, and variations in size and quality.
- End fittings and splices which are not as strong as the rope itself.
- Extra loads imposed by acceleration and inertia (starting, stopping, swinging and jerking of the load).
- Increase in line pull (load on the rope) due to frictions of the rope passing over sheaves.

- Inaccuracies in the weight of the load/rigging.
- Reduced strength of the rope due to bending over sheaves.

This list of variables is not complete. It is intended to show why a factor of safety is required and why it must never be lowered.

9.18.3 Care of ropes and slings

The quality and strength of ropes can be maintained by taking following precautions:

1. Where a rope / sling pass over sharp edges, pads shall be used to protect the fibers against cutting. And undue stress.
2. Do not drag the rope on the ground unnecessarily as the dirt damages the fibers.
3. Do not use too small a pulley.
4. Do not use pulleys with rough surfaces or broken edges.

5. Do not let the rope slip on the drum of a mechanically or hydraulically driven winch or lie idle on moving drum unnecessarily.
6. Do not place kinked rope under stress.
7. Do not tie knots where splices should be used.
8. Do not allow the rope to become oil-soaked or exposed to acid or corrosive substances.
9. Do not allow the rope to remain dirty or gritty, wash and dry.
10. Do not allow rope to remain exposed to weather longer than necessary. Carefully dry rope when it becomes wet.
11. Do not use excessive heat when drying a wet rope.
12. Do not allow wet rope to freeze in winter.
13. Protect slings from sharp ends.
14. Do not allow slings to become oil soaked or exposed to acid or corrosive substances.
15. Do not allow slings to remain exposed to weather and sunlight unnecessarily.
16. The safe working load, as marked on rope / sling, shall not be exceeded.
17. Check the sling before use for cuts, burns and scraps. Replace, if defective.

10 SAFETY AT INTERFACE

10.1 Safety at Interface

This section specifies the safety management criteria to be applied by GEPCO and all Users of the GEPCO Distribution System and those who interface with it:

a) Embedded Generators.

b) Other Distribution Companies with boundaries connected to GEPCO Distribution System.

c) Bulk Power Consumers.

Before carrying out any operational, maintenance or construction activity at the interface points, the GEPCO and any of the above mentioned party shall jointly agree in writing schedules of any work at interface points specifying the responsibilities for control of equipment and facilities. They shall ensure that only one party responsible for any particular work shall work at any given time. For this purpose, concerned field officer/official of GEPCO shall at all times inform the SE concerned in writing and the Circle Safety Inspector at least 48 hours prior to the proposed activity day for the co-ordination of electrical safety, identification of possible hazards and their controls. The principles of control responsibilities and their specifics must be clearly spelled out on prescribed proforma and agreed between all parties.

10.2 Control Documentation

Concerned officer/official of GEPCO and the other party shall maintain documentation which shall record all relevant operational events and the co-ordination of relevant safety precautions that have taken place between them for and during work as a permanent record for at least 5 years.

10.3 System Diagrams

Diagrams illustrating sufficient information for control personnel to carry out their duties shall be exchanged by GEPCO officers/officials and the other party.

10.4 Communications

A suitable communication system shall be established between GEPCO officers and other party to ensure that the control function is carried out in a safe and secure manner. However, where the GEPCO officers reasonably decides a backup or

alternative routing of communication, it is necessary to provide for the safe and secure operation, the means shall be agreed between the GEPCO and other party. Schedules of telephone numbers/call signs shall be exchanged by GEPCO officers/officials and the other party for efficiently enabling the control activities.

The GEPCO officers/officials and the other party shall establish 24 hour availability of personnel with suitable authorization where the joint operational requirements demand it.

10.5 Carrying Out Work at Interface Point

a) After meeting all above mentioned pre-requisites, the ownership, operation and maintenance schedules shall be jointly agreed upon by GEPCO and the other party for each location where an operation or interface or joint responsibilities exist.

b) Then all schedules and diagrams shall be maintained by GEPCO and the other party and exchanged as necessary to ensure they reflect the current agreements and network configuration.

Finally, the work shall be done keeping in view above mentioned formalities and safety precautions.

11 GENERAL MISTAKE/ VIOLATIONS MADE BY LINE STAFF

Accidents do not "just happen". Accidents are the natural result of UNSAFE CONDITIONS OR UNSAFE ACTS, usually a combination of both.

11.1 General Mistakes/Violations

GENERAL MISTAKES/VIOLATIONS made by the line staff, include but not limited to the following;

i) No Risk Assessment before Start of Work

a) No hazard assessment before the start of work.

b) No checking of the line (as PTW is already taken and assume that line is dead).

c) Beeper tester is not used.

ii) Wrong Earthing

a) Not earthing the line due to overconfidence.

b) Start providing temporary earthing without checking the line.

c) Wrong earthing method i.e. to provide earthing with hands.

iii) Overconfidence

a) Working haphazardly with overconfidence.

b) No usage of belt due to over confidence.

c) No consideration of the feedbacks from any other feeder touching/ generators/UPS etc.

iv) Careless Attitude

a) Taking unsafe position or posture such as working on live LT conductors from above instead of below.

b) Sagging on the last span of PC pole without support, stay may uproot and PC pole may collapse (such accidents happened in past).

c) Standing on Transformer without belt.

11.2 Reasons of General Mistakes

a) Procedures are not adopted.

b) Over confidence.

c) Haste.

d) Lack of knowledge of the work/hazards.

e) Lack of knowledge of SOPs.

f) Poor monitoring.

g) Lack of accountability.

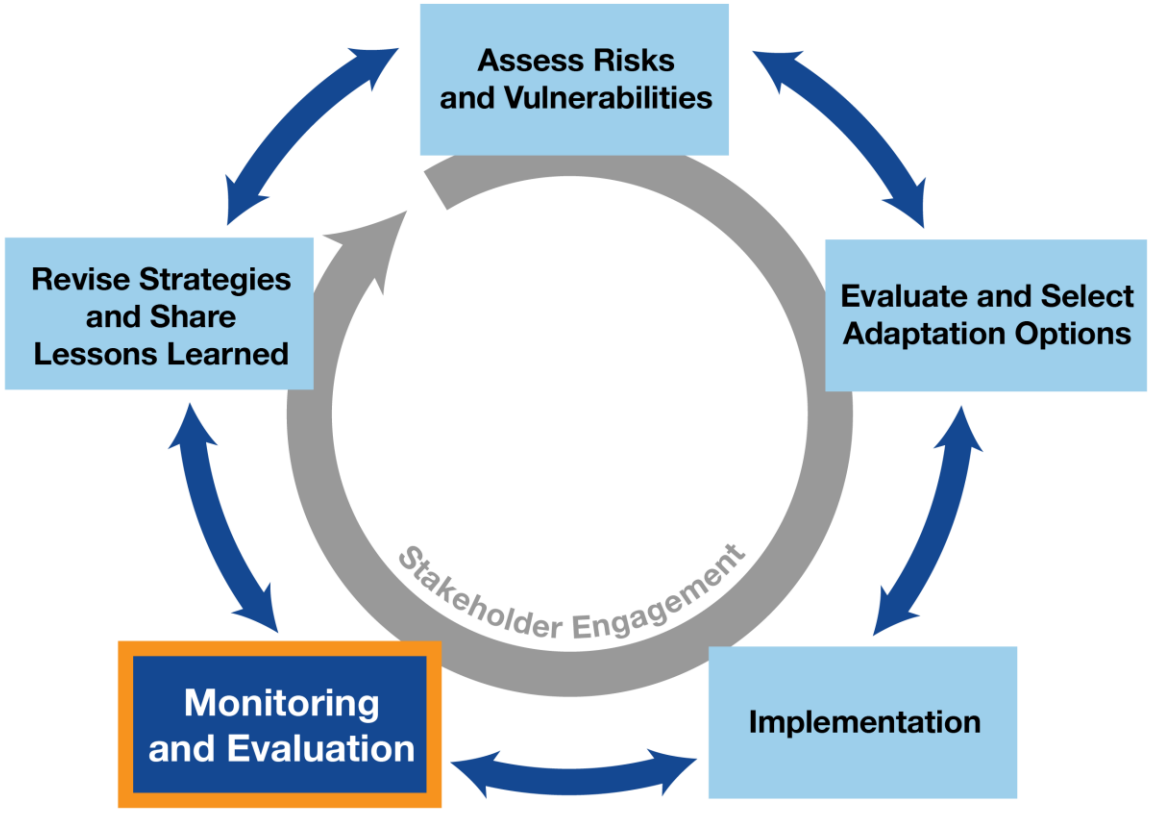
11.3 LM Complaint Re-dressal System

Mental peace is of utmost importance for line staff who works day and night and it is the responsibility of management to create an atmosphere in which the LM is mentally satisfied and at least free of office worries.

Many problems of our LM/ALM associated with their petty issues like TA bill, Medical bill, House rent bill, off day wages, PPE/T&P issues etc. which can be solved by the SDO offices but the LM/ALM have to visit the XEN/SE office to resolve their petty problems. Due to this reason, not only their working hours are spoiled but also they become mentally upset which in turn becomes a potential cause of accidents.

Therefore, GEPCO shall establish one window facility at SDO office where the LM/ALM shall submit his problems to be resolved by SDO and XEN. XEN shall conduct progress review meetings of one window operation every month and its report shall be sent to SE and Director Safety on prescribed format.

12 Monitoring and Evaluation



12.1 Behaviour Assessment Safety Walk

12.1.1 PROCEDURE

BAS focuses on Human Behavior in order to transform it positively to eliminate the causes of accidents. A possible set of activities to perform a complete BAS observation / inspection are:

- Observe , then contact the Supervisor
- Ask him to call the lineman over without causing any disturbance in line work.
- Comment on safe behavior aspect observed (e.g. correct PPEs)
  - Provide positive reinforcement for all those acts that were being performed in a safe manner
  - If “at risk behaviors” are observed, ask for feedback from the workers to understand why they were performing tasks in a risk and unsafe manner.
  - Provide coaching/ correction so that the required safe behavior is adopted
- Discuss
  - Consequences of unsafe act

- Safer ways to do the task
  - Get agreement of the individual to work safely
  - Discuss any other safety issues encouraging him to speak.
  - Thank the employee
  - Encourage team to continue to work safely

12.1.2 Points to be observed during BAS Walk

- Introduce yourself to Supervisor and others.
- Explain what you are there for
- Tell Observes that they are the job specialists
- Spend some time (say 1- 2 minutes) watching the task being performed
- When doing this the observer should not distract the workers involved in work at a critical moment
- Observations should determine if workers can perform the task safely and proactively
- Identify concerns that might increase the chances of an injury.
- Observations should not be used as a faultfinding opportunity
- Don't
  - Say nothing and just fill in your checklist
  - Just ask for observer name, department, designation and leave
  - Try to prove you know everything better
  - Assume/assign blame, and create threatening atmosphere
- Listen to what the Observer has to say
- Ensure your own safety and use of required PPEs

Comment on Safe Behavior

In a Behavior Assessment Safety process, to get the best results emphasis must be laid on recognizing/rewarding the workers when they perform the tasks safely.

- Recognize/reinforce safe behavior through souvenirs or rewards
- Discuss how to make safe behavior easier

Provide correction/coaching to the workers when the required task or part thereof has been performed unsafely.

- Influence risk perception if needed
- Correct unsafe behavior

Discussion with Workers

- Establish a positive dialogue with openness, trust, confidence and honesty at the same level.
- Also recognize safe behavior adopted and share identification of hazards and safe work methods in a cooperative learning environment.
- It is important that whenever an "at risk" behavior is observed, there should be some coaching and correction advices to the person performing it.
- Determine why a precaution was not taken.

- If an unsafe activity may result in exposure to high risk, then:
    - Stop the Work Immediately
    - Explain risk behavior observed
    - Discuss why it is unsafe
    - Ask for suggestions
    - Share your ideas
    - Reach to an agreement on safety measures to be taken
    - Express confidence that the task can be performed safely
    - Ask for commitment to work safely
    - Follow-up and give positive feedback when behavior is corrected.
- To find out the possible reason , ask the most appropriate questions such as
    - Why did you do it in that way?
    - Is that the way you always do it?
    - Do you feel safe doing it that way?
    - Is there a safer way to do it?
    - Were you trained to do it that way?
- The comments made by the workers will give good indications of why the required behavior is not being performed (e.g. not wearing gloves - workers' comments suggest they are uncomfortable to wear).

Get Agreement to Work Safely

- When risk is identified during an observation, the language chosen to provide feedback is critical and that should not be dictating, bossy and harassing.
- The communication instead should be in a coaching tone, exchanging knowledge and emphasizing on best safety practices leading to an understanding and agreement to perform the task in safer way and to proactively correct unsafe behaviors in future.

Thank the Worker

- Thank the worker for participating and expressing his views during the observation
- Recognize efforts and motivate the workers and team to work safely.
- Fill in the BAS Walk Form (Annexure-A) in your vehicle to obviate any worries in the working team.

12.2 Audit

An accountability process is to assess whether the SOPs are being implemented in all the jobs, to check that proper measures are being taken to detect the wrong practices, besides, corrective measures are being taken to stop repetition of wrong practices. The safety audit activity shall be of two types;

a) Internal audit

b) External audit

12.2.1 Internal Audit

Internal audit shall be carried out by the field officers i.e. SDO, DMO, DDT and SE. They shall check the following registers;

a) Morning Assembly Register

b) Record of Monthly PPE/T&P Kit Parade

c) Record of Safety S.O.P Visits

d) Illustration of safety posters & panaflexes in SDO office premises and in Complaint Centre premises

e) Hazard register

f) Near miss accident register

g) PTW register

h) Complaint register

i) Attendance register

j) Safety call register

k) Patrol book

l) PPE/T&P register (drawn, issued and survey off)

12.2.2 External Audit

GEPCO HSE team shall do scheduled visit of sub-divisions, divisions and circle offices to evaluate their performance regarding safety on the prescribed safety Performa. They shall ensure that safety SOP is being implemented in true spirit and shall report any violations found in their audit.

12.3 GEPCO HSE REWARD AND REPRIMAND PROCEDURE

12.3.1 PURPOSE:

This procedure defines a system of reward in recognition of best safety practices adopted by employees/Circle/Sub Division/field formation and reprimands in case of safety violations.

12.3.2 SCOPE:

The scope of this procedure is to ensure safe system of work within the field formation and to all concerned therein.

12.3.3 DISTRIBUTION:

Throughout all levels in GEPCO Circles/All field formation (Operation, Construction, GSO, GSC and M&T) and relevant support Departments.

12.3.4 RESPONSIBILITIES

A. GENERAL

- All employees of GEPCO Circle/Division/Sub-Division (field office) and offices are required to comply with the safety requirements stipulated in this procedure and any other related requirements defined in subsequent issue of safety circulars from time to time.
- The Assistant Managers / SDOs shall be responsible to initiate necessary action for rewards for safe conduct by their respective department personnel and disciplinary actions for safety violations other than when recommended by the Accident Investigation Committee for Fatal/Major Accidents or any other incidents.
- HR Directorate shall be responsible to directly initiate necessary disciplinary actions for safety violations as per recommendations of Accident Investigation Committee as forwarded by HSE and in accordance with Table 3.
- HR / Safety Heads are responsible to maintain safety records (Reward & Reprimand) which shall be inspected during surprise and scheduled audits.
- HR / Safety / SE/ XEN to share list of personnel counseled on monthly basis with HSE Distribution and HR.

B. MANAGER/ ASSISTANT MANAGER SUB DIVISION:

- Ensure that each employee in his Field Formation / Sub Division is aware of this procedure.

- Comply with all aspects of the procedure.
- Nominate employees for awards with honesty and to the best of his observations.
- Make an evaluation of the relative worth of the employees before nominating them for the stated category of award.
- Take necessary action on safety violations as tabulated in Table 3.
- 5.2.6 Provide clear cut recommendations for rewards and reprimands to his GM/SDO/Incharge.

12.3.5 GENERAL MANAGER / DEPT.:

- On receipt of nomination from the Manager/Assistant Manager, evaluate nominations/violations in a fair and impartial manner.
- Endorse remarks on nominations/violations on online portal also.
- Take action on safety violations as tabulated in Table 3 other than those initiated directly by HR.
- Would forward the nominations/violations to respective.

12.3.6 HEAD-:

- Ensure implementation of this procedure within his area of responsibility.
- Review and evaluate the nominations/safety violations and indicate his endorsement.
- Take required action on safety violations as tabulated in Table 3.
- Forward reward recommendations/violations to HSE and HR for processing as per below given procedure.

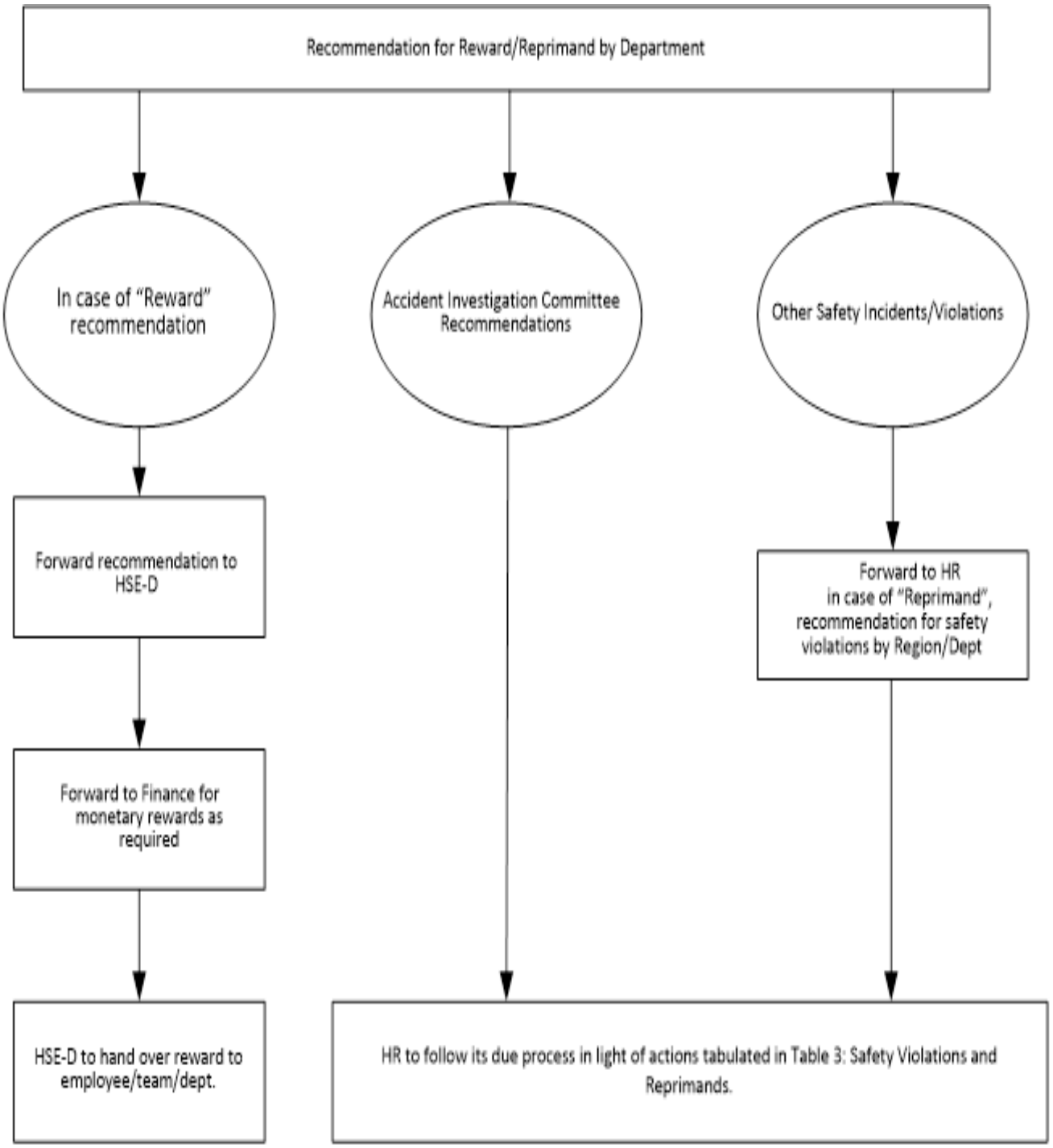
12.3.7 GEPCO HSE DEPARTMENT:

- Oversee process of reward/reprimand is done in a fair and transparent manner.
- Return approved reward recommendations to concerned departments.
- Issue appreciation/certificate on Safety Team/Employee of the Month as decided from time to time.
- Already existing Standing Committee as per Investigation Procedure and forward recommendations for disciplinary action to HR.

- Follow up on recommendations of all Accident Investigations till their closure.
- Maintain record of all rewards/violations.
- Provide safety marks deduction data to HR on quarterly and yearly basis.

12.3.8 HR DEPARTMENT:

To follow its due process in light of actions tabulated in Table 3: Safety Violations and Reprimand.


Recommendation for Reward/Reprimand by Department
In case of "Reward" recommendation
Accident Investigation Committee Recommendations
Other Safety Incidents/Violations
Forward recommendation to HSE-D
Forward to HR in case of "Reprimand", recommendation for safety violations by Region/Dept
Forward to Finance for monetary rewards as required
HSE-D to hand over reward to employee/team/dept.
HR to follow its due process in light of actions tabulated in Table 3: Safety Violations and Reprimands.

12.3.10REWARD & REPRIMAND:

12.3.11PURPOSE

This policy defines a system of reward in recognition of best safety practices adopted by employees of Operation / Grid System Operation (GSO) / Grid System Construction (GSC) / Construction and reprimands in case of safety violations. From the last few years, large numbers of fatal / non-fatal accidents are being occurred repeatedly time and again which is causing heavy loss to the company in the shape of shortage of skilled / trained manpower as well as financial loss in the shape of compensation grants i.e. ex-gratia grant. Besides, shortage of skilled / already trained manpower is matter of concern for organization.

To overcome the said issue, there is need to develop a mechanism which motivates / encourages the employees / line staff to adopt safety measures for saving their precious lives for the department and their families as well.

12.3.12SCOPE

The scope of this policy is to ensure safe system of work within the Distribution System of GEPCO.

12.3.13DEFINITIONS

Incident: Work-related event(s) in which an injury or ill health (regardless of severity) or fatality occurred, or could have occurred.

Accident: An incident which has given rise to injury, ill health or fatality. Types of accidents include Fatal, Non-Fatal Accident (Major / Minor).

i. **Fatal Accident:** An accident resulting in death of an employee / public man.

ii. **Non-Fatal Accident:**

a. **Major Accident:** Damage that, permanently alters a person's life or future (e.g. disablement, disfigurement, psychological disturbance, amputations, spine injury etc.), Second/third degree burns, which prevents the person from resuming designated work.

b. **Minor Accident:** Damage that causes Temporary inconvenience to the individual (e.g. minor cuts, bruises, sprains etc.), First degree burns and First aid treatment injury.

iii. **Significant Near Miss:** Incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury easily could have caused a major or fatal accident.

iv. Near Miss: Incidents where no property was damaged and no personal injury sustained, but where, given a slight shift in time or position, damage and/or injury could have easily occurred

12.3.14 REASONS OF FATAL & NON-FATAL ACCIDENTS

1. The most common reason of accidents is that the workers violated safety precautions and not use the personal protective equipment during the work on system due their over confidence and take short cut chance.
2. Non-provision of proper guidance by supervisory staff before starting work.
3. Non issuance of PTW while depending on disconnection of D-Fuses from section of 11 KV line.
4. Most of the employees works without any PTW & try to avail load shedding timings of the feeder by communicating on mobile phone. Work could not be completed within the load shedding time & supply restored from station resultantly employees electrocuted.
5. Execution of work by unauthorized ALM instead of LM.
6. Climbing of pole without checking its position.

12.3.15 MEASURES TO BE TAKEN TO AVOID FATAL / NON-FATAL ACCIDENTS

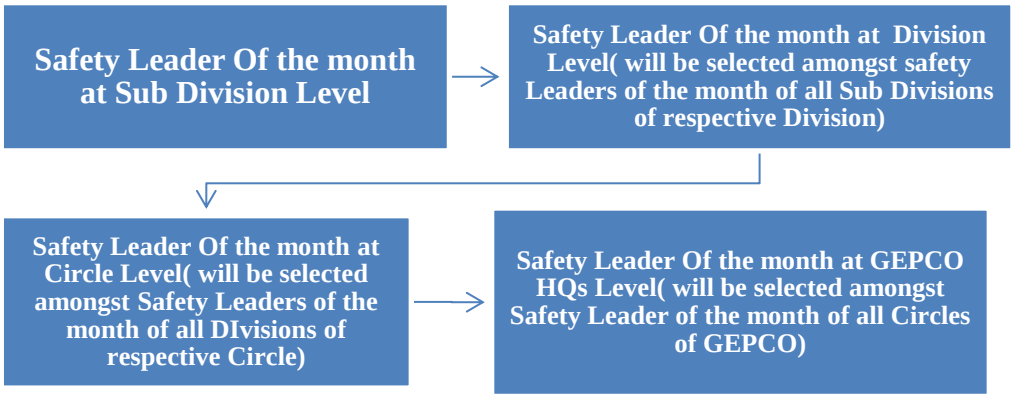
All (OP) Sub Divisional Officers / XENs (OP) are advised to show "zero tolerance" on safety and must enforce the following measures / recommendations: -

- Due to non-obtaining of Permit to work (PTW) and not providing temporary earthing on both sides of work place, if fatal / non-fatal accident of employee occurs, LS/ SDO / XEN & SE concerned will be responsible and strict disciplinary action will be initiated against them. The penalty will not be less than major penalty.
- The lineman who appears to be sick or disturbed due to any reason may not be allowed to work on line till he is found fit for duty in all respects.
- Line Superintendent should never be allowed to obtain PTW at a time on more than one feeder at different locations for effective supervisory control.
- Presence of supervisor on all major break downs may be ensured. SDO concerned should also visit the site of work at random to ensure that all safety precautions are adopted by the line staff and no compromise on safety even in emergency conditions.
- No work should be executed on HT line / transformer substation without obtaining PTW. Proper earthing is provided before starting of any work on distribution system.
- A committee comprising upon the following officers be constituted to check the working site at any time & any place & strict disciplinary action will be initiated against delinquent(s).
    - i. 01 representative of HSE Directorate.
    - ii. 01 representative of respective Circle.
    - iii. 01 representative of respective Division

12.3.16 SAFETY REWARDS & PRIVILEGES

Following awards will be given to line staff who adopt all safety measures throughout the month, on the recommendation of concerned SDO, XEN & SE / PD on monthly basis at Sub Division, Division, Circle & GEPCO HQs level :-

- An employee will be declared "**Safety Leader**" of the month at Sub Division Level & his photograph will be placed at the notice board of respective Sub Division Office for one month.
- An employee will be declared "**Safety Leader**" of the month at Division Level & he will be awarded appreciation Certificate besides placing his photograph on the notice board of respective Division Office for one month.
- An employee will be declared "**Safety Leader**" of the month at Circle Level & he will be awarded appreciation Certificate & Rs. 5000/- as Cash Prize besides placing his photograph on the notice board of respective Circle Office for one month.
- In addition to above, following criteria will be observed to announce GEPCO's "**Safety Leader**" of the month for the whole company.



- SDO will announce the "**Safety Leader**" of the month upto 05th of each month and forward the same to XEN who will announce the same upto 08th of each month and forward the same to SE. Similarly SE concerned will announce the same upto 10th of each month and send the same to GEPCO HQs Gujranwala, "**Safety Leader**" of the month at GEPCO level will be announced upto 15th of each month after scrutiny / interview by the following committee:-

  i. GM (Operation) Convener
  ii. CE (O&M) Distribution Member
  iii. Chief (HSE) Officer Member

- A certificate from Chief Executive Officer will be awarded by announcing his name as "GEPCO's Safety Leader of the month". Copy of the same will be placed in his personal file / dossier.
- Cash Award of Rs. 10,000/- (Rupees Ten Thousand only).
- "GEPCO's Safety Leader of the month "Shield & Badge" as well as "Green Helmet" to be conferred by Chief Executive Officer.
- Photograph, name and month of award displayed on notice board at GEPCO HQs Gujranwala as well as in the office of concerned employee.
- Photograph of GEPCO's Safety Leader of the month" will be uploaded on GEPCO website and also published in GEPCO magazine.

- To evaluate the safety performance, a scoring system designed on the basis of Safety Initiatives undertaken (Trainings, Safety Audits, Safety Walks, Toolbox Talks and Accident / Incident Occurrence etc.) and improvements achieved in safety performance as a result of efforts and initiatives.

12.3.17 Zero Accident Achievement – Reward

If no accident (Fatal / Non-Fatal) occurred for 365 days continuously in a calendar year, a financial reward will be given for Safety Promotional purposes as follows:

- Concerned SE Appreciation Certificate
- Concerned XEN Rs. 5,000/-
- AM (HSE) Team Rs. 5, 000/-

Selection Criteria for Safety Leader of the Month

Sr. No.	Criteria	Details	Marks
1.	Non Compliance	No non-compliance should have been reported against the said nominee during HSE field inspections in the same month.	10
2.	Saving of GEPCO Assets	Has saved GEPCO Assets from any sort of damage.	15
3.	Public Safety	Has saved harm to any consumer.	15
4.	Initiatives	Implementing initiatives for the workplace.	10
		Initiative taken is fruitful for entire GEPCO system.	10
5.	Safety enhancement	Making an extra effort to improve existing Safety practices in the workplace.	10
6.	Activity type	The activity performed is not included in his routine activity.	15
7.	Hazard	Hazard mitigation performed is permanent in nature.	10 (for permanent mitigation)
		Did the nominee mitigated the Hazard completely by Himself or by coordinating with concerned departments.	05

SAFETY VIOLATIONS / REPRIMANDS

Accidents			
Sr.	**Category**	**Reprimands**	**Remarks**
1 (a)	Fatal Accident (Directly responsible employee)	Major penalty i.e. Dismissal from Service subject to recommendation of Enquiry of HSE Directorate	Disciplinary Action will be initiated
1 (b)	Fatal Accident (Indirectly responsible employee)	**1st Time** Minor penalty i.e. Stoppage of increment (s) **2nd Time** Major penalty i.e. Reduction to a lower post or to lower stage in time scale **3rd Time** Major penalty i.e. Compulsory Retirement OR Dismissal from service subject to recommendation of Enquiry of HSE Directorate	Disciplinary Action will be initiated
2(a)	Non-Fatal Accident **(Major)** (Directly responsible employee)	**1st Time** Major penalty i.e. Reduction to a lower post or to lower stage in time scale. **2nd Time** Major penalty i.e. Compulsory retirement OR Dismissal from service subject to recommendation of Enquiry of HSE Directorate	Disciplinary Action will be initiated
2(b)	Non-Fatal Accident **(Major)** (Indirectly responsible employee)	**1st Time** Minor penalty i.e. Stoppage of increment (s) **2nd Time** Major penalty i.e. Reduction to a lower post or to lower stage in time scale. **3rd Time** Major penalty i.e. Compulsory Retirement OR Dismissal from service subject to recommendation of Enquiry of HSE Directorate	Disciplinary Action will be initiated
3(a)	Non-Fatal Accident **(Minor)** (Directly responsible employee)	**1st Time** Minor penalty i.e. Minimum 02 Increments will be stopped **2nd Time** Major penalty i.e. Reduction to a lower post or to lower stage in time scale. **3rd Time** Major penalty i.e. Compulsory retirement / Dismissal from service subject to recommendation of Enquiry of HSE Directorate	Disciplinary Action will be initiated
3(b)	Non-Fatal Accident **(Minor)** (Indirectly responsible employee)	**1st Time** Minor penalty i.e. 01 Increment will be stopped **2nd Time** Minor penalty i.e. Withholding for specified period promotion **3rd Time** Major penalty i.e. Reduction to a lower post or to lower stage in time scale.	Disciplinary Action will be initiated
Safety Violations			

Sr.	Category	Reprimands	Remarks
4(a)	Significantly near miss Violation / Non Adherence to GEPCO Procedures	**1st Time** Minor penalty i.e. Censure	I. Significant Safety Violation means "any violation which can result in a fatality & major accident e.g.: ·none or Incomplete line isolation (shutdown) including line short & ground LT not isolated. Not using live line tester / beeper for absence of supply. Non-usage of rubber gloves / use of rubber glove in one hand and nonuse of safety helmet. ii. The significantly near miss will be reported by relevant HSE Team by itself and / or as reported by concerned formation.
		2nd Time Minor penalty i.e. Stoppage of increment (s)	
		3rd Time Major penalty i.e. Reduction to a lower post or to lower stage in time scale.	
4(b)	Other safety Violations / Non adherence to GEPCO Safety Procedures (Note: Includes all Violations other than 3(a) above.	**1st Time** Recorded Warning	Disciplinary Action will be initiated on the recommendations of HSE Directorate and / or as reported by concerned formation.
		2nd Time Minor penalty i.e. Censure	
		3rd Time Minor penalty i.e. Stoppage of increment	

12.3.18 Non-Reporting / Misreporting / Late Reporting

It has been observed that whenever Fatal / Non-Fatal accidents occurs, mostly concerned officers / officials try to hide the facts & misguide / submit report at belated stage to save them from disciplinary proceedings. In order to eliminate these issues, delinquents / responsible for non-reporting / misreporting / late reporting will also be dealt under the Rules in vogue and following penalties will be imposed: -

Sr. No.	CATEGORY	HSE Proposal	Remarks
5(a)	Non Reporting / Misreporting	**1st Time** Minor penalty i.e. Stoppage of Increment (s)	i. Disciplinary Action will be initiated on the recommendations of HSE Directorate. ii. Accident must be reported within Four (04) hours. If reported after (04) hours and within eight (08) hours of occurrence, it will be considered **as late reporting**. After eight (08) hours, it will be considered as **non-reporting**.
		2nd Time Major penalty i.e. Reduction to a lower post or to lower stage in time scale.	
		3rd Time Major penalty i.e. Compulsory retirement OR Removal from service subject to recommendation of Enquiry of HSE Directorate	
5(b)	Late Reporting	**1st Time** Minor penalty i.e. Censure	
		2nd Time Minor penalty i.e. Stoppage of increment (s)	
		3rd Time Major penalty i.e. Reduction to a lower post or to lower stage in time scale.	

Note: -

i. Any safety violation pointed out by the HSE Directorate / concerned formation will be depicted / recorded in relevant column of the Performance Evaluation Report (PER) of officer / official.

13 COMPENSATION PROCEDURE

13.1 Who Are Entitled to Compensation?

i) The LM/ALM who is authorized to work on the line and meet with accident.

ii) Some time it has been noticed that LM/ALM are doing work on GEPCO system but in case of accident, they are shown as working unauthorized on following grounds:

a) No complaint was entered in the complaint register.

b) The work was being done without knowledge/permission of LS/SDO.

c) Working on private transformer.

d) The ALM was not authorized, etc.

Explanation

i) The public complaints remain unattended for days hence due to failure of the company in attending public complaints, the public contacts the LMs/ALMs at their own and complaints are attended and it is a practice which is in the knowledge of XEN/SDO/LS. In such failure of management, Distribution Company cannot be absolved of its responsibilities. Such accidents of LMs are due to failure of XEN and SDO to;

a) Timely attend public complaints.

b) No check on the LMs/ALMs.

ii) As presently there is no proper Complaint Management System. The LMs/ALMs (especially in rural areas) are doing complaint duties around/near their resident villages. It is also in the knowledge of LSs/SDOs and there is verbal approval of same SDOs/LSs however, when accident happens the LM/ALM is proved to be working unauthorized. Company is doing its efforts to stop such practices which ultimately result in accidents. Hence the LMs/ALMs emoluments shall not be stopped in such cases. Only following things should be established prior to giving the emoluments (till proper Complaint Management System is established and becomes functional).

a) He was working in his own sub-divisional jurisdiction.

b) He was doing some work i.e. Maintenance of system/complaints.

13.2 Compensation to Employees

13.2.1 Compensation of Fatal Accident

The Accident shall be reported (preliminary report) on prescribed proforma to XEN and Director Safety. The compensation process shall be started simultaneously on the same day by SDO.

i) SDO shall send all the required documents to XEN with covering letter and check list on the same day not later than 24 hours with list and amount of emoluments to be paid.

ii) XEN and accountant shall process the case immediately and the case with check list shall be sent to concerned higher office for approval/allocation of money.

iii) Manager finance shall approve/allocate the demand with in one day of receiving the demand. In case of shortage of any documents, Manager Finance shall immediately acquire the same from concerned XEN to fulfill the requirements with copy to CEO.XEN shall provide the required documents on the same day.

iv) XEN and accountant both shall be responsible for payment of all dues within one week and action shall be initiated against them in case of delay of more than 07 working days.

v) Director Safety shall report such delay to HR Director and shall get approval to issue charge sheet to XEN and accountant.

13.2.2 Compensation of Non-fatal Accident

i) The case of compensation shall be initiated by SDO and sent to XEN with covering letter and check list.

ii) Percentage disability shall be established through medical board.

iii) XEN shall write for assessment to medical board within 07 days of the accident.

iv) The medical report shall be obtained within 15 days of accident and after getting the report, the case shall be sent to Manager Finance. The case shall be approved by Manager Finance within 02 days of receiving the case. In case of shortage of any documents, Manager Finance shall immediately contact concerned XEN to fulfill the requirements through WHATSAPP and Phone call with copy to CEO.XEN shall provide the required documents on the same day.

v) XEN and accountant both shall be responsible for payment of all dues within one week and action shall be initiated against them in case of delay of more than 07 working days.

vi) Director Safety shall report such delay to HR Director and shall get approval to issue charge sheet to XEN and accountant.

13.2.3 Compensation Package

a. The assistance package for families of employees who die in service or are 100% incapacitated due to Fatal/Non-fatal accidents.

Compensation in Case of Accident to Employee

The assistance package for families of employees who die in service or are 100% incapacitated due to fatal/non-fatal accidents is as under;

i) Ex-gratia grant of Rs. 3.5 million to the families of those employees who die due to fatal accident or are 100% incapacitated/disabled (non-fatal accident) with immediate effect.

ii) Retention of house or payment of rent of hired house for five (5) years or till the date of retirement of deceased whichever is more.

iii) Employment to one child or widow for posts in BPS-1 to BPS-15 without advertisement according to qualification.

iv) To ensure providing best medical treatment in country to the employee incapacitated in accident (amputation of hands, legs, etc.) and replacement of amputated limbs with best possible available limbs.

v) Free education to all children of the deceased/100% incapacitated employee's upto graduation (all fields of graduation) in any public government educational institution including expenses of tuition fee, books, related material, living allowance, etc., subject to production of verification certificate from the Head of Institution.

vi) Grant of Welfare Fund to the family of the deceased employee, as per entitlement.

vii) Marriage grant amounting to 400,000/- (Rupees four lac each) on the marriage of two (2) children of the deceased / 100 incapacitated employees.

100% free electricity units, as per their entitlement, to the family of deceased / 100% incapacitated employees till superannuation. After superannuation electricity units will be reduced to 50% similar to the employees retired in ordinary manner.

viii) The compensation package for families of government employees who die in service according to Government of Pakistan shall also be in vogue and applicable.

13.2.4 Assistance Package for Families of Employees Who Die in Service

The said package is applicable, mutatis, mutandis, for families of employees, who die in service, as under;

Item	In Service Death	Security Related Deaths
Lump Sum Grant	Up to Rs. 3.0 million according to	a. Up to Rs. 10 million according to

<table>
<tr><td></td><td>following scales:-<table><tr><th>BPS</th><th>Amount</th></tr><tr><td>1–4</td><td>Rs. 600,000</td></tr><tr><td>5–10</td><td>Rs. 900,000</td></tr><tr><td>11–15</td><td>Rs. 1,200,000</td></tr><tr><td>16–17</td><td>Rs. 1,500,000</td></tr><tr><td>18–19</td><td>Rs. 2,400,000</td></tr><tr><td>20 & above</td><td>Rs. 3,000,000</td></tr></table></td><td>following scales:-<table><tr><th>BPS</th><th>Amount</th></tr><tr><td>1–16</td><td>Rs. 3 Million</td></tr><tr><td>17</td><td>Rs. 5 Million</td></tr><tr><td>18–19</td><td>Rs. 9 Million</td></tr><tr><td>20 & above</td><td>Rs. 10 Million</td></tr></table>b. Rs. 700,000/- to the officers/ officials incapacitated and released from service for having become invalid as a result of injury in encounters/ bomb blasts/ riots, watch and ward duty or terrorist activity.</td></tr>
<tr><td>Pension</td><td>100% pension to the families of deceased employees as per their length of service and last pay drawn. In case of less than 10 years' service of the deceased employees' rate of minimum 10 years' service will be applicable.</td><td>100% pension to the families of deceased employees as per their length of service and last pay drawn. In case of less than 10 years' service of the deceased employees' rate of minimum 10 years' service will be applicable.</td></tr>
<tr><td>Accommodation</td><td>Retention of official accommodation or payment of rent of hired house till the age of superannuation.</td><td>Retention of official accommodation or payment of rent of hired house till the age of superannuation.</td></tr>
<tr><td>Education</td><td>Free education to all the children of the deceased employees upto graduation in any public/government educational institution including expenses of tuition fee, books related material and living allowance etc.</td><td>Free education to all the children of the deceased employees upto graduation in any public/government educational institution including expenses of tuition fee, books related material and living allowance etc.</td></tr>
<tr><td>Allotment of Plot</td><td>Payment of lump sum grant in lieu of plot subject to the condition that no plot had been allotted in the past, as per scale given below:-<table><tr><th>BPS</th><th>Amount</th></tr><tr><td>1–8</td><td>Rs. 2 Million</td></tr><tr><td>9–16</td><td>Rs. 5 Million</td></tr><tr><td>17 & above</td><td>Rs. 7 Million</td></tr></table></td><td>Payment of lump sum grant in lieu of plot subject to the condition that no plot had been allotted in the past, as per scale given below:-<table><tr><th>BPS</th><th>Amount</th></tr><tr><td>1–8</td><td>Rs. 2 Million</td></tr><tr><td>9–16</td><td>Rs. 5 Million</td></tr><tr><td>17 & above</td><td>Rs. 7 Million</td></tr></table></td></tr>
</table>

Item	In Service Death	Security Related Deaths
Employment	Employment for posts in BS-01 to BS-15 on two years contract without advertisement. Provided further that in-case of the deceased employee is survived by two or more widows and/or children from these widows, right of contract shall be decided in the following manner and order:- a. the first widow or child (18 years or above in age) from the first widow as soon as he/she attains age of 18 years but he/she has to exercise the option within the time period (one year from date of death) failing that: b. the right to contract appointment shall stand transferred to the second widow or to a child (18 years or above in age) from the second widow or to a child (18 years or above in age) from the second widow or to a child or a minor child from the second widow as soon as he/she attains age of 18 years but he/she has to exercise the option within two years of death. c. If an eligible child is not available, the widow of a deceased employee who expires/expired on or after 13.06.2006 while in service shall be offered employment on the same basis as a child of the deceased employee would have been offered employment. d. Exception from prescribed Grade/Division of educational qualification of widow while considering for the above-said category. e. General relaxation shall be available to the widow in the upper age limit up to 45 years.	Employment for posts in BS-01 to BS-15 on two years contract without advertisement. Provided further that in-case of the deceased employee is survived by two or more widows and/or children from these widows, right of contract shall be decided in the following manner and order:- a. the first widow or child (18 years or above in age) from the first widow as soon as he/she attains age of 18 years but he/she has to exercise the option within the time period (one year from date of death) failing that: b. the right to contract appointment shall stand transferred to the second widow or to a child (18 years or above in age) from the second widow or to a child (18 years or above in age) from the second widow or to a child or a minor child from the second widow as soon as he/she attains age of 18 years but he/she has to exercise the option within two years of death. c. If an eligible child is not available, the widow of a deceased employee who expires/expired on or after 13.06.2006 while in service shall be offered employment on the same basis as a child of the deceased employee would have been offered employment. d. Exception from prescribed Grade/Division of educational qualification of widow while considering for the above-said category. e. General relaxation shall be available to the widow in the upper age limit up to 45 years.

Item	In Service Death	Security Related Deaths
	f. The authority competent for relaxation of the upper age limit of a widow up to 50 years shall rest with BOD of the GEPCO on a case to case basis.	f. The authority competent for relaxation of the upper age limit of a widow up to 50 years shall rest with BOD of the GEPCO on a case to case basis.
Marriage Grant	Marriage grant amounting to Rs. 8 lac on wedding of one daughter may be granted to family of deceased employees.	Marriage grant amounting to Rs. 8 lac on wedding of one daughter may be granted to family of deceased employees.
Health	Free health facilities as per their entitlement during service	Free health facilities as per their entitlement during service
House Building Advance	In case of advance against salaries sanctioned by the competent authority, the unpaid balance to be waived off as per prevailing procedure.	In case of advance against salaries sanctioned by the competent authority, the unpaid balance to be waived off as per prevailing procedure.
Nomination of an Officer as Council	An officer of BS-17 or BS-18 may be nominated by respective office as Council who will be responsible for finalization/provision of all the facilities under the package, to the families of employees who die in service within one month of the incident.	An officer of BS-17 or BS-18 may be nominated by respective office as Council who will be responsible for finalization/provision of all the facilities under the package, to the families of employees who die in service within one month of the incident.
Special Lump Sum Grant from Welfare Fund	Nil	A special lump sum grant from Welfare Fund ranging from Rs. 200,000 to Rs. 500,000/- according to following scales:-

Sr. #	BPS	Lump Sum Grant
1	1–10	Rs. 200,000
2	11–16	Rs. 300,000
3	17–19	Rs. 400,000
4	20 & above	Rs. 500,000

Item	In Service Death	Security Related Deaths
Monthly Welfare Grant		

Sr. #	Pay Slabs		Grant
	Minimum	Maximum	
1	Upto	5000	4000
2	5001	5500	4150
3	5501	6000	4300
4	6001	6500	4450
5	6501	7000	4600
6	7001	7500	4750
7	7501	8000	4900
8	8001	8500	5050
9	8501	9000	5200
10	9001	9500	5350
11	9501	11000	5600
12	11001	13000	5900
13	13001	15000	6200
14	15001	17000	6500
15	17001	19000	6800
16	19001	21000	7100
17	21001	23000	7400
18	23001	25000	7700
19	25001	27000	8000
20	27001	29000	8300
21	29001	31000	8600
22	31001	33000	8900
23	33001	35000	9200
24	35001	37000	9500
25	37001	39000	9800
26	39001 & above		10100

Sr. #	Pay Slabs		Grant
	Minimum	Maximum	
1	Upto	5000	8000
2	5001	5500	8300
3	5501	6000	8600
4	6001	6500	8900
5	6501	7000	9200
6	7001	7500	9500
7	7501	8000	9800
8	8001	8500	10100
9	8501	9000	10400
10	9001	9500	10700
11	9501	11000	11200
12	11001	13000	11800
13	13001	15000	12400
14	15001	17000	13000
15	17001	19000	13600
16	19001	21000	14200
17	21001	23000	14800
18	23001	25000	15400
19	25001	27000	16000
20	27001	29000	16600
21	29001	31000	17200
22	31001	33000	17800
23	33001	35000	18400
24	35001	37000	19000
25	37001	39000	19600
26	39001 & above		20200

Prerequisite for facilitation of family of deceased Employees	In case of in service death of an employee, the following pre-requisites must immediately be fulfilled by the concerned office so that the family of the deceased employee may be facilitated without any delay:- a. Immediate submission of family pension case. b. Application for Anticipatory Pension (80% of total pension). Besides, as a pro-active approach respective offices must observe the following practices regarding their employees:- a. Up to date list of family members of each employee for pension purpose be maintained beforehand.	In case of in service death (security related) of an employee, the following pre-requisites must immediately be fulfilled by the concerned office so that the family of the deceased employee may be facilitated without any delay:- a. Immediate submission of family pension case. b. Application for Anticipatory Pension (80% of total pension). Besides, as a pro-active approach respective offices must observe the following practices regarding their employees:- a. Up to date list of family members of each employee for pension purpose be maintained beforehand.
Item	**In Service Death**	**Security Related Deaths**

Prerequisite for facilitation of family of deceased Employees	b. Nomination for Employees Provident Fund must be ensured for each employee in his/her life.	b. Nomination for Employees Provident Fund must be ensured for each employee in his/her life.
EP Fund	Only payable amount of EP Fund shall be paid to the family of deceased employee.	Only payable amount of EP Fund shall be paid to the family of deceased employee.

Note:

1) A death will be deemed to be a 'Security Related Death' if it occurs due to a terrorist act or while combating or confronting the terrorist(s).
2) Relevant rules and policies stand amended to the above effect.

13.3 Responsibilities for Payment of Compensation

13.3.1 Responsibilities of XEN

i) He shall ensure the maintenance of the record of families of all employees, their address, heirs, nominees and their contact numbers under his division.

ii) He shall ensure timely payment of all the emoluments to heirs of the deceased employee.

iii) He shall be responsible for payment of all dues within one week, failing which action shall be initiated against him.

13.3.2 Responsibilities of SDO

i) He shall ensure the maintenance of the record of families of all employees, their address, heirs, nominees and their contact numbers under his sub- division.

ii) He shall ensure timely payment of all the emoluments to heirs of the deceased employee.

iii) He shall be responsible to process the case for payment of all dues on the same day of accident, failing which action shall be initiated against him in case of delay of more than 02 working days.

13.3.3 Responsibilities of SDC (Sub-divisional Clerk)

i) He shall maintain the record of details of families of all employees, address, heirs, nominees and contact numbers of his sub-division.

ii) He shall prepare the case for payment of all dues on the same day of accident and get it proceeded from SDO, failing which action shall be initiated against him in case of delay of more than 02 working days.

13.3.4 Responsibilities of Divisional Accountant

i) He shall prepare the case for payment of all dues on the same day of receiving the documents from concerned office and get it proceeded from XEN, failing

which action shall be initiated against him in case of delay of more than 02 working days.

13.4 Compensation to General Public

13.4.1 TITLE.

This policy will be called the " Compensation Policy for Public Personnel/Legal Heirs" affected by an electric shock from GEPCO System due to system fault or negligence of GEPCO Employee duly approved by Standing Committee.

13.4.2 INTRODUCTION.

An employee who is electrocuted OR encounters fatal/non-fatal accident while performing duty, the department, in recognition of his services, extends maximum compensation to him in the shape of different assistance package , grants other associated/allied facilities and benefits as per policy/rules.

However, when a Public Person encounters electrocution, fatal/non-fatal accident due to any departmental negligence, omission or commission, the grieved person or his/her legal heirs are left remediless. Neither any compensation nor any assistance is provided by the department. Therefore, there was a dire need for Compensation Policy for the Public Personnel or their legal heirs who lose their precious lives in such accidents, or face major/minor injuries form GEPCO Distribution System.

13.4.3 DEFINITION OF COMPENSATION.

Under this Policy compensation may be of:-

a) Anything given as an equivalent or to make amends for a loss , damage etc. OR
b) Counterbalancing the death of a human being, injury to (major/minor as determined by authorized Medical Board) or loss of body part (s) as a result of electric shock due to a safety hazard in the Distribution system of GEPCO.

13.4.4 JURISDICTION.

This policy will be applicable in the jurisdiction of GEPCO (Gujranwala, Gujrat, Sialkot, Narowal, Hafizabad and M.B. Din Districts).

13.4.5 BENEFICIARY.

Public Personnel who meet with fatal/non-fatal accident (s) due to electric shock resulting from GEPCO Distribution System or their legal heirs will be the beneficiary of this policy.

13.4.6 PROCEDURE OF COMPENSATION.

Any fatal/non-fatal accident to a Public Person is reported by a field officer i.e. A.M. (Operation) or Dy. Manager (Safety) GEPCO or through electronic/print media, the "Compensation Committee" comprising upon following officers will visit the site and submit a report to CEO, GEPCO keeping in view the given TORs:-

a) Chief Engineer (O&M) Distt: Convener.
b) Chief (HSE) Officer Member.
c) Manager (Operation) concerned. Member/

TORs.

i) The committee will physically inspect the premises of an accident to visualize the exact accident picture and determine the cause of the accident.
ii) The committee will ensure adherence to SOP regarding fatal and non fatal accidents to the public under Rule-69 A & B and Rules-70 of Electricity Rules 1937.
iii) After tracing out hazard (s), if pointed out, they will assess response time.
iv) The committee will fix the responsibility of the accident upon officers/officials involved in the omission & commission or negligence resulting in the accident.
v) On the recommendations of the committee, the competent authority will refer the case to the Medical Board (either WAPDA Medical Board or Medical Board of respective DHQ Hospital) to determine the nature and status of injury as to whether major or minor on actual basis depending upon the nature of the accident.

13.4.7 CASH COMPENSATION.

The following compensation is proposed in case of death or injury to the Public Person:-

i) Up to Rs.750,000/- to legal heirs in case of death.

ii) Up to Rs.500,000/- to a public man in case of accidents resulting in major disability.
iii) Up to Rs. 300,000/- to a public man in case of accidents result in a minor disability.

13.4.8 PAYMENT PERIOD.

Payment of the compensation will be made within 30-days from the receipt of the inquiry report of the accident.

13.9 COMPETENCY.

Since the office of XEN/Dy. Manager (Operation) also serve as Drawing and Disbursing office, therefore, he will be authorized for payment of compensation and allied expenses to the disabled person or legal heirs of the bereaved family for immediate relief.

PTW Register

1	2	3	4	5	6	7	8		9
Sr. No.	**Grid / Feeders under Outage**	**PTW Approved by**	**Nature of Work**	**Name of LS In-charge of Work**	**Names of Members (Working Line Staff Crew)**	**PTW No.**	**Date with Starting Time and End Time**		**Violations Regarding Safety Observed by SDO / LS**
							Time Issued	**Time Cancelled**	
1									

Report Regarding PPE / T&P Kit Parade

Sub Division		Division		Date of Inspection	

S#	Name & Designation	AVAILABILITY POSITION OF PPE / T&P																	
		Rubber Gloves		Leather Gloves		Safety Belt		Safety Hat		Safety Boot		Insulated Plier		Safety Chain		Beeper		D-Rod	
		SA	USA	SA	USA	SA	USA	SA	USA	SA	USA	SA	USA	SA	USA	SA	USA	SA	USA
1																			
2																			
3																			

Attendance of Supervisory Staff:

Sr. No.	Name of LS:	Desg.	Detail of Assigned Duties.	Present / Absent
1				
2				

Attendance of Line Staff:

Description.	LM-I	LM-II	ALM	TOTAL
Total Working Line Staff in S/Div as per Vacancy Statement				
Line Staff attached with other offices / Sportsmen.				
Line Staff attended the PPE/T&P Parade and Safety Lecture				

Detail of Any Shortage of PPE/T&P in Sub Division.

PPE/T&P Parade Conducted by SDO during Last Six Months or Not.				
Safety Posters Pasted	1 - SDO Office	Yes / No	2- Complaint Office	Yes / No
Safety Flexes Pasted	1 - SDO Office	Yes / No	2- Complaint Office	Yes / No

T&P Parade		PTW Register		T&P Register	
BAS Walks		Cleanliness		Housekeeping	
High Volatge Detectors		FG Ladders		Grounding Sets	

Seating arrangement

All Allocated PPE/T&P have been collected by SDO/LS or not, give details.

Name of PPE/T&P Incharge		Name of SDO	

Behavior Assessment Safety Walk Proforma

Name of Sub Division _____

Name of Division _____

Name of Circle _____

SR. NO.	ITEMS DESCRIPTION		DETAILS
1	Site Info.	Date / Time of Checking	
		Name of Installation	
		Location	
2	Observer	Name of checking Officer	
3	Supervisory Staff	Name of Site Supervisor	
		Name of Incharge of Installation	
		Name of Incharge PPE/T&P	
4	Working Staff	Names &Designation	
5	Helping Staff	Names &Designation	
6	Site Scenario	Nature of Job / Work	
		Resources Required to perform the job	
		Supervisor Present at site or not	
		Line Staff Authorized or Not	
		PTW (Required or not)	
		PTW (taken or not taken)	

		PTGs (installed or not)	
7	Facilities	Line Staff wearing PPE or not (if not provide detail)	
		Availability of T&P	
		T&P (Serviceable or Un-serviceable)	
		Departmental Vehicle (Provided or not)	
8	Observation	Staff execute job as per SOP or not	
		If not then detail of violations observed	
		Violations Committed by	
		Site Snaps (with names of each individual)	
9	Action	Action Taken at the spot	
		Action Recommended	
		Name of Office to whom Recommendations sent	

Signature & Stamp
Assist. Manager / Dy. Manager / Manager

References:-

1. NEPRA-Power Safety Code for licensees (2nd Edition) issued in June, 2021.
2. GEPCO Safety Code-2006.
3. HSE Manual K-Electric.
4. Factories Act, 1934 (Chapter No. 3)
5. The Punjab Occupational Safety & Health Act-2019.
6. Pakistan Environmental Protection Act, 1997.
7. Workmen's Compensation Act, 1923.
8. Dock Laborer Act, 1934.
9. Draft Pakistan Occupational Health & Safety Act-2018 (Draft)

Prepared By:

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Ehsan Elahi
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GEPCO H/Q Gujranwala

Approved By:

BOD GEPCO