Energy That Moves Life

Corporate HSEQ Manual

DOCUMENT CHANGE RECORD:

REV. NO	DESCRIPTION OF CHANGE	EFFECTIVE DATE
01	Initial Version	July, 2010
02	Changes done as per Revised NEPRA Power Safety Code 2021	November 15, 2021

Contents

1.0 PURPOSE:

The purpose of this CHSEQ Manual is to lay down management framework which serves as a reference for implementation of the safety management system. It provides direction to management at all levels for implementing Occupational Health, Safety, Environment and Fire Safety to achieve compliance to legal and regulatory requirements. It establishes a safety management structure built upon safety procedures and practices for K-Electric especially focusing on electrical work related to Power Generation, Extra High Tension (EHT), High Tension (HT) and Low Tension (LT) network.

This Safety Manual is for the guidance of employees/workers, in the prevention of accidents, which may result in injury or death of the workers, their fellow employees, workers of contractors or the public, or damage to KE property or equipment. However, most of the instructions will help prevent injuries and sufferings in the normal life too. It applies to all the employees at work and the contractors working for KE.

No Manual can cover all conditions that may arise when work is in progress. Everyone should remain alert and exercise good judgment according to circumstances and as and when required. This Manual prescribes minimum requirements and cannot be treated as a complete working guide. Additional safety practices will be incorporated as and when considered necessary and updated in the amendment sheet of this manual. Above all, the employees/workers/ and contractors are encouraged to submit safety suggestions.

The principle elements of the HSEQ Management systems, described in this manual are given in Contents. This manual is designed in accordance with the NEPRA Power Safety Code 2021.

2.0 SCOPE:

This CHSEQ Manual shall apply to all BUs, premises (offices, distribution, generation, and transmission) of the company and electrical network system managed by the company as on date. The objective is to ensure control of operations and management of safety outcomes.

The KE HSEQ Management System provides a mechanism for Occupational Health & Safety, Environment and Quality Management throughout all areas and departments of KE.
The HSEQ Management System is designed to cover:

1. Environmental Aspects and Impacts
2. Occupational Health & Safety Hazards and Risks
3. OH&S Risks KE can control / manage directly
4. Risks which are beyond KE control with limited influence

CHSEQ and BU HSE shall develop and revise their procedures based on the guidelines given in this manual.

3.0 DEFINITIONS:

The terms and expressions used but not defined in this code shall have the meaning assigned to them in the Act.

1. Act:
The term "Act" means the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (XL of 1997).

2. Annual:
The period of one Fiscal year, starting from July and ending on June 30.

3. Authority:
The term "Authority means the National Electric Power Regulatory Authority (NEPRA) established under Section 3 of the Act.

4. Building:
A structure with a roof and walls.

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

6. Contractor:
External organization providing services to the licensee in accordance with agreed specifications, terms and conditions.

7. Contractor Employee:
Person employed by licensee as a contractor or sub-contractor engaged in providing services for licensee on the company's worksites.

8. Competent Person:
A medically and physically fit person who is assigned, designated and authorized in writing by the Licensee 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.

9. 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.

10. Distribution Company:
The term "Distribution Company" means a person engaged in the distribution of electric power.

11. Distribution Facilities:

The term "Distribution Facilities" means electrical facilities operating at the distribution voltage and used for the movement or delivery of electric power.

12. Distributed Control System (DCS):

DCS is used in Power Plants, a computerized process control system for operation usually with many control loops, used for system management and data collection.

13. 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. Examples of employees include:

a) Full-Time Employees
b) Part-Time Employees
c) Temporary Employees
d) Seasonal Employees
e) Freelancers
f) Temporary workers
g) Consultants

14. Environment:

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

15. Environmental Impact Assessment:

Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, considering inter-related socioeconomic, cultural and human-health impacts, both beneficial and adverse.

16. Environmental Aspect:

An element of licensee activities, products and services that can and/or does interact with the environment. Examples of environmental aspects categories are:

a) Air Emissions,
b) Energy,
c) Soil contamination,
d) Water contamination,
e) Biodiversity,
f) Materials (Procurement),
g) Materials (Storage and Use),
h) Effluent discharges,
i) Solid Waste Generation,
j) Sludge Generation,
k) Freshwater/Seawater consumption,
l) Crude Oil consumption (consumption of non-renewable resources),
m) Noise.

17. Environmental Impact:
Any change to the environment, whether adverse or beneficial, resulting from Licensee's activities, product, and services.

18. Exposure:
Presence of a hazardous substance (Solid, Liquid or Gas), or physical factors (noise, temperature, vibration, non-ionizing, and ionizing radiation) in an area where a person works.

19. 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.

20. Facilities:
Space or equipment necessary for doing an operation or process.

21. Fire:
The combustion of any material and substance gives rise to a fire. The evidence of combustion shall be indicated by one or a combination of the following fire signs;

a) Visible flames including flashes and arcing,
b) Visible glow of combustible materials resulting from elevated temperature,
c) Damage or destruction of materials or equipment resulting from elevated temperature, including short-circuiting, overheating or spontaneous combustion,
d) Smoke.

22. First Aid Injury or illness:
First aid case is limited to any one-time treatment and any follow up visit for the purpose of observation of minor scratches, cuts, burns, splinters and so forth, which do not ordinarily require prescription medication / medical care.

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

24. Generation Company:
The term "Generation Company" means a person engaged in the generation of electric power.

25. Generation Facility:
The term "Generation Facility" means the electrical facility used to produce electric power.

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

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

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

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

30. HSE:
Occupational Health, Safety & Environment

31. 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.

32. 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. Management systems include procedures, standards, planning, design, personnel selection, supervision, safety/hazard reviews, emergency planning, work permitting, trainings, communications, maintenance, inspection, behavior of people, etc.

33. 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.

34. Incident / Accident:
An unplanned event which results or could have resulted in an adverse or undesirable consequence of workplace injury, fire, explosion, damage, or an environmental impact. Undesirable consequences related to such incidents include but are not limited to the following:

a) Fires
b) Work-related injuries
c) Process safety incidents
d) Property or equipment damage.
e) Unfavorable impact on the public.
f) Shortness of breath due to oxygen deficiency in a confined space
g) Toxic gases exposure resulting in dizziness
h) Release of chemical or hydrocarbon from a tank
i) Near miss

35. Incident Direct Cost:
Incident Direct Cost refers to cost of direct damage, repairs or replacement, clean-up, material disposal and environmental remedy 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.

36. 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.

37. Key Performance Indicator:
A Key Performance Indicator (KPI) is a 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.

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

39. Licensee:
The term "Licensee" means a holder of a license under the Act.

40. Likelihood:
Frequency of occurrence of an event/incident.

41. Live Parts (Energized):
Any live, exposed, guarded or unguarded electrical conductors or components that are not placed in an electrically safe work condition.

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

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

44. Medical Treatment Injury or illness:
Any work related injury in which treatment (other than first-aid) is administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first-aid treatment, even though provided by physician or registered professional personnel.
Examples of Medical Treatment Case;

a) Abrasions - Treatment of abrasions that occur to deeper than full skin depth.
b) Bruises - Treatment of a bruise by drainage of blood.
c) Burns - The treatments of second and third degree burns
d) Casts - Application of a cast or other professional means of immobilizing an injured part of the body.
e) Debridement - Surgical Debridement, that is, the removal of dead or damaged skin. Fractures - Treatment of fractures

f) Infections - Treatment of infections arising out of an injury.
g) Prescriptions - Administration of prescriptions medicines
h) Sutures - The suturing (stitching of the edges) of any wound

45. 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.

46. 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.

47. Occupational Health & Safety:
Intended to the conditions and factors that affect, or could affect, the health and safety of employees, temporary workers, contractor personnel, visitors or any other person in the workplace.

48. On-job Fatality:
An on-job injury or illness that results in death.

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

50. Restricted Duty Injury or Illness:
Any work-related injury that results in restricting the employee to perform all or any part of his/her normal assignment during all or any part of the workday or shift. Recordability of restricted duty at times will be dependent upon the nature of the work performed by the employee. For example, a sprained ankle may not be 'Lost Workday' for an office assistant working at a desk since he/she can perform all his/her duties, but it probably would be for an operator, mechanic or warehouse man.

51. Lost Time Injury or Illness:
Any injury or illness which prevents the employee from performing all the duties of his/her regularly assigned job on any calendar workday followed by the day of the incident

52. Permissible Exposure Limit (PEL):
PEL is the occupational exposure standard that refer to the maximum permissible exposure to air-borne chemicals to which nearly all healthy persons can be exposed to an average 8hour period per day (TWA) without adverse health effects. Detail information about PEL is primarily found in the Material Safety Data Sheet (MSDS).

53. Property Damage Incident:
All safety incidents that result in damage to the licensee property/structure/equipment however, excludes 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 an equipment, resulting in direct cost as per criteria set by licensee.

54. Process:
A series of actions or steps taken to achieve an end result.

55. Product:
The goods or energy produced/generated/manufactured for sale.

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

57. Risk Assessment/Treatment:
Overall process of Hazard identification, analysis, evaluation of risk level and application of controls.

58. 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.

59. 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. In addition, exposure to STEL shall not be repeated more than 4 times per day. Information about STEL is found in Material Safety Data Sheet (MSDS).

60. Severity:
Level of consequences/outcomes of an event/incident.

61. Shall:
The term "shall" indicate a mandatory requirement.

62. Should:
The term "should" indicate a suggested/ optional recommendation.

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

64. Task:
A piece of work activity to be completed or undertaken.

65. Task Steps:
Each separate part of a work activity.

66. 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).

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

68. Transformer:
Generated energy is regulated to increase or decrease voltage.

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

70. Transmission Facilities:
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:

a) 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.

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

71. 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.

72. Utilities:
Services such as gas, water, electricity and telecommunication, etc.

73. Vehicles:
A thing used for transporting people or goods.

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

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

76. Working on Live Parts:
Coming into contact with the live electrical components with hands, feet, other body parts, tools, probes or test equipment, etc.

77. Workplace:
Place under the control of the licensee where a person needs to be or to go for work purposes.

78. Worksites:
Includes licensee owned and directly managed properties.

4.0 ABBREVIATIONS:

- ABC Aerial Bundle Cable
- AC Alternating Current
- AE Assistant Engineer
- BU HSE HSE-G&T, HSE-D, Safety Coordinators of Support and Other Departments
- CXO Chief Officer
- D Distribution
- DC Direct Current
- DT Distribution Transformer
- EHT Extra High Tension-66/132/220/500 kV
- ELCB Electric Leak Circuit Breaker
- FAC First Aid Case
- G Generation
- G&T Generation and Transmission
- GFCI Ground Fault Circuit Interrupter
- GHS Globally Harmonized System of Classification and Labelling of Chemicals
- GSMO Grid System Maintenance & Operation
- HSEQ Health Safety Environment & Quality
- HT High Tension-11kV
- JSA Job Safety Analysis
- KE K – Electric Limited
- LDC Load Dispatch Control
- LM Lineman
- LOTOTOTO Lock Out Tag Out Try Out Test Out
- LT Low Tension-400V
- LWI Lost Workday Injury
- MCP Manual Call Point
- MOC Management of Change
- MSA Management Safety Audits
- MTC Medical Treatment Case
- NEBOSH National Examination Board in Occupational Safety and Health
- NEPRA National Electric Power Regulatory Authority
- NIOSH National Institute of Occupational Safety & Health
- OSHA Occupational Safety & Health Administration
- PCB Polychlorinated Biphenyls
- PDCA Plan Do Check Act Cycle
- PMT Pole Mounted Transformer
- PNRA Pakistan Nuclear Regulatory Authority
- PPE Personal Protective Equipment
- Ppm Parts per million

- PSM Process Safety Management
- PSSR Pre Startup Safety Review
- PT Power Transformer
- PTG Portable Temporary Guard
- PTW Permit to Work
- RCCDs Residual Current Circuit Breakers
- RCDs Residual Current Devices
- RT Radiography Test
- RWC Restricted Work Case
- S/S Sub-Station
- SBM Standby Man
- SDS Safety Data Sheet
- SEPA Sindh Environmental Protection Agency
- SEQS Sindh Environmental Quality Standards
- SOP Standard Operating Procedure
- SRL Self-Retractable Lifeline
- T Transmission
- TLD Thermo Luminescent Dosimeter
- TN Transmission Network
- TRA Task Risk Assessment
- TRIR Total Recordable Injury Rate
- WI Work Instructions

5.0 INTRODUCTION TO KE:

5.1 Our Vision:

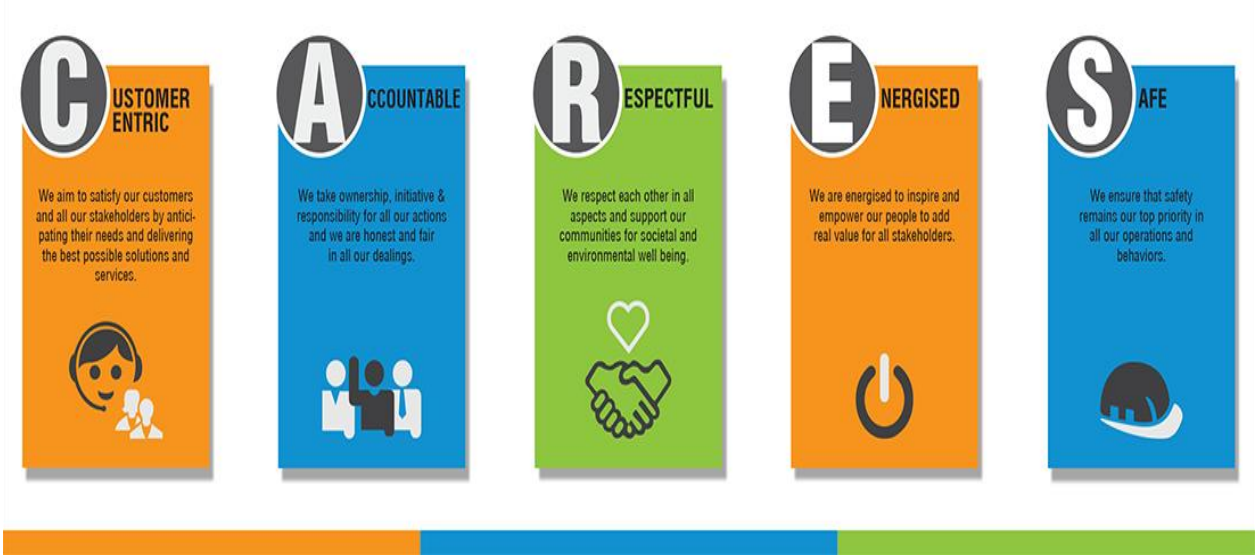
To restore and maintain pride in KE, Karachi and Pakistan.

5.2 Our Mission:

Brightening lives by building the capacity to deliver uninterrupted, safe and affordable power to Karachiites.

5.3 Our Values:

At K-Electric, our employees are the key driver of our success. This ethos is reflected in our values – CARES – which define our corporate culture.



6.0 CORPORATE HSEQ POLICY:

Energy That Moves Life

CORPORATE HSEQ POLICY				
KE - HSEQ POLICY-001	06	8th June, 2018	1 of 1	CORPORATE HSEQ
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We at KE are committed to surpassing the requirements and expectations of our customers / stakeholders and continually improving upon our Health, Safety, Environment and Quality performance by:

a) Complying with applicable legal, regulatory and other requirements to which our company subscribes;
b) Embedding the Health, Safety, Environment and Quality requirements in our routine and non-routine activities;
c) Preventing injuries and ill health to personnel affected by our activities through a proactive system of risk management;
d) Conserving natural resources and reducing the carbon footprint of activities by proactively assessing their environmental impact and mitigating their adverse effects;
e) Ensuring competency of employees by providing them with adequate training, information, instructions and supervision;
f) Communicating with stakeholders to ensure a mutually beneficial understanding of our HSEQ policies, standards, programs and performance;
g) Ensuring continual improvement through a system of performance planning, measurement and regular reviews.

KE employees are at the forefront of this policy; for its successful implementation, they shall demonstrate their HSEQ consciousness by practising their assigned safety roles and responsibilities. The policy shall also reinforce our standards of nurturing and developing our substantial talent pool, building shareholder value through performance excellence and improved financial results, and measuring customer satisfaction by providing reliable, safe and cost effective service.

It is my firm belief and a core business value that all accidents and work related ill health are preventable. To achieve this, I shall ensure that timely decisions are taken and resources provided to demonstrate our commitment to implementing our HSEQ vision and strategy.

SYED MOONIS ABDULLAH ALVI
CHIEF EXECUTIVE OFFICER
Date: 8th June, 2018

7.0 SMOKE FREE WORKPLACE POLICY:

1. Policy Statement:

To promote a healthy working environment, all forms of smoking are prohibited at all KE locations Including (but not limited to) Office buildings, Power plants, Grids, Integrated business centers, Control centers, Learning and training institutions, workshops, stores, construction & project sites and all hired and owned vehicles of K-Electric except at the "Designated smoking areas".

2. Communication:

a) The policy shall be made available to all new employees during orientation.

b) The policy shall be communicated to all employees, contractors and visitors to the company sites including external clients / vendors together for compliance.

c) The company shall ensure demarcation of both designated smoking and smoke free areas.

3. Responsibility:

a) Responsibility of implementation of the policy lies with the location owner.

b) All KE employees including contractual staff are responsible to take reasonable care for health and safety of themselves and others and adhere to the requirements of smoke free workplace policy and cooperate with the management in creating a smoke free healthy working environment.

4. Visitors:

It is the responsibility of all KE employees to ensure that visitors, guests including external clients must adhere to smoke free workplace policy.

5. Smoking Prohibited Areas:

a) Smoking shall be prohibited at all Business units (BU) of KE (including all functional units related to BU).

b) Smoking is also prohibited in company owned and contractor vehicles including MTLs and special vehicles

c) Smoking is not permitted in the following areas:

d) Main entrances

e) Lifts

f) Corridors and stair ways

g) Canteens/cafeteria

h) Rest room/toilets

i) Meeting rooms

j) Car Parks

k) Smoking is also not allowed outdoors in any of the grassy areas and near flammable objects.

6. Designated Area for Smoking:

Smoking shall only be allowed in a designated area with clearly displaying "Smoking Area". Location owners to designate the smoking area with relevant HSE professional after proper risk assessment.

7. Violations:

To enable individuals to become accustomed to the restrictions on smoking, employees breaching the policy

will be supported with counselling and education process. If the individual persists in breaking these rules, he / she will be subjected to disciplinary action.

8. Facilities for Smokers:

a) Smoking area to be an area that is not substantially enclosed by a roof or walls, stairs or passage.

b) It should be an outdoor area at least four meters away from any door or window into which smoke cannot drift.

c) The "Smoking Area" should be equipped with ashtrays or non-combustible covered receptacles for the disposal of waste.

9. Applicability:

This policy is applicable to all the employees working for KE including contractual staff in all BU's (Distribution, G & T, Support Departments) as well as Visitors.

NOTE: This policy is applicable to all Events planned by or for K-Electric.

Note: For Details, see following;

- KE-SP-036 - Smoke Free Workplace Policy

8.0 DRIVING AND TRANSPORT SAFETY POLICY:

1. Scope:

This section covers the policy to establish mitigation measures pertaining to traffic movement and transportation at all KE locations / sites.

Requirements of this policy applies to all company staff (KE or OSP), contractors, suppliers that drive any vehicle which is owned, leased, rented or contracted by K-Electric or by an employee for company business. This policy applies to everyone in KE who operates a motorized vehicle (automobile, two-wheeler, MTL, special vehicles etc.) for Company business. This includes workers who travel to and from their home to KE offices and work sites in personal transportation (automobiles and two-wheelers) or they are a passenger in a motorized vehicle.

2. Policy Statement:

To minimize risk and ensure that procedures for driving qualification and practices are followed, this policy applies to all KE locations. The policy also provides the foundation for building a driver improvement program. The following shall be implemented in all locations in accordance with local standards and regulations. All Legal / Regulatory and Statutory requirements referenced in clause 12 are applicable.

2.1 Driver Training & Qualification:

Only qualified & approved drivers (as per Fleet Management Criteria) with a valid vehicle driving license and fulfill all requirements (such as training / certification) for the vehicle that the person is operating, are allowed to drive vehicles on behalf of KE including company-owned, leased vehicles or rented for business purposes.

Approval by Fleet Management will only be granted to those who possess a valid driving license that satisfies the federal, provincial and local government requirements to drive the specific vehicle in the area of operation.

For Special Vehicles, Operator and Equipment shall be certified from reputed certifying agency / institute.

2.2 KE employees operating a vehicle at any KE location, will have an annual review of this Policy. KE employees operating a vehicle on Company Business more than 1500Km per year shall have the following training:

a) Defensive Driving initial training – New Inductees (by FM through External Training firm)

b) Defensive Driving refresher training every 3 years (by FM through External Training firm)

c) KE driving and Transport Safety policy (By CHSEQ through Internal Resource)

Note: For Hired vehicle, 5.2 a), b) and c) shall be made part of vendor P. O. contracts.

3. Vehicle Condition:

All KE Vehicles, including company-owned, leased vehicles or rented for business purposes, must be inspected and confirmed to be in safe working condition (fit for purpose) by the driver before using. Initial availability will be ensured by FM, while regular maintenance / availability will be ensured by User Department. Vehicles accompanying the passengers for official trips should have the following mandatory items:

a) Airbags,

b) ABS system,
c) First aid box & Fire extinguisher,
d) Seat belts,
e) Safety Cones (Excluding Personal Cars),
f) Reverse Alarm (Excluding Personal Cars).

Note:

1. Existing KE Own, Hired and Leased vehicles, without provision of ABS and Airbags are to be replaced with ABS and Airbags equipped vehicles within TEN (10) year from the date of issuance of this policy.
2. All vehicles without Seat Belts are to be equipped with Seat Belts within three months from the date of issuance of this policy.
3. The vehicle in use by KE, whether owned or hired, should be used as per the recommended life span of OEM in term or KM or years, whichever comes earlier. Afterwards, it should be replaced upon completion of its useful life. As first step, Salvage life for KE Own, Hired and Leased (Light Duty Vehicles) will be 25 years. Replacement shall be ensured within two (02) years, after promulgation of this SOP.
4. Special Vehicles (Forklift, Lifters, Loaders and Cranes etc.) are subject to satisfactory third-party testing of compliance, hence salvage life requirement is not applicable to Special vehicles.

Note: For details, see following;

- KE-SP-037 - Driving and Transport Safety Policy

9.0 NEPRA POWER SAFETY CODE-2021 REQUIREMENTS:

9.1 Compliance to The Legal and Other Requirements:

S No	Law / Regulation / Standard	Area of Focus	Description	Applicability
NEPRA Code / Regulations / Standard				
1	NEPRA Power Safety Code -2021	HSE	A) Development and implementation of HSE Manual as prescribed in NEPRA PSC. B) Procedures through locally prepared, documented procedures and/or other systems	G&T, D
Environmental Laws – National & Local				
1	Pakistan National Conservation Strategy (NCS) 1992	Environment	It is a broad-based policy statement aimed at achieving environmentally sustainable social and economic development in Pakistan.	G&T, D
2	Sindh Environmental Protection Act (SEPA) 2014	Environment	To provide for the protection, conservation, rehabilitation, and improvement of the environment, for the prevention and control of pollution, and promotion of sustainable development in the province of Sindh.	G&T,D
3	National Environmental Policy 2005	Environment	Aims to protect, conserve, and restore Pakistan's environment to improve the quality of life of the citizens through sustainable development. It provides broad guidelines for addressing environmental concerns and ensuring effective management of their environmental resources.	G&T, D
4	The Sindh Environmental Quality Standards (SEQS) 2016	Environment	SEQS are uniform standards applicable to all kind of industrial and municipal effluent. There are 32 parameters prescribing permissible levels of pollutants in liquid effluent while 16 parameters for gaseous emission.	G&T
5	The Sindh Environmental Quality Standards Regulations 2014	Environment	For grant/renewal of certification as an Environmental laboratory to test and analyze samples of air, water, soil, effluents or wastes to determine their compliance with the NEQS	G
6	The Environmental Samples Rules 2014	Environment	For detailed sampling procedures, tests and analysis of effluent, air, and soil.	G&T

7	National Climate Change Policy 2012	Environment	It provides solid foundational framework for ensuing Climate Change Action Plans, Programs and Project. The vulnerabilities of various sectors (including energy sector) to climate change have been highlighted and appropriate adaptation measures spelled out	G&T
8	Sindh Environmental Protection Agency (Review of Initial Environmental Examination and Environmental Impact Assessment) Regulations 2014	Environment	It categorizes New developmental energy generation and transmission projects for IEE and EIA.	G&T
9	The Hazardous Substances Rules 2014	Environment	Handling, Storage, and disposal and for grant/renewal of license for hazardous substance. (Asbestos, PCBs, etc.)	G&T
10	Port Qasim Authority Act 1973	Environment	71B: The Authority shall be responsible for maintaining marine environments of the port's limit to ensure that sea, land, an air is free from pollution	G&T
11	Port Qasim Authority Act 1973-Amendment made vide Port Qasim Authority Ordinance 2002.	Environment	71C: No proponent of a project shall commence construction or operation unless he has filed with this Authority as IEE or EIA and has obtained approval.	G&T
12	The Antiquities Act 1975	Environment	To ensure that no activity is undertaken within 200 ft of a protected antiquity, and to report to the department of Archeology, Govt. of Pakistan, any archeological discovery made during the project.	T
13	Pakistan National Operational Strategy for the Clean Development Mechanism (CDM) 2006	Environment	It provides policy guidance for implementation of CDM in Pakistan in line with national sustainable development goals	G&T, D

14	National Energy Conservation Policy (NECP) 2006	Environment	To achieve energy efficiency improvement in industries by providing support to industry for energy audits; better housekeeping and implementing low cost and fast payback energy conservation measures.	G&T, D
15	Land Acquisition Act, 1894	Environment	The Land Acquisition Act (LAA) of 1894 amended from time to time has been the defacto policy governing land acquisition, resettlement, and compensation in the country. The LAA is the most used law for acquisition of land and other properties for development projects.	G&T, D
16	Sindh Wildlife Protection (Amendment) Act 2008	Environment	The Sindh Wildlife Ordinance 1972 empowers the government to declare certain areas reserved for the protection of wildlife and to control activities within these areas. It also provides protection to endangered species of wildlife.	G&T, D
17	Sindh Forest Act (2012)	Environment	The act empowers the provincial forest departments to declare any forest area as reserved or protected. The Act also empowers the provincial forest departments to prohibit the clearing of forest for cultivation, grazing, hunting, removing forest produce, quarrying, and felling, lopping, and topping of trees, branches in reserved and protected forests	G&T, D
18	Cutting of Trees (Prohibition) Act, 1975	Environment	This Act prohibits cutting or chopping of trees without permission of the Forest Department.	G&T, D
National and Provincial Health and Safety Laws / Regulations				
1	The Sindh Factory Act 1934 as amended to 2015 (Chapter 3- Clause 25)	Fire Safety	- Precautions in case of fire. - - Every factory shall be provided with such means of escape in case of fire - In every factory the doors affording exit from any room shall not be locked or fastened so that they can be easily and immediately opened from insides and all times be kept free from any obstruction. - In every factory every window, door or other exit affording means of escape in case of fire, other than means of exit in ordinary	G&T, D

			use, shall be distinctively marked in a language understood by the majority of the workers and in red letters of adequate size or by some other effective and clearly understood sign. - In every factory there shall be provided effective and clearly audible means of giving warning in case of fire to every person employed therein. - The Provincial Government may make rules prescribing in respect of any factory, or class or description of factories, the means of escape to be provided in case of fire and the nature and amount of firefighting apparatus to be provided and maintained	
2	Building Code of Pakistan Fire Safety Provisions-2016	Fire Safety	The Building Code provide rules for fire prevention, life safety in relation to fire and fire protection of building and structures.	G&T, D
3	The West Pakistan Factories Canteen Rules, 1959 read with Factories Act 1934(Chapter 3, Section 24) and The Sindh Factories Act, 2015(Chapter3, Section 27)	Health and Safety	House Keeping, Hygiene and Food safety in Canteens	G&T, D
4	West Pakistan Hazardous Occupations rules, 1963	Health and Safety	Special emphasizes on Sand Blasting	G&T, D
5	The West Pakistan Labor Camps Rules, 1960 read with The Sindh factories Act,2015(Chapter 3)	Health and Safety	Lay-out, water supply, Contentions, and sanitation in Labor Camps at project sites	G&T, D
6	Pakistan Penal Code 1860	Health and Safety	It deals with the offences where public or private properties and/or human lives are	G&T

			affected due to intentional or accidental misconduct of an individual or body of people	
7	Boilers Act 1923	Safety	Hydraulic Tests, Inspections, and overall safe operation of Boilers	G
8	The Boilers and Pressure Vessels Ordinance 2002	Safety	As above	G
9	Nuclear Safety & Radiation Protection Ordinance, 1984	Safety	Safe storage of radio isotopes and disposal of Radiography films	G
10	Pak Nuclear Regulatory Authority Ordinance 2001	Safety	Same as above	G
11	Motor Vehicles Rules 1969	Safety	Vehicles operations and Driving	G&T, D
12	Drugs Act 1976	Safety	safe Storage, distribution of drugs	G&T, D
13	Explosive Substance Act 1908 and The Petroleum Rules 1937	Safety	Transport, storage of furnace Oil, HSDO, petroleum, kerosene oil and other inflammable substances	G&T
14	The Electricity Act 1910, Electricity Rules 1937	Safety	It provides legal base for power distribution and obligates licensee to pay compensation for any damages caused during the constructions and maintenance of any power distribution / transmission facilities.	G&T, D
15	Factories Act 1934 (Chapter 3; Sections 13 to 24 & N33.	Health and Safety	Provision for Drinking water, Lighting, housekeeping, First Aid, Firefighting Arrangements, Trainings, ventilations, Toilets, Lifting equipment's& gears inspections	G&T, D
16	Sindh Factories Rule 2015 (Chapter 3. Sections from 15 to 27 & 51.)	Health and Safety	These are not entirely environment related laws but do incorporate many clauses pertaining to general environmental conditions and occupational health and safety issues. It also provides regulations for handling and disposing of toxic and hazardous materials.	G&T, D
17	Prohibition of Smoking and Protection of Non-	Health	Prohibition of smoking at public and workplaces and designation of exclusive smoking zones for smokers	G&T, D

	smokers Health Ordinance – 2002			
18	Sindh Occupational Safety and Health Act, 2017 and Sindh Occupational Safety and Health Act, 2019	Health and Safety	It covers Safety, Health, Fire Safety ensure safe and healthful working conditions for workers by setting and enforcing standards and by providing training, outreach, education and assistance.	G&T, D

Note: This legal Register is an immediate reference point for all the legal obligations that shall be applicable to KE (Every BU has developed Compliance Matrix of their department/locations)

Note: For details, see

- **"**KE-SP-016 - Environmental Legal Procedure".

9.2 HSEQ Management Team:

1. General Requirements:

KE is committed to promote the highest standards of HSE for minimizing risks to human health and the workplace environment. KE has established a Safety Management System and is devoted to provide safe work conditions to its employees, customers and general public as well as preserving the integrity of our environment. The HSE requirements are specified in accordance to relevant national (NEPRA, Factory Ordinance, EPA) and international (DuPont Process Safety Management System, ISO 45001, ISO 14001) standards and legislation. The maintenance and continual improvement of the HSEQ Management Systems shall be pursued by performing PDCA Cycle.

2. Safety Personnel Responsibilities:

The safety professionals should:

a) Verify implementation of Corporate HSEQ Policy in alignment with corporate intent.

b) Verify implementation of HSE rules, standards, and procedures in operations & project activities including turnaround.

c) Provide consultation & technical knowledge to all levels of management in the areas of HSE & fire protection.

d) Should assign (in coordination with IHU Doctor) a classification to each injury in accordance with OSHA requirements, develop and maintain records for injury performance, exposure hours, fires etc. Track injury/incident data, analyze & highlight areas of concern.

e) Steward & assist in mandatory safety training compliance

f) Should screen all purchases of safety equipment other than reorders of equipment already approved by the site.

g) Should assist in the orientation of new employees to inform them of their safety responsibilities.

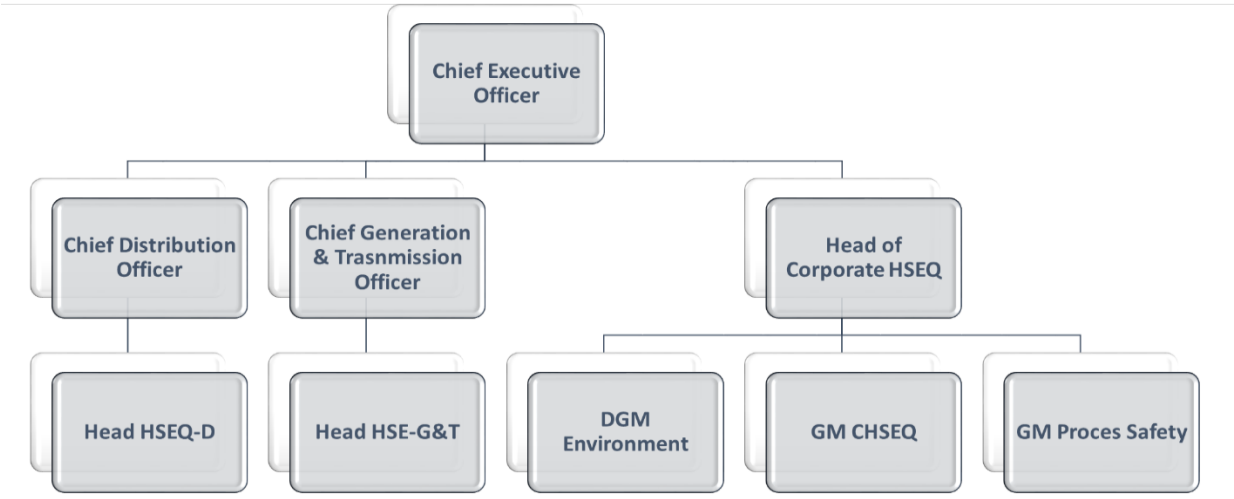
h) Should assist and lead the investigation of serious injuries and incidents.

3. HSEQ Organization:

At K-Electric, each employee has a role to play since safety is a common responsibility; it is a deliberate & conscious commitment of every individual working for K-Electric that he or she shall endeavor to make a positive difference in the system, to make it safer.

BU HSE's shall take guideline from Corporate HSEQ Manual to develop their own manual and HSE coordinators are responsible for ensuring the compliance of these manuals and procedures.

4. Organogram – CHSEQ:



Note:

CHSEQ reports to CEO and BU HSE reports to respective BU Heads. There is a safety coordinator at each plant/transmission department /region/cluster/Location etc.

5. Minimum HSE Staffing in Project:

a) The HSE management team is independent in all its functions under the direct control of Project Heads.

b) HSE management team is deployed to oversee critical activities.

c) Responsibilities and duties of the HSE management team are clearly defined.

d) KE shall provide full-time and experienced, qualified and trained HSE staff to execute, coordinate and implement the HSE Management System / Manual. The minimum number of HSE staff member shall be evaluated on case-to-case basis, corresponding to the level of risk, criticality of operational activities, and required work supervision. The appointed HSE team shall be experienced and competent for the defined roles and responsibilities and shall possess at least one of the approved safety qualifications, such as NEBOSH International General Certificate, NEBOSH International Diploma in OH&S, OSHA Certificate or other approved Safety/ HSE Certificate/ Diploma.

e) The table below provides the minimum number of HSE staff required at construction project sites as per NEPRA:

Project Contractor Minimum HSE Staffing Requirements			
Total No. of Employees	**HSE Manager or Equivalent Position Required**	**Min No. of HSE Supervisors(s) Required**	**Min No. of HSE Officers Required**
1 to 25	No	No	1 HSE Officer
26 to 50	No	1 Supervisor	1 HSE Officer
51 to 250	Yes	2 Supervisor	2 HSE Officer
251 to 500	Yes	3 Supervisor	1 HSE Officer for 50 Employees (or part thereof)
501 to 1,000	Yes	1 Supervisor for every 10 Safety Officers (or part thereof)	1 HSE Officer for 50 Employees (or part thereof)
1,001 to 5,000	Yes	1 Supervisor for every 10 Safety Officers (or part thereof)	20 HSE Officers plus additional 1 HSE Officer for 100 Employee (or part thereof)
5,001 +	Yes	1 Supervisor for every 10 Safety Officers (or part thereof)	60 HSE Officers plus additional 1 HSE Officer for 150 Employee (or part thereof)

f) KE shall upload HSE staff contact details at NEPRA's Data Exchange Portal as mentioned in Annexure-1 "HSE Team Contact Details" within seven (07) working days. Licensee's representative shall also upload the revised and updated contact list, in case of new recruitment, transfer, resignation or in case of HSE organization change.

Note: For details, see following;

- **"**KE-SP-004 - Integrated Organization Structure for Safety"

9.3 Communication Plan:

1. Purpose:

Safety communications are essential; therefore, KE has maintained a high level of communication to establish an effective communication program. It includes:

- Development of a meaningful message.
- Delivery of that message.
- Verifying that the message is understood.

Senior management plays an important role in developing the message; the entire line organization delivers the message and ensures that it is understood. To ensure effectiveness, communication flow covers both from the management to employees and from employees back to management.

2. Scope:

Communication protocols and shall be implemented in all Business Units of KE.

3. Summary:

The basic goal of any safety program is to prevent injuries, illnesses and to prevent damage to assets. It is important that people understand how to avoid injury and, more important, that they choose to do so. An essential element of any HSE program is good communication. Safety professionals must communicate the program's contents to supervisors and team leaders, who must, in turn, effectively communicate to their teams. They must be able to effectively explain their plans for preventing accidents and creating a safer workplace.

This section to emphasize & elaborate the importance of Effective Communication in prevention of occupational accidents / illnesses and achieving safety goals and objectives.

4. Method of Communication:

The three methods of communication are oral, written and nonverbal. Different methods are appropriate in different situations. Supervisors may choose to combine the methods. For example, they may explain job procedures face-to-face, pointing out the hazards and showing operators how to do the jobs safely. They may also give workers a job safety analysis form that reinforces these points.

a) Oral Communication
b) Written Communications
c) Non-Verbal Communications

5. Safety Communication Goals:

The most significant safety communications are one-on-one communications from the supervisor to those people working for him or her. The message can be very simple: "This is what I believe is necessary for you to avoid injury; this is what I want you to do regarding safety." The message is reinforced through:

a) The safety policy statement
b) Safety Induction
c) Training
d) Rules and procedures
e) Safety goals and objectives

f) Personal one-on-one messages
g) Job safety analysis
h) Toolbox meetings
i) Work group safety meetings
j) HSE Newsletters
k) D-Level Safety Talks
l) Supplementary paths of communication such as Safety signs, slogans, posters, and incentives communications are useful but are not significant safety communications in themselves.

6. External Communication Protocol:

All major incidents / injuries at KE shall be reported to NEPRA or other Regulatory bodies as and when required through below protocol.

EXTERNAL REPORTING	
Form C-4 (Annexure A - NEPRA Reporting Template) to be submitted by Respective BU HSE to CHSEQ Considering weekend, night time and gazette holidays, reporting time will be:	08hrs (For Staff) 16hrs (For Public) 20hrs (For Public)
Form C-4 (Annexure A) to be submitted to Regulatory Dept. by CHSEQ.	24hrs
Schedule 3 Form (Annexure F – External Lenders Template**)** to be submitted by CHSEQ to Treasury Dept.	24hrs (For Fatality) 03 days (For LWI)
Form J-1 for Employee (Fatal & LWI) incidents (Line to share with IR department, keeping respective BU HSE and CHSEQ in loop)	24hrs

7. HSEQ Roles & Responsibilities:

S. #	Category	HSE-Distribution	HSE-G&T	Corporate HSEQ
1	Accident Reporting & investigations	Accident and incident reporting (Public & Employee) to CHSEQ (within 30 minutes) Form C-4 to be submitted by line to CHSEQ	Accident and incident reporting (Public & Employee) to CHSEQ (within 30 minutes) Form C-4 to be submitted by the line directly to CHSEQ	- Accident & Incident reporting to NEPRA (Form C4) - Incident Investigation Procedure (all BUs) C-4 Form CHSEQ is prime custodian
2	Investigation follow up for closures	Ensure timely closures of accident investigation recommendations	Ensure timely closures of accident investigation recommendations	Investigation follow up till closure shall be done by CHSEQ

3	HSE Audits	Conduct region/department safety audits (SLA)	Facilitate CHSEQ in conducting safety audits (SLA)	- Conduct process safety audit of HSE-D - Conduct safety audit of BU G&T & BU Support Services (SLA)
4	Safety Inspections and Management Safety Audits (MSA)	Conduct safety inspections/ BBS walks covering below elements; - Accident prevention plan (DAPP, PAPP) formulation & inspection - Ensure Regulatory & Legal Compliance through inspections	- Preparation & execution of Accident Prevention Plan covering both employees & public - Ensure timely closure of inspection observations with coordination of respective safety coordinator/Line management Corp HSEQ will provide DAPP Guidelines	- Spot check/ safety Inspections of BU G&T & SS - Oversight DAPP of BU G&T & BU Support Services
5	Policy & Procedures	Develop and review BU HSE Manual/ Procedures and ensure implementation	Develop and review BU HSE Manual/ Procedures and ensure implementation	Develop and review HSE Policy & Manual/ Procedures for implementation
6	Quality Oversight	-Shall conduct quality inspections -Quality is managed at Cluster Level	Shall facilitate CHSEQ in conducting Quality inspections	- Safety alerts & advisory notification - Lead organizational HSE Program through conduct of “Safety Leadership Committee” - Marketing Collateral, Media Campaign, Safety awareness campaign - Sample based oversight of Risk assessments (All BUs) - Review BU HSEQ plans for new/ major projects - Facilitate BU G&T and BU Support Services for International HSEQ certification standards
7	Safety Trainings	- Plan and conduct safety trainings - Public awareness sessions	Public awareness sessions	- Plan & conduct HSE training program for New inductees - MS (All BUs) - Conduct safety trainings and

				refreshers for BU G&T and BU Support Services
8	Internal Safety Awards	- Conduct monthly safety awards within BU - Conduct annual safety awards (SLA)	-	- Conduct annual safety awards (SLA) for BU - G&T & BU Support Services - Conduct annual safety internal awards (EEA & Fire Safety) for all BUs - Conduct monthly safety awards for BU G&T and BU Support Services
9	External Engagements	-	-	- Plan & participate for external HSE awards - Facilitate HSE due diligence for financial institutions - Regulatory & Legal Compliance
10	Emergency Response Mechanism	Emergency response mechanism shall remain under operational control.	Facilitate CHSEQ in development of Emergency plan and ensure implementation	- Liaison with PMD and PDMA shall be with CHSEQ, who shall also be responsible for raising of "flag" under emergency rain/weather conditions/heat wave etc. This raising of flag shall activate BU's emergency plan as deemed appropriate by BU head
11	Environment Management	-	-	All BUs - Legal and Regulatory Compliance of Environmental laws - Plan and conduct biannually AEEA Audits - Environmental Awareness and Trainings - EIA / IEEs Management
12	IHU functions	-	-	All BUs - Compliance with legal requirements of Factories Act, SEPA Regulations or other National Occupational Health Laws - Issue health advisories to prevent epidemic & endemic diseases - Conduct Hygiene Inspections of work locations including canteens

				- First aid training & First Aid box provision & replenishment - Investigation & classification of injuries to victims in case of accidents
13	Fire Safety Management	-	-	All BUs - Provide Fire Prevention and Fire Safety guidelines to BUs - Provide advice to Works Department on installation of fire safety equipment in buildings - Provide and/or recommend fire safety training for BUs - Fire safety audit of organization. - Oversight of fire safety training and drills at selected locations - Training of Emergency Controllers - Review of ERP - Annual and on occurrence replenishment of fire extinguishers at all KE locations (except Generation plants, who maintain their own inventories)

Note: For details, see following;

- "KE-SP-002 - Incident Investigation Procedure"
- "KE Business Continuity Plan 2021"

9.4 Risk & Impact Assessments:

1. Purpose:

The Purpose of HSE & Social Risk Management process (Mechanism & Responsibilities) and its applicability is to ensure that:

a) All Social and community related actions and issues are taken into consideration.

b) HSE risk management process is properly documented in order to ensure periodic monitoring of risk and their traceability.

c) HSE hazards of all activities and associated site operations are identified, analyzed; 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 KE operations and activities are assessed, treated as required and controlled to "As Low as Reasonably Practicable (ALARP)" to avoid future incidents associated with:

2. Scope:

This section is describing the requirements (HSE hazards/Environmental aspects/Social issues/ Impact assessment) and shall be applicable on all KE personnel, contractor personnel, visitors, passengers or community that may interact with or is affected by any aspect of KE activities, locations, facilities and equipment at workplace, belonging to KE, contractors or others, all Routine (R), Non-routine (N) (operations, processes, maintenance) and Emergency (E) activities and all products and services in use of KE.

3. Risk Management Process:

There is no one method for hazard identification and risk analysis. Generally, the type and rigor of the risk assessment process adopted shall depend on the potential severity of the harm that could occur and the likelihood of occurrence. For simplicity and standardization, we shall adopt the unified procedure with quantitative and qualitative analysis in parallel to each other in following steps:

a) Step 1 – Establish the context
b) Step 2 – Hazard Identification
c) Step 3 – Analyze Risk
d) Step 4 – Evaluate Risk and Determine Acceptability
e) Step 5 – Decision to accept or treat risk
f) Step 6 – Treat Risk
g) Step 7 – Monitor and Review
h) Step 8 – Communicate and Consult

Note: For details, see following;

- "KE-SP-006 – HSE & Social Risk Management Procedure"
- "KE-SP-039 – Environment Aspect Impact Management Procedure"

9.5 HSE Meetings:

1. Purpose:

The purpose of this section is to provide details of overall safety organization and its horizon in K-Electric

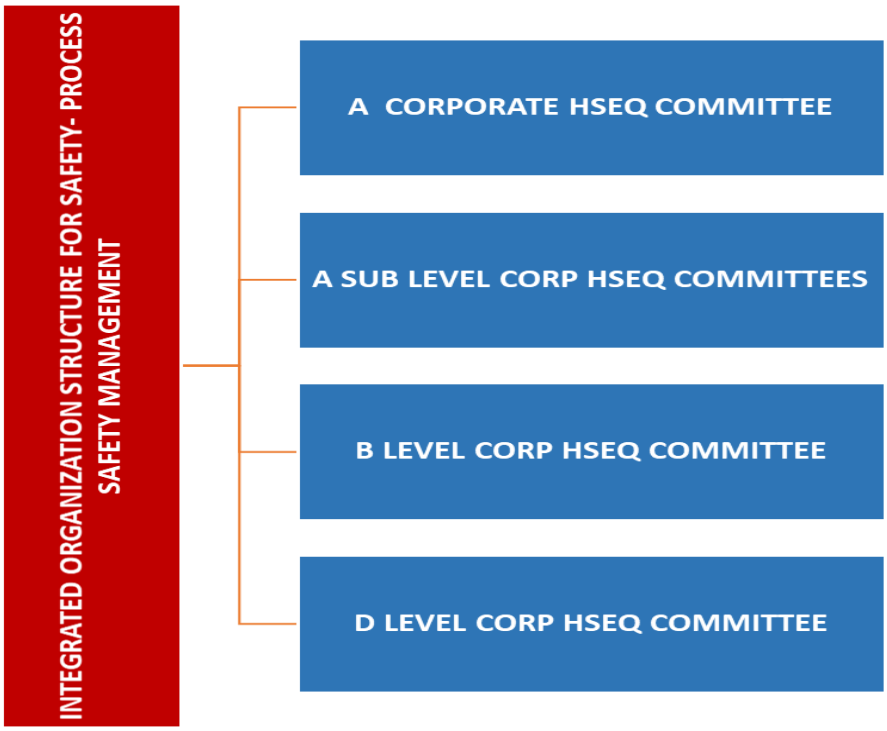
2. Scope:

This section describes the requirement for complying with the Process Safety Management Element of Integrated Organization Structure and its applicability throughout K-Electric.

3. Summary:

The purpose of the overall safety organization is to mobilize all available talent in the interest of safety, health, and environmental protection. It does not in any way relieve individual members of the line organization of their safety responsibilities; rather it provides additional resources upon which they can draw to execute these responsibilities more effectively. Safety committees and safety meetings have proven to be effective means of formulating and carrying out company safety policies, gathering and disseminating safety information, enlisting employee participation in the safety effort, and generating and sustaining interest in safety. Committees are staffed principally by members of the line organization supplemented by safety staff members and other specialists. Below is the overview of the Integration Organization Structure.

SOP defines committee's memberships, roles & responsibilities, functions, HSE goals, meeting frequency, sample framework/formulation of following.



a) KE shall plan and conduct Safety Meetings at top management level (A level and A Sub-Level) on quarterly basis to address the following:

- 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.

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

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

d) NEPRA may call a virtual or physical meeting of licensee's HSE personnel on monthly or quarterly basis, defend on their HSE Performance and Statistics

Note: For details, see following;

- "KE-SP-004 - Integrated Organization Structure for Safety"

9.6 HSE Orientations:

1. Purpose:

Safety induction / orientation plays a pivotal role at any organization to ensure employee, contractors and visitors are known to site safe work practices and its hazards. KE believes that **"ALL INJURIES ARE PREVENTABLE",** then through this everyone will help KE to achieve its goal.

2. Scope:

This section is applicable to all KE locations.

3. Summary:

In KE, it is mandatory for all employees to get safety induction on on-boarding. However, contractor and visitors shall get safety induction whenever they visit plant, region, clusters, locations for any work or survey. While going through safety induction, following areas shall be covered during safety induction but not limited to:

a) Corporate HSEQ Policy
b) Smoke Free Workplace Policy
c) Driving & Transport Safety Policy
d) KE Cardinal Rules
e) PSM Introduction
f) Emergency Response Plan
g) Personal Protective Equipment
h) Site Specific General Rules
i) General HSE Checks
j) Area Specific Major Hazards
k) Communication about Hazard
l) Incident Reporting
m) Fire Protection & Prevention
n) Intro to Permit to Work System & LOTOTOTO
o) Working at Height & Scaffolding Safety
p) Specific Site Prohibition
q) Intro to IHU
r) Introduction to Environment

Note: For details, see following;

- "KE-SP-022 - Contractors & Suppliers HSEQ Management Procedure"

9.7 Job Specific Trainings:

1. Purpose:

KE believes that all staff who is directly involved in maintaining safe operation of the plant/ regions/ cluster/ IBC/ departments must have and maintain the necessary knowledge and skills to safely execute their job functions. Through continuous training and coaching, we can make our operation safer and sustainable.

2. Scope:

The section shall be applicable to all Business Units of K-Electric.

3. Essential Features:

KE shall provide Job Skills Competency 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.

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:

a) HSE Principles:

- Identification, elimination, controlling of Hazards/Risks to avoid incidents,
- Identification of unsafe conditions/acts for safe operation.

b) Examples of Unsafe Acts:

- Operating without Authority or Warning,
- Working without PTW, when required,
- Operating or Working at unsafe Speed,
- Making safety devices In-operative/bypassing,
- Use of unsafe equipment or improper use of equipment
- Unsafe Loading,
- Placing or Leaving Objects,
- Mixing improper Packing,
- Taking unsafe Position or Posture,
- Working on equipment without taking proper precautions,
- Non-vigilant and inattentive behavior,
- Distracting, Teasing or Startling,
- Failure to use safe clothing or protective equipment.

c) Examples of Unsafe Conditions:

- Improper Guarding,
- Defective material or equipment,
- Hazardous arrangements,
- Hazardous weather,
- Hazardous place of work,
- Insufficient lighting,
- Improper ventilation,

- Unsafe Clothing,
- Unsafe Design & Construction.

d) Operation & Maintenance:

- Operations & Maintenance Manual/ SOP's/ Work Instructions
- Shift Duties
- Reporting of duty in an unfit condition
- Assistance from employees not on duty
- Operation, Maintenance and Inspection of Equipment
- Fire Precautions
- Working in a confined space
- Working on road
- Work in Substations! Grid! Hazardous Area
- Weather information
- Interference of animals
- Visitors
- Working of employees of other organizations
- Identification of operating equipment

Note: For details, see following;

- "KE-SP-008 - Corporate HSEQ Training Procedure"

9.8 HSE Awareness Trainings:

1. Purpose:

KE believes that all staff who are directly involved in maintaining safety of the plants/ regions/ clusters/ IBCs/ departments must have and maintain the necessary knowledge and skills to safely execute their job functions. Through continuous training and coaching, we can make our operation safer and sustainable.

2. Scope:

The section shall be applicable to all Business Units of K-Electric.

3. Essential Features:

KE 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.

Refresher trainings shall 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.

Following trainings but not limited to shall be part of HSE awareness sessions

a) Safe Work Practices
b) Working at Height & Scaffolding
c) Confined Space Entry
d) Excavation Safety
e) Electrical Safety
f) LOTOTOTO
g) Process Safety Management
h) Safety Induction
i) First Aid & CPR
j) Fire Protection & Prevention
k) Emergency Response Plan
l) Emergency Rescue
m) Waste Management
n) Spill Management
o) Welding, Cutting & Grinding
p) Crane & Lifting Equipment
q) Radiography
r) Sandblasting
s) Manual Handling
t) Hazard Communication / Safety Data Sheet (SDS)
u) Office Safety & Ergonomics

Note: For details, see following;

- "KE-SP-008 - Corporate HSEQ Training Procedure"

9.9 Control of Visitors & Animal Access:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety standard for Control of Visitors and Animal Access to KE premises.

2. Scope:

This section is implemented on all Business Units/locations of KE.

3. General Requirements:

All KE locations/ departments/ plants/ regions/ clusters/ IBC entry gates are secured, unauthorized access of visitors and vehicles are restricted to KE operational areas. Following controls are in place at KE Locations:

a) Visitor, employees of other departments and guests etc. are not permitted to access to any KE location without prior intimation/ approval taken by concern employee from security department and other stake holders.

b) Security Policy available and displayed at every location. No visitor/ employee is allowed to enter the KE Location/Premises without permission.

c) All employees to accompany their guest/visitors.

d) Any visitor/ guest is not allowed to visit any restricted/operational areas without the approval.

e) All visitor shall be given orientation when entering to Generation Plants and other KE locations

f) Appropriate/ mandatory PPE's are provided to visitors for restricted and operational area as per identified hazards and Risks/HSE requirements.

g) All visitors/ contractor shall be equipped with safety induction card having information of site hazards, assembly points and emergency contact details whenever they visit KE Location

h) Customers briefing on IBC desks

i) All premises are secured and restricted for stray or street animals.

Note: For details, see following;

- "KE-Security-SP-001, Security Instructions"

9.10 Contractors, Sub-Contractors & Suppliers:

1. Purpose:

The purpose of this section is to ensure that Process Safety Management goal of contractor safety is met. Further, the health and safety aspects of contractor employees are managed in a systematic way.
KE believes that all jobs must be completed safely in accordance with established procedures and/ or safe work practices consistent with the KE's Process Safety Management (PSM) whether the tasks are completed by KE or Contractor Employees. Contractors shall be required to pass on their HSE requirements to subcontractors.

2. Scope:

This document is applicable at all KE administered locations. It describes the requirement for complying with the Process Safety Management element on Contractor Safety Management.

3. Summary:

The basic goal of any safety program is to prevent injuries, illnesses and asset damage. It is important that people understand how to avoid injury and, more important, that they choose to do so. Knowledge must be transferred to the employee, in order to accomplish this, use all possible communications paths. The paths should not contradict one another, should be mutually supportive, and should combine to present the entire range of knowledge that is desired. All safety communications should reflect management's commitment to work safely. The document captures necessary ingredients of an effective Two-Way Safety Communication protocol.

This section is intended to address the requirements and guidelines related to contractor safety, ensuring that:

a) Contractors are capable of effectively managing the safety requirements
b) KE Safety Expectations have been defined and shared with contractor
c) HSE plan has been defined for project
d) Compliance status of HSE Plan are being monitored
e) Good Compliance recognized
f) Deviations are being corrected
g) Contractor shall be penalized against HSE violations as per company policy

4. Steps in Contractor Safety Management:

This section summarizes the Contractor Safety Management (HSE aspects only) steps to meet PSM program. The short-term target is to get 100% fulfillment of the contract, including delivery of safety results. Longer-term target is to build a mutually successful working relationship that allows both contractor and KE to gain a return. Consequently, adequate training and close oversight shall be provided to contractor, while insisting that contractor workers are fully accountable for their own behavior.

This section is applicable to all onsite contractor and sub-contractor activities.

To accomplish an effective Contractor Safety Management process, site management shall:

a) Set goals, objectives, and expectations for contractor performance.
b) Establish clear accountability for performance against goals, objectives, and expectations.

c) Demonstrate "felt leadership" and commitment towards contractor HSE excellence.

d) Designate a contract administrator (this can be a leveraged resource).

e) Provide sufficient and qualified resources to implement this standard and to audit contractors for compliance.

f) Have adequate systems in place to comply with this standard.

g) Identify a safety resource qualified to address contractor safety (this can be a leveraged resource).

h) Periodically evaluate the overall Contractor Safety Management process to determine if upgrades should be made.

Steps in Contractor Safety Management (CSM) are:

4.1 Contractor Pre-Qualification:
Hire and retain contractors who have demonstrated a satisfactory safety performance.

4.2 Contract Preparation:
Document the safety performance expectations, standards for execution of the work, capabilities of key personnel, and expected behaviors.

4.3 Bid Meetings, Bidding, Contract Awarding & Post Contract Award Items:
Communicate and test for understanding the safety expectations which are documented in the contract.

4.4 Orientation & Training:
Brief the contractor and his team about basic site HSE rules/SOPs, common workplace hazards and emergency role statement.

4.5 Monitoring & Supervision - Auditing & Monitoring of the Work:
Assure that the contractor is following the contract. Also, make sure that all parts of organization are conforming to KE Safety Standards (PSM etc.).

4.6 Contract Evaluations & Records:
Assess the level of success and the lessons learned. Determine whether to retain the contractor and determine what changes need to be made in our administrative or operational controls.

Reference: For details, see following;

- "KE-SP-022, Contractor & Suppliers HSEQ Management Procedure"

9.11 Management HSE Walk-Through/ Site Tours:

1. Purpose:

OSHA defines that 96% of unsafe acts are the leading cause of an incident to occur. The purpose of this section is ensure the recording and tracking of unsafe acts across KE with the involvement of top management.

2. Scope:

This section is applicable at all employees at KE and its administered locations. It describes the requirement for complying with the Management Safety Audit within the Process Safety Management element on Audits & Observations

3. Summary:

Safety Contact audits approach is considered as one of the best audit techniques. During a one-on-one audit, a manager and a subordinate (if required) audit a portion of the subordinate's area together.

Management Safety Audit requires that all CXO's/ Directors/ Dy. Directors/ General Managers/ Dy. General Managers/ Managers/ DMs/ AMs/ Officers should formally visit, tour, and audit the worksite as per defined MSA plan circulated by respective Safety coordinators and respective BU HSE. The visit should be planned well in advance and should not be postponed or canceled except for an extreme emergency, and even then it should be postponed for only a day or two at the most. During this visit, the auditor should review the worksite's safety program, activities, and progress. While at the worksite, the auditor should spend at least 30 minutes and meeting at least 03 staff and observing work habits and conditions. At the end of the visit, the auditor should give a brief review of the observations made during the day and his/her impressions of the worksite. An audit feedback form (Annexure 'A' - MSA Form) shall be submitted to area / department / location in charge (HoD) with copy to respective BU HSE. Focus of the audit should be to establish a safety contact with down the line staff. Additionally, all observations made should be concurred with the respective interface before filing an audit feedback form.

Note: For details, see following;

- "KE-SP-011 - Audit and Observation Policy"

9.12 Standard Operating Procedure (SOP)/ Work Instructions:

1. Purpose:

KE believes that safe operation of our business is our foremost priority. For this intent, development of effective procedures, work instructions are mandatory. SOP and Work Instructions ensures that operations are being carried out in a safe and environmentally possible and protective way. This will help us to make healthy and safer work environment for our employees, contractors and visitors.

2. Scope:

This section is applicable at all KE administered locations. It describes the basic requirements for the development of Standard Operating Procedures.

3. Summary:

SOP/ Work Instructions should include following contents but not limited to,

a) Purpose
b) Scope
c) Definitions & Abbreviations
d) Roles & Responsibilities
e) Operation Description
f) Potential Hazards
g) Safety, Health and Environmental Controls/Precautions
h) Specific Administrative Controls
i) Specific Engineering Controls
j) Specific Personal Protective Equipment (PPE)
k) Operation Modes (Temporary, Normal, Start-up, turnaround, Emergency), Operational Limits/ Parameters, Maintenance, Records and Check Lists or Log Sheets.

To ensure safe operation, following procedure shall be available with respect to each BU.

a) Operation Procedure
b) Mechanical Procedure
c) Electrical Procedure
d) Instrument Procedure
e) Job Cycle Check
f) Electrical Safety Manual
g) Health Safety Environment Procedures and Checklists
h) Risk Assessment Procedure
i) Safe Work Practices
j) Site Safety Manual

k) Safety Critical Top-Level Procedure

l) Safety & Fire Fighting

m) Access Control

n) Line Break and Equipment Opening Procedure

o) Office Safety Protocols

4. Document Retention:

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

5. Training:

Adequate training/ refresher trainings shall be provided to each employee and contractor (where applicable) to adhere safe operation and work practices at site.

Note: For details, see following;

- "KESC-SP-09 - HSE Data & Document Control Procedure"

9.13 Documents & Record Control:

1. Purpose:

This section defines:

a) The mechanism to be followed for HSEQ data, documents and records management system that would ensure compliance to the statutory and regulatory requirements and international standards unto which the company subscribes to.

b) The method for preparing, reviewing, maintaining, tracking, and revising documents identified in the Corporate HSEQ Manual.

c) The responsibilities in order to control all documents and records that support operation in HSEQ Management System (HSEQ MS)

2. Scope:

This procedure applies to all procedures and records integral to the Health, Safety, Environment and Quality (HSEQ) management system of KE.

3. Distribution:

Throughout all levels in the company.

4. Records Management Procedure:

a) Record Listing:

The respective Departmental HSEQ Managers are responsible to maintain the master list of the controlled documents/data. They also record all revisions and amendments to these documents. All records must be identified with a unique number relevant to the SOP or management system to which they are related.

b) Record Retention:

The retention period of records is given in the master list of records maintained by each department. The records may be required for study or verification. It is based on the following factors:

i. Frequency of record generation
ii. Contractual, legal or warrantee obligations
iii. Regulatory Requirements

All the internal HSEQ records shall be maintained for at least five (5) years until unless specified otherwise in the regulations.

c) Disposition of Record:

The method of rescinding the records after completion of retention period will be determined by the respective Departmental HSEQ Manager or as per company policy. After the expiry of retention period of a record, the concerned departmental head must review the validity and usefulness of the record and decide whether to:

- Scrap the record OR file the record in box file and shift to the archives for reference purposes in case of any requirements in the future

d) Departmental Record Control Procedure:

Specific procedure on control of record is included in respective departmental HSEQ manuals or as standalone SOP's.

e) Record Legibility:

Respective department HSEQ Managers are responsible for ensuring that all records are properly maintained such that they remain legible. Proper record management of records especially those that are related to operations and reflect the fulfillment of operational & Regulatory requirements shall be strictly ensured. Such documents include (but not limited to) qualifications, training records, safety audits/evaluations etc. HSEQ Manager shall initiate actions and implement management decisions in this regard. HSEQ Manager shall also ensure that such records are properly protected and secured, that any backup records are remotely secured.

5. Forms / Documents:

KESC-SP-09-F01 ---------- Master List of Controlled Document
KESC-SP-09-F02 ---------- Document/Data Change Form
KESC-SP-09-F03 ---------- Master List of Controlled Records

Note: For details, see following;

- "KESC-SP-09 - HSE Data & Document Control Procedure"

9.14 Engineering & Construction Management:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety standard for all work activities which involves engineering & construction management.

2. Scope:

This section is implemented on all Business Units of KE where applicable.

3. Summary:

a) KE shall establish, implement and maintain a section or unit which shall be responsible for managing engineering documents, conduct detailed engineering design, identify specific requirements for the application of Standards, Specifications, Rules, Regulations and Codes for Engineering & Construction works. To avoid substandard construction and installation, KE must specify the protection devices and schemes, prescribe mandatory design basis and performance criteria for electrical power systems, critical operational parameters, execution of electrical equipment and materials.

b) 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 RCCDs (Residual Current Circuit Breakers) shall be used as per design in circuits in order to prevent fires and shocks in electrical installations.

c) Protective relays and protection schemes set points 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.

d) All design aspects/ design criteria shall be provided to NEPRA as and when required and complete record shall be maintained by KE.

e) 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.

f) 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.

   Note: ABC (Aerial Bundle Cables) Clearances shall be added after revision in instructions by NEPRA

g) KE 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.

h) Minimum clearance for overhead High Tension/Voltage (11 KV & 33 KV) lines from house/ building shall be:
   - Vertical clearance above the rooftop: 12 feet.
   - Horizontal clearance from side of the building: 6 feet.

Note: ABC Clearances shall be added after revision in instructions by NEPRA

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

j) 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.
- Vertical clearance above the rooftop: 25 feet.
- Horizontal clearance from side of the building: 30 feet.

Note: For details, see following;

- "KDTP-P11-21-01 - Safe Clearances of Electrical Power Lines Structure & Minimum Approach Distance"
- "KTDP-P649-19-00 - LT ABC Execution"
- "PID/TS/TLOH/1.0 - Technical Specification overhead transmission lines"
- "TS-Specs-overhead transmission line V2.0"
- "Anex-D8-A DISTRIBUTION PROJECTS EXECUTION MANUAL"
- "SC-W&E-01/11 - Civil Work manual"

9.15 Operation & Maintenance:

1. Purpose:

The purpose of this section is to provide guidelines in establishing safe work practices during planning and executing of maintenance and operation activities

2. Scope:

This section is implemented on all Business Units of KE and its administered location

3. Summary:

1. All critical high risk activities including boiler/ turbine operations, turnaround/ startup, 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 manholes shall be performed safely in compliance to KE Operation/ Maintenance Procedure, SOP, or Manufacturer's manual.
2. KE shall implement all necessary precautions to avoid any leakage of electrical current or hazardous energy from its system/ infrastructure to ensure safety of human life.
3. Bonding and grounding conductors shall be provided where needed to dissipate static charge accumulations.
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 hands on experience.
5. KE 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.
6. Voltage testing including Hi-pot tests (AC/ DC), power frequency, impulse voltage withstand tests and high current tests shall be performed safely in compliance to KE Operation/ Maintenance Procedure, SOP, or Manufacturer's manual.
7. Protections/ controls/ interlocks shall be intact and shall not be by-passed or modified without approved Management of Change (MOC).
8. Isolation shall be done for maintenance activities, whenever required.
9. Switching operations for isolation of the transmission network shall be well coordinated with relevant control center.
10. Safe working of remotely and automatically controlled equipment shall be established.
11. Combustible and flammable materials shall be removed from the area.
12. Gas Testing shall be conducted as per Task Risk Assessment/ JSA/ Permit to Work at same/ above/ below elevation to test oxygen deficiency and/ or for flammable or toxic gases and vapors.

13. Gas cylinders shall be secured in an upright position with proper labels and a safety cap shall be installed when not in use.
14. Use cylinder trolleys, material baskets, cylinder racks, and other proper types of equipment to transport cylinders.
15. Use approved pressure-reducing regulators with a check valve connected to the cylinder valve on all cylinders.
16. Always close the cylinder valve before attempting to stop leaks.
17. Inspect cylinders for safe condition before use like gauges, valves, regulators, hoses, any damage and valid hydro test date.
18. Protect cylinders from direct flame, sunlight, and other heat sources.
19. Install flashback arrestors at O_2, acetylene/other fuel type cylinder regulators.
20. Properly identify and label empty and full cylinders.
21. All power-driven tools, equipment and heavy equipment shall be inspected before use.
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.
23. Crane operation activity should be supervised by experienced, trained and authorized Crane Rigger against approved Permit to Work.
24. Crane lifts shall not be allowed at wind speeds above 32 km/h (20 mph-17.4/ knots- 9 meters/second).
25. Crane Lift Plan should be prepared by experienced, trained and authorized Crane Rigger.
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.

27. Use non-conductive insulated measuring stick to verify clearance distances.
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.
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.
30. Crane Rigger shall ensure that no one shall be under a suspended load.

31. All electrical equipment and portable lighting including flashlights shall be inspected as per defined frequency.
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.
33. The confined space shall be provided with illumination of not less than 50lux. 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.
34. Visitor access should be controlled.
35. Day and Night shifts representatives shall ensure proper hand over take over, information of all on-going critical activities/ issues in writing and verbally to avoid any confusion.
36. Permit to Work system shall be followed for all activities.
37. Barricading and warning signs shall be provided, wherever required.
38. Fire protection system shall be provided, inspected and maintained.
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.
40. Use self-retractable lifelines (SRL) when working in elevated areas such as rooftop.
41. PPE shall be in good condition. PPE should be inspected before use. Remove and dispose defective PPE from the job site.
42. Employee/ contractor should be familiar with the nearest manual call point (MCP), safety shower, fire extinguisher, nearest safe escape route and assembly point.
43. Employee/ Contractor shall be familiar/ trained in incident reporting.
44. Housekeeping shall be conducted regularly.
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.

Note: For details, see following;

SOP NO.	TITLE
OP-GS-11 46.1	SOP for cleaning of Line insulator of 220KV, 132KV and 66KV transmission lines
KDTP-P604-16-00	Meter Reading on Height for Energy Meter in Boxes on Poles
KDTP-P610-20-01	Crossing LT ABC/Leads through PMT(s)
KDTP-P626-17-00	Installation of Single, Three Phase Energy Meters in KE Distribution Network
KDTP-P638-18-00	Transportation Loading Unloading of Distribution Equipment DTS
KDTP-P649-19-00	LT ABC Execution
KDTP-P651-20-00	Load Break Switch LBS
KDTP-P652-20-00	Installation of poles
KDTP-P653-21-01	HT LT Underground Cable Laying and Execution
KDTP-P658-20-00	Installation Operation of Earth Fault Indicator (EFI)
KDTP-P659-20-00	Dismantling of poles
KDTP-P663-20-00	Installation - Removal of PMT
KDTP-P671-20-00	HT ABC Execution
KDTP-P615-17-00	Installation of Automatic Splices (for OH Conductors) in KE Distribution Network
KDTP-P616-16-00	Preparation and Operation of 11 KV Cable Spiker Kit
KDTP-P617-17-00	Standardization of Installing LV Distribution Boxes (DBs) at Pole Mounted Transformer (PMT) of K-Electric Distribution Network
KDTP-P618-10-00	REPLACEMENT OF DAMAGED DISTRIBUTION TRANSFORMERS
KDTP-P619-19-02	Earthing of HT/LT Equipment(s) and Poles – Revision 02
KDTP-P620-17-00	Tree Pruning at Existing HT/LT OH Mains of KE Distribution Network
KE/TPRE/SOP/621	Proactive Preventive Maintenance of Distribution Transformer
KDTP-P623-18-00	Installation and Operation of Reconnection/Disconnection (RCDC) Boxes
KDTP-P630-13-00	Protection & Maintenance of Distribution Transformer
KE/TPRE/SOP/637 (Rev.00)	Anchor Bolt Sealing (Twist Wire) For Single & Three Phase Static Meters
KDTP-P640-18-00	Use of anchoring structure (A-type Fiber Glass Ladder) for the purpose to work at LT O/H of KE Distribution Network especially for Service Bracket in Rural Area
KDTP-P644-18-00	Cable termination at RMU
KDTP-P645-20-01	Installation and Operation of Ring Main Unit (RMU)
KDTP-647-19-00	Installation of service connection & Meters
KDTP-P657-20-0	Multistory Busbar (MSBB) Execution
KDTP-P660-20-00	INSTALLATION AND MAINTENANCE OF DRY TYPE TRANSFORMER
KDTP-P661-20-00	OPERATION OF HT DO CUT OUT FUSE CARTRIDGE THROUGH HOT STICK (FUSE CLAW)
KDTP-P665-20-00	HT/LT BARE AND XLPE COVERED HT CONDUCTOR EXECUTION
KDTP-P666-20-00	Installation & Operation of VCB Trolley Type Substation Panel
KDTP-P667-20-00	Installation & Operation of VCB Cassette Type Substation Panel
KDTP-P668-20-0	STREET LIGHT CONNECTION
KDTP-P669-20-00	EQUIPMENT PLACEMENT / INSTALLATION IN 11 KV SUBSTATION
KDTP-P670-21-01	Pad Mounted Unit (PMU with RMU) Installation
KDTP-P672-20-00	Guidelines for Removal of Illegal Street Light Connections

KDTP-P677-21-00	Installation of HT Polymer Type Drop Out Cutout's Covers
KDTP-P678-21-00	Feeder Pillar Box Installation
KDTP-679-21-00	Installation, Operation & Troubleshooting of DCRC Panel

9.16 Asset Integrity Management:

1. Purpose:

KE believes that a comprehensive Asset Integrity program is necessary to ensure that the system integrity is maintained throughout the life of equipment / facility. Asset Integrity program contains following tests, inspections, & procedures:

a) Equipment tests and inspections - predictive and preventive maintenance.
b) Reliability engineering
c) Maintenance procedures
d) Quality control procedures
e) Training and performance of maintenance personnel

The predictive and preventive maintenance and reliability engineering are important to ensure reliable and incident-free operation. It also avoids actual root cause of the problem to recur. Such programs help prevent premature failure and help ensure operability of the systems for emergency control.

2. Scope:

This section is applicable to all KE administered locations. It defines the requirement for complying with the Asset Integrity.

3. Essential Features:

a. Inspection or Test Design:

A written or computer-based design or procedure for inspecting or testing each equipment piece or system must be prepared in advance. It shall include:

i. The equipment or system identification
ii. Inspection or test frequency
iii. The inspection methods to be used, including measurement locations
iv. Codes and standards to be followed
v. Acceptable limits
vi. A means for finding the design basis and previous history
vii. Any special safety considerations
viii. Instructions for those who are to prepare the equipment or system for inspection

b. General Requirement:

i. An equipment inspection program shall be established for safety critical equipment consisting of inspections and tests to detect impending or minor failures and procedures to mitigate their potential before they can develop into more serious failures.
ii. However, respective BU management may also consider listing other equipment, taking into consideration:
   - Actual equipment replacement cost

- Relationship to identified critical equipment, or
- The cost of system / unit shut down for the repair of unsuspected equipment failure.

iii. The following essential features of the test and inspection program shall be included:
- Application listing developed for the equipment and systems subject to tests and inspections.
- Documentation of test objectives and method

iv. The frequency of inspections and tests of process equipment shall be consistent with applicable manufacturer's recommendations and good engineering practices and more frequently if indicated by prior operating experience.

v. KE and its administered locations/facilities shall document inspection and testing procedures with appropriate references to applicable codes, standards and vendors' recommendations that were used as a basis for good engineering practices.

vi. Variances from or substitutions for codes, standards, and recommended practices shall be documented, including the reason for variance or substitution and a description of the engineering practice used.

vii. Accuracy of testing and monitoring equipment used in the inspection process shall also be verified.

viii. All equipment testing shall be recorded and maintained. Instrument / interlock devices shall be tested from the primary sensor down to the final trip element connected to the process. All relays and control devices involved in the trip or alarm shall be exercised.

ix. If a safety critical device, interlock or equipment can't be handed over for preventive maintenance or dummy checkup (either one) waiver shall be obtained by the owner of the equipment.

x. KE management and supervision shall analyze results to verify integrity.

xi. Condition of equipment and recommendations for repairs or replacement shall be documented and effectively communicated to the appropriate management. The results of the program shall be reviewed periodically by respective A Level Sub HSEQ Committee

xii. Accepted recommendations shall be tracked until maintenance is complete.

xiii. Rationale for rejected recommendations or deferred maintenance shall be documented.

c. Applicable Performance Limits:

Performance limits shall be established that are consistent with limits established in process technology e.g. brittle fracture, hydrogen attack etc.

d. Exception List:

Exceptions lists shall be issued for corrective action and follow-up.

e. Documentation Records:

Documentation records shall be prepared showing that each inspection and test has been performed in accordance with this section. The documentation shall identify the following information:

i. The date of the inspection or test.

ii. The name of the person who performed the inspection or test.

iii. The serial number or other identifier of the equipment on which the inspection or test was performed.

iv. A description of the inspection or test performed.

v. Results of inspection or test, including whether a pass or fail condition.

vi. Recommended corrective action(s).

f. Record-Keeping Systems:

Record-keeping system shall be developed to document test results in a way that facilitates review and analysis of test data.

Note: For details, see following;

- "OP-GS-11 46.1 - SOP for cleaning of Line insulator of 220KV, 132KV and 66KV transmission lines"
- "G&T-HSE-11 - 132KV & 220KV transmission line insulators offline washing through line washing unit"
- "Annex D8-A Anex-D8-A DISTRIBUTION PROJECTS EXECUTION MANUAL"

9.17 Management of Change:

1. Purpose:

KE believes that the generation plant, grids, transmission and distribution networks and other facilities are designed as per standard engineering practices. The Changes to the documented PSI - Process Safety Information (e.g., hazard of material, equipment design basis & process design basis) can invalidate the prior hazard evaluations. Similarly, the subtle or temporary changes can lead to catastrophic events. Therefore, these changes must be made in such a manner that safety, integrity of the plant, other facilities and environment is not compromised.

As changes whether to or within the documented process safety information package may potentially lead to an unsafe condition and/or incident, therefore, ALL changes must go through appropriate review and authorization before being implemented.

2. Scope:

This section defines the requirement for Management of Change and its applicability across the K-Electric.

3. Change Types:

There are eight major classification of changes as listed below.

a) Technology Changes

b) Facility Changes
   - Approved Project Changes

c) Operation Changes

d) Document Changes

e) Analytical Method Changes

f) Subtle Changes

g) Temporary Repair Changes

h) Test Run / Authorization (TA's)

Note: Replacement is kind is not part of Management of Change process.

4. General Requirement for Implementing a Change:

In general, following considerations shall be addressed by KE Management through systems, prior to any change:

a) Purpose of the change

b) The technical basis for the proposed change

c) Description

d) Impact of change on health, safety and environmental aspects, including whether a Process Hazard Analysis (PHA) is required or not. In case a PHA is required, it shall be attached to management of change document

e) Human factor impact

f) Modifications to operating / maintenance procedures or work practices – these shall be completed before the implementation of change.

g) Necessary time period for the change

h) Employees involved in operating a process, and maintenance and contract employees whose job tasks will be affected by a change in the process shall be informed of and trained in the change prior to start-up of the process or affected parts of the process.

i) Update of Process Safety Information (PSI) package.

j) Assessment of any possible effects on product quality.

k) Approval and authorization requirements – to include operation, technical performance, maintenance personnel. Personnel approving and authorizing management of change documents should do so only after they are satisfied that all the elements of PSM have been satisfactorily addressed.

l) KE management from each BU's shall establish a follows up, tracking and closure of these changes to ensure that close out report / document is issued in timely manner. At a minimum close out report of modifications and new projects shall capture the following:

- Document the status of any open PHA recommendations and move them to a separate tracking system.
- Document the status of any open Pre-Startup Safety Review (PSSR) and move them to a separate tracking system.

m) KE management from each BU's shall plan periodic internal audits of the Management of Change system to verify it is being managed properly, particularly with respect to review, approval and documentation. The results of such audits shall be stewarded to the management on a periodic basis.

Note: For details, see following;

- "KE-GEN-BQPS II-SOP-032 - MOC"

9.18 Traffic Management:

1. Purpose:

The purpose of this section is to provide safe guidelines for traffic management across KE and its administered locations.

2. Scope:

This section is applicable to all KE Locations.

3. General Requirements:

Traffic on the worksite will be minimized to avoid unnecessary hazards and congestion at the workplace, with entry onto worksite being controlled via the issue of vehicle passes.

Specific accesses and egresses for pedestrians will always be maintained, as will routings for emergency vehicles. Any vehicle wishing to block roads for any period of time will first obtain a road closure permit through respective BU.

Traffic 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, Excavators) and Pedestrians within, through and around sites where work is carried out.

KE shall develop its Traffic Management Plan which should include but no limited to:

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,
r) Emergency Support Services access.

Note: For details, see following;

- "KE-SP-037 - Driving & Transport Safety Policy".

9.19 Task Risk Assessment/ Job Safety Analysis:

1. Purpose:
This section establishes a standard method for developing, using, and maintaining Task Risk Assessment/ Job Safety Analyses (JSA) of all non-routine and low frequency/ critical operation, maintenance and project jobs meeting the requirements of ISO 45001:2018.

2. Scope:
It is applicable to all non-routine and low frequency /critical operation, maintenance, and project activities throughout K-Electric and its administered location.

3. Task Risk Assessment/ Job Safety Analysis:
Also known as job hazard analysis, is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. Ideally, after you identify uncontrolled hazards, you will take steps to eliminate or reduce them to an acceptable risk level.

4. Hazard:
Anything that has the potential to cause harm, ill health and injury to people, damage to property, products or the environment, production losses or increase liabilities, is considered as "HAZARD".

5. Risk:
The product of the probability of a hazard resulting in an adverse event, times the severity of the event.
Risk = (probability of the occurring event) X (Severity of the event occurred)

6. Probability:
the extent to which something is likely to happen or be the case

7. Severity:
If an accident takes place, how horrific it will be in terms of loss of life and /or property loss and how big is the harm to natural environment.

8. What jobs are appropriate for a job safety analysis?
A job safety analysis can be conducted on many jobs in your workplace. Priority should go to the following types of jobs:

a) Jobs with the highest injury or illness rates.
b) Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents.
c) Jobs in which one simple human error could lead to a severe accident or injury.
d) Jobs that are new to your operation or have undergone changes in processes and procedures.
e) Jobs complex enough to require written instructions.

Note: TRA/ JSA should be carried out for one-time activity. If the activity is repeated a procedure should be developed on the basis of previous JSA and gaps observed during job execution.
For all hot jobs JSA is mandatory (ref hot work permit)

9. Stages of Job Safety Analysis:

Job safety analysis has three main stages.

a) Hazards identification
b) Risk assessment
c) Risk control

In many cases, in the early phase of writing sequence of steps we may in fact be looking to identify all the hazards/ risks associated with each step of activity, in which case the activity is more properly referred to as hazard identification, risk assessment and then risk control.

The aim of the process is to minimize the likelihood or consequence of a particular risk to a level that is minimal and that we are prepared to accept. JSA process must include following considerations:

a) Hazard Identification
b) Assessment of the risk - which includes:
   - The likelihood (frequency)
   - The consequence
   - Assigning a priority for rectification
c) Control of the risk - using a hierarchy of control measures consisting of (in order of preference):
   - Elimination
   - Substitution
   - Engineering Controls
   - Administrative Controls
   - Personal Protective Equipment (PPE)

Note: For details, see following:

- "KDTP-P602-20-05 - LINE ISOLATION FOR WORKING ON HT/ LT SYSTEM Annexure B: Safety Toolbox Talk Risk Identification"

9.20 Personal Protective Equipment:

1. Purpose:

"Personal Protective Equipment" (29 CFR 1910.132) requires that workplaces be assessed for hazards that may require personal protective equipment. Moreover, it also addressed the training and upkeep of PPEs.

2. Scope:

This section shall be applicable to all employees, contractors and visitors at K-Electric and its administered locations

3. General Requirements:

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

b) KE shall maintain list of approved Stock and Non-Stock Safety items including PPE/ Tools with material description and model number

c) Those required to wear PPE must be trained and tested in the applications. Use and limitations of the PPE prior to exposure to the potentially hazardous area/ task.

d) Maintain adequate amount of PPE/ Tools inventory at each site. Conduct visual inspection of PPE/ Tools before each use

e) Identify task specific PPE/ Tools in Task Risk Assessment / JSA / Permit to Work/Job Cycle Check.

f) PPE/Tools shall be stored and maintained in a safe working condition after completion of work

g) Areas/ Equipment that requires PPEs must be sign posted which shall warn of the hazard and define the required PPEs.

4. PPE's Hazard Assessment:

a) Relevant Manager/Area Owner in coordination with respective BU HSE Coordinators shall carry out Base Level Hazard assessment for their respective Plant/Regions/Clusters/IBC's based on location/work tasks. Hazard Assessment sheet

b) All work tasks should be evaluated for task specific PPEs.

c) All Operation and Maintenance procedure shall incorporate the Hazard Assessment and required PPEs.

HAZARDS	CONDITIONS
Head Hazard	Falling objects Moving objects Bumping into equipment
Foot Hazard	Falling or rolling objects Sole-piercing objects Slippery or uneven surfaces
Body/Torso	Flash fire Hazardous liquids or vapors Molten metal/welding slag/sparks

Eye and Face	Flying particles Molten metal/welding slag/sparks Hazardous liquids or vapors Light radiation Flash fire
Hand	Hazardous liquids or vapors Abrasions Punctures Lacerations Temperature extremes
Electrical	Electrocution Arc Flash
Noise	High noise levels Impact noise
Respiratory	Harmful dusts, fibers, fumes, mists, gases, smoke, vapors

Note: See the Hazard Assessment template as reference for respective BU's to develop as per their site/location hazards.

Note: For details, see following;

KDTP-S50-15-03-Insulating Gloves	KDTP-S51-17-02-Leather Protector Gloves
KDTP-S239-16-02-Danger Board	KDTP-S336-19-02-Safety Helmet
KDTP-S343-17-00-Head Lamp for Helmet	KDTP-S346-17-00-LT Leather Gloves
KDTP-S347-18-01-Fiberglass Ladder	KDTP-S278-15-00-KE Uniforms
KDTP-S190-19-02-Earthing Grounding Kit	KDTP-S352-18-00-Safety Gum Boot
KDTP-S353-18-00-Safety Raincoat	KDTP-S406-18-00-Anti Flash Hood
KDTP-S413-18-00-Working Glove for Karkun	KDTP-S422-19-00-Safety Jacket Executive
KDTP-P603-16-00-Isolation Maintenance Work on HT LT Pole & OH Line	KDTP-P602-20-50, HT-LT Line Isolation Procedure

9.21 De-Energized Transmission & Distribution Circuits & Apparatus:

1. Purpose:

The purpose of this section is to provide guidelines in establishing and implementing the minimum safe requirements when working on de energized circuits and apparatus.

2. Scope:

This section is implemented on all Business Units of KE where operation or maintenance activity requires de-energization of transmission & distribution circuits and apparatus.

3. General Requirements:

a) KE shall ensure that only electrically experienced, trained and authorized employees/ contractors shall perform electrical work against approved Permit to Work (for PTW, please see reference 9.27).

b) Always make sure to install and maintain earthing/grounding system (i.e., equipment, exposed steel structure/ pole along with stay wire).

c) Earthing/ grounding resistance shall be as per design or manufacturer's instruction. In the absence of grounding instruction, the earthing resistance for EHT/ 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.

d) 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 KE for three (03) years.

e) Before working on circuits and apparatus, identify task specific PPE/ Tools in Permit to Work.

f) Insulated stick/ rod, tools and PPE/ Tools shall be used for applying and removing the earthing connection to lines or equipment.

g) Maintain an appropriate minimum distance from energized power lines at all times. For EHT, following table shall be followed:

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)

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

i) 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.

j) When working on the lines, de-energize the lines, test all phases by beeper/ voltage detector and provide grounding set of same voltage level.

k) 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.

l) 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.

m) 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.

n) 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.

o) Grounding cable shall be capable to conduct the same voltage level as the protective device supplying the conductor.

p) All relevant BU's shall establish written procedures, training, audit and inspection program to ensure that these minimum requirements are implemented by the line management

Note: For details, see following;

- "KDTP-P603-16-00 - Isolation Maintenance Work on HT LT Pole & OH Line"
- "KDTP-P602-20-05 - HT-LT Line Isolation Procedure"
- "KE-HSE-D-12 - HSE-D Manual"
- "KDTP-P11-21-01 - Safe Clearances of Electrical Power Lines Structure & Minimum Approach Distance"

9.22 Working on Energized Conductors & Apparatus:

1. Purpose:

This purpose of this section is to provide guidelines in establishing safety standard for all work activities which involve energized conductors or apparatus.

2. Scope:

This section is implemented on all Business Units of KE where operation or maintenance activity requires work on energized conductors and apparatus.

3. General Requirements:

a) KE shall ensure that only electrically experienced, trained and authorized employees! contractors shall perform electrical work against approved "Permit to Work" (For PTW, please see Reference section 9.27) under the continuous direction and supervision of the job in-charge.

b) 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:

- 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.

c) The energized part is insulated or guarded from the employee by portable rubber insulated mats or insulated working support/ blanket or any other nonconductive object such as plywood barriers that prevent accidental contact.

d) The hazard of falling/ touching of tools on live circuits/ breakers shall be understood by all concerned and appropriate precautions shall be taken.

e) If work is to be done on energized electrical conductor, bus bar, etc. effective supervision of site senior in-charge shall be ensured.

f) Identify task specific PPE/ Tool in Permit to Work/ Job Cycle Check/ Procedures especially Category 4 Arc flash resistant suit, Arc flash hood, Arc-rated gloves and Arc-rated Fall Protection while working on high voltages (more than 420 V).

g) Hazards and appropriate protection for work on live circuits shall be effectively communicated to all concerned involved in the job. JSA must be included in tool box talk session with the workforce before start of the activity.

h) KE shall ensure that all related procedures are developed, maintained and implemented and staff are trained on these SOPs before they are assigned on this job. All BU's shall establish job cycle check and audit program to verify that established requirements in this section are met.

Note: For details, see following;

- "KDTP-P11-21-01 - Safe Clearances of Electrical Power Lines Structure & Minimum Approach Distance"
- "KDTP-P603-16-00 - Isolation Maintenance Work on HT LT Pole & OH Line"

- “KDTP-P602-20-05 - HT-LT Line Isolation Procedure”
- “LDC-SD-001 - LDC actions while arranging shutdown of power transformer”
- “LDC-WP-000/03 - Work permit system for Transmission line outages incorporated”
- “Generation Safety Rule Book”

9.23 Safe Practices for Transformer & Capacitor Installations:

1. Purpose:

The purpose of this section is to provide guidelines in establishing safe work practices for transformer and capacitor installation activity.

2. Scope:

This section is implemented on all Business Units of KE where applicable.

3. General Requirements:

Only electrically experienced, trained and authorized employees/ contractors shall perform electrical work near energized equipment against approved Permit to Work.

a) 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.

b) Work on Energized Transformer:

- Every possible attempt shall be exercised to avoid working on energized equipment. TRA/ JSA shall be carried out before carrying out the job.
- Appropriate PPEs to be used for the work.
- When replacing fuses on the high voltage side of transformer, all possible secondary load shall be removed.
- Insulating tongs, similar to insulated switch sticks shall be used to remove and
- install fuses.
- Fuse cut-outs shall be opened or closed in a sure, positive manner by an experienced, trained and authorized employees! contractors.

c) Work on De-Energized Transformer:

- **Dry Type Transformer**
  - TRA/ JSA shall be carried out before carrying out the job. Power transformer shall be de-energized, isolated and grounded.
- **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 development of 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.

d) High Voltage Static Capacitor Banks

- All high voltage capacitors whether a single unit or a bank shall be de-energized and grounded at their terminals before starting work.
- The discharged time constant of capacitors is given in the name plate data which must be considered to discharge the capacitor for safe working.

e) Transformer Installation

- PTW shall be by Concern Manager for transformer installation.
- AE/Supervisor/officer shall take PTW on the feeder and other safety PTWs if required where transformer is to be installed.
- After taking PTW, AE/Supervisor/officer shall reach at the site where transformer is to be installed.
- After seeing PTW, LM shall check the line by 11 kV tester or D-rod.
- After checking line, AE/Supervisor/officer shall earth the line on both sides as per earthing procedure.
- With the help of crane, transformer shall be placed at the platform.
- AE/Supervisor/officer shall tight the HT and LT jumpers and connect D-fuse links with the help of D-rod.

f) Procedure for Line Patrolling

- The objective of foot patrolling of transmission & distribution lines is to identify the mechanical and electrical defects and point out other problems that require further attention and corrective measures, for smooth and reliable performance of lines.

g) Procedure for Foot Patrolling

- Foot patrolling shall be done at least twice a year on all transmission & distribution lines.
- Line patrolling should be performed with caution. Patrollers shall be alerted to avoid walking into fallen wires or metal fences that may be energized.
- Patrollers should be alert and avoid stumbling hazards, poisonous plants and snakes.
- Patrollers shall break all matches and crush all discarded smoking tobaccos lying in the vicinity of lines.
- The report of line patrolled shall be made on patrol books as per transmission & distribution lines maintenance package.

h) 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:
- 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.
- Careful check of alignment of structures and poles.
- Careful check of leaning of structures & poles and backfilling.
- 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.
- Construction of roads, buildings or other structures near the line.
- Healthiness of insulators in all respects.
- Erection of new telephone, telegraph or other lines by other departments near the KE lines.
- Healthiness of cross arms in all respects.
- Any other defect noted by the patrollers.

Note: For details, see following;

- “KDTP-P663-20-00 - Installation & Removal of Pole Mounted Transformer”
- “KDTP-P669-20-00 - Equipment Placement / Installation in 11KV Substation”

9.24 Electrical Isolations:

1. Purpose:

This section defines mechanism and responsibilities of Lock Out Tag Out Try Out Test Out (LOTOTOTO). To establish, implement and maintain a process for the isolation, lock out and tag out of energy and equipment prior to commencing of works to prevent injury due to unexpected energization or startup of machines, equipment, and release of energy. Ultimate intent is to ensure safety of personnel working on equipment which have enough energy to cause injuries and / or major equipment damage.

2. Scope:

This section shall be applicable to all KE and its administered location where electrical isolations are required during maintenance/ project activity

3. Energy-Isolating Device:

A mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

a) A manually operated electrical circuit breaker.

b) A disconnect switch.

c) A manually operated switch by which the conductors of a circuit can be disconnected

d) from all ungrounded supply conductors and, in addition, no pole can be operated independently

Note: Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Note: For details, see following;

- "KDTP-P602-20-05 - HT/LT Isolation Procedure"
- "KDTP-P603-16-00 - Isolation Maintenance Work on HT LT Pole OH Lines"
- "KE/TPRE/SOP/624 - Lock-Out & Tag-Out of Indoor & Outdoor Equipment Used in KE Distribution Network"
- "LDC-SD-001 - LDC actions while arranging shutdown of power transformer"
- "LDC-WP-000/03 - Work permit system for Transmission line outages incorporated"
- "Generation Safety Rule Book"

9.25 Mechanical Isolation:

1. Purpose:

Mechanical isolation is done before any employee/ contractor perform any servicing or maintenance on machinery, equipment, vessels or pipes where unexpected start up or release of any type of energy (kinetic, potential, thermal or chemical) can cause damage to equipment, injury to personnel and/or environment can be adversely impacted.

2. Scope:

This section shall be applicable to all KE and its administered location where mechanical isolations is required during maintenance activity

3. General Requirements:

All Business Units (where applicable) shall ensure that they have up to date mechanical isolation procedure that covers following before going for maintenance:

a) Equipment owner shall be responsible to ensure isolation, depressurizing, pouring and / or inserting of equipment as required.

b) Equipment owner shall ensure that equipment is completely isolated, drained, purged, flushed and de-pressurized prior to opening a closed system.

c) Put Tags or isolation devices on valves

To provide the most positive means of isolation following shall be carried out.

a) Disconnection of lines

b) Insert Isolation Blinds / Spades

c) Double Block and Bleed with use of blind

d) Blinding shall be installed on the following, as a minimum:
   - Confined spaced entry
   - Removal of equipment
   - When the only isolation is a check valve

e) Isolating plant processes

Note: For details, see following;

- "KDTP-P602-20-05 - HT/LT Isolation Procedure"
- "KDTP-P603-16-00 - Isolation Maintenance Work on HT LT Pole OH Lines"
- "LDC-SD-001 - LDC actions while arranging shutdown of power transformer"
- "LDC-WP-000/03 - Work permit system for Transmission line outages incorporated"
- "Generation Safety Rule Book"

9.26 Permit to Work:

1. Purpose:

The purpose of a work permit system is to ensure that jobs are safely planned, equipment is properly prepared, employees are adequately informed and work is safely executed. The responsibility of safety is shared by all involved in the job covered by the work permit system.

2. Scope:

This section shall be applicable to all KE and its administered location where permit is required for any routine, non-routine maintenance and project activity.

3. General Requirements:

"Work permit is an authorization given by approved, designated person of area owner to relevant interfaces to work in respective areas with a given time limit and as per specific conditions which were marked on the work permit."

The work permit system must provide a work permit document or form(s) which are used as a tool to:

a) Describe the type of work and specifically identify the area and equipment where work is to be performed.

b) Confirm that the work area has been properly prepared and inspected for the specific task before the work is issued.

c) The Work Permit system should separately address the permit requirements for different categories of work and cover the following aspects:

- Lock out Tag Out of hazardous energy sources
- LT/ HT Isolation for work
- Control of ignition sources (Hot Work Permit). Permits shall be issued for all hot work, except for areas exempted by A Sub Level HSEQ Committee e.g., in mechanical workshops, canteen etc.
- Entry into confined spaces.
- Movement of heavy equipment relative to equipment containing hazardous materials (Including lifting over utility pipelines etc.)
- Opening of Equipment and piping
- Hot Work Permit like welding, cutting, grinding hydro-jetting etc.
- Cold Work Permit, like routine maintenance activity (which do not involve ignition source), inspection, cleaning, scaffolding etc.
- Vehicle Entry Permit
- Excavation / Break-In Work Permit
- Electrical Work Permit
- Instrument Work Permit
- Radiography Permit
- Lifting Operation Permit
- Diving Permit

d) Specify time limits of the permit.

e) Evaluate the need for a TRA/ JSA.

f) Designate if a gas test is needed type of test, time, and results of explosivity (LEL) etc.

g) Specify standby equipment, personnel, and any special precautions, such as protective equipment, hazardous materials monitoring, etc.

h) Provide space for signatures / initials of the responsible parties:

Note: For details, see following;

- "General Safety Rule Book"
- "LDC-WP-000/03 - Work permit system for Transmission line outages incorporated"
- "LDC-SD-001 - LDC actions while arranging shutdown of power transformer"
- "LDC-SD-000/03 - LDC ACTIONS FOR NETWORK OUTAGE PLANNING"
- "KE-HSE-D-06 -SOP for requesting and arranging shutdown for CM/PM work through PTW form"
- "KE-HSE-D-05
- "Hot work permit-KDTP-P619-16-02-Earthing of HT/LT Equipment"

9.27 Tools, Portable Power Tools & Heavy Equipment:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements for all hand, Portable power tools and heavy equipment.

2. Scope:

This section is implemented on all Business Units of KE where operation or maintenance activity requires work on energized conductors and apparatus.

3. General Requirements:

a) Correct tool for the required job is necessary. One must ensure that the tool being used for a job is the appropriate/recommended tool.

b) Use guards/covers on all portable grinders & rotating machines.

c) Inspect each tool prior to use to make sure that it is in good condition.

d) Make sure each portable power tool, whether electrical or air powered, is in good condition prior to use and current inspection tape is attached.

e) Be sure all recommended safety devices and machinery guards are in place before

f) using equipment and or machinery.

g) Do not tamper with, experiment with, or operate equipment that you are not

h) authorized to use.

i) Position hands and body carefully when using hand tools or portable power tools.

j) Use hoses approved for the service.

k) Scissors and other sharp tools shall have ends blunted and when not in use must be

l) stored in a sheath.

m) Do not use spark-producing tools in classified areas without proper authorization.

n) Use tool holders for chisels and punches.

o) Do not hold tools or other items while climbing on monkey ladder.

p) Defective and/or damaged tools must not be used.

Hand tools can cause accidents when a wrong, improvised or defective tool is used. Also, when the correct tool is used carelessly or not put away safely, there is danger of an accident. While using hand tools, the following rules should be observed:

a) Make sure you select the correct type and size of tool for the job.

b) Check the condition of the tools before you use them.

c) Don't use tools that are worn out or damaged.

d) Maintain your tools in good condition and remember that cutting and drilling tools need to be sharp to be safe.

e) Make sure you use each tool in the correct manner.

f) Store tools safely

4. Heavy Equipment:

a) Prior to mobilization, KE/Contractor must assess crane/lift operators for competency and ensure that all certification is valid for the equipment, operator and riggers being used.

b) Competent persons will conduct inspection of rigging equipment and label it. Use tag lines when lifting with hoist or cranes. Designated qualified crane rigger trained in approved hand signals will be required.

c) An attendant must always be appointed and be available during crane/excavator work to assist and guide the operator

d) Excavators with a swinging motion must have a clearance of at least 0.6 meter (2 feet) from any fixed object.

e) Booms/hooks on excavators/Cranes must be latched before travel.

f) Pedestrians should be instructed in safe pedestrian routes on site and the procedure for making drivers aware of their presence

5. Inspection & Audit:

a) KE shall establish Risk Management audit program in which hand tools audit shall be carried out at set frequency.

b) KE Line management shall ensure inspection of hand tools regime is developed and implemented and record is being maintained.

c) Risks associated with lifting are significant and, coupled with the considerable scope of such activity, represent a substantial area of potential loss exposure. Consequently, the KE or its contractor will utilize stringent control on both the lifts themselves and the hardware involved. Therefore, all cranes, lifting accessories/ tools, fork lifters, etc., will be inspected, load tested, and all certification checked by the KE/Contractor prior to entry onto the worksite. For critical lifting (above 20 T), rigging plan shall be submitted by contractors. Apart from 3rd party certification of lifting equipment and tools, KE shall develop their internal inspection protocol.

Note: For details, see following;

- KE-HSE-D-12, HSE-D Manual
- G&T-HSE-2016 Safe operating procedure for using overhead cranes
- KDTP-P601-09-00 Care Maintenance & Use of Workman's Safety Devices and Tools

9.28 Scaffolding:

1. Purpose:
The purpose of this section is to provide guidelines for safe access at height and fall protection.

2. Scope:
This section is implemented on all Business Units of KE.

3. General Requirements:
Special care and awareness should always be practiced when working jobs on elevated structures or platforms. Even the smallest of objects dropped from an elevated structure has the potential of causing severe injury and death

Worker must always use certified scaffolding if permanent working platform is not available. Scaffolding erection staff must do care and follow the standards identified in procedure mentioned above like use of double lanyard safety harness and installing red tag.

If possible, work should be scheduled that removes as much of this potential as possible. However, when this cannot be avoided good communication and work practices must ensure in protecting people from potential falling objects. Site supervisor must ensure the permit to work compliance and conducted TBT highlighting the hazards pertaining to scaffolding and working at height. Area should be barricaded and warning labels attached to inform and warn anyone in the area of the ongoing elevated work. Ensure adequate toe boards are in place at all times while working on scaffolding. Use proper storage of tools and equipment to reduce the chance for falling objects. Use proper rigging techniques for handling of material/equipment.

Caution: "Do Not Use This Scaffolding" tag should be displayed on the scaffold if it is incomplete, unsafe, substandard, expired or yet to be certified by Scaffolding Erecting job executor.

Contractor is responsible to ensure that their scaffolding inspectors are 3rd party certified and maintaining their certification valid.

Note: For details, see following;

- "KE-GEN-BQPS II - HSEQ-SOP-018, Work at Height"

9.29 Ladders:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements for while using ladders.

2. Scope:

This section is implemented on all Business Units of KE and its administered location.

3. General Requirements:

The safety of a ladder depends on four important factors: selection, condition, position and use.

a) A ladder must be of the proper length for the job to be done. If it is to be used for access or as a working place, it shall rise to a height of 36 inches to 42 inches above the landing place or above the highest rung to be reached by the feet of the man using the ladder.
b) Ensure ladders extend a minimum of 1 m (3 ft.) above the top landing point
c) Metal ladders, ladders with metal reinforced side rails, and ladders which are wet shall not be used near electrical equipment with exposed live conductors. Such ladders shall have a warning notice attached to guard against use near electrical equipment.
d) Each ladder shall be examined before use. Those with split or broken side rails, missing, broken, loose, decayed or damaged rungs or cleats, or with other faulty equipment shall be tagged and removed from service.
e) Rungs shall be properly mortised into side rails. Rung distance should be even and range between 12 to 18 inches.
f) The side rails of a ladder shall be equally supported on a firm level surface. Boxes, blocks, barrels, etc. shall not be used as a means of support. The area at the base of a ladder must be kept clear. Ladders shall not be used in a horizontal position as platforms, runways or scaffolds.
g) Ladders shall not be supported on their rungs or cleats. Rungs or cleats shall not be used to support planks.
h) 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.
i) Whenever possible, ladders shall be set at an angle of 75˚ to horizontal ground.
j) Obstruction should not be observed at backside of the rung to avoid foot slipping
k) Both side rails of ladder should be evenly place on surface.
l) Before mounting a ladder, personnel shall check their shoes for freedom from grease, oil or mud. They shall always step through, not around, the rail extensions at the top of the ladder
m) Personnel ascending or descending ladders shall not carry tools and materials in their hands.
n) Metal ladders shall not be used for electrical works.
o) Step ladders should be extended to fullest to provide integrity
p) Ladders should not be painted.

Note: For details, see following:

- "SOP/D/R&D/ESP/0601-2009 - Personnel Protective Equipment PPEs Ref. HSE D Manual)"

- "KE Specification NO. K/R&D/RG/50 - Requirement of safety devices and special tools (Ref. HSE D Manual)"
- "Daily inspection checklist MTL ladder safety SOP/FM/MTL-L5 & 16 Feet MTL ladder checklist"
- "Ladder daily inspection checklist - KDTP-S347-18-01-Fiberglass Ladder"

9.30 Excavation:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements while planning excavation activity.

2. Scope:

This section is implemented on all Business Units of KE and its administered locations.

3. General Requirements:

Special care and awareness is required while performing civil jobs at site. Ensuring compaction of site before bringing in heavy equipment must be ensured to avoid vehicle toppling and / or sticking in field. Only Certified and fit equipment shall be brought into the job site.

It is imperative to ensure that before commencing excavation, standard requires to determine the approximate location(s) of underground utility installations — including sewer, telephone, water line, process pipelines, electrical cables, or grounding system. Follow Excavation permit protocols and identify underground utilities on drawings which should be attached with permit. In case the piping or electrical cables are present, and excavation is still to be carried out, this should be done through excavation permit protocols, identify utilities on drawings which should be attached with permit and communication shall be done to all interfaces.

To protect workers from cave-ins, following control measures must be taken:

a) Sloping and benching the sides of the excavation.

b) Supporting the sides of the excavation; or

c) Placing a shield between the side of the excavation and the work area.

d) The removed soil shall not be stockpiled closer than 2ft from the excavated edges

e) If excavation is over 4ft depth, then safe means of access shall be provided for entering and exiting any excavation

f) A safe means of egress from trench such as ladder, ramp, or stairway shall be located with 25ft of workers present in excavated area

CAUTION: As per OSHA, any excavation, sewers, pits more than 4ft depth shall be considered as Confined Space**.**

Note: For details, see following;

- "KE-Gen-BQPS-II-HSEQ-II/042 - Control of Digging"

9.31 Welding & Cutting:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements while planning/executing welding & cutting related activity.

2. Scope:

This section is implemented on all Business Units of KE and its administered locations.

3. General Requirements:

a) All welding and cutting jobs shall be done against Permit to Work System.
b) Personnel working with welding, cutting, and grinding equipment shall be trained, competent, and provided with personal protective equipment.
c) Welding goggles, helmets, screens, forced ventilation (for confined space) and similar equipment shall be provided to all workers and to trainees in the immediate area.
d) TRA/ JSA shall be carried out before every hot job (except normal drilling activity).
e) All equipment should be examined immediately before use and regularly maintained.
f) All welding operations shall be conducted in well ventilated areas.
g) Hoses should be used for one type of gas only and color coded for identification. They should be examined before use for any signs of splitting which might give rise to leakage. All connections should be made by clips or crimps. The hoses used for acetylene and for oxygen shall not be interchangeable.
h) Means of torch ignition should be readily available. A friction lighter shall be used for this purpose.
i) Gas cylinders shall be color coded and stored in segregation. Color coding can be of great help but also a potential source of danger.
j) Flash back arrestors shall be installed on both ends of hoses (torch side and cylinder side)
k) Never put the heating torch to cylinder body contact.
l) Acetylene can form explosive compounds in contact with certain metals or alloys, particularly unalloyed copper or silver. Joint fittings or lines made of copper should not be used and acetylene should not be allowed to come into contact with copper pipe work or tubing. Only approved materials shall be used for acetylene systems.
m) Welding connections for arc welding should be properly tight.
n) Ventilation fan should be in working condition.
o) Equipment should be grounded properly.
p) Welding cable insulation must not be damage. Always replace with new one if found damage. Cracked insulation is not acceptable.
q) Do not adjust the 'current control' while welding is in progress. This can damage the control.
r) Always ensure that combustible material is removed at least 35 ft. surrounding the hot work.
s) Use canopy made of fire blankets that should cover the welding, cutting and grinding activity.
t) Use fixed guard on grinder machine.
u) Properly rated disks should be used for grinding and cutting.

Note: For details, see following;

- "KE-Gen-BQPS-II-HSEQ-II/038 - Hot Work Safety"
- "Hot work permit - KDTP-P619-19-02-Earthing of HT/LT Equipment"

9.32 Hydro-Jetting:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements while planning/executing hydro-jetting activity.

2. Scope:

This section is implemented on all Business Units of KE and its administered locations.

3. General Requirements:

Personnel engaged in high-pressure water cleaning operations will have satisfactorily completed a training course provided by the employer, which includes safety considerations and equipment operation before cleaning on company sites.

All contractor employees involved in high pressure water cleaning must be a full-time employee of the service company. Contractors must be able to provide all qualifying documentation to site personnel upon request. Following protocols shall be established before commencing hydro jetting activity:

a) Activity shall be performed in accordance with Permit to Work System

b) Hydro jetting checklist shall be filled along with permit.

c) High pressure water cleaning activity shall require JSA prior to start the activity.

d) Activity shall be completely cordoned off with sheets, concrete wall, tarpaulin, and appropriate safety signs shall be posted.

e) Ensure proper working of Dead Man handle of the hydro-jetting equipment before start of work.

f) Before attempting to inspect or adjust any component of the hydro-jetting machine, the Foot-Control Valves (dump valves) must be not pressed.

g) Job shall be carried out by trained and designated person who shall wear:

- Face Shield
- Heavy Duty Hydro Jetting Suit
- Rubber Gloves
- Gum Boots
- Ear Plugs / Earmuffs

h) Pump unit shall be equipped with safety relief valve.

i) All hoses shall be free of damaged wire braids and of correct pressure rating equipped with restraining (Whip Check) devices across couplings.

j) When hose drops exceed ten (10) feet, the hose shall be securely tied off to a rigid support to limit the pull due to the weight of the hose. All hoses must be protected from damage due to vehicle traffic.

9.33 Ionizing Radiation:

1. Purpose:

The purpose of this section is to provide guidelines in establishing minimum safety requirements while planning/executing ionization radiation (radiography).

2. Scope:

This section is implemented on all Business Units of KE and its administered locations.

3. General Requirements:

KE shall establish, implement, and maintain a program to ensure safe use, handling, managing, processing, operating, storing, transporting, and monitoring. This program shall also provide minimum safety requirements for 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. This procedure shall be in compliance with applicable national and provincial legal requirements to protect people and the environment from harmful effects of ionizing radiation. KE shall regularly monitor radiation workers, who are likely to receive an effective dose of radiation, for corrective and preventive actions.

Communication between area owner and the contractor who is performing this service must be established and maintained throughout the activity. To ensure this, following protocols shall be established before commencing the activity:

a) All radiography activity shall be performed through Permit to Work System.

b) Activity plan shall be provided by contractor to KE (Activity Coordinator) who will then circulate it to all stakeholders for effective communication.

c) The activity supervisor shall ensure the complete evacuation of the area before starting the radiation job.

d) The Ionization Radiation contractor shall provide the following documents before starting the job:

- Pakistan Nuclear Regulatory Authority (PNRA) Valid License
- Decay Table of 3rd Party
- Emergency Response Procedure

e) Each Person engaged in the activity shall have a valid certificate.

f) All individuals handling the radiation sources shall wear approved PPE and Film / TLD (Thermo Luminescent Dosimeter) Badges

g) Each area where activity to be performed shall be barricaded with yellow and black tape mentioning “DANGER RADIATION” sign.

h) Visual warning signs of radiation hazard posted at all sides of the restricted area. During night, flashlights should be installed to ensure communication at larger distance.

i) Radiation activity supervisor shall establish a controlled area of radiation zone.

j) Radiography activity will be carried out during night or lunch time when minimum workforce will be present at plant area.

k) All other work within the identified radiation hazard area must be stopped and all personnel must be evacuated from this area.

l) Deputation of standby man surrounding the area especially at pedestrian passage if present.

m) All radiography equipment especially the projector and survey meter shall be regularly inspected, calibrated, and kept in working condition.

n) In case of Emergency:

- In case of mishap, immediately inform Supervisor In-Charge of the area where Radiography Test (RT) is conducted and seek advice for proposed action.
- Attempt to place source in Lead Container quickly if possible
- Do not try to pick the source with bare hand.
- The supervisor shall summon any other necessary help outside agency i.e. PNRA if required

Note: For details, see following;

- "KE-Gen-BQPS-II-HSEQ-II/043 - Ionization Radiation for Non-Destructive Testing"

9.34 Hazard Communication Program:

1. Purpose:

The purpose of this document is to describe the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS), The primary purpose of HAZCOM (Hazard Communication) is to reduce the frequency of incidents and injuries caused by chemicals and to educate the workers how to react when they engage in emergency due to chemical exposure or spill etc.

2. Scope:

This section is implemented on all Business Units of KE and its administered locations (where applicable).

3. Summary:

The GHS is of Classification and Labeling of Chemicals, standardizing and harmonizing the classification and labeling of chemicals. It is a logical and comprehensive approach to:

a) Define health, physical and environmental hazards of chemicals.
b) Create classification processes that use available data on chemicals for comparison with the defined hazard criteria; and
c) Communicate hazard information, as well as protective measures, on labels and Safety Data Sheets (SDS).

4. Safety Data Sheet:

Safety Data Sheet (SDS) is the comprehensive documents which provide the information needed to understand following:

a) What chemical is?
b) What hazards are presents?
c) How to response to these hazards?

As per OSHA, following mandatory information must be part of every SDS:

1.	Chemical Identification	2.	Hazard (s) Identification
3.	Composition/Information on Ingredients	4.	First Aid Measures
5.	Fire Fighting Measures	6.	Accidental Release Measures
7.	Handling & Storage	8.	Exposure Control and PPE
9.	Physical & Chemical Properties	10.	Stability & Reactivity
11.	Toxicological Information	12.	Ecological Information
13.	Disposal Considerations	14.	Transportation Information
15.	Regulatory Information	16.	Others

Reference: OSHA 29 CFR 1910.1200 Hazard Communication Standards: Safety Data Sheet

Note:

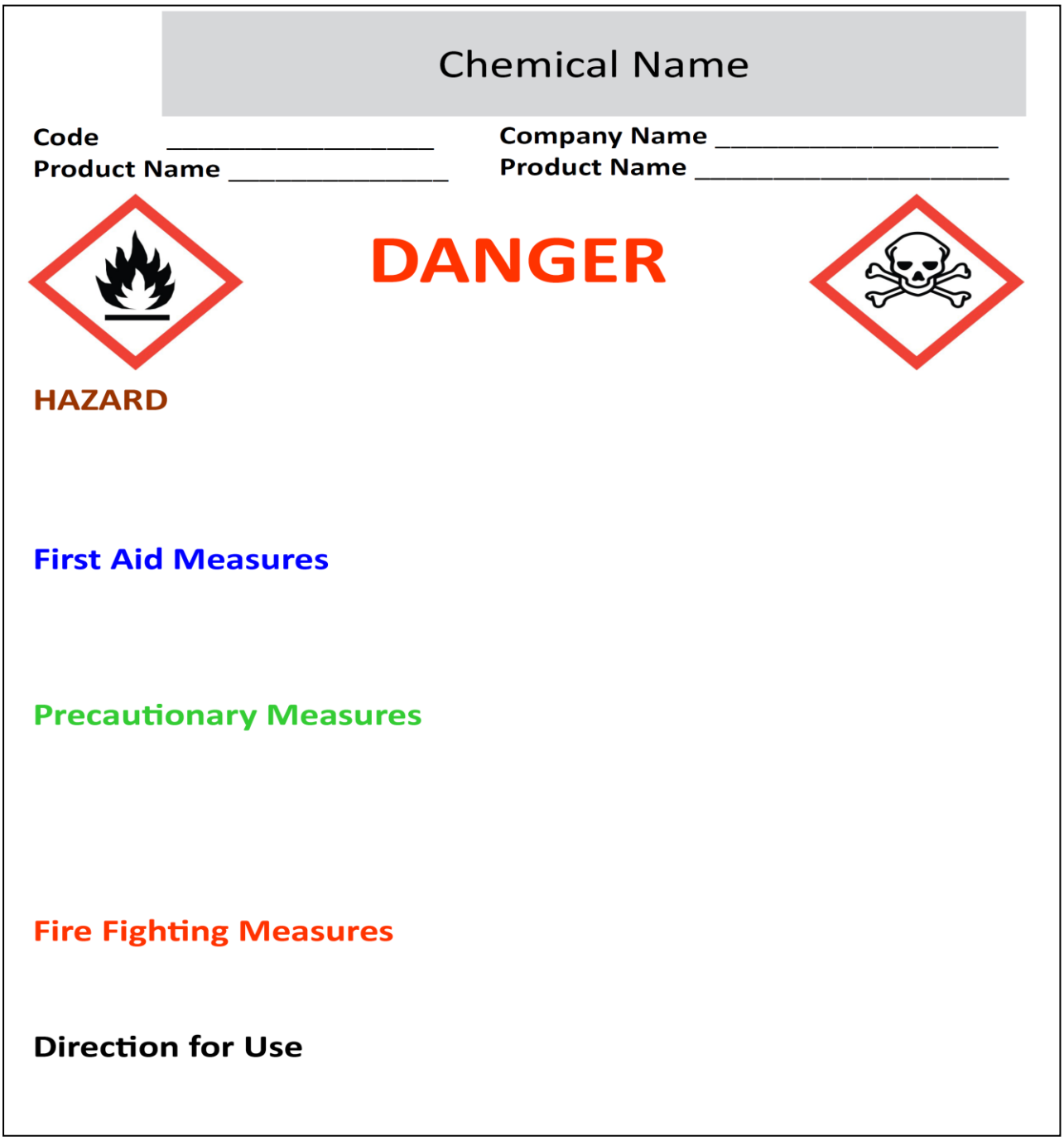
SDS are not risk assessment. When using substances, risk assessment must be performed by taking guideline from SDS.

Where applicable, every site shall be equipped with SDS.

5. GHS Labels:

		
Flame Over Circle	Flame	Skull & Crossbones
		
Corrosion	Exploding Bomb	Gas Cylinder
		
Environment	Health Effects	Exclamation Mark

6. Sample HAZCOM:



Note: For details, see following;

- "KE-Gen-BQPS-II-HSEQ-II/029 - Safety Signs & Tags"

9.35 Polychlorinated Biphenyls (PCBs):

Polychlorinated biphenyls (PCBs) were widely used as a fire retardant and insulator in the manufacture of transformers and capacitors due to their ability to withstand exceptionally high temperatures till 1979. KE has used PCBs as dielectric oil in the past and has relevance with the issues related to the management, disposal, and alternatives of PCBs as a category of Persistent Organic Pollutants (POPs).

Although KE has eliminated PCB from its system with the assistance from Ministry of Climate Change Pakistan and United Nations Development Programme. However, in case PCB presence is found, care must be taken to ensure strict adherence to PCB Management Procedure as it lists all the required safety precautions, personal protective equipment, handling, storage, decontamination, and disposal protocols.

“Relevant procedure: KE – SP – 029 PCB Management Procedure”

9.36 Asbestos & Asbestos Containing Material, Equipment & Items:

KE has generally eliminated asbestos from its facilities. Asbestos shall not be used in new projects. Demolishing works where asbestos may be present must be conducted with strict adherence to Asbestos Management Procedure as it defines all required personal protective equipment and decontamination protocols.

"Relevant procedure: KE – SP – 027 Asbestos Management Procedure"

9.37 Work over or adjacent to water:

1. Purpose:

The purpose of Work Over Adjacent to Water is to provide guidelines for safe work practices.

2. Scope:

This section is applicable to all KE Locations (where applicable).

3. General Requirements:

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

a) Life vests shall be worn by employee/contractor when working over water. Full body harness with double lanyard for 100% securing the personal all the times shall be used to avoid fall hazard.

b) KE shall ensure that people that have fallen in water can be easily and swiftly be rescued and/or brought to the shore.

Note: For details, see following;

- "Safety Rule Book"

9.38 Adverse Weather:

1. Purpose:

The purpose of this Procedure is to provide guidelines to stay alter for Adverse weather forecast and same is immediately communicated to all concern stake holders.

2. Scope:

This Adverse Weather Procedure applies to all KE locations.

3. Summary:

KE in collaboration with MET department is monitoring weather updates day and night of all the strategic location of assets and operational areas and when inclement weather is expected, necessary corrective and preventive measures/precautions is implemented to ensure safe continual operations, avoid any incident to employee/ contractor, member of general public and loss of equipment/property:

a) Adverse weather forecast is immediately communicated to all internal and external stake holders for taking early necessary precautions for any forthcoming weather issues.

b) Safety alerts/advisories for emergent safety issues to public, posted on social media, safety alert messages forwarded to employees and public.

c) Ensure safety messages/alerts are disseminated to customers/public utilizing all possible forms of media including local cable networks, as and when required/advised by HSE concern departments.

d) Ensure media campaign for public safety before and during monsoons as well as heat waves.

e) Adverse weather conditions include:

i. Heat Wave, Extremely hot and humid weather,
ii. Medium to heavy rainfall
iii. Floods
iv. Heavy and continued sandstorm,
v. Strong winds,
vi. Lightning and thunderstorms,

Note: For details, see following:

- “KE-SP-026 - Disaster Management Procedure”
- “HSE-D and HSE-G&T Manuals”
- “KE Social Media”
- “KE Business Continuity Plan 2021”

9.39 Environmental Management System:

1. Environment and Sustainability Management System (ESMS)

KE has established an Environmental & Sustainability manual which defines KE's Environment and Sustainability Management System (ESMS) and provides guidelines for the implementation and operation of the ESMS to all personnel including all relevant documents to ensure that the business activities undertaken by KE have a minimal impact on the surrounding and wider environment. KE Management Places Environment & Sustainability (E&S) ahead of its planning, construction, operations, maintenance schedules, quality, costs, and all other phases of business. To accomplish and sustain this goal, each employee must accept and exercise individual responsibility by working safely and contribute effectively towards environmentally sustainable activities across KE. The ESMS Manual captures the detailed rules to be followed by all concerned in connection and acts as a signposting document to indicate how each of the clauses in ISO14001:2015 is addressed. It contains:

a) Corporate HSEQ Policy
b) Corporate environmental procedures and controls
c) Statements of responsibility and authority
d) Identification of the resources and training allocated to management, performance of work and verification activities including internal audit
e) Appointment of the Environment & Sustainability Management Representative (ESMR)
f) Arrangement for periodic management reviews

The scope covers all the departments falling under BU Generation, Transmission, Distribution, Enabling Functions, and third-party contractors/suppliers working across KE.

Below is an overview of Corporate environmental procedures. For details, refer ESMS Manual.

2. Environmental Aspect Impact Assessment

The ESMS of KE is developed to manage significant environmental aspects so as to minimize or eliminate their impacts on the environment. The planning process commences with the identification and updating of environmental aspects. In order to evaluate the impacts of its activities to the environment, KE shall establish, implement and maintain a procedure to identify the environmental aspects of its activities and services that it can control and those that it can influence taking into account planned or new developments, or new or modified activities and services. These aspects, inclusive of those arising from works carried out by contractors, are registered in the "Register of Environmental Aspects".

Each department will conduct assessment to identify its environmental aspects that can result in a positive or a negative impact. This aspect/impact assessment will be conducted on the risk matrix where the highest rated risks will be given the highest priority and mitigation plan will be developed. KE shall ensure that all environmental aspects that may pose significant impacts to the environment are under control and prioritized for improvements. KE shall keep this information up to date.

"Relevant procedure: KE – SP – 039 Environmental Aspect Impact Assessment"

3. Environmental Legal Register

KE shall establish, implement, and maintain a procedure to identify and maintain access to legal requirements that are relevant to the company, as well as other requirements that the company subscribes to which relates to the company's environmental aspects.

KE shall identify all relevant regulations, codes of practice and guidelines that are applicable to the environmental aspects of its activities and services and record this information in the Environmental Legal Register. KE shall keep this information up to date.

"Relevant procedure: KE – SP – 015 Environmental Legal Register"

4. Environmental Monitoring and Management

In order to meet the company's commitment to compliance, KE shall regularly monitor and evaluate the compliance status of the applicable environmental legal requirements and other requirements that the company subscribes to. The records of the results of the periodic evaluations shall be retained.

"Relevant procedure: KE – SP – 016 Environmental Monitoring and Management"

5. SF6 Monitoring

KE uses Sulphur hexafluoride (SF6) at high voltage interface between the generation and transmission systems for insulation, arc quenching, and current interruption in gas-insulated switchgear (GIS) and circuit breakers. It is also used in Distribution RMUs. SF6 is a fully fluorinated compound (FFC) gas, recognized as being the most potent greenhouse gas. Having 23,900 times the global warming potential in comparison to carbon dioxide (CO2). SF6 has atmospheric lifetimes of up to 3200 years, thereby significantly and permanently contributing to global warming.

Management of SF6 Gas must be done with strict adherence to SF6 Monitoring & Management Procedure as it lists all the required safety precautions, personal protective equipment, handling, storage and disposal protocols.

"Relevant procedure: KE – SP – 028 SF6 Monitoring & Management Procedure"

6. EMF Monitoring

Electromagnetic fields (EMF) are emitted around energized power lines and electric equipment. There has been scientific debate about the health effects of EMF exposure, there is no agreement among the scientific community about certain effects. However, the weak evidence has led some legislation bodies and international organizations to put some standards regarding exposure to EMF.

KE has established a procedure to provide guidelines for Electromagnetic Field (EMF) measurement and management and ensuring safe exposure of KE staff and general public to KE's transmission and distribution network. It also lists the International Standards Guidelines as well as measuring, recording, reducing and reporting protocols.

"Relevant procedure: KE – SP – 030 EMF Monitoring & Management Procedure"

7. Indoor Air Quality Monitoring

KE is committed to provide each employee a safe place of employment and will take actions to keep the workplace free of recognized hazards that cause, or are likely to cause, serious physical harm and, when available, will employ feasible means that will eliminate or materially reduce the recognized workplace hazard. KE recognizes the impact that indoor air quality has in the workplace and has developed a procedure to provide the staff with the optimum level of indoor air quality at KE locations and recommend actions for identifying and resolving IAQ issues in a manner that prevents them from reoccurring and avoids the creation of other problems.

"Relevant procedure: KE – SP – 041 Indoor air Quality Monitoring Procedure"

8. Noise Monitoring

Consistent exposure to noise levels above allowable limits and suggested duration is hazardous to human health and in such case precautionary measures should be employed. The purpose of this procedure is to provide guidelines for hearing conservation and occupational noise management within KE premises as per OSHA Hearing Conservation Program. The ambient noise monitoring at and beyond the boundary of the facilities is covered in the scope of KE-SP-015 Environmental Monitoring & Measurement Procedure.

"Relevant procedure: KE – SP – 042 Noise Monitoring Procedure"

9. Illumination Monitoring

Lighting is an essential provision for any workplace. It is preferable to provide uniform illumination over the entire workplace by combining both natural and artificial lighting. Localized lighting may be required in certain cases to cut costs and improve illumination. The purpose of this procedure is to eliminate the risk of harm (injury or illness) due to poor lighting where reasonably practicable.

"Relevant procedure: KE – SP – 043 Illumination Monitoring Procedure"

10. Waste Management

Waste is generated from various activities at different locations across KE. The type of waste generated depends upon the nature of operations and activities at a particular location or site. Improper management and disposal can cause serious impacts on health and problems to the surrounding environment. Proper methods of waste disposal have to be undertaken to ensure that it does not affect the environment or cause health hazards. It is the responsibility of the respective BU to protect human health and the environment by ensuring compliance with the applicable regulatory requirements.

"Relevant procedure: KE – SP – 012 Waste Management Procedure"

11. Hazardous Substance Management

KE management is committed to protect the environment and to ensure the health and safety of employees, contractors and visitors. Employees and contractors must be aware of the hazardous substances, their safe management, and hazards of spills and know how to protect themselves and the environment.

"Relevant procedure: KE – SP – 017 Hazardous Substance Management Procedure"

12. Resource Conservation

Sustainable natural resource conservation is a process of rational use and skilful management and preservation of the natural environment with all its resources. BUs at K-Electric shall quantify current practice, set targets and take practical action to reduce environmental impact and costs by optimizing the use of resources.

"Relevant procedure: KE – SP – 40 Resource Conservation"

13. Environmental Studies & Management

Under federal and provincial Environmental Protection Acts, no proponent of a project can commence construction or operation without filing an initial environmental examination, an environmental impact assessment or an environmental checklist with the respective Agency and obtaining an approval in respect thereof. There is a procedure to set a guideline to carry out Environmental Studies of new and expansion projects within KE for regulatory compliance and to ensure that the business activities undertaken have a minimal impact on the surrounding and wider environment.

"Relevant procedure: KE – SP – 038 Environmental Studies & Management Procedure"

14. Chance Find Procedure

This procedure outlines the commitments and shapes the responsibilities, monitoring, and implementation schedule in relation to Chance Finds for cultural heritage during execution of the projects undertaken by KE. It includes the mitigation guidelines necessary to ensure that negative impacts to cultural heritage, due to project activities are prevented or, if this is not possible, as low as reasonably practicable (ALARP) during different project phases.

"Relevant procedure: KE – SP – 044 Chance Find Procedure"

15. Internal Environmental Audit

KE believes that audit is an important tool in the establishment, measurement, maintenance, and continuous improvement of environment performance. Audit compares performance vs. established standards and evaluates effectiveness of systems in accomplishing their intended purpose. Proper auditing provides a process that nourishes and reinforces correct systems, behaviour and work practices while identifying opportunities for improvement.

KE has in place a procedure to carry out periodic environmental management system audits to:

a) Determine whether or not the environmental management system:
   i. Conforms to planned arrangements for environmental management including the requirements of ISO 14001.
   ii. Has been properly implemented and maintained.
b) Provide audit results and information for management review for environmental improvement.

The audit procedure covers audit criteria, scope, frequency and methods, as well as responsibilities and requirements for conducting audits and reporting results and retaining associated records.

KE conducts environmental audits on a regular basis to ensure appropriate preventive actions are being taken as planned, and corrective actions being carried out timely.

“Relevant procedure: KE – SP – 033 Environmental Excellence Award Audit Criteria & Procedure”

9.40 HSE Signs:

1. Purpose:

The purpose of this section is to provide guidelines based on world recognized standards as well as best industry practices to ensure that all safety signs, sign boards, tags and other hazard communication methods at KE and its administered location are homogenized and according to world class standards.

The purposes of this standard is to:

1. Establish a uniform and consistent visual layout for safety tags and sign boards etc.
2. Minimize the proliferation of designs for safety tags and sign boards etc.
3. Establish a uniform system for safety tags and sign boards etc. that communicates safety information.

2. Scope:

This section shall apply to all Safety Signs, sign boards, Tags and other hazard communication methods at all KE administered locations and infrastructures.

KE believes that all hazards should be clearly identified, and proper actions shall be taken to prevent any human interaction with these hazards.

3. Types of Safety Signs:

a) Prohibition/ Danger Sign:

A sign prohibiting behavior likely to increase or cause danger (e.g. "no access for unauthorized persons"). Danger signs shall be used only where an immediate hazard exists. Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.

Intrinsic features:

i. Round shape.
ii. Black pictogram on white background, red edging and diagonal line (the red part to take up at least 35% of the area of the sign).

b) Warning/ Caution Sign:

A sign giving warning of a hazard or danger. Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices. The standard color of the background shall be yellow; and the panel, black with yellow letters. Any letters used against the yellow background shall be black.

Intrinsic features:

i. Triangular shape.
ii. Black pictogram on a yellow background with black edging (the yellow part to take up at least 50% of the area of the sign).

c) Notice & Mandatory Sign:

A sign prescribing specific behavior (e.g. eye protection must be worn"). Notice sign must be square in shape with a blue background and message written in white.

Mandatory Sign Intrinsic features:

i. Round shape
ii. White pictogram on a blue background (the blue part to take up at least 50% of the area of the sign).

d) Emergency Escape Sign:

A sign giving information on emergency exits, first aid, or rescue facilities. i.e. emergency exit/ escape route. Escape signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters shall be at least three-fourths inch in width.

Intrinsic feature; rectangular or square shape.

e) Safety Instruction Signs:

Safety instruction signs, when used, shall be white with green upper panel with white letters to convey the principal message. Any additional wording on the sign shall be black letters on the white background (see accompanying figure).

f) Directional Signs:

Directional signs, other than automotive traffic signs specified in the paragraph below, shall be white with a black panel and a white directional symbol. Any additional wording on the sign shall be black letters on the white background.

g) Traffic Signs:

Construction areas shall be posted with legible traffic signs at points of hazard. All traffic control signs, or devices used for protection of construction workers shall conform to American National Standards Institute ANSI D6.1-1971, Manual on Uniform Traffic Control Devices for Streets and Highways.

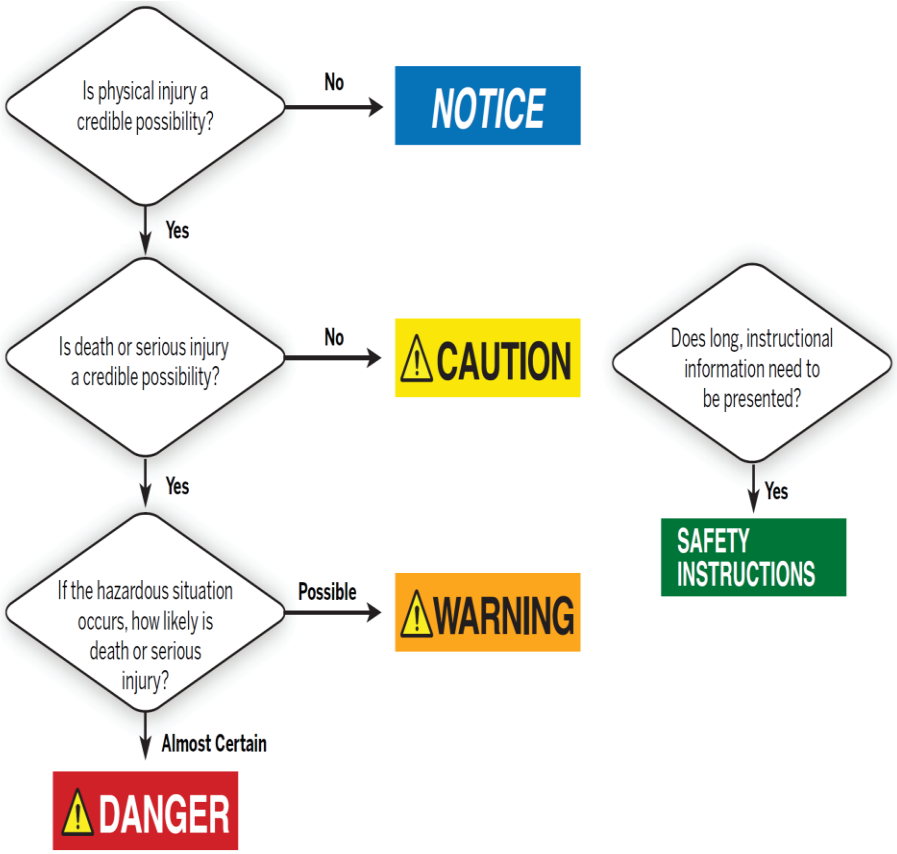
h) Fire Safety Sign:

Provides information on the identification or location of firefighting equipment or gives warning in case of fire.

Intrinsic features:

i. Rectangular or square shape.
ii. White pictogram on a red background (the red part to take up at least 50% of the area of the sign).

4. How to select a right sign to match risk level?



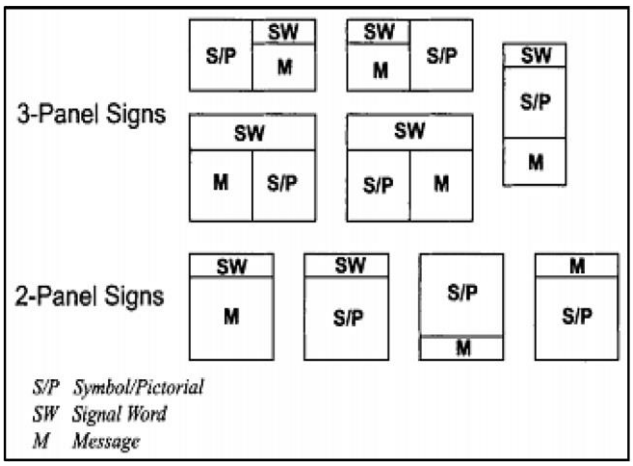
5. Design Specifications

a. Safety Signs Format:

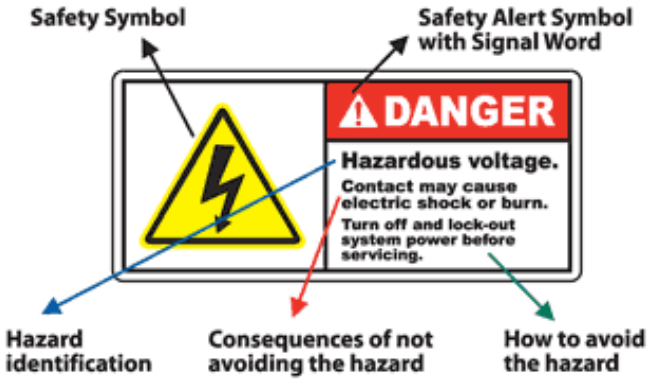
The safety alert symbol shall precede the signal word. The base of the safety alert symbol shall be on the same horizontal line as the base of the letters of the signal word. The height of the safety alert symbol shall be equal to or exceed the signal word in letter height.

For safety tags, signal word panel shall be located near top of the tag, above message panel.

Following are the standard formats of safety signs / tags/ boards.



Sample# 01



OSHA / ANSI old signs:

OSHA / ANSI new signs:

Note: For details, see following;

- "KE-Gen-BQPS-II-HSEQ-II/029 - Safety Signs & Tags"

9.41 Housekeeping:

1. Purpose:

This procedure defines a system for ensuring compliance to the housekeeping practices and promoting healthy competition through a reward and reprimand system.

2. Scope:

This procedure is applicable to all KE owned and rented locations excluding the operational locations, whose housekeeping performance is already being covered under SLA (Safety Leader Award) Criteria.

3. Procedure:

To implement and promote good housekeeping practices in the company at par with the best industrial practices, location owners are required to maintain their workplace, carry out Housekeeping inspections in accordance with this guideline and maintain record (signed hardcopy). The location owner shall submit monthly housekeeping inspection checklists to Corporate HSEQ before end of each month through KE online Portal.

a) Location owner will constitute team(s) to ensure the housekeeping is being maintained.

b) Corporate HSEQ shall conduct bi-annual housekeeping audits for monitoring implementation as per criteria attached as Annex “A”.

c) Location owners shall close open points within 10 days upon receipt of audit or inspection report. In case any point requires longer time, budgetary approval or involvement of other departments, an action plan with timeline shall be sent to CHSEQ in stipulated time mentioned above.

d) Corp HSEQ shall conduct periodic analysis and present to leadership for continual improvement.

Note: For details, see following;

- “KE-SP-025 - Fire Safety and housekeeping Award Procedure”

9.42 Hygiene & First Aid Facilities:

1. Purpose:

This describes a proper Health & Hygiene Management System to specify precautions to be taken or equatorial that shall be on hand or utilized to minimize health and safety risks. Highlight significant health and safety concerns or activities and any health and safety documentation that is applicable.

2. Scope:

This applies to all KE personnel, contractor's employees, and visitors.

3. Main Functions:

a) Industrial Accident & Emergencies:

To take care of the health of workers and get them treated in case of accident, investigate to find out root causes of the accident and suggest preventive measures to avoid recurrence. Industrial Hygiene Unit (IHU) deals with all sorts of Industrial Accidents and Emergencies/ occurring during assigned work. The doctors of I. H. Unit remain on call / stand by during & after office hours, round the clock 7/24, for any Industrial accident to facilitate treatment and transportation, and reduce financial and skill loss to the Company.

Note: For detail, refer Annex 'A' of KE-SP-013

b) Installation & Replenishment First Aid Box:

First aid boxes are installed throughout KE locations scattered over a vast area of outspread KE domain. The first aid boxes 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. It is also helpful to control bleeding or revive an unconscious patient/injured person. This is in accordance with Sindh Factories rule 1975 section-94.

Note: For detail, refer Annex 'B' of KE-SP-013

c) Vaccination:

Vaccinations against notorious and deadly diseases, to employees are mandatory by law. Vaccination of all KE employees and their dependent family members are carried out against Hepatitis B, Tetanus, Typhoid, Dog bite, Chicken Pox etc. in accordance with EPI Program of Govt. of Pakistan and factories act.

Industrial Health Unit's Vaccination Program comprises of:

- Routine Vaccination at I. H. Unit on all working days.
- Setting of Vaccination Camps at various KE Colonies, generating stations & offices etc. according to a notified program.

Note: For detail, refer Annex 'C' of KE-SP-013

d) Hygiene Card Examination:

The Medical Examination of Workers shall be done twice a year, is mandatory by law. Each worker shall be provided with a Hygiene Card in which entries are recorded twice a year i.e. Jan & July by Medical Officer after Medical Check-up to the effect that the worker is not suffering from any contagious / communicable or infectious disease. If a worker is found to be suffering from any such disease, he shall not be appointed on work till he is treated and declared free from such disease from the medical staff.

Note: For detail, refer Annex 'D' of KE-SP-013

e) Hygiene Inspection Visit of Premises / Canteens:

Hygiene inspection of all KE premises, colonies & installations including canteens is the prime function performed by M.O / Sanitary Inspector of IHU. This is in accordance with factories act 1934, chapter III section 13 to 22 and 24.

A monthly program trial be prepared and dispatched by doctors with the coordination of Manager Admin to various KE offices. The discrepancies found and notified to concerned departments for early rectification with intimation to higher authorities.

Note: For detail, refer Annex 'E' of KE-SP-013

f) First Aid Training:

Training of KE employees shall be done in batches, department/region wise to enable them to take safety precautions which can reduce the risk of major accident / major loss of human as well as KE properties. They are also trained to combat any injury/accident in a proper way before the victim gets proper medical attention.

Note: For detail, refer Annex 'F' of KE-SP-013

g) Audits / Reward / Reprimand:

For SLA Award twice i.e. in May/ June & November/ December carried out by IHU team of Medical Department.

h) Issuance of Circulars:

Industrial Health Unit issues circulars through administrator from time to time regarding health & safety like health advisory, weather advisory, working in heat (loo lagna), dengue fever, bird flu, burns etc.

Note: For details, see following:

- "KE-SP-013 - Occupational Health & Hygiene Management System/ Procedure"

9.43 Fire Prevention:

1. Purpose:

The purpose of this procedure is to provide guidance, awareness, define roles and responsibilities of departmental executives and senior management at all KE business operations and to ensure:

a) Functions of Corporate HSEQ Fire Section are clearly outlined.

b) Functions, roles, and responsibilities of All BUs with respect to fire protection and prevention.

2. Scope:

This procedure applies to all BUs/employees' of K-Electric and contract employees.

3. HSE Related Legal/Regulatory Requirements:

a) Building Code of Pakistan Fire Safety Provisions 2016

b) Sindh Factories Act 2015

c) NEPRA POWER Safety Code

d) Civil Defence Act/Building by Laws

e) NFPA (1, 10, 13, 14,24, 25, 72, 101, 850, 2001 and other applicable standards)

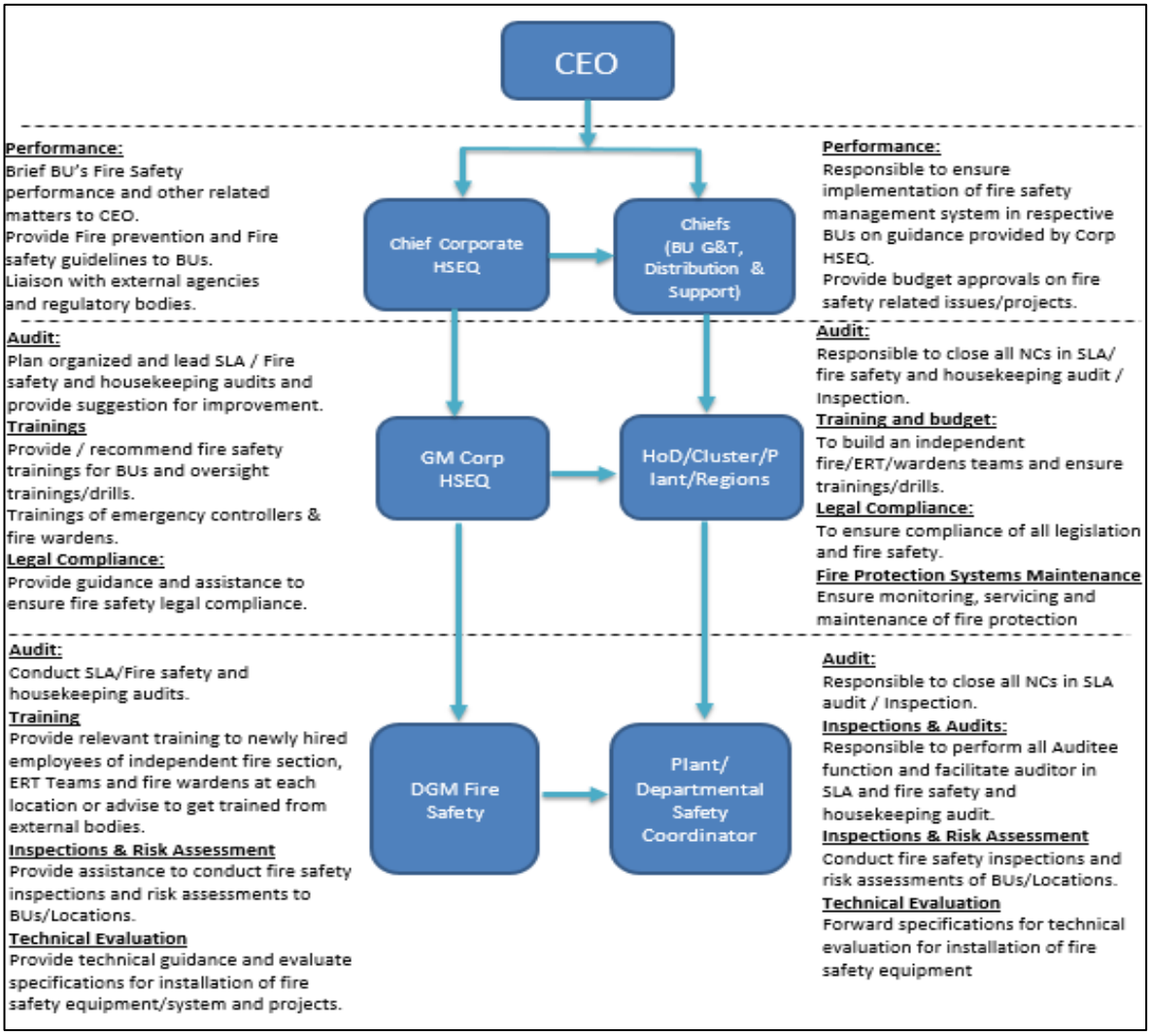
4. Procedure:

a) Emergency Response Organization:

KE has established an Emergency Response Organization for responding to accidents and emergencies at its KE House (Refer to procedure KE-ERP-002 or emergency response plan template Annexure "A"). Similarly, each BU shall formalize their Emergency Response Procedure to respond and to prevent the escalation of any unforeseen (Accident / incident). The Emergency Response Organization consists of the Emergency Controller, who in the case of KE House shall be DD- Administration assisted by Manager Administration. For all dept./ BU's, the duty of Emergency controller shall be assigned by BU's/ departments assisted by Safety Coordinator and fire wardens posted at each BUs / departments.

b) Functions:

The fire preventive and management system envisage a fire system which is both effective and practicable in operation. A decentralized system of fire prevention has been adopted, to timely and effectively prevent fire and its associated effects.



Fire safety inspection conducted quarterly at G&T locations and Monthly at other KE locations as per KE-SP-024 Fire Safety Inspection Procedure

- Fire Safety inspections are also reported through **online KE portal** to ensure fire safety vigilance at KE locations.
- Biannual Fire Safety audits of KE Distribution and Support locations are conducted to maintain good housekeeping and fire safety practices at the locations as per KE-SP-025 Fire Safety and Housekeeping Award procedure.
- Safety Leaders Award Audit conducted biannually to check the safety, Fire Safety, equipment healthiness and housekeeping at G&T locations as per G&T Safety Leaders Award Criteria.

Note: For details, see following;

- "KE-SP-21 - Fire Prevention and Management System Procedure"

9.44 Emergency Management System:

1. Purpose:

To identify potential hazards and formulate a procedure at KE Offices/locations whereby an appropriate response could be initiated in case of any emergency. It also covers the requirement First aid and Emergency Rescue methods.

2. Scope:

This procedure is applicable to all KE Offices/locations after customization.

3. Introduction:

a) Reference to KE-SP-021 Section 5.1 Emergency Response Organization, KE has established and maintains plans and procedures to identify the potential for, and response to, incidents and emergency situations, and for preventing and mitigating the likely illness and injury that may be associated with them.

b) "Each BU shall formalize their Emergency Response Procedure to respond and to prevent the escalation of any unforeseen (Accident / incident)"

c) To facilitate BUs for development of Emergency Response Plans for their building/location, Corporate HSEQ has provided a template in (KE-ERP-001) and Guidelines for the use of template are attached in Annexure "A" of KE-SP-021.

d) The guideline template is prepared for Emergency Response Plan preparation of General Office Buildings and is not intended for Grid Stations and Generation Plants, who have their own location specific Emergency Response Plans.

e) Corp HSEQ Team shall review its emergency preparedness and response plans and procedures, after the occurrence of incidents or emergency situations, or addition of a new process / activity.

f) Periodically test such procedures on regular basis through evacuation drills as per prescribed frequency in the procedure.

4. Emergency Response Organization:

The Emergency Response Organization of < XYZ Building > consists of the Emergency Controller, Mr. XXX assisted by Mr. YYY along with safety wardens posted at each floor/ major units of the building occupied by KE.

5. < XYZ Building >Emergency Response Team (ERT):

a) Emergency Controller: DGM/Manager/Assistant Manager, Mr. XXX will be overall in charge and assume responsibility as "Emergency Controller". Manager/AM/Officer, Mr.YYY will assist him and also assumes responsibility in the absence of emergency controller.

b) The ERT will respond to emergencies such as fires or any other potential accidents / emergency conditions. The Overall responsibility will lie with the Emergency Controller assisted by his deputy and Safety Wardens.

c) Nominated Emergency Controller shall nominate "Safety Wardens" as team members, keeping in view that all < XYZ Building > Floors/Areas are adequately covered. The team shall respond in accordance with the emergency response instructions.

d) The list of Safety Wardens/Emergency Response Team in < XYZ Building > is documented in Annexure "C". The updated list shall be maintained by Emergency Controller.

6. Emergency Rescue:

This section is intended to give only general knowledge of safe and effective methods of applying first aid for certain types of injuries. Keep the injured person lying down in a comfortable position, head level with the body, until you know that the injury is serious.

Look for discharge of blood, stoppage of breathing, signs of poisoning, burns, fractures and dislocations. Remember that serious bleeding, stoppage of breathing, and internal poisoning must be treated immediately in that order before anything else is done.

a) Send someone to call a physician or ambulance.
b) Never give water or liquid to an unconscious person.
c) Keep onlookers away from the injured person.
d) Do not let the victim see the injury.
e) Make the victim comfortable and cheerful, if possible.
f) Keep the victim warm but maintain normal body temperature.
g) Keep calm and do not be hurried into moving the injured person unless necessary.

I. Hemorrhage (Bleeding)
II. Internal Hemorrhage
III. Nose Bleeding
IV. Sun Stroke, Heat Stroke & Hear Exhaustion
V. Fainting
VI. Fractures (Broken Bone)
VII. Transportation of Victims
VIII. Wounds
IX. Splinters or Foreign Substances in Body
X. Animal Bites
XI. Snake Bite
XII. Shock
XIII. Breathing and heartbeat
XIV. Identifying the snake
XV. Cleaning the bitten area
XVI. Cold therapy
XVII. Medicine to relieve pain
XVIII. Snakebite kits

XIX. Electrical Burns

XX. Eye Injuries

XXI. Sprain & Strains

XXII. Bruises

XXIII. Frostbite

XXIV. Heimlich Maneuver

XXV. Method of Pole Top Rescue

Note: For details, see following;

- "KE-ERP-002 - Emergency Response Plan KE House
- "KE SP-013 - Occupational Health & Hygiene Management System Procedure"

9.45 Incident Reporting & Investigation:

1. Purpose:

The purpose of this section is to document the process for reporting and investigating incidents that occur in K-Electric Business Units, Departments, either On-the job or Off-the-job in a way that:

a) Promotes thorough and efficient investigation in a timely manner
b) Promotes uniform, accurate, clear, and concise documentation, and reporting
c) Identifies and implements recommendations to prevent incident recurrence
d) Promote Safe, Secure Electricity and elimination of Public Safety incidents
e) Involves the right people to get the information
f) Ensures a clear understanding of key factors and key learning
g) Participating personnel obtain a positive learning experience
h) Promotes an atmosphere of openness by improving communications and understanding about the incident
i) Providing input to the development and implementation of HSEQ policies, procedures, guidelines, and standards

So that recurrence of the incident is PREVENTED.

2. Scope:

This section describes the requirement for complying with the Process Safety Management (PSM) element on Incident Reporting and Investigation.

3. Classification of Injury & Accident:

a) Definition of Accident:

An incident is an unexpected / unplanned occurrence that interferes with the orderly progress of work and that caused or might have caused one or more of the following:

- A serious injury or adverse effect on the health of one or more employees.
- Actual or potential significant loss of physical facilities even though potential for injury was small.
- An environmental incident.
- A situation that could have an unfavorable impact (Adverse community reaction) on the public.

Incidents (other than environmental incidents) have been classified into three major categories:

1) Work related
2) Non work related
3) Off the job

Work related incidents can be categorized in following:

1) Process Safety Incident (Electrical / Non-Electrical)
2) Personnel Safety Incident (Electrical / Non-Electrical)
3) Vehicle Incident
4) Near miss

4. Reporting an Incident:

The initial incident / injury occurrence information will be submitted by the respective first line supervisor with copies to the concerned area in-charges, respective BU HSE and CHSEQ as per below mentioned timelines. Incidents/near miss can be reported through Incident Reporting system (IRS). Till the time incident reporting system is developed on share point portal, current incidents reporting system of emails can be utilized.

Reports can also be sent through email.

Respective BU HSE will issue FIR - an Orange flyer – Annexure C, on all incidents and injuries as an alert to all concerned within 24 working hours of receipt an initial report.

Description of Reporting	Timeline
INTERNAL REPORTING	
On receipt of information for all incidents (Staff & Public). Immediate initial information to be shared by respective Dept with CHSEQ & BU - HSE	02 Hours
Initial Information (Fatal & LWI) to be shared by CHSEQ with Leadership.	As soon as possible
Staff & Public – **C-4 form (Annexure A)** to be submitted by line to respective BU HSE for ownard shring with CHSEQ, alongwith Scoring Sheet for process and personnel safety incidents. Considering weekend, nighttime and gazette holidays reporting time will be;	04 Hrs. 08 Hrs.
Preliminary incident report - Orange Flyer (Staff & Public) to be shared by Respective BU HSE with D- Level committees and CHSEQ	24 Hrs.
Detailed Investigation Reports (DIR) to be compiled & submitted	Team Investigation – 15 Working days Dept. Investigation – 07 working days Unit Investigation – 03 working days
Public Accident (Rebuttal) Form to be submitted by line to respective BU HSE for onward sharing with CHSEQ (For cases not investigated thru "Team Investigation"). **(Annexure D)**	15 Working days
DIR – Green Flyer (Staff & Public) to be shared by Respective BU HSE with D- Level committees and CHSEQ.	After Management Approval

EXTERNAL REPORTING	
Form C-4 (Annexure A – NEPRA Reporting template) to be submitted by Respective BU HSE to CHSEQ. Considering weekend, nighttime and gazette holidays reporting time will be;	08 hrs (For Staff) 16 hrs (For Public) 20 Hrs. (For Public)
Form C-4 (Annexure A) to be further submitted to Regulatory Dept by CHSEQ.	24hrs
Schedule 3 Form (Annexure F – External Lenders template) to be submitted by CHSEQ to Treasury dept	24hrs (For Fatality) 03 days (For LWI)
Form J-1 for Employee (Fatal & LWI) incidents (Line to share with IR department, keeping respective BU HSE and CHSEQ in loop)	24 Hrs.

5. Public Accidents:

a) ALL public accidents will be shared by line supervisor of dept./IBC/plants to respective BU HSE on **"Form C-4" (Annexure A)** and onward with CHSEQ for sharing with Leadership.

b) After sharing the initial information with leadership, investigation shall be held as per below mentioned Table 'A'.

c) An investigating team will be appointed for Team investigation by the Head of CHSEQ in consultation with CEO. Investigation team will be led by the cross functional Team Lead (Director or above) across BUs. Detail investigation with Why tree analysis will be done by the team. Detail report should be submitted to the CHSEQ Department within 10 working days of initial information of the accident for onward submission to Leadership.

d) **Public Accident form – Rebuttal Form (Annexure E)** shall be filled by respective dept./IBC/plant's and same will be forwarded to CHSEQ within 15 working days along with (necessary documentations, witness statement, video etc.) keeping respective BU HSE in loop. CHSEQ shall conduct investigation, if required.

Table 'A'	Public Incidents classification and Investigation		
Nature of Injury	**KE Network / Non KE Network**	**KE Related / Non KE Related**	**Level of actions required**
Fatal	KE Network	KE Related	Team Investigation
Fatal / Non-Fatal	KE Network	Non KE Related	Accident Details (Rebuttal Form)
Fatal / Non-Fatal	Non KE Network	Non KE Related	Accident Details (Rebuttal Form)

The decision to designate type of investigation lies with respective HSE Head except Team investigation, for which CHSEQ will designate investigation team.

Note: For details, see following;

- "KE-SP-002 - Incident Investigation Procedure"

9.46 HSE Performance Reporting:

1. Purpose:

The purpose of this section is to document the process for Monthly HSE Performance reporting incidents that occur in K-Electric Business Units, Departments, either On-the job or Off-the-job to NEPRA.

2. Scope:

This section shall be applicable to KE and its administered locations.

3. Summary:

a) KE emphasizes accuracy and transparency when reporting monthly Occupational Health, Safety & Environment (HSE) performance report.

b) Monthly HSE performance shall include all HSE data of KE BU's (Client, Contractor, Consultant, and member of general public). The performance report shall be prepared on Annexure-3 and soft copy shall be sent to NEPRA email address: "hse@nepra.org.pk" by 10th of each month for the previous month HSE Performance. Original record of year-end report shall be retained and preserved by KE for three (03) years.

c) The Monthly HSE Performance Report shall contain only TOTAL NUMBERS of On-job Fatality, Lost Time Injury or Illness, Restricted Duty Injury or Illness, Medical Treatment Injury or Illness, First Aid Injury or Illness, Fire Incident at Licensee (KE) Property, Licensee Property Damage Incident, Crane/Heavy Equipment Incident related to Licensee, Fatality of member of general public and Major Environmental or Occupational Health Violation.

d) The Monthly HSE Performance Report shall NOT contain any supporting or relevant document unless directed by NEPRA.

Note: For details, see following;

- "KE-SP-003 - Safety Reward & Reprimand Policy"

9.47 HSE Audits:

1. Purpose:

The purpose of this document is to discuss importance of effective auditing in HSE management and provide guidelines for conducting and evaluating HSE audits.

K-Electric believes that audits are important tools in the establishment, measurement, maintenance, and continuous improvement of process safety performance. Audits compare performance vs. established standards and evaluate effectiveness of systems in accomplishing their intended purpose. Proper auditing provides a process that nourishes and reinforces correct systems, behavior and work practices while identifying opportunities for improvement.

2. Scope:

This section describes the requirement for complying with the Process Safety Management element on Audits & Observations.

3. Summary:

Auditing is an important aspect of safety management system, if used properly and tactfully, audits bring various good results, e.g.

1. Maintain standards by ensuring that everyone follows the rules and procedures
2. Highlights areas where rules and procedures are insufficient
3. Measures the effect of safety training and reveals weaknesses
4. Motivates supervisors/ workers by giving results of their safety efforts

A documented audit program should be in place which also provides guidelines for conducting and evaluating results of safety audits by line managers and safety personnel. Necessary training should be provided to all relevant personnel on auditing techniques.

Audit program/ results should be stewarded by line managers/ respective BU HSE. The audits should be used to determine necessary changes in management of safety. This procedure covers the requirements, guidelines on how to conduct audits, compile report and steward recommendations for following types of audits: 1st Party PSM Audits (Internal Audit); 2nd Party PSM Audits; 3rd Party Audit (External PSM Audits); Hazardous Substances Survey; Safety Critical System Audit.

The intent is to comply with the applicable Legal and Regulatory requirements, OSHA regulation 29 CFR 1910.269 - operation and maintenance of electric power generation, control, transformation, transmission, and distribution lines and equipment, 29 CFR 1910.119 - preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals and EPA regulation 40 CFR Part 68-Protection of Environment, Chemical Accident Prevention Provisions.

4. Audit:

An audit is a methodical examination of a facility's procedures and practices to verify whether they comply with Corporate and legal requirements, internal policies, and good practices, whether they are being followed and whether they are effective.

5. Audit Types - 1st Party Audit:

An audit of a worksite carried out by team comprising of personnel working at that worksite, as per worksite's established HSE program. It is an Own-Area Audit in which no independent auditor (from outside the company) is employed. There are several types, or levels, of 1st party audits typically conducted at a worksite, some types are listed below.

a) Behavior Based Audit
b) Layered or Tiered Audit
c) Area Audit
d) Cross Functional Audit
e) Focused Audits

6. Audit Types – 2nd Party Audit:

An audit of a worksite carried out by independent auditors, as per worksite's established HSE program. The auditors are staff of the same company and thus are knowledgeable in corporate HSE program; however, they are working at different worksite. The strength of 2nd party audit is that auditors are external to the worksite and therefore, carry out the audit from an independent viewpoint, which can help in identifying area of improvement that may be overlooked during internal audits.

7. Audit Types – 3rd Party Audit:

An audit of worksite PSM program, conducted by personnel who are external to K-Electric, e.g. DuPont, Government agencies.

Note: For detail, see following;

- "KE-SP-011 - Audit and Observation Policy"

9.48 Annual HSE Performance Evaluation:

1. Purpose:

The purpose of this section is to document the process for Annual HSE Performance reporting incidents that occur in K-Electric Business Units, Departments, either On-the job or Off-the-job to NEPRA.

2. Scope:

This section shall be applicable to KE and its administered location.

3. Summary:

KE has established a system-based procedure for performance measurement and monitoring of Safety Management System through periodic monitoring of standard evaluation parameters (SEPs) for OHS & EMS.

a) NEPRA will conduct annual HSE performance evaluation for KE "HSE Management System" for last fiscal year, of documents and record submitted.

b) KE shall provide/ attach all supporting documents/ evidences at NEPRA Data Exchange Portal for last fiscal year by July 31st of each year for Annual HSE performance evaluation in accordance to "Annexure-4: Annual HSE Performance Evaluation Form".

c) NEPRA will assign category points such as outstanding, good, adequate, poor, or unsatisfactory to rate the HSE performance of Licensee, based on provided supporting document/evidences. NEPRA will deduct points for unavailability, irrelevant, incomplete, or unapproved documents/evidences.

d) Subsequent evaluations shall be conducted every six (6) months, if KE has persistent Poor or Unsatisfactory HSE performance.

e) Formal performance counselling shall be conducted, if KE has persistent Poor or Unsatisfactory safety performance after three (03) subsequent evaluations.

f) If KE fails to take corrective and preventive action within prescribed time to improve his HSE performance, NEPRA may initiate legal proceedings against the KE or registered persons under NEPRA (Fines) Rules, 2002 until satisfactory corrective and preventive action has been implemented.

Note: For details, see following;

- “KE-SP-003 - Safety Reward & Reprimand Policy”

10.0 ANNEXURES:

Annexure-1: HSE Team Contact Details Form

Licensee Name		**License Category***	
NEPRA License No.		**CEO Name**	
CEO Mobile Contact No.		**CEO Email Address**	
Licensee Corporate Address			

No.	HSE Team Name(s)	Job Title	Site/Plant Address	Office Contact No.	Mobile Contact No.	WhatsApp Contact No.	Email Address	Remarks
1.								
2.								
3.								
4.								
5.								

Role	Name	Mobile Number	Signature	Date
Prepared by (Licensee Representative)				

*License Category: Generation, Transmission or Distribution

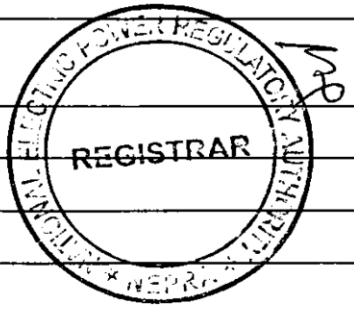
Note-1: Licensee shall upload HSE staff contact details at NEPRA's Data Exchange Portal as mentioned in Annexure-1 "HSE Team Contact Details" within seven (07) working days. Licensee's representative shall also upload the revised and updated contact list, in case of new recruitment, transfer, resigned or in case of HSE organization change. Avoid use of abbreviations.

Annexure-2: Incident Notification Form

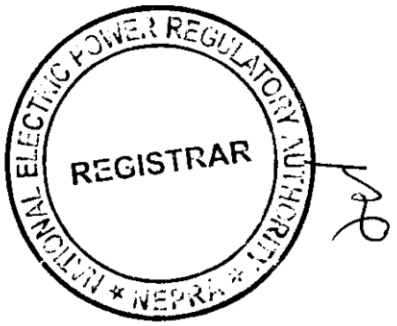
(Required within 24 hours)

Licensee Name			NEPRA License No.		
Incident Location			Date of Incident		
Time of Incident			Incident No.		
License Category (Tick mark which is applicable)	Generation ☐		Transmission ☐	Distribution ☐	
Incident Category (Tick mark which is applicable)	Employee ☐		Contractor ☐	General Public ☐	
	Environmental Violation ☐		Occupational Health Violation ☐	Outage of Plant or Grid/ Sub-station ☐	

Incident Type	Fatality ☐		Public Injury ☐	Public Illness ☐	
	Lost Time ☐		Restricted Duty ☐	Medical Treatment ☐	
	First Aid ☐		Fire ☐	Release/ Spilled ☐	
	Crane/ Heavy Equipment ☐		Property Damage ☐		
Total Victim(s)					
Name of Victim-1			CNIC No.		
Gender			Age		
Fathers Name			Occupation of Victim		
Victim Relative Contact No.			Extent of Injury		
Name of Victim-2			CNIC No.		
Gender			Age		
Fathers Name			Occupation of Victim		
Victim Relative Contact No.			Extent of Injury		
Witness-1 Name			Witness-1 Contact No		
Witness-2 Name			Witness-2 Contact No		
Witness-3 Name			Witness-3 Contact No		
Which PPE used by victim(s) at the time of incident:					



Incident Description. (Write down how incident happened, beginning with the normal job activity that led to the incident. Put the events with timing, as far as possible, in the order they happened)



Action Taken	Yes	No
Is the local police informed/ FIR lodged?		
Is necessary evidence immediately gathered from the incident site for Licensee investigation process?		
Is an investigation team formed by Licensee to determine root cause?		
Responsibility is fixed upon (with justification).		
What corrective actions are implemented immediately at incident site?		
What preventive actions are implemented at other sites to avoid reoccurrence of similar Incident?		
Is this incident reported within 24 hours? (Yes/No). If No, provide justification.		

Role	Name	Mobile Number	Signature
Prepared by (Licensee Representative)			

Note-1: Licensee shall immediately report incident to NEPRA through Phone/ WhatsApp/ SMS or outage of an electrical generation plant or grid/sub-station due to fire or explosion incident and fill/ upload initial occurrence report at NEPRA Data Exchange Portal in Incident Notification Form.

Note-2: In case of multiple fatalities/ injuries due to one incident, Incident Notification shall include

Annexure-3: Monthly HSE Performance Report Form

Company Name	
NEPRA License No.	
License Category*	
Address	
Reporting Month	

No.	Classification / Type	Total Last Month	Total Year To Date
1.	Fatality of member of general public, involving Licensee Operations/ Infrastructure.		
2.	On-job Fatality of Employee.		
3.	On-job Fatality of Contractor.		
4.	Fatality Incident Notification submitted to NEPRA.		
5.	Injury or Illness of member of general public, involving Licensee Operations/ Infrastructure.		
6.	Lost Time Injury or Illness of Employee.		
7.	Lost Time Injury or Illness of Contractor staff.		
8.	Restricted Duty Injury or Illness of Employee		
9.	Restricted Duty Injury or Illness of Contractor staff.		
10.	Medical Treatment Injury or Illness of Employee.		
11.	Medical Treatment Injury or Illness of Contractor staff.		
12.	First Aid Injury or Illness of Employee.		
13.	First Aid Injury or Illness of Contractor staff.		
14.	Fire Incident at Licensee Property.		
15.	Licensee Property Damage Incident.		
16.	Crane/Heavy Equipment Incident related to Licensee.		
17.	Major Environmental Violation related with Emissions, Liquid Effluent and Solid Waste, etc.		
18.	Major Occupational Health Violation related with Licensee Workplace Ventilation/Temperature, Drinking Water, Noise, Illumination, Heat Stress, etc.		
19.	Outage of plant or any grid/sub-station due to any incident.		

Role	Name	Mobile Number	Signature
Prepared by (Licensee Representative)			

*License Category: Generation, Transmission or Distribution

Note-1: HSE Performance Report shall not cover non-work related incident of Licensee employee, contractor staff, visitor or any incident to member of general public, not directly involving Licensee Operations/ Infrastructure.

Note-2: HSE Performance Report shall include all HSE data of Licensee (client, contractors, visitors, consultants and members of general public).

Note-3: This form shall be send to NEPRA email address: " hse@nepra.org.pk " by 10th of each month for the previous month HSE Performance.

Annexure-4: Annual HSE Performance Evaluation Form

Licensee Name		**License Category** (Generation, Transmission or Distribution)	
NEPRA License No.		**Licensee Corporate Address**	
Evaluation Year		**Submitted Date**	

Instructions:

1. Licensee shall provide/ attach all supporting documents, record and evidences of last fiscal year for HSE Performance Evaluation at NEPRA Data Exchange Portal in Annual HSE Performance Evaluation Form by July 31st of each year.
2. NEPRA will assign category points, based on provided supporting documents, record and evidences. NEPRA will deduct points for unavailability, irrelevant, incomplete or unapproved documents/ evidences.
3. Subsequent evaluations shall be conducted every six (6) months, if Licensee has persistent Poor or Unsatisfactory HSE performance.
4. Formal performance counselling shall be conducted, if Licensee has persistent Poor or Unsatisfactory HSE performance after three (3) subsequent evaluations.
5. If Licensee fails to take corrective and preventive action within prescribed time to improve his HSE performance, NEPRA may initiate legal proceedings against the licensee or registered persons under NEPRA (Fines) Rules, 2002 until satisfactory corrective and preventive action has been implemented.
6. NEPRA will assign category points from 1 to 5 using the following scale to rate the HSE performance of Licensee.

Points	**1**	**2**	**3**	**4**	**5**
Points x No. of Categories	**1 x 20**	**2 x 20**	**3 x 20**	**4 x 20**	**5 x 20**
Percentage	**20**	**40**	**60**	**80**	**100**
Category	**Unsatisfactory 1 - 20**	**Poor 21 - 40**	**Adequate 41 - 60**	**Good 61 - 80**	**Outstanding 81 - 100**
Licensee Evaluation Percentage					