وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewable Energy
State of Kuwait | دولـــة الكويـت

SAFETY RULES & REGULATION

FOR ELECTRICAL TRANSMISSION NETWORK

2025

THIRD VERSION

وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewable Energy
State of Kuwait | دولـــة الكويت

This publication has been officially developed under the supervision and sponsorship of the Ministry of Electricity & Water & Renewable Energy, Kuwait

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Eng. / Noura Faisal Alsadiqi **Eng. / Osama Mohammed Alrayes**

Appreciation and Gratitude

To all employees in the Electrical Transmission Networks Sector,
We extend our heartfelt thanks and appreciation for your dedicated efforts in maintaining the stability of the electrical network and ensuring continuous power supply. Your commitment and sacrifices, including those affected by work-related injuries, are deeply valued and remain a source of pride for the sector and the nation.

Special Thanks to the Former Acting Assistant Undersecretary, Eng. Abdullah Ayed Sanqour

We extend our sincere gratitude to the Assistant Undersecretary for his vital support, guidance, and contribut ions that greatly advanced the sector, improved its systems, and safeguarded both employees and assets. Notable achievements under his leadership include:

1. **In 2008/2009, the signing of the first official contract for the washing of overhead line insulators at 300 kV, marking a milestone in enhancing network efficiency and reducing outages.**
2. **A remarkable national achievement by Eng. Abdullah Ayed Sanqour, who became the first Kuwaiti engineer to carry out insulator washing of 300 kV overhead lines in Kuwait, strengthening the role and recognition of national expertise in this critical field.**

Introduction

In today's rapidly evolving engineering environment—marked by advancements in design, construction, and automation—safety remains a non-negotiable pillar in ensuring the protection of workers, equipment, and infrastructure. Despite technological progress, incidents—whether minor or severe—continue to occur due to human error, lack of knowledge, insufficient training, or failure to properly apply safety procedures. This makes safety not just an individual responsibility but a collective obligation that affects all who interact with high-risk systems.

This book, "Safety Rules & Regulations for MEWRE", serves as a vital reference to standardize safe work practices across all levels of operation. It aims to equip engineers, technicians, contractors, and visitors with the essential knowledge, procedures, and skills to identify hazards, apply safety protocols, and maintain operational discipline. By understanding and applying the content within, readers will enhance personal and organizational safety performance, reduce incidents, and contribute to a culture of proactive risk management.

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Commitment to Safety Rules & Regulations
Ministry of Electricity & Water & Renewable Energy
State of Kuwait

Transmission & Distribution of Electrical Networks & Control Center

The Ministry of Electricity & Water & Renewable Energy (MEWRE) is fully committed to maintaining a safe, healthy, and responsible work environment for all employees, contractors, and visitors involved in the operation, maintenance, and control of Kuwait's electrical transmission and substation systems.

This Safety Guidelines Book sets forth clear principles and procedures to promote safe work practices, prevent injuries, and protect personnel, equipment, and infrastructure. It reflects the regulatory framework and operational context of MEWRE and is aligned with international safety standards and best practices.

Compliance with these guidelines is mandatory. Ignorance of safety procedures will not be accepted as a justification for unsafe behavior or violations. Only trained and MEWRE-authorized personnel are permitted to perform switching operations or engage in work involving high-voltage equipment (EHV/HV/MV/LV).

All tasks & Roles shall be conducted under proper safety clearance and official authorization. These guidelines shall be applied in conjunction with MEWRE's technical instructions, internal procedures, and safety policies.

If any part of this document is unclear, personnel are required to seek immediate clarification from the MEWRE Safety Department, the Site-In-Charge Engineer, or the designated MEWRE Supervisor Engineer before proceeding with the task.

Safety is a non-negotiable value at MEWRE it is a shared responsibility and an essential part of maintaining operational excellence.

Eng. Faisal Alsumait
Assistant Undersecretary Electrical Transmission Networks Sector
Ministry of Electricity & Water & Renewable Energy
7/7/2025

A-Governance, Responsibilities, and Safety Framework

1. Safety Policy:

Ministry of Electricity & Water & Renewable Energy – Kuwait

The Safety Rules & Regulations outlined in this document are intended to establish a unified approach to safe working practices within MEWRE's electrical transmission and substation environments. These rules apply to all MEWRE personnel, contractors, and authorized individuals operating within MEWRE-controlled facilities.

Lack of awareness or disregard for these Safety Rules & Regulations shall not be accepted as a justification for unsafe acts or violations.

MEWRE's safety culture is founded on the following guiding principles:

Comprehensive Safety Rules & Regulations, technical instructions, and relevant codes of practice will be issued periodically to reflect evolving operational needs. All personnel, including contractor representatives, specialists & MEWRE Consultants, are expected to follow these official documents while working at MEWRE facilities:

- In areas classified as high-risk or safety-critical, access and supervision are strictly limited to individuals who are competent, trained, and formally authorized by MEWRE. These individuals are responsible for confirming that all necessary safety measures have been applied before work commences.
- A safety-first mindset shall be promoted across all MEWRE departments, where every individual share accountability for personal and collective safety.
- MEWRE leadership at all levels shall lead by example, demonstrating commitment to safety and reinforcing it as a core organizational value.

Definitions for the Purpose of this Policy:

1.1 MEWRE:

Where the term 'MEWRE' is used in this document, it refers to the Ministry of Electricity & Water & Renewable Energy – State of Kuwait.

1.2 Safety Rules & Regulations:

This term refers to the overall framework of safety requirements, principles, and responsibilities that govern the control, operation, and maintenance of MEWRE's high-voltage and substation systems. These rules are designed to protect both people and assets during all technical activities.

1.3 "Shall":

Where the word 'shall' is used without any qualification, it signifies a mandatory requirement that must be followed without exception or interpretation.

1.4 "Shall, where practicable":

Where the word "shall" is modified by "where practicable", it indicates a strong expectation that the requirement must be fulfilled whenever it is realistically achievable based on current knowledge, available technology, and existing safety conditions.
This requirement must not be dismissed due to inconvenience, cost, or effort, especially when risks to personnel or equipment are involved.

2. Admission to MEWRE Substations & Electrical Installations

Access to MEWRE's electrical substations and installations is restricted. No individual is permitted to enter any MEWRE-controlled, operated, or owned transmission or substation facility without formal approval from the authorized MEWRE authority.

Entry and exit to primary substations must be:

- Communicated to the Control Center (DCC & NCC).
- Logged in the official station logbook at the point of access.
- In certain MEWRE facilities, biometric systems may be in place to control and monitor access.

All personnel are required to use these systems when entering or exiting the substation, as per site-specific protocols. This applies to all MEWRE staff, contractors, vendors, and visitors. Personnel must carry appropriate identification and authorization at all times. Unauthorized access constitutes a violation of MEWRE's Safety Rules & Regulations.

3. Duties of Employees and Other Personnel

3.1 Familiarity with Safety Rules & Regulations:

All employees whose duties involve MEWRE's transmission & distribution of electrical networks, including those handling EHV, HV, MV & LV equipment must be fully familiar with the Safety Rules & Regulations contained in this document.

This obligation extends to:

- MEWRE staff & consultants
- Contractors & Contractors Specialists
- Technicians
- External personnel authorized to operate or work on MEWRE systems

Everyone is equally responsible for complying with these guidelines and promoting a safe work environment.

3.2 General Safety Responsibilities:

Maintaining a safe work area is a continuous responsibility shared by MEWRE Authorized Supervisor Engineer / MEWRE Site-In-Charge Engineers and workers.

The following Responsibilities shall be implemented:

- Before beginning any task or test, the assigned MEWRE Authorized (Supervisor Engineer / MEWRE Site-In-Charge Engineer) must confirm that all required safety precautions have been implemented.
- Once work has started, the person in charge must ensure safety conditions remain stable throughout.
- Work must be managed in a way that does not bring risks to nearby teams or areas.
- General safety must be preserved at all times and in all areas surrounding the job site.
- No unofficial interpretations, personal assumptions, or informal modifications of these rules are permitted. All clarifications or deviations must be formally approved.

3.3 Compliance with Additional Rules, Codes, and Procedures:

In addition to these Safety Rules & Regulations, all personnel must comply with related MEWRE-issued documents, including but not limited to:

- Grid Code
- Technical Standards
- Codes of Practice
- Circulars
- Internal Memoranda
- Operational Guidelines
- Departmental Procedures and Manuals

These documents are periodically updated to reflect MEWRE's operational and safety requirements and shall be reviewed and followed by all concerned MEWRE staff and contractors.

3.4 Additional or Special Instructions (transmission only):

Special or supplementary instructions such as **System Operation Memos (SOMs),** departmental circulars, or any formal directives related to working in or near EHV/HV/MV/LV installations are considered an integral part of MEWRE's Safety Rules & Regulations.

If a situation arises where the standard Safety Rules & Regulations do not apply or cannot be applied due to the nature of the task or equipment, the work may only proceed under a formally documented and approved procedure. (See Annex)

Such approval must be issued in writing by:
Assistant Undersecretary Electrical Transmission Networks Sector.
A formally authorized delegate acting on behalf of the Director.

3.5 Use of Personal Protective Equipment (PPE):

All personnel shall wear appropriate Personal Protective Equipment (PPE) based on the nature of the task and the site-specific hazards even if PPE causes discomfort or results in longer task durations.

- General PPE requirements must be known by all workers operating on-site.
- Additional PPE shall be determined through:
  - Site-specific risk assessments & job Requirements
  - Material Safety Data Sheets (MSDS)
  - MEWRE's health and safety protocols.
- A master **PPE requirement table** may be issued by MEWRE, tailored by department or activity type, and must be adhered to.
- **PPE** maintenance**, inspection, and replacement:** MEWRE authorized engineer shall be responsible for the expiry checks conducted periodically.

Use of PPE is mandatory at all times inside substations and electrical installations. Failure to wear the prescribed PPE will be considered a direct violation of the Safety Rules & Regulations.

4. Issuance and Availability of Safety Rules & Regulations

A. A copy of these Safety Rules & Regulations shall be issued to all personnel involved in the operation, control, or maintenance of MEWRE's transmission & distribution electrical network (EHV / HV / MV / LV) Each recipient must acknowledge receipt in writing. This signed record shall be maintained by the relevant department for official tracking and compliance purposes.

B. An accessible reference copy of the Safety Rules & Regulations must be kept on-site at all MEWRE Control Centers and primary substations MEWRE equipment.

C. The official version of this document shall be managed, reviewed, and updated under the authority of the Transmission Control Center Department at MEWRE.

Any amendments or responsibilities shall follow MEWRE's formal document control procedures.

5. Authorized Variation of Rules

In exceptional circumstances where operational continuity or safety considerations necessitate specific provisions of the Safety Rules & Regulations may be temporarily varied.

Such variations:

- Shall be authorized in writing by higher authorities of the departments.
- Shall clearly state the scope, duration, and reason for the variation,
- shall be communicated to all relevant personnel before implementation,
- Shall not compromise fundamental safety principles.

No verbal instructions or informal agreements may override the written Safety Rules & Regulations under any condition.

6. Definitions

The following definitions apply throughout this Safety Rules & Regulations Book:

I. Personnel, Roles, and Authorizations

6.1 MEWRE Authorized Engineer:

A technically competent engineer with the necessary qualifications and substantial practical experience, who has been formally appointed in writing by the Assistant Undersecretary for the Electrical Transmission Networks Sector, the General Manager, or the relevant Director. This individual is certified and authorized by MEWRE to perform, supervise, or manage tasks on the electrical network, including substations, transformers, cables, and related equipment.

The MEWRE Authorized Engineer is responsible for:

• Issuing and canceling all assigned Safety Documents (PTW) under their scope

• Supervising switching operations, testing procedures, and isolation/earthing activities

• Coordinating directly with the Control Center and field teams to ensure operational safety

• Ensuring full compliance with MEWRE Safety Rules & Regulations during critical tasks

• Issuing work documents to certified personnel engaged in hazardous operations

This role is essential to the safe operation, maintenance, and control of MEWRE's transmission infrastructure.

This role requires extensive technical knowledge and is limited to individuals with valid, up to date authorization certificates.

In special or emergency cases, the MEWRE Authorized Engineer must consult and confirm with the MEWSR Supervisor or a Senior MEWRE Authorized Engineer before proceeding with or canceling any Safety Document.

6.2 Authorization License:

An official License issued to a qualified person confirming that they are authorized and capable of carrying out specified operations in accordance with MEWRE's Safety Rules & Regulations. When an MEWRE engineer is in charge, he will be responsible for the MEWRE facilities & equipment's in transmission & distributions electrical network

Note: this certificate is given after completing a training course & pass the committee exam.

6.3 Competent person:

A professionally qualified individual with sufficient training and authority to:

- Identify existing and foreseeable hazards in work conditions,
- Take prompt corrective measures to mitigate those hazards,
- Oversee safe execution of electrical operations on MEWRE installations.

6.4 Approved Contractor Representative:

An individual formally assigned by an external company under contract with MEWRE to carry out specific tasks on or in proximity to MEWRE assets, substations, or electrical installations.

The Contractor Representative:

- Must be authorized by MEWRE through prequalification and site orientation procedures.
- Shall comply fully with MEWRE's Safety Rules & Regulations, site-specific protocols, and supervision requirements.
- Remains accountable to the designated MEWRE Authorized Engineer for worksite coordination, safety compliance, and permit adherence.

6.5 MEWRE Control Center Engineer:

An engineer appointed by MEWRE responsible for overseeing real-time electrical system operations in transmission electrical network.

This role includes:

- Ensuring implementation of MEWRE Safety Rules & Regulations.
- Coordinating the control of Generation, Transmission, and Distribution.
- Ensuring maximum safety for personnel and assets.
- Operating in accordance with MEWRE procedures and control center protocols.

6.6 Distribution Network Engineer (Authorized LV-Side Engineer):

MEWRE distribution engineer responsible for supervising & executing work on the consumer-side network (LV or MV). This engineer acts as the authorized person when coordination with MEWRE's transmission sector is required (e.g., for loop closures, joint operation, fault isolation).

All requests or actions must be communicated to the Transmission Control Engineer using official and recorded channels.

6.7 Working Party:

A group of individuals actively engaged in work within the transmission network. This includes MEWRE Authorized Engineers, Authorized Contractor Site Engineers, Specialists, and Consultants.

Where all the parties shall be following the next rules by MEWRE Authorized engineer:

- Be briefed on the task, hazards, and precautions.
- Comply with all MEWRE Safety Rules & Regulations.
- Remain within the scope and boundaries of the authorized safety document (PTW).

6.8 Permit Receiver:

A competent person who accepts responsibility for performing the work described in the Safety Document and ensuring full compliance with safety measures.

6.9 Approved:

An action, procedure, or method that has been formally authorized in writing by the Director of the Transmission Networks Department, or by an authorized engineer assigned by official delegation from the Ministry of Electricity and Water & Renewable energy.

II. Safety Documents & Work Permits:

A Safety Document is any formal record, certificate, declaration, or agreement that authorizes work on MEWRE's electrical equipment or within its Transmission and Distribution network. These documents are essential for ensuring safe practices and avoiding energy-related hazards.

Examples include:
SOM – System Operation Memorandum
PTW – Permit to Work

All Safety Documents shall be:

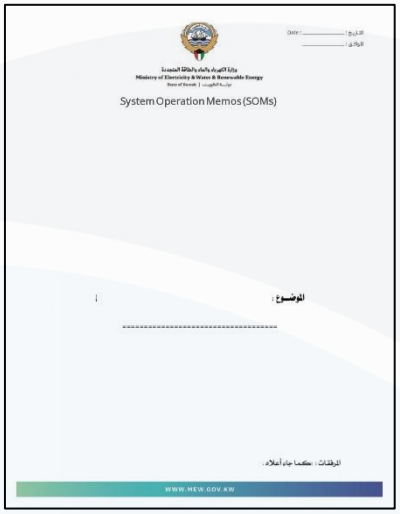
- Retained for auditing in accordance with MEWRE's safety retention policy.
- Registered in station and control center logs.

Each Safety Document has specific issuance criteria and responsible authorization levels.

6.10 System Operation Memorandum (SOM):

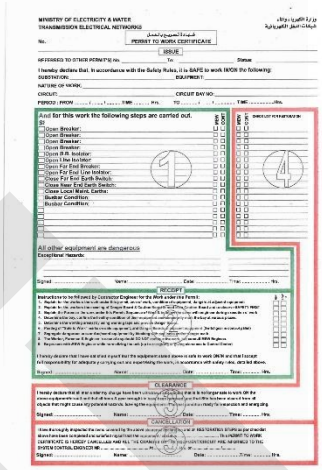
A System Operation Memorandum (SOM) is an official directive issued by MEWRE as part of its Safety Rules & Regulations. SOMs may be released under the authority of the Assistant Undersecretary Electrical Transmission Networks Sector to:

- Clarify or interpret specific safety rules.
- Explain the operational handling of new substations or components integrated into the system.
- Provide instructions during abnormal, emergency, or transitional operating conditions.
- Define corrective actions or preventive measures following incidents or faults.


System Operation Memos (SOMs)

All SOMs must be treated as binding instructions and distributed to all relevant departments and personnel.

6.11 Permit-to-Work (PTW):



A formal declaration issued by a MEWRE Authorized Engineer to a Competent Person before work can be carried out on electrical apparatus (LV and above).

The PTW ensures the recipient understands that the apparatus is:

- **Dead (De-Energized)**
- **Isolated from all sources of supply.**
- **Earthed properly.**

The PTW defines the exact boundaries of safe work and applies to:

- Work directly on the apparatus.
- Work at height or near live equipment where there is no direct contact.

The PTW also confirms that the Authorized Person has ensured proper coordination and safety arrangements for the intended task, and that the area is free from any stored energy or hazards. (See Annex)

All permits issued only by MEWRE Authorized Engineers:

- An authorized individual responsible for preparing, verifying, and issuing Safety Documents such as PTW (Permit-to-Work).
- A person in possession of an active Permit-to-Work may not transfer it to another individual.
- In case of unavoidable absence of the issuing authorized person, another authorized engineer may be appointed in writing by the relevant department head or supervisor.

The substitution must be officially communicated to the Control Center Engineer prior to continuation of any tasks.

6.12 Taking Over & Acceptance Certificate:

In MEWRE Kuwait, the Taking Over & Acceptance Certificate or Final Certificate – Completion of Contract is used to formally recognize the transfer of responsibility for a site or project area, typically after successful completion of works. (see Annex)

III. Operations & Technical Terms

6.13 Apparatus:

Apparatus refers to electrical components, conductors, and associated equipment installed across MEWRE's network.

Apparatus is categorized based on nominal operating voltage as follows:

- Extra High Voltage (EHV): Equipment normally operated at 275KV & above.
- High Voltage (HV): Equipment operated above 33 kV up to and including 132 kV
- Medium Voltage (MV): Equipment operated from 1 kV to 33 kV (inclusive)
- Low Voltage (LV): Equipment operated from 25 V to below 1 kV
- Extra Low Voltage (ELV): Equipment operated below 25 V

Note: These classifications are based on MEWRE-approved standards and may be referenced in technical memoranda or internal voltage policies.

6.14 Live:

Describes any electrical component or apparatus that is electrically energized or at a voltage different from earth potential. Live equipment poses a serious risk of electric shock, arc flash, or injury and must be approached only by trained and authorized personnel following proper safety protocols.

Refer to the relevant Transmission Safety & Operations Memorandum (SOM) for detailed procedures.

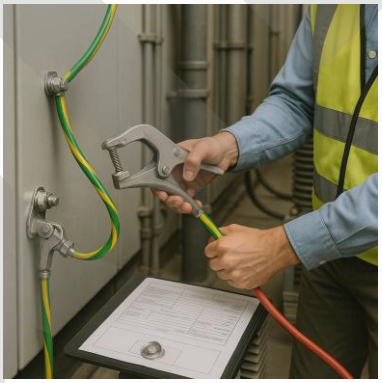
6.15 Dead (De-energized):

Describes electrical apparatus that is:

- At or near zero potential relatives to earth.
- Properly disconnected or isolated from all sources of electrical energy.

Note: Apparatus Shall be confirmed dead and earthed before any work is carried out.

6.16 Earthed:



Refers to equipment or conductors that are intentionally and securely connected to the general mass of earth. This ensures the safe dissipation of any electrical charge and eliminates the risk of electric shock or arc flash during maintenance or testing activities.

6.17 Additional Earth (Temporary):

An approved earth connection that is applied after a Permit-to-Work has been issued such as an earth applied directly at the worksite. This connection must be explicitly mentioned in the relevant safety document.

It may be applied or removed while the permits issued by MEWRE Authorized Engineer is in force without seeking separate approval from the Control Center.

6.18 Temporary Equipment Use Authorization (If Applicable):

In MEWRE, any temporary use or release of equipment for testing, energization, or operational support shall be authorized through the relevant department's written memo, Permit-to-Work or both clearly stating the conditions and responsible parties clearance.

6.19 Caution Notice:

A standardized portable notice attached to equipment or its control device, displaying a clear warning not to interfere with the apparatus.

The notice must have a yellow background with black lettering stating:

"CAUTION – DO NOT OPERATE" in both Arabic and English.

The design and placement of caution notices shall follow MEWRE safety signage protocols (See Annex).

6.20 Danger Notice:

A portable safety sign affixed to an apparatus or equipment that is energized (LIVE). It serves to warn personnel not to approach or interfere with the live apparatus.

The notice must have a red background with white text stating: "DANGER" (Bilingual: Arabic & English)

The design shall follow MEWRE's official safety signage standards (See Annex).

6.21 Working Area Notice:

An approved portable notice attached to equipment or its control devices, indicating that the apparatus is safe for work. Design standard:

Green background
White text: "WORKING AREA" in both Arabic and English

This notice is used to identify areas where proper isolation and safety precautions have been applied, and work can proceed under authorized conditions.

6.22 Switching:

The act of operating switchgear, isolators, or any related equipment to make or break an electrical circuit, whether manually or automatically. It includes operations for energizing, de-energizing, isolating, or restoring circuits during maintenance, testing, or fault management.

The MEWRE Control Center Engineer is on duty 24/7 and is the final authority for permitting system-related operations across the national grid.

6.23 Single Feed Circuit (SFC) Notice:

An approved, portable notice used to indicate that a specific electrical circuit is the sole source of supply to a system or equipment. It Shall be placed on:

- Relay panels
- Local control cubicles (LCC)
- Or any control equipment involved

Design standard:

- Blue background
- White text: "SINGLE FEED CIRCUIT" (in Arabic and English)

This signage highlights increased operational risk and must be respected by all personnel.

6.24 Trip / Tripping:

The automatic or manual disconnection of an electrical circuit or equipment due to abnormal conditions such as faults, overloads, or unsafe operational parameters.

6.25 Isolation:

The process of physically and electrically disconnecting equipment or apparatus from all sources of energy to ensure it cannot be operated or energized while work is being performed.

6.26 Interlock:

A safety mechanism or system that prevents incorrect sequences of operation or enforces a condition before an action can be safely taken. Commonly used in high voltage switching or access procedures.

6.27 Lockout-Tagout (LOTO) Devices

LOTO Devices are approved locking and tagging mechanisms used to secure electrical or mechanical equipment in an isolated & earthed state to prevent unintended operation. These include:

- Padlock
- Spout shutter locks.
- Barrier locks
- Interlock devices
- Clearly visible warning tags

Applied under the authority of an MEWRE Authorized Engineer & authorized contractor site engineer in the presence of both parties.

6.28 Isolation and Earthing Declaration:

At MEWRE Kuwait, all circuit isolation, earthing declarations, and work authorization are managed under the **Permit-to-Work (PTW)** process.

6.29 Interconnection Point (Transmission to Distribution)

A technical point where MEWRE's transmission system interfaces with the distribution network or consumer-owned systems.

Special precautions must be followed during isolation or energization, including:
• Prior permit issuance
• Involvement of both transmission and distribution engineers
• Clear communication protocol under MEWRE supervision

6.30 Grid Code

The Grid Code is an official technical document issued by the Ministry of Electricity & Water & Renewable Energy (MEWRE), defining the operational rules, technical standards, and coordination protocols required for safe and reliable operation of the national power grid.

While the power system in Kuwait is fully owned and operated by the government, the Grid Code ensures consistent practices across all internal departments (e.g., transmission, generation, control centers), as well as approved external entities (e.g., EPC contractors, industrial bulk users, or temporary IPPs under MEWRE agreement).

The Grid Code governs:
• Grid stability and operational security
• Power dispatch and load-sharing practices
• System planning and maintenance standards

Adherence to the Grid Code is mandatory across MEWRE sectors and for any entity interfacing with Kuwait's transmission infrastructure.

IV. Hazards, Risks, and Incident Management

6.31 Hazard

A **source, situation, or condition** with the potential to cause:

- Injury or ill health
- Damage to property, equipment, or environment
- Disruption of operations

Examples include exposed live conductors, oil leaks, improper earthing, obstructed escape routes, or failure to use PPE.

6.32 Risk

The combination of the likelihood of a hazardous event occurring and the severity of its consequences. Risk is often expressed as: (Risk = Likelihood × Severity)
Risk assessments must be conducted prior to all critical tasks, especially in high-voltage zones.

6.33 Incident

An unplanned event that:

- It did not result in injury, damage, or loss.
- It had the potential to cause harm if circumstances were slightly different.
- Also referred to as a "near miss" or "close call".
- All incidents must be reported and investigated to prevent future occurrences.

6.34 Accident

An unplanned, undesired event that results in one or more of the following:

- Injury or harm to a person.
- Damage to assets or infrastructure.
- Environmental contamination.
- Interruption of operations.

Accidents Shall be immediately reported, documented, and analyzed in accordance with MEWRE's Safety procedures & Protocols.

6.35 Danger

Any **risk or hazard** that may result in:

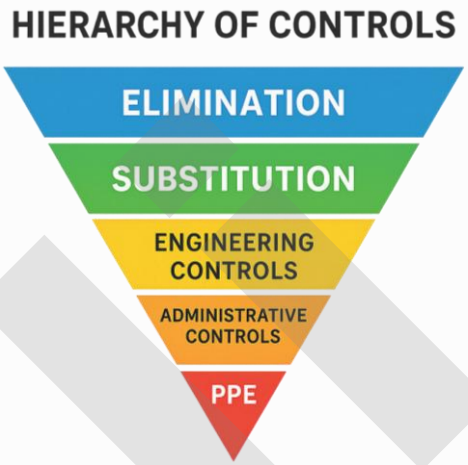
- Loss of life.
- Bodily injury.
- Health damage (e.g., due to electric shock, burns, arc flash, or other causes) arising from the generation, transmission, distribution, or use of electrical energy.

6.36 Residual Risk:

The level of risk that remains after all feasible hazard controls or mitigation measures have been applied during a task or operation.

6.37 Hierarchy of Controls

An internationally accepted system for minimizing or eliminating exposure to hazards, prioritized in the following order:



- Elimination: eliminate hazards
- Substitution: Substitute hazards
- Engineering Controls: In-Site Actions
- Administrative Controls: Management decisions
- Personal Protective Equipment (PPE)

6.38 Emergency Response Plan (ERP):

A structured set of procedures and contacts that guide actions during emergencies, including fire, electrical faults, environmental spills, injuries, and evacuations.

6.39 First Aid:

Immediate and temporary care given to an injured or ill person until professional medical treatment is available.

6.40 Zebra Tape:

High-visibility striped tape (usually black/red) is used to mark hazardous areas, restricted zones, or work boundaries. It serves as a visual warning in substations, especially during testing or maintenance. Not a physical barrier used for alerting only.

6.41 Minimum Approach Distances (MAD):

The closest allowable distance a person, tool, or conductive object may approach exposed live electrical parts without proper insulation or protective equipment. These distances are established to prevent electrical shock, arc flash, or inadvertent contact with energized equipment.

Minimum approach distances vary depending on:
• The system voltage
• Type of task being performed
• Use of approved insulating tools or PPE
• Environmental conditions (e.g., humidity, wind, surface contamination)

All MEWRE personnel shall strictly observe the applicable MAD as defined in MEWRE's safety procedures, relevant voltage level policies & standards.

Note: No work shall be conducted within the MAD zone unless authorized and protected by an approved Permit to work & safety PPE.

B- Standardized Operational Protocols for Electrical Systems

7. Switching Operations

7.1 Operation of Circuit Breakers and Isolators:

A. No switching or related operation shall be performed without the explicit permission of the MEWRE Control Center Engineer, except in emergencies involving immediate danger to persons or equipment.

B. When switching is required, the MEWRE Control Center Engineer shall communicate directly with an MEWRE-authorized Engineer responsible for performing the operation. If direct communication is unavailable the work should not be completed until communication has been achieved.

Communication of Messages: All communication related to MEWRE's system operations, including relayed messages, shall be clear, complete, and approved terminology. Messages shall be documented with time, read back word-for-word by the receiver, and confirmed to avoid misinterpretation or ambiguity.

C. All switching operations whether directed or approved by the MEWRE Control Center Engineer or conducted in response to emergency conditions, must be executed without undue delay after direct instruction from the directors in charge or approved official letter signed and reported.

D. If any equipment shows signs of abnormal behavior, the issue shall be promptly reported to the MEWRE Control Center Engineer & MEWRE Supervisor in charge, and further operation suspended until inspection & examined is completed.

E. Any personnel receiving instructions for equipment operation shall voice any objections or safety concerns to the MEWRE Control Center Engineer, who will investigate and escalate if necessary.

7.2 Recording of Switching:

All switching operations and relay events shall be documented in the Station Logbook. The MEWRE Control Center Engineer shall also log the time and nature of each switching operation, including Safety Document issuance and cancellation, in the Control Center Log.

8. Earthing

8.1 Line Earth Switch (LES):

- Line Earth Switch (LES) connections shall not be applied, removed, or altered without prior instruction or consent from the MEWRE Control Center Engineer & signed Permit to work in the presence of MEWRE Authorized engineer & authorized contractor site engineer. Every LES operation shall be reported and recorded in the relevant Safety Document (Permit-to-Work).
- The MEWRE Control Center Engineer shall log in to the exact time and location of every (LES) connection applied or removed.

8.2 Additional Earth (Temporary):

Additional Earths may be applied when required for specific outages. They should be listed in the Safety Document and recorded before issuance. They shall not be left in place unless accounted for and verified by MEWRE Authorized Engineer, noted in logbook & Control Center shall be notified.

9. Loading Instructions to transmission & distribution networks

Recording of Loading Instructions: The MEWRE Control Center Engineer must log all load allocation commands and related actions, along with time-stamped notes and justifications as required.

All voice calls and messages related to network switching, approvals, or operations shall be exchanged through official, authorized channels. These communications must be recorded or documented to ensure accountability, traceability, and safety compliance.

10. Reporting Supply Failure (transmission Sector only)

Any supply failure in the MEWRE network shall be reported immediately to MEWRE concern Authorized Engineer by MEWRE Control Center Engineer.

Important Note: All affected equipment, lines, and circuits must be considered LIVE until proven de-energized & Verification by The MEWRE Engineer by The MEWRE Engineer shall verify & alert the control.

11. Reporting of Dangerous Occurrences and Accidents

All serious incidents, safety threats, and accidents shall be reported to the emergencies immediately with Security, Fire Force, and Ambulance as needed. Additionally, the accidents shall be reported to the Assistant Undersecretary Electrical Transmission Networks Sector or an authorized deputy as soon as possible.

12. Safety Document Handling

A. All Safety Documents (PTW) shall be issued, controlled, and cancelled in accordance with MEWRE's Safety Rules & Regulations by a MEWRE Authorized Engineer in charge.

B. Duplicate or Unclear Safety Documents are strictly prohibited. Any correction must be clearly marked, signed, and justified.

C. Cancelled Safety Documents shall be returned, documented, and retained for audit purposes.

13. Use of Remote Operation Systems

- Remote switching or equipment control from SCADA, HMI, or RTU shall only be executed after site confirmation and MEWRE Control Center Engineer approval.
- A double verification protocol (local & remote) shall be followed to prevent accidental operations.

14. Verification Prior to Commencement of Work

A. Prior to the issuance of any Safety Document, the responsible MEWRE Engineer shall ensure that all intended apparatus or equipment is conclusive:

- Dead (De-energized)
- Isolated from all sources of supply, and
- Earthed through both visual inspection and approved testing instruments (if applicable).

B. A Live–Dead–Live test sequence shall be carried out on all conductors or terminals using certified and calibrated voltage detection equipment. This procedure shall be completed:

- Immediately prior to the start of work.
- In the presence of the authorized MEWRE personnel designated for the task.

15. Re-energization Procedure

A- Re-energization of electrical apparatus shall only be permitted after the following conditions are fully met:

- A final inspection of the main task in the permit by MEWRE authorized engineer **confirms** its readiness for safe return to service.
- All related Safety Documents (PTW) have been formally cleared up by authorized contractor site engineer & cancelled by MEWRE Authorized Engineer.
- The work site is declared clear of personnel, tools, and equipment by the responsible MEWRE Engineer.

B- Prior to initiating re-energization:
The MEWRE Control Center Engineer shall be notified and provide explicit approval.

C- All main & additional (temporary) earths applied during the course of work must be:

- Safely removed,
- Cross-verified by the responsible Engineer.
- Documented in the station log with time and initials.

16. Weather Conditions and Switching

A. Outdoor switching operations shall not be conducted during adverse weather conditions such as lightning, heavy rain, humidity (85-100%), dust storms, or extreme wind except in cases of system emergency.

- **In such cases, explicit authorization shall be obtained from the MEWRE Control Center Engineer prior to any action.**

B. When switching into damp or high-risk environments:

- Class-rated insulated gloves and tools shall be used.
- Personnel shall wear appropriate weather-resistant PPE compliant with MEWRE standards.
- Extra caution shall be exercised to ensure slip resistance and avoid flashover or accidental contact hazards.

17. Audible & Visual Warning Devices

Before switching or energizing equipment, MEWRE authorized engineer ensures audible alarms, signal lights, and mimic panels (if applicable) function correctly to alert nearby personnel.

C- Regulatory Controls and Safe Work Practices

18. General Safety Precautions

18.1 Work on Apparatus (Low Voltage and Above):

No individual shall undertake any work (including maintenance, repair, testing, etc.) on electrical apparatus unless the apparatus is:

a) **The apparatus is verified & confirmed to be de-energized** using approved voltage testing tools and procedures before & after by MEW Authorized engineer.

b) **Isolation is established and secured** at all practicable points, with Lockout-Tagout (LOTO) devices applied (if applicable). If not, you shall use the substation Key box.

Isolation keys shall be controlled and retained by the Authorized MEWRE Engineer in accordance with MEWRE's LOTO procedure.

c) Earthing is effectively applied at all necessary disconnection points and at the work location using certified grounding equipment by MEWRE Authorized engineer.

d) Secured and clearly marked using proper barriers and safety roping:

- Live area: Red & White tape (Zebra tapes)

e) Clearly labeled with "Danger", "Caution," "Working Area" & "SFC".

f) A valid and active Permit-to-Work (PTW), issued and approved by an Authorized MEWRE Engineer, shall cover the task. No alternative documentation shall substitute the PTW.

g) All technical work and operations shall be directly supervised by Authorized MEWRE Engineer fully familiar with the equipment and scope of work.

The energization or de-energization of any equipment based on time schedules, remote signaling, or verbal assumptions is strictly prohibited. Operations shall only be executed upon formal instruction and confirmation

18.2 Interference with Conductors:

Before issuing the PTW (permit to work), No personnel shall touch or interfere with any conductors, busbars, or associated insulation unless the conductors are:

- Confirmed de-energized (Dead) using certified test equipment before & after.
- Isolated at all practicable points.
- Earthed using approved earthing procedures and equipment.

- **Touching or approaching conductors without these conditions is strictly prohibited.**

18.3 Fixing of Notices, Barriers, and Screens:

No work shall commence unless all necessary Notices (Danger, Caution, Work Area, SFC), Barriers, Screens, and Flags are installed. Only an Authorized MEWRE Engineer or someone under their direct instruction & supervision may install or remove them.

18.4 Safety locks:

Safety locks used for isolation must be unique & different, clearly labeled, and exclusively used for safety purposes separate from operational or routine control locks.

Where isolation is achieved by removal of fuses, links, or disconnecting devices, the MEWRE Engineer shall remove and secure these components, applying lockout devices as per MEWRE's approved LOTO (Lockout-Tagout) procedure.

The keys to LOTO devices must remain in the possession of the issuing MEWRE Engineer and shall not be transferred unless authorized through the PTW cancellation process.

Isolation Keys:

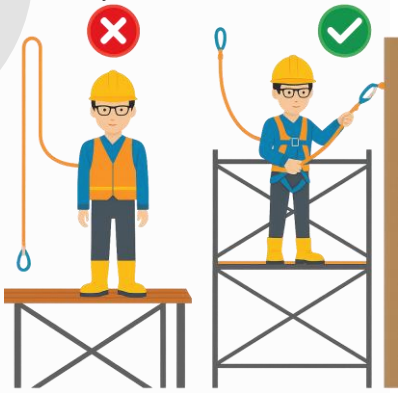
- All isolation keys, safety lock keys, and control access tools must be retained securely by the MEWRE Engineer in charge.
- Logbook or (Digital Access Register if applicable) shall be maintained to record the issuance and return of isolation keys.
- No keys shall be released or returned to service until the Permit-to-Work is formally cancelled and confirmed closed.

18.5 Work on Towers and High Structures:

All personnel working on elevated structures shall wear full PPE and remain within visual contact of the Permits issued by MEWRE Authorized Engineer Holder at all times.

18.6 Working at Heights (Scaffolds, Platforms, Cranes):

All work conducted at heights within MEWRE electrical installations shall strictly follow MEWRE safety protocols. The following requirements shall apply:



A. Scaffolds and Platforms:

- It must be designed, erected, and inspected by qualified personnel in accordance with MEWRE-approved standards.
- Only certified scaffolding systems shall be used; unapproved structures are prohibited.
- Platforms must have guardrails, midrails, toe boards, and anti-slip surfaces as per equipment & device safety manuals specifications.

B. Fall Hazard Protection (PPE):

- All areas with a risk of falling (including open edges, rooftops, elevated tanks) must be clearly barricaded or roped off.
- The fall arrest system (safety harnesses with lifelines or anchorage points) must be used by all personnel working at heights above 1.8 meters (6 feet).
- Harnesses shall be inspected daily, and any defective equipment must be withdrawn from service.
- All anchorage points used for fall protection must be structurally verified and capable of supporting the intended load according to MEWRE-approved standards.

C. Electrical Clearance:

- A minimum safe clearance from live conductors must be maintained at all times.
- No scaffold, crane, or elevated work platform shall be used within prohibited approach boundaries unless the line is confirmed de-energized and grounded by authorized MEWRE engineer.

D. Crane and Lifting Operations:

- Cranes must operate strictly within rated load limits and under the direct supervision of an Authorized MEWRE Engineer or appointed lifting supervisor.
- All lifting equipment must be **inspected, calibrated, certified, and color-coded** per MEWRE's lifting equipment program. **Slingers and signalers** shall be properly trained and certified.

19 Access to Enclosures and Apparatus (EHV/HV/MV/LV)

19.1 Access to High Voltage Enclosures:

- Entry into enclosures housing live or potentially live HV apparatus is forbidden & only in the presence of authorized MEWRE Engineers.
- All gates, doors, covers, and safety barriers must remain locked and clearly labeled at all times. They may only be opened during authorized work under the supervision of a certified MEWRE engineer. After the work is completed, all access points must be immediately secured.

Access shall be granted only under a valid Permit-to-Work (PTW) & equivalent safety document, with full compliance with isolation and earthing procedures.

19.2 Underground Chambers, Cable Tunnels, and Confined Spaces:

- No smoking, naked flame, or spark-producing equipment is allowed inside any confined space.
- Entry is permitted only after gas testing (if applicable), and proper ventilation, certified by an Authorized MEWRE Engineer.
- Continuous communication, personnel tracking, and standby supervision must be ensured throughout the operation. If atmospheric hazards are present, breathing apparatus and rescue lines must be used in accordance with MEWRE's confined space entry policy.

19.3 Towers and Elevated Structures

- **All climbing restrictions must be secured and locked. Access shall only be permitted by the instructions of an Authorized MEWRE Engineer.**
- **Access or climbing to transmission towers, gantries, and elevated work areas shall be securely restricted and locked when not in use.**

Personnel shall use approved fall protection equipment (PPE) and maintain safe working clearances from live conductors at all times.

20 Earthing Procedures

20.1 Equipment for Earthing:

Earthing must be performed via:

- Earthing switches or approved special apparatus.
- Circuit breakers, with tripping features disabled and mechanisms locked, when applicable.

Only MEWRE-approved methods and devices shall be utilized to ensure reliable earthing of equipment. Acceptable options include:

- Fixed **earthing switches** or other available authorized earthing devices.
- In specific cases, **circuit breakers** may serve as an earthing point **only if**:
  - Tripping mechanisms are rendered inoperative,
  - The breaker mechanism is **securely locked** to prevent unintended operation.

When **portable (temporary) earthing** is required, the following safety conditions shall be met:

- Inspection and Condition: All portable earthing tools must be visually inspected at least once every 3 months, and prior to each use.
- Voltage Verification: An approved and calibrated voltage detector must confirm the equipment is fully de-energized. The detector must be tested before and after the verification process by the MEWRE Authorized engineer.
- Earthing Sequence:
  1. The device shall be connected first to the earth point.
  2. Then attached to the conductors using MEWRE-approved earthing poles.
  3. For removal, the reverse sequence must be followed.

20.2 Earthing of Metal-Clad Switchgear (Applicable to LV & MV Systems):

To ensure safe working conditions on metal-clad switchgear within MEWRE substations and facilities, the following conditions are mandatory:

- Only approved and tested equipment shall be used.
- Manual contact with internal conductors or spout connections using hands or non-insulated tools is strictly prohibited.
- Prior to initiating any maintenance or access to the withdrawable truck-type portion of the switchgear:
  - **A.** A voltage detector shall be used by an MEWRE Authorized Engineer to **verify de-energization**. The detector must be tested both **before and after** application.
  - **B.** Any residual voltage must be discharged using **officially approved discharge devices**.
  - **C.** A **direct and secured connection** to the earthing system must be established and maintained by MEWRE Authorized engineer until the apparatus is fully withdrawn and **isolated from all live sources**.

21 Permit-to-Work (PTW)

21.1 Issuance Procedures:

A. Authorization & Acknowledgment Requirement:

- All PTWs shall be issued & cancelled only by MEWRE Authorized engineer & Authorized contractor site engineer in charge.
- The MEWRE Engineer must ensure the recipient (authorized contractor site engineer in charge) fully understands the scope of work, associated hazards, isolation status, and safety requirements before handover.

personnel shall not perform any work on or near EHV/HV/MV/LV apparatus unless a signed Permit-to-Work (PTW) has been issued and received from an authorized MEWRE engineer & Authorized contractor site

B. Competency and Supervision:

The PTW recipient (Contractor Representative in site) must be a Authorized Engineer in charge as defined by MEWRE. The work must be conducted under their continuous supervision, ensuring compliance with the approved safety scope. For overhead line work, this includes the entire area between all additional earths, if applicable.

C. Continuous Presence Requirement:

The PTW holder shall remain at the site while the work is ongoing. In case of absence (Permit issuer), the PTW must be formally cancelled or re-issued.

D. Separate PTWs for Each Team:

Each working party shall be issued a dedicated PTW. PTWs are not transferable between teams or different work scopes.

21.2 During Work Execution:

A. **Isolation Integrity:**
All equipment covered by a valid PTW must remain **isolated, earthed, and clearly marked** until the PTW is formally cancelled through authorized procedures.

B. **Partial Energization or Commissioning:**
If any portion of the system requires energization (e.g., testing, commissioning) **before total work completion**, the existing PTW must be **cancelled** and a **new PTW reissued** covering the revised scope, with updated isolation and safety measures.

C. The MEWRE Authorized Engineer & Authorized contractor site engineer shall be responsible for the coordination and safety of testing activities.

21.3 Clearance and Cancellation:

A. **PTW Closure Process:**

Upon work completion, the **Contractor's Representative (or Competent Person)** signs off the PTW and returns it to the **MEWRE Authorized Engineer**. The MEWRE Engineer shall then formally **cancel the PTW**, ensuring all earths are removed, barriers are cleared, and the site is safe for re-energization.

B. **Documentation:**

All cancelled PTWs shall be **filed and archived** by the responsible MEWRE department for compliance review, safety audits, and future reference.

Throughout the work, the MEWRE Authorized Engineer retains full authority and responsibility for supervising & applying safety compliance, coordinating switching actions, and ensuring proper communication with the Control Center.

22 Work in electrical transmission & distribution network on Exposed Live Conductors

22.1 Minimum Safety Clearance to Exposed Live Conductors:

A. When performing work in substations or switching stations containing exposed live high-voltage conductors, and where complete de-energization is not feasible, the designated work area shall be:

- Physically segregated using barriers, warning tape, flags, and caution signage,
- Inspected and verified by a MEWRE Engineer before the commencement of any activity.

The Minimum Approach Distance (MAD) to exposed conductors shall strictly adhere to Table 4 (as listed in the annex), based on the BS 7354:1990 standard.

Table 4: Minimum Working Safety Clearance for Exposed Live Conductors

Rated Voltage	Safety Working Clearance (Horizontal)	Safety Working Clearance (Vertical)
Not exceeding 11 kV	1.6 m	2.6 m
Exceeding 11 kV but not exceeding 33 kV	1.8 m	2.8 m
Exceeding 33 kV but not exceeding 66 kV	2.1 m	3.1 m
Exceeding 66 kV but not exceeding 132 kV	2.7 m	3.7 m
Exceeding 132 kV but not exceeding 275 kV	4.2 m	5.2 m
Exceeding 275 kV but not exceeding 500 kV	5.4 m	6.4 m

The clearance zone must be strictly limited to the work area only and monitored continuously.

B. If specific work requires encroachment within the minimum clearance zones, enhanced engineering controls such as insulated barriers or temporary enclosures must be applied subject to written approval by a MEWRE Authorized Engineer.

C. The use of mobile lifting equipment (e.g., cranes, boom lifts, trucks) inside substations require:
A pre-approved movement plan, including access routes and working positions,
Inclusion in the corresponding Safety Document (such as the PTW),
Supervision by the responsible MEWRE Engineer during mobilization and operation.

22.2 Use of Ladders & Long Objects:

A. Only approved ladders of suitable material and minimum required length shall be used inside electrical transmission & distribution network under the supervision of MEWRE authorized engineer. Their use must strictly observe the minimum safety working clearances.

B. Ladders and other long or conductive objects shall not be moved, transported, or erected without prior permission from MEWRE competent personnel. When moving at ground level, they shall be carried horizontally and as close to the ground as safely possible to minimize risk.

C. When not in use, portable ladders within electrical transmission & distribution network shall be securely locked or chained to a suitable fixed anchoring point to prevent accidental displacement or unauthorized use.

23 Work on Remotely or Automatically Controlled Equipment

23.1 Isolation of Remote/Automatic Functions:

Before commencing any work on remote or automatically controlled equipment such as:

- Circuit breakers
- Isolators
- Tap changers or similar devices.

the automatic and/or remote-control features must be rendered inoperative by disconnecting control signals or isolating the associated control circuits. This ensures the equipment cannot be operated inadvertently during the work.

This shall be achieved by disconnecting relevant control signals or isolating the control circuits to ensure the equipment cannot operate inadvertently during work execution.
Such actions must be coordinated with the MEWRE Control Center Engineer, and their status.

23.2 Work on Protection, Control, and Indication Circuits:

Before performing any modification, testing, or maintenance involving protection, control, or indication circuits, the following should be implemented:

- The MEWRE Control Center Engineer shall be notified in advance.
- Suitable measures shall be implemented to prevent:
  - False tripping of protection devices.
  - Generation of spurious (false) alarms.
  - Mal-operation of relays or remote systems.

Only MEWRE Authorized Engineers, shall undertake such tasks, and all operations must be logged and performed under strict coordination.

24 Work on EHV/HV/MV/LV Apparatus other than Metal-Clad Switchgear Spouts, Cables, or Overhead Lines

Before any person is permitted to perform maintenance, repair, modification, or cleaning work on EHV/HV/MV/LV apparatus—excluding metal-clad switchgear spouts, cables, or overhead lines—the following safety steps shall be executed in strict sequence:

24.1 Mandatory Isolation and Earthing Procedures:

A. **Make Dead (De-Energized):**
The equipment shall be made electrically dead (De-energized) by switching off and isolating it from all points of Power supply.

B. Complete Isolation:

- Isolation from all voltage sources (including VT and CT secondaries).
- Isolation from Auxiliary circuits.
- Isolation from any interconnected common neutral earthing systems that could inadvertently energize the equipment.

C. Attach Caution Notices:

All possible points of re-energization must display: Caution Notices at control or switching points and Danger Notices on adjacent live equipment.

D. Verify Dead (De-energized) Status:

- Check the equipment with an approved voltage detector.
- Ensure the tester is validated both before and after the verification.

E. Apply Earthing:

- Efficiently connect the equipment to earth at all points of isolation, including any common neutral earthing system. **Use Properly rated earthing devices only.**

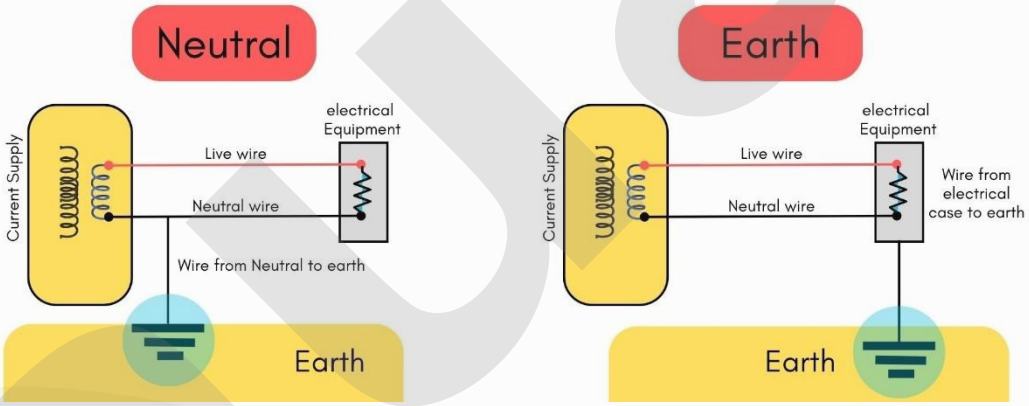
Remember the following:

✓ Connect the apparatus to the earth at required relevant disconnection point.

✓ Where applicable, ensure any neutral or common earthing system is also safely grounded.

✓ Only approved and properly rated portable (temporary) earthing devices shall be used.

- The following diagram illustrates the difference between Neutral & Earth:



24.2 Safety Locking and Documentation:

F. Lockout Arrangement: "check & follow (Rule 18.4)"

G. Multi-Location Isolation:

If the isolation spans multiple substations, each MEWRE Authorized Engineer shall:

- Lock local isolation points individually.
- Store the keys separately.
- Coordinate clearance for system restoration with the MEWRE Control Center.

H. Issue of Safety Documents:

- After all safety measures are completed, a formal Permit-to-Work (PTW) shall be issued by the MEWRE Authorized Engineer.
- The PTW shall specify the apparatus, boundaries, precautions, and responsible personnel.

24.3 Earths at the Point of Work:

I. Application of Additional Earths at Worksite:

- If the LES is not physically visible from the point of work, additional (temporary) earths shall be applied directly at the work location.
- If the LES is visible and judged sufficient by the MEWRE Authorized Engineer, additional earths may be deemed unnecessary.

J. Classification of Earths for Specific Outdoor Equipment or Cable Compounds:

When portable (temporary) earth is used in outdoor yards or cable trenches, they may be classified as **LES** if they are:

- First to be applied.
- Last to be removed.
- Located at a supply disconnection point.
- In such cases, these do not need to be labeled as 'Additional Earths'.

K. Temporary Removal of Earthing for Testing (If Applicable):

In exceptional cases where testing procedures require temporary removal of earthing, this shall only be done under written instruction by the MEWRE Authorized Engineer.

The following conditions must be fulfilled:

- The removal must be justified, documented, and approved in the PTW or test clearance.
- Earths shall be restored immediately after testing or the exception must be noted in the PTW clearance form.
- This activity must remain under the direct supervision of the MEWRE Authorized Engineer

25 Work on Metal-Clad Switchgear Spouts

This section outlines safety measures for working on busbar spouts, busbar voltage transformer (VT) spouts, feeder spouts, and feeder VT spouts. **All procedures must be followed in strict sequence and supervised by a MEWRE Authorized Engineer.**

25.1 Busbar Spouts & Busbar VT Spouts:

Before starting any work on busbar-related components:

A. De-energization & Isolation (Very Important):

The relevant busbar section must be de-energized by The MEWRE Authorized Engineer shall verify that the system is isolated from all points of supply.

B. Mechanical Locking:

- Lock all isolating arrangements to prevent operation.
- Lock shutters of adjacent live spouts.

C. Verification of Dead Condition:

- Use an approved voltage indicator (Approved Phase Stick), tested before and after by megger test & inspection to confirm the busbar is not live.
- This test must be conducted:
  - On the panel to be earthed (for LES).
  - On the panel where work is to be performed.

D. Warning Notices:

- Fix Caution Notices at all potential live points.
- Attach Danger Notices to adjacent energized components.

E. Apply Busbar Earths:

- Earth the busbar using approved earthing devices on a different panel than where the work is being performed.
- Never insert hands, tools & unrequired devices & items directly such as (watches, jewelries, metallics, etc.) into busbar or feeder spouts.

F. Safety Locking and Documentation: Follow Rule 18.4

G. Busbar Earthing During Testing:

Under a valid Permit to work, earths may be temporarily removed and shall be restored or noted under 'exceptions' upon clearance.

25.2 Feeder Spouts & Feeder VT Spouts:

The following sequence applies to all work on feeder spouts and VT spouts:

A. Circuit De-energization & Isolation:

- The relevant feeder section must be de-energized by The MEWRE Authorized Engineer shall verify that the system is isolated from all points of supply.
- Withdraw the circuit breaker from the far end to confirm the isolations **MEWRE Authorized engineer**.

B. Mechanical Locking:

- Lock all isolating arrangements to prevent operation.
- Lock shutters of adjacent live spouts.
- Lock the shutters in the far end (if applicable).

C. Verification of Dead (de-energized) Condition:

- Use an approved voltage indicator (Approved Phase Stick), tested before and after by megger test, to confirm the feeder is not live.
- This test must be conducted:
  - On the panel to be earthed (for LES).
  - On the far end to be earthed.

D. Safety Notices:

Caution Notices shall be placed at all re-energization control points.
Danger Notices shall be affixed to adjacent energized apparatus.

E. Application of Earthing:

- Apply approved earthing devices at all isolation points using approved tools.
- No hand or tool insertion is allowed into feeder or VT spouts.

F. Locking & Documentation: Follow Rule 18.4

G. Supervised Verification:

The MEWRE Authorized Engineer, after temporarily removing the earths, shall:

- Confirm the spout is dead using a verified voltage tester,
- Oversee work at the site.

Note: If LES is applied directly at the spout, no other work on the connected circuit is allowed while spout work is in progress.

H. Additional Earths for OHL Circuits:

When spouts are connected to **overhead line (OHL)** feeders where induced voltages may occur, **additional earths** must be applied at the nearest safe point along the conductor.

I. Post-Test Procedures:

Under the permit to work, earths may be removed but must be restored or recorded as exceptions.

26 Work on (EHV / HV / MV / LV) Cables

The provisions of **Rule 24** apply to all cable-related work. In addition, the following specific precautions shall be observed:

A. Authorization to Work:

No person shall commence any work on, or interfere with, any (EHV / HV / MV / LV) cable, conduit, or cable trough without receiving a valid **Permit-to-Work (PTW)** and **personal instruction at the point of work from a MEWRE Authorized Engineer**.

B. Identification, Isolation, and Spiking:

When a cable is to be cut, spliced, or jointed, the MEWRE Authorized Engineer shall:

- Confirm the cable is fully isolated and dead (De-Energized).
- Identify and clearly mark the correct cable.
- Spike the cable using an approved spiking device before allowing work to proceed.

C. Work Near Live Circuits or Metallic Sheaths:

- Special precautions must be taken when:
- Working near adjacent live cable circuits.
- Working on cables with fully insulated metallic sheaths.

These precautions include:

- Application of portable earths where applicable.
- Use of induced voltage warning devices.
- Ensuring cable separation and safe approach limits.

26.1 Work on Overhead Lines with All Conductors Dead:

In addition to the general provisions of **Rule 24**, the following must be strictly adhered to when working on de-energized (EHV / HV / MV / LV) overhead lines:

A. Climbing Safety and Visual Oversight:

Personnel working on towers, poles, or elevated structures shall:

- Use certified fall protection equipment (PPE), including full-body safety harnesses and helmets.
- Remain within **visual contact** of another person at all times during elevated work.

Before climbing:

- Each pole or structure shall be sounded or physically tested to verify the structure.
- Poles or supports exhibiting signs of decay, mechanical damage, or instability shall **not be climbed** unless securely **guyed or splinted**, and then only by **one authorized climber at a time**.

B. Circuit Identification at Source:

The MEWRE Authorized Engineer at each switching or isolation station shall:

- Personally confirm the **identity of the circuit** at the point of isolation by approved voltage indicators.
- Report this confirmation directly to the MEWRE Control Center Engineer before issuing any safety document.

C. Circuit Identity Wristlets and Flags (Transmission Use Only):

- All personnel climbing towers shall Wear **wristlets** or identifiers indicating the circuit name, number, and color code as per system records.
- At every worksite tower the designated person in charge shall **hoist a green flag** in a prominent location before authorizing the tower ascent.

D. Earthing for the discharging of Conductors in (OHL):

- All conductors shall be **efficiently earthed** under the supervision & Instruction of the MEWRE Authorized Engineer.
- Earthing shall be applied:
  At or near the point of work. or, **On the adjacent towers** on either side of the work location.
- The following conditions shall also apply:
  - Earths must be applied **no more than two spans apart**.
  - If the conductor is to be cut or disconnected, **earths must be placed on both sides at the same tower** prior to cutting.
- Earths shall **remain in place** until:
  - The conductor is fully reconnected and restored, and
  - The MEWRE Authorized Engineer clears the work as complete

Earths shall remain in place until conductors are reconnected, or work is fully completed.

26.2 Work on Double-Circuit Overhead Lines with One Circuit Live:

When maintenance or inspection is required on one side of a double-circuit overhead line, and the adjacent circuit remains energized, all provisions of **Rule 26.1** shall apply **in addition** to the following mandatory safety precautions:

A. Earthing, Flagging & Access Control:

- Green Flag Placement: (Before permitting access to any tower):
  - The designated Person in Charge shall fix a green flag at the base or designated point on the de-energized side of the tower.
  - This signals clearance for safe climbing.
- Earthing of Conductors: The earthing party, under the supervision of a Competent Person, shall:
  - Climb only the de-energized side of the tower.
  - Apply portable (temporary) earths to each individual conductor on the dead (De-Energized) side using approved earthing.
- Red flag on Live Conductors: to clearly mark energized sections in addition to zebra tapes.
- Additional Earthing (temporary) Rules: All portable earths shall be under the MEWRE authorized engineer supervision & instructions where the following shall be applied:
  - Remain in place for the entire duration of the work.
  - Be removed only after all personnel have safely descended.
  - Be removed by the same Earthing personnels.
- Ground-Level Supervision: During both the application and removal of additional earthing (temporary):
  - The Earthing personnels shall be under continuous visual observation by the MEWRE Supervisor Engineer, MEWRE Site-In-Charge Engineer, or a designated safety observer positioned at ground level.

B. Special Considerations for Critical Tower Types:

- Tee-Off Towers: Work on Tee-Off Towers:
  - Shall be performed only under the supervision of a MEWRE Authorized Engineer.
  - Requires specific risk assessment and additional controls due to the unique circuit configuration.

Limits of access shall be permitted only by an MEWRE Authorized Engineer **&** Authorized contractor site engineer **to** Competent Persons **only. A separate Limit of access must be issued for each work group.**

- Terminal (gantry), Transposition, special towers and Angle Towers: These tower types must be assessed on a case-by-case basis.
- Additional precautions shall be applied due to:
  - Closer proximity to energized circuits.
  - Modified phase spacing.
  - And the increased likelihood of induced voltages.

26.3 Work on Towers Carrying Live Conductors (Transmission Only):

Working above the anti-climbing devices on towers that carry live conductors is strictly controlled and must only proceed under the following safety measures and authorization protocols:

A. Authorization and Documentation:

- **Permit Requirement**: A valid Permit-to-Work must be issued by a MEWRE Authorized Engineer before any work begins.
- **Scope of Access**: Work shall be performed only from within the tower structure (unsupported areas).

B. Delineation of Safe Working Area:

The Competent Person in charge at each tower must Clearly define and restrict the working zone using:

- Removable barriers.
- Warning signs.
- Safety roping or flagged.
- Conductive suit & Conductive shoes
- Insulated tools & equipment's

- These must prevent personnel from encroaching within **minimum safe working distances** from live conductors as per **BS 7354:1990 (Table 4)**:

Rated Voltage	Horizontal Clearance	Vertical Clearance
Up to 33 kV	1.8 meters	2.8 meters
>33 to 66 kV	2.1 meters	3.1 meters
>66 to 132 kV	2.7 meters	3.7 meters
>132 to 275 kV	4.2 meters	5.2 meters
>275 to 500 kV	5.4 meters	6.4 meters

While defining the zone, the Competent Person shall be monitored by a ground observer.

C. Conduct During Work:

No person shall allow:

- Their hands, arms, or tools extend beyond the defined working limits.
- Any conductive tools longer than 0.3 meters (12 inches) to be taken up the tower.

- **All activities must be performed with an electrically rated PPE, and safety harnesses must be secured at all times & approved by MEWRE authorized engineer.**

D. Upon Completion or Cancellation of Work

The Competent Person in charge shall:

- Inform all team members of work status.
- Remove **all temporary barriers, flags, signs, and ropes** from the tower base and structure.
- Ensure this process is **observed by another designated person** at ground level for accountability.
- Confirm that all tools, equipment, and materials have been safely retrieved from the tower or elevated structure before leaving the site.

E. Induced Voltage Hazard and Electric Field Risk:

In the live overhead conductors, personnel are exposed to induced voltages and electrostatic fields.

- Special PPE:
  - All workers must wear suitable electrically conductive PPE (e.g., conductive suits or gloves & shoes)
  - These must be tested and certified annually for integrity and insulation discharge capability.
- Shock Risk: Accidental discharge of body-stored electric charge when touching grounded parts can cause shock or fall risk. To mitigate:
  - Follow proper bonding and grounding procedures,
  - Maintain continuous training on induced field hazards and anti-static safety behavior.

26.4 Adverse Weather Conditions:

Work on overhead lines and elevated structures must be immediately suspended or prohibited during adverse environmental conditions that pose risk to personnel safety or system integrity.
The following rules & regulations shall be strictly observed & apply:

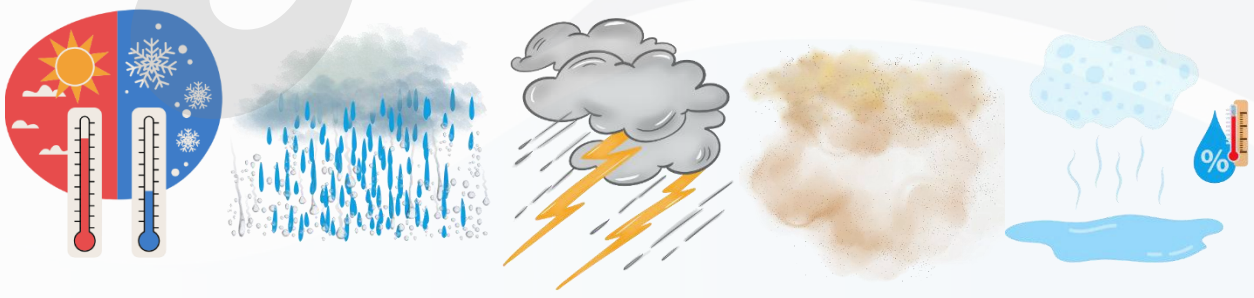
A. Lightning and Storm Conditions:

- All work on towers, poles, or conductors must cease immediately if:
  - A lightning storm is detected in the vicinity.
  - Sudden thunder or electrical discharges are observed,
  - Control centers issue a weather-related warning.
- The **MEWRE Control Center Engineer** shall be informed immediately, and no work may resume until official clearance is granted.

B. Strong Wind and Visibility Hazards:

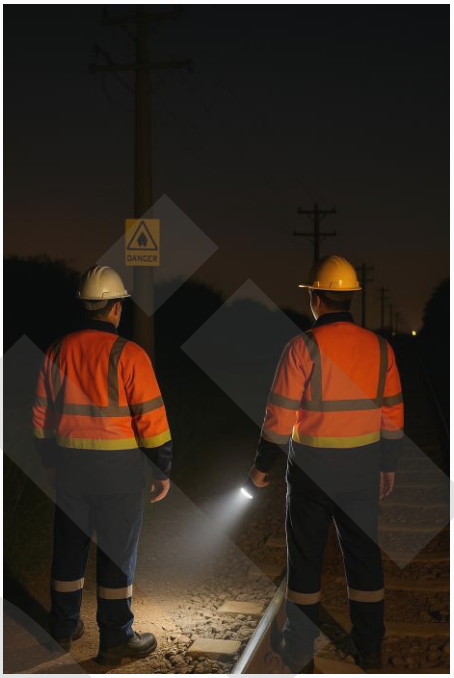
- Work shall not proceed in conditions of:
  - **Strong winds** exceeding the approved threshold for safe tower or pole climbing (as per MEWRE safety engineering guidelines) by approved devices.
  - **Impaired visibility** due to fog, dust, or other atmospheric conditions that hinder safe observation and communication.

No individual patrol or solo inspection shall be permitted under reduced visibility conditions.



C. Nighttime Patrols:

- Overhead line patrols conducted during hours of darkness must be used:
  - Properly maintained lighting equipment,
  - No lone working, at least MEWRE Engineer & Competent Person together.
- Route and communication protocols must be pre-established and logged with the Control Center.



D. Tower Work Postponement:

- No climbing or elevated work shall be allowed during:
  - Heavy rainfall or when metallic surfaces become slippery.
  - Storm watch periods declared by the Kuwait Meteorological Center or MEWRE Emergency Coordination.

27 Testing of (EHV / HV / MV / LV) Apparatus

This section outlines the mandatory safety requirements for applying test voltages to any Low Voltage (LV), Medium Voltage (MV), High Voltage (HV), or Extra High Voltage (EHV) electrical apparatus prior to energization. These tests are typically conducted during commissioning, fault diagnosis, or post-maintenance verification activities across MEWRE facilities.

27.1 Safety Governance and Test Authorization:

- **A Permit-to-Work (PTW)** shall be issued by a **MEWRE Authorized Engineer** before initiating any equipment's & devices test.
- The **test area boundaries** shall be clearly defined, isolated, and controlled.
- Appropriate **barriers** shall be erected and **Danger Notices** prominently displayed around the test perimeter.
- The apparatus is adequately guarded with physical barriers where necessary to prevent danger.
- Danger Notices are affixed in highly visible locations for the entire period where the apparatus may be energized under test conditions.
- All associated cables shall be safely discharged both before and after the application of test voltage using appropriate discharge equipment.

27.2 Testing Conditions and Restrictions:

The apparatus under test shall be:

- Fully isolated and confirmed dead (De-Energized).
- Testing is strictly prohibited in environments where flammable gas, oil vapors, or explosive mixtures are known or suspected to be present.
- Discharged for any chargeable equipment's (Not live) using suitable approved method before connecting any test apparatus.
- No test connections shall be made within live compartments or in proximity to exposed energized conductors.

- Test connections must not be made within any cell, cubicle, or compartment containing exposed conductive parts that are live at high voltage.
- (This does not prohibit the use of approved voltage indicators or phasing devices designed for such conditions.)
- All temporary test leads must be:
  - Of appropriate current-carrying capacity.
  - Properly routed and easily visible for safety and identification.

27.3 Use of Approved Equipment:

- Only approved voltage sources, test equipment, and insulated tools rated for the specific test voltage shall be used.
- All test devices (e.g., phasing sticks, Multimeter, megger, injection device, etc) must be Calibrated within valid intervals,
- Tests shall be operated by **Competent and Trained Personnel** by MEWRE engineer under the supervision & instruction of MEWRE authorized engineer.

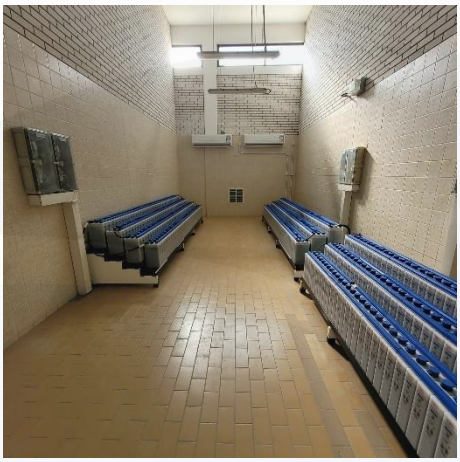
27.4 Risk Mitigation and Isolation:

- When test voltage is applied:
  - Entry into the test area is strictly prohibited,
  - All exposed conductive parts of the test setup shall be earthed after the test.
  - Any tested equipment's shall be discharged both before and after testing.

27.5 Post-Test Procedures and Clearance:

- After completing testing:
  - All temporary test connections shall be removed,
  - Apparatus shall be visually inspected, discharged, and verified as safe to energize,
  - A clearance must be issued and logged with Control center.
- All test activities, voltage levels, and durations shall be recorded in:
  - The substation logbook,
  - The Control Room testing register.

28 Work on Batteries and DC Systems



This section sets out the mandatory safety rules governing the handling, maintenance, testing, and inspection of battery systems and DC panels installed within MEWRE substations. These rules ensure the safe continuity of critical protection and control functions and apply to all voltage-rated installations.

28.1 General Safety Requirements:

A. Authorization and Supervision:

- Only trained, competent personnel shall work on batteries or DC panels.
- A **MEWRE Authorized Engineer** shall supervise tasks involving the risk of electrical shock, acid exposure, or interconnection of circuits.

"No battery isolation, inter-cell connection, or charger modification shall be undertaken unless specifically authorized under a Permit-to-Work issued by a MEWRE Authorized Engineer."

B. Safety Documentation:

- Permit-to-Work (PTW): Required for:
  - Battery circuit isolation
  - Inter-cell/inter-string connections
  - Work inside live DC distribution panels.

C. Room Ventilation & Signage:

- Battery rooms must be equipped with adequate ventilation.
- Display visible **"No Smoking"** and **"Explosive Gas Risk"** signs.

28.2 Personal Protective Equipment (PPE):

- Personnel shall wear:
  - Acid/electrolyte-resistant gloves and aprons
  - Safety goggles or face shield
  - Rubber-soled shoes

28.3 Work on Battery Terminals and Cells:

A. Precautions

- Use **insulated tools** to prevent short circuits.
- Avoid metal brushes or non-approved cleaning materials.
- Clean terminals with neutralizing solutions.
- Ensure connections are tight and free from corrosion.

B. Electrolyte Handling:

- Only trained & competent MEWRE personnels can handle electrolyte refills.
- Use acid & electrolyte-resistant funnels and hydrometers.

28.4 Battery Charger & DC Panel Work:

A. Isolation Procedures:

- Disconnect both **AC supply** and **battery backfeed** before internal work.
- Verify isolation with approved **voltage indicator** and **insulation tester by the MEWRE Authorized engineer in charge.**

B. Circuit Labeling and Continuity:

- Maintain clear labeling of DC circuits.
- Only isolate circuits under work with issued PTW; ensure continuity of dc supply for protection systems.

28.5 Fire Response:

- Install Class C or CO_2 fire extinguishers in the substations.
- In case of fire:
  - Evacuate the area.
  - Inform control center and Emergency Services.

28.6 Post-Work Inspection and Reporting:

All Inspections, updating, informing & Reporting shall be applied by MEWRE Authorized engineer in charge.

- Inspect for:
  - Voltage stability
  - Terminal tightness
  - Alarm and change over function
- Update: **Record at Substation Logbook** & **Control Room Report**
- Inform Control center of:
  - Charger parameters
  - System anomalies
  - Final work clearance

29 Work on Equipment & Ancillary Apparatus Containing Sulphur Hexafluoride (SF_6) Gas

This section sets out the mandatory safety requirements for working on electrical equipment containing Sulphur Hexafluoride (SF_6) gas or its by-products within MEWRE installations. It covers isolation, evacuation, personal protection, and procedural controls in accordance with the Ministry's approved for SF_6 gas handling and environmental compliance.

A. For any equipment that contains Sulphur Hexafluoride (SF_6) gas, the relevant gas handling and safety shall apply.

A safe area accepted by MEWRE Authorized engineer for approved SF_6 Handling. SF_6 gas cylinders shall be kept at the work location for reference throughout the task. Each apparatus shall carry a clear warning notice indicating that it contains SF_6 gas.

B. b. In addition to the requirements of Rule 26 and Rule 30, the following special safety precautions shall be applied when work involves access to any part of the equipment that contains or has been exposed to SF_6 gas or its by-products:

1. The apparatus shall be isolated from all gas supply sources, and the SF_6 gas must be fully evacuated and vented to atmosphere safely. All associated receivers, pipework, and storage tanks shall remain open to the atmosphere during work.
2. Valves shall be secured using approved safety locks & LOTO procedure at the control point by MEWRE Authorized engineer in charge & authorized contractor site engineer.
3. **Caution Notices** shall be clearly affixed to all relevant valves and compartments associated with the gas system.
4. The work shall proceed only under the authority of a valid and appropriate Safety Document (Permit-to-Work), issued & supervised by an MEWRE Authorized Engineer.

C. Where there is risk of exposure to SF_6 gas or its decomposition products, the following protective equipment and precautions shall be used:

- Approved available PPE.
- Gas monitoring equipment must be available to detect SF_6 concentrations and confirm the absence of harmful levels.
- Personnel must be trained in SF_6 handling, exposure risks, and emergency procedures.

30 Work on HV Apparatus Containing Compressed Air, Hydraulic Fluid, or Spring Mechanisms

30.1 Apparatus Containing Compressed Air Mechanism:

Before performing any maintenance or internal work (other than approved operational adjustments) on HV apparatus equipped with compressed air systems, the following steps shall be taken:

The air supply valves shall be fully closed, and air shall be discharged from all associated receivers and pipework, which shall be left open to the atmosphere.

A. System Isolation and Depressurization

- Fully close all air supply valves.
- Discharge compressed air from all associated receivers, pipework, and accumulators.
- Leave all system ports open to the atmosphere during the entire maintenance period.

B. Mechanical Lockout and Documentation

- Lock relevant valves in the isolated position using MEWRE-approved safety padlocks.
- Secure keys inside the designated key box or by (LOTO).
- Document the isolation details in the issued Permit-to-Work (PTW).

C. Affix **Caution Notices** to all relevant valves, compressors, and air lines involved in the isolated circuit.

D. No work shall proceed without a valid **PTW** issued to the authorized contractor site engineer in Charge by an **Authorized MEWRE Engineer**.

30.2 Apparatus Containing High-Pressure Hydraulic Operating Mechanism In addition to isolation and labeling requirements:

The relevant Hydraulic Safety must be followed before performing any work beyond operational adjustments on equipment operated by high-pressure hydraulic systems.

- Pressure Isolation
  - Release or isolate all hydraulic pressure safely using the designated venting system.
  - Lock and label all hydraulic valves as per MEWRE procedure.
  - All hydraulic pressure shall be safely released or isolated, and valves locked and documented in the associated Safety Document.
  - Any abnormal pressure readings or valve behavior shall be reported to the MEWRE Control Center.

30.3 Apparatus Containing Spring-Charged Mechanism:

Before maintenance on spring-operated mechanisms:

A. Discharge and Restraint:

- Mechanisms shall be fully discharged or mechanically restrained using approved locking or blocking devices to prevent accidental movement during maintenance.
- Visual indicators shall confirm spring status before any disassembly by both MEWRE authorized engineer & the authorized contractor site engineer.
- This applies to spring-charged tripping or closing mechanisms in circuit breakers or disconnectors.

B. Verification and Documentation:

- The isolation status shall be **confirmed** and **recorded** by a MEWRE Authorized Engineer in the corresponding PTW & logbook.

30.4 Inspection or Operational Adjustments:

Inspection or minor adjustments not involving disassembly of compressed air, hydraulic, or spring-charged components shall be carried out under the direct supervision of a MEWRE Authorized Engineer.

- **Permissible Scope:** Visual inspection and minor adjustments (e.g., valve setting, gauge reading) may be performed under direct supervision of a MEWRE Authorized Engineer.

31 Work on Oil Tanks and Equipment Containing Flammable Substances

31.1 Entry and Ventilation Precautions:

A. No person shall enter any oil tank, conservator, or vessel previously containing flammable liquids until it has been properly ventilated and tested.

B. The MEWRE Authorized Engineer shall verify that all flammable vapors have been safely expelled and certify that the atmosphere is safe for entry.

C. An approved Permit-to-Work shall be issued prior to entry, clearly specifying confined space controls and atmospheric test results.

31.2 Fire and Ignition Hazard Controls:

A. Smoking, open flames, and the use of spark-generating tools are strictly prohibited in or around tanks and vessels containing, or those have contained, oil or flammable substances.

B. "No Smoking" and "Danger – Flammable" signs shall be prominently posted and visible in the area.

C. Hot work, such as welding or cutting, shall not be allowed unless:
- All flammable residues and vapors have been eliminated, or
- The space has been rendered non-flammable through approved techniques.

31.3 Safety Supervision and Rescue Arrangements:

A. Where one or more persons are required to work inside a tank or enclosed space, a standby person shall be posted outside the entry point to maintain continuous communication and initiate an emergency response if needed.

B. If deemed necessary by the MEWRE Engineer, the approved breathing apparatus shall be worn, and the worker shall be equipped with a rescue line securely fastened and supervised at all times.

31.4 Documentation and Compliance:

- All procedures, gas test results, and safety briefings shall be recorded in the Permit-to-Work.
- Entry logs and hazard mitigation steps shall be documented.
- Work shall be conducted in compliance with MEWRE internal procedures and the latest health and safety obligations under national law.
- Personnel should be briefed on site-specific hazards and encouraged to review emergency procedures relevant to the task.

32 Work on Low Voltage Apparatus, Conductors & Equipment

32.1 Precautions Before Working on Low Voltage Systems:

In the event of any 11 kV feeder switching or disconnection operation, the authorized engineer from the Ministry must coordinate in advance with the responsible Distribution Engineer to avoid unplanned outages that may impact consumers. This coordination is essential to ensure service continuity and prevent any operational disruptions on the consumer side. (PTW) shall be issued before any work by MEWRE authorized engineer & authorized contractor site engineer.

Although classified as Low Voltage (LV), electrical shock, arc flash, or short-circuit risks may still result in severe injury or fatality. Therefore, the following precautions shall be applied:

A. De-energization of Apparatus:

- Work on LV equipment shall be performed **in a de-energized state** wherever this does not impact critical consumer supply.
- All disconnection and de-energization shall be **verified by the MEWRE Authorized Engineer**.

B. Screening and Isolation: All adjacent live conductors shall be adequately physically screened or isolated to prevent inadvertent contact during operations on dead apparatus.

C. Caution and Danger Notices:

- Caution Notices shall be securely affixed to all switchgear or control devices connected to de-energized & Verification by The MEWRE Engineer equipment.
- Danger Notices shall be prominently posted adjacent to live apparatus and at the defined boundaries of the work zone.

D. Confirmation of Isolation: If full isolation is not feasible, all apparatus must be treated as live until proven de-energized by proper testing and confirmation by MEWRE Authorized Engineer.

E. Live Working Requirements shall only be performed:

- By a Competent Person,
- Using approved PPE (e.g., insulated gloves, boots, face shields),
- With insulation barriers to prevent accidental contact.

32.2 Work on Low Voltage Cables:

A. Cable Identification: Cable misidentification, particularly for underground cables, poses a serious hazard. The outer sheath or armoring is not a reliable voltage indicator.

- The **Engineer-in-Charge** shall positively identify the correct cable prior to any work.
- If any uncertainty exists, all cables along the route shall be de-energized.

B. Dead Cable Work:

- The cable must be isolated from all known supply points.
- Locking and caution notices must be applied to relevant switches.
- Fuses or links shall be removed and stored securely.
- The cable must be proven dead using an approved indicator (tested & evaluated before and after use by MEWRE authorized engineer).

C. Live Cable Work:

- If absolutely necessary and approved:
  - Only one conductor may be exposed at a time.
  - Use of insulated gloves, rubber mats, and safety boots is mandatory.
  - All adjacent metal structures shall be insulated or shrouded.
  - The metallic sheath must be bonded using approved insulated conductors before any cutting.
  - No person shall work on a live cable alone.

D. Auxiliary / Pilot Cable Work:

Where induced voltage may occur due to proximity with HV equipment, work must comply with special instructions issued by the relevant MEWRE authority.

32.3 Work on Low Voltage Overhead Lines:

A. General Safety

- Personnel climbing poles must use full-body harnesses, helmets, and remain in visual contact with another team member.
- Poles shall be sounded and inspected prior to climbing.
- Damaged poles must be guyed or reinforced; only one person may climb such poles.

B. Adverse Weather Conditions:

- Work shall immediately cease if lightning or high winds are present.
- Line patrols must not be conducted alone during poor visibility.
- Night patrols shall use appropriate lighting equipment.

C. Work on LV Overhead Lines

- Before working on dead lines, all conductors (including neutral) shall be short-circuited and earthed.
- If the work crew leaves the area, local earths must be rechecked upon return.
- Live line work may only be performed:
  - With written approval from the department.
  - By a Competent Person wearing insulated gloves and safety belt
  - With a second person present at the base of the pole.

D. Fuse and Link Handling:

Removal or replacement of pole-mounted fuses or links may be performed by a Competent Person without an assistant, provided it is done from the ground.

32.4 Work on Pilot, Telecommunication & Fiber Optic Equipment:

A. All work on live Telecom / SCADA / Tele-Control equipment must be performed under a valid.

B. Testing, fault location, or repairs on telecommunication or pilot cables shall be done under the appropriate permit to work, with precautions taken against induced voltages.

C. Where fiber optic cable fault repairs are to be performed near HV or EHV cables, an outage of the affected power circuit is required.

D. Work on PLCC Line Matching Units (LMUs) within substations shall only be performed under Permit-to-Work.

E. For OPGW (Optical Ground Wire):

- OPGW is considered part of the overhead line (OHL) and shall follow all provisions under Rule 24.
- Hood closure splicing may be carried out with limit of access considerations.

33 Fire Protection Equipment and Systems

33.1 Automatic Fire Suppression Systems (e.g. CO_2 Systems):

A. Before performing any work or inspection inside enclosures protected by automatic fire extinguishing systems, the automatic mode shall be switched to manual control, and a clearly visible notice indicating this status must be posted at the system panel.

B. The automatic control mode shall be reinstated immediately after completion of work and full evacuation of personnel from the protected area.

C. The act of disabling the fire alarm control panel (FACP) and re-enabling the system shall be:

- Clearly recorded in the **Permit-to-Work (PTW)**.
- Issue & sign the F/F Isolating Request for isolating the (FACP) by the MEWRE Engineer in charge before work. (See Annex)
- Issue & sign the Normalizing Request for the (FACP) by the MEWRE Engineer in charge after the work. (See Annex)

Communicate MEWRE Control Center Engineer both before disabling and after restoring the system by the MEWRE engineer.

33.2 Clean Agent Gas Systems:

A. For enclosures protected by cleaning agent gas extinguishing systems, specific local instructions posted within the substation must be strictly followed.

B. Upon gas discharge or audible alarm activation, all personnel must evacuate immediately.

C. Do not re-enter the space until it has been thoroughly ventilated and declared safe by the MEWRE Authorized Engineer.

33.3 General Fire Safety Precautions:

A. Where chemical agents are used in fixed or portable fire protection systems, appropriate hazard notices must be placed nearby to warn of risks associated with direct contact or inhalation.

B. Portable fire extinguishers shall not be used on live electrical equipment unless the equipment is confirmed isolated and earthed.

C. Exceptionally, CO_2, dry chemical, or carbon tetrachloride extinguishers may be used in the vicinity of energized equipment, but only if:

- Operators maintain the required safety clearances.
- Personnel are trained and authorized to do so.

D. After discharging CO_2 or carbon tetrachloride extinguishers in a confined or enclosed space:

- Operators must exit the area immediately.
- Re-entry is permitted only after complete ventilation or with the use of an approved breathing apparatus.

• All MEWRE engineers must be familiar with the location and types of fire extinguishers, understand proper usage procedures, regularly check expiry dates, ensure the safety of firefighting equipment, and be aware of fire alarm systems and response protocols.

D- Emergency Preparedness, Response, and Incident Management

34 Guidelines to Emergency Response

34.1 Basic Emergency Preparedness:

- All MEWRE personnel, contractors, and visitors shall be familiar with the emergency response procedures relevant to their worksite. This includes:
  - The location of First Aid kits (for minor injuries)
  - The location and operation of Firefighting equipment
  - Emergency exits, evacuation assembly points, and alarm systems
- Familiarization must occur prior to starting work and be reinforced during Toolbox Talks and site orientations.

34.2 Reporting Accidents and Dangerous Occurrences:

- In the event of an incident & Accident, all dangerous occurrences and accidents within the MEWRE Transmission Network must be immediately reported to the Control Center Engineer who shall initiate the following:
  - Notify Security, HSE Department, Local Fire Force, or other relevant emergency responders.
  - Call 112 (or applicable emergency services)
  - Alert the Control center, firefighting department, MEWRE supervisor & Section head without delay.
- While reporting an incident, remain calm and provide:
  - Your name and contact number.
  - Clear explanation of the situation
  - Exact location of the accident
  - Time of occurrence
  - Specific directions to the site for emergency access

34.3 General Evacuation Procedure:

- Evacuation may be necessary due to:
  - Fire
  - Gas leaks
  - Environmental hazards
  - Natural disasters
  - Any other imminent danger
- **Standard Evacuation Steps include:**

1. Control center shall be notified to alert relevant parties (HSE, Fire, Emergency Units).
2. Emergency Alarm shall be activated if installed.
3. The on-site MEWRE Supervisor Engineer / MEWRE Site-In-Charge Engineer announce control and coordinates evacuation.
4. All personnel must proceed immediately to the Assembly Point.
5. A call must be taken to verify that everyone is accounted for.
6. No one shall re-enter or leave the site unless it is cleared by the MEWRE Supervisor Engineer / MEWRE Site-In-Charge Engineer.
7. When emergency responders arrive, control is on coordination with them.

34.4 Response to Electrical Injuries:

- **Electrical shock** can result in:
  - Skin burns
  - Internal organ damage
  - Cardiac arrhythmia (especially if current passes through the chest)
- Precautionary measures:
  - Call for emergency assistance immediately.
  - Do not attempt to remove burnt clothing that is stuck to the skin.
  - Ensure the injured person is taken to a hospital immediately, even if they appear stable, due to the risk of delayed heart complications.
  - Treat the scene as high-risk until isolation is confirmed.

34.5 Response to Other Physical Injuries:

- If the injury is not electrical in nature:
  - Confirm airway and breathing.
  - Control bleeding using pressure and elevation.
  - Keep the victim warm and lying down.
  - Do not give liquids if the casualty has signs of shock or internal injury.
  - Move the casualty only when absolutely necessary and support any injured areas.
  - Maintain verbal reassurance and presence to calm the victim.

34.6 First Aid Responsibility and Emergency Actions:

- Time is critical between injury and medical intervention. Immediate first aid can:
  - Save lives.
  - Minimize injury severity.
  - Prevent long-term damage.
  - Provide psychological support.
- Personnel should be aware of the presence and basic purpose of first aid kits, particularly when working with external contractors, to support site safety readiness before beginning any critical tasks.

✓ **The following procedures outline appropriate actions to take until trained emergency responders arrive:**

34.7 Burns (Thermal or Electrical):

- Ensure the scene is safe. If electrical, confirm isolation before approaching.
- Remove the person from the heat or electrical source only if it is safe.
- Cool the burn with clean, running water for 10–15 minutes. Avoid using ice or creams.
- Cover the area with a sterile, non-stick dressing or clean cloth.
- Do not remove clothing stuck to the wound or burst any blisters.

34.8 Severe Bleeding:

- Apply firm direct pressure using sterile dressing or clean cloth to stop bleeding.
- Elevate the injured area above heart level, if it doesn't cause more injury.
- Maintain pressure until bleeding stops or helps arrive.
- If blood soaks through, do not remove the first dressing add another on top.

34.9 Fractures / Broken Bones:

- Do not move or attempt to realign the bone or joint.
- Immobilize the affected area using available supports (e.g., rolled cloth or wood splint).
- Keep the person calm and prevent movement.
- Call emergency services and wait for trained responders.

34.10 Unconscious Person (Not Breathing):

- Check for response and breathing immediately.
- If the person is not breathing, begin CPR (30 chest compressions to 2 rescue breaths), if trained.
- Use an AED (if available) and follow the voice prompts.
- Continue CPR until emergency services take over or the person regains consciousness.

34.11 Shock (Circulatory Collapse):

- Lay the person on their back and elevate legs unless there is a suspected spinal injury.
- Keep the person warm with a blanket or jacket.
- Do not give food or drink.
- Reassure the person and monitor for changes in consciousness or breathing.

34.12 Choking (Airway Obstruction):

- If the person can cough or speak, encourage coughing and do not interfere.
- If not breathing or unable to speak, give up to 5 back blows, then 5 abdominal thrusts (Heimlich maneuver) if trained.
- Continue until the object is cleared or the person becomes unconscious in which case begin CPR and call for help.

34.13 Eye Injuries:

- Do not rub or apply pressure to the eye.
- Flush with clean water or saline for at least 10 minutes if chemicals or dust are present.
- Cover the eye lightly and seek immediate medical attention.

34.14 Heat Exhaustion / Heatstroke:

- Move the person to a cool, shaded area.
- Loosen clothing, apply cool wet clothes, and offer sips of water if conscious.
- If symptoms worsen (confusion, loss of consciousness), treat them as heatstroke and call emergency services.

34.15 General Notes:

- Always ensure your own safety before assisting others.
- Stay calm and speak reassuringly to the injured person.
- Keep records of all first aid given and report the incident as per MEWRE procedures.

Department / Service	Phone Number(s)
Police, Ambulance, and Fire Emergency	112
MEWRE National Control Center (NCC)	+965 2499 6000
MEWRE Regional Control Center (RCC)	+965 2483 1000
MEWRE Protection Department (Control Room)	+965 2499 6333
MEWRE HSE Department	+965 2499 5000 (Ext. HSE)
MEWRE Fire & Safety Unit	+965 2499 5900
MEWRE Transmission Sector – Duty MEWRE Supervisor Engineer / MEWRE Site-In-Charge Engineer	+965 2499 6600
Kuwait Civil Defense (General Emergency)	1804000

34.16 Emergency Response Plan (ERP) Documentation:

MEWRE facilities shall maintain a formal, site-specific Emergency Response Plan (ERP) aligned with Kuwait Civil Defense and international standards. The ERP must include:

- Defined emergency scenarios (e.g., fire, gas leak, electrical injury, chemical spill, security threat)
- Clear roles and responsibilities
- Emergency contact list
- Maps of emergency exits, assembly points, firefighting systems
- Procedures for drills and continuous review
  (See Annex)

E-Annexure

1-MEWRE Final Certificate:

MINISTRY OF ELECTRICITY & WATER & RENWABLE ENERGY

وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewal
State of Kuwait | دولة الكويت

وزارة الكهرباء والماء والطاقة المتجددة

الشهاده النهائية (جزء من الأعمال)

FINAL CERTIFICATE - COMPLETION OF CONTRACT

Contractor	المقاول :
Subject of Contract	موضوع العقد :
Contract No.	رقم العقد :
Contracting Date	تاريخ العقد :
No. & Date of Taking Over And Accept. Certificate:	رقم وتاريخ شهادة الاستلام والقبول :
Date of Certificate	تاريخ الشهادة :
Certificate No.	رقم الشهادة :

In accordance with rules stipulated in the Contract and upon the request of the Contractor concerning Contract works : i.e:

استنادا الى الاحكام المقررة فى العقد وبناء على طلب المقاول بشأن اعمال العقد التاليه :

Prev.

And Whereas :

The period of guarantee and maintenance for the refered works has been expired and the Contractor has fulfilled all obligations stipulated by Contract Conditions in regard with the guarantee maintenance of the works

All exceptions, amendments, Variation Orders related to the above referred works have been executed, tested, taken over and maintained subject to contract requirements.

All required spare parts for the referred to works have been delivered to the Owner's Stores.

The "Engineer" hereby certifies that the Contractor has fulfilled all his obligations related to works referred to above in accordance with Contract Conditions and specifications and therefore he is entitled to get all outstanding monies due to him in connection with the referred to above works.

وحيث أن :

- فترة الضمان والصيانة بالنسبه للاعمال المذكوره أعلاه قد انقضت وان المتعهد قد اوفى بكافة الالتزامات التى تفرضها عليه شروط العقد بشأن الضمان والصيانة .
- كافة الاستثناءات والتعديلات واوامر التغيير ذات العلاقة بالاعمال المذكورة اعلاه قد تم انجازها وفحصها وقبولها وصيانتها طبقا لشروط ومواصفات العقد .
- جميع قطع الغيار المطلوبة للاعمال المذكورة اعلاه قد اتم المقاول تسليمها لمستودعات المالك .

يشهد المهندس بان المقاول قد اوفى بكافة الالتزامات المترتبة عليه فيما يتعلق بالاعمال الوارد ذكرها اعلاه طبقا لشروط العقد ومواصفاته ، وعليه فانه يستحق ان يدفع له باقى مستحقاته من قيمة العقد فيما يعود للاعمال المشار اليها اعلاه .

الوكيل المساعد لشبكات النقل الكهربائية	معتمد	مهندس
AUS for TEN	Approve	The Engineer

وكيل الوزارة
Under Secretary

CC : Contractor
AUS [TEN]
Concerned Technical Dept. (2)
C.C.C.D. (2)
Registry

نسخه : المقاول
الوكيل المساعد لشبكات النقل الكهربائية
الادارة الفنية المختصة (2)
ادارة العقود والمناقصات (2)
السجل

2- Taking Over & Acceptance Certificate:

MINISTRY OF ELECTRICITY & WATER & RENEWABLE ENERGY

وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewal
State of Kuwait | دولة الكويت

وزارة الكهرباء والماء والطاقة المتجددة

شهادة استلام وقبول (جزء من الأعمال)

TAKING OVER AND ACCEPTANCE CERTIFICATE

Contractor		المقاول :
Contract No.	**Contract No.**	رقم العقد :
Contracting Date		تاريخ العقد :
Subject of Contract		موضوع العقد :
Reference		تاريخ الشهادة :
Certificate No.		رقم الشهادة :

Subject to the General Contract Conditions and Accordance with the provisions of Article ( ) and with regard to the following works :

بموجب شروط العقد العامه ، وعملا بحكم الماده ( ) فيما يعود للاعمال التالية :

Maintenance and Repair of 400/300/132kV Substations

The "Engineer" hereby certifies that as the contractor has completed the above referred to works in accordance with thecontract requirements excluding "Exceptions" below and whereas the Taking Over and Acceptance Test have been carried out successfully, the following have been considered:

(a) The date of Taking Over and Acceptance is to be : Prev

The period of guarantee maintenance shall commence from the date. and shall last for a period: **(6) Months** .

(b) Monies due to Contactor on Taking Over and Acceptance of the referred to works as per Contract Conditions may now be paid.

Exceptions

NILL

يشهد المهندس بأنه لما كان المقاول قد انجز الاعمال المذكوره اعلاه بما يطابق ما يقتضيه العقد باستثناء ما هو مفصل ادناه وحيث ان فحوص الاستلام والقبول قد تم اجراؤها بنجاح تام فقد تقرر اعتبار الامور التالية :

أ – تاريخ الاستلام والقبول للاعمال هو : .

ب – تبدأ فتره الضمان والصيانة من تاريخ : استلام الاعمال .

وتستمر لمدة : .

ج – مستحقات المقاول عند صدور شهادة الاستلام والقبول طبقا لما هو مقرر فى شروط العقد يمكن دفعها الان .

استثناءات :

الوكيل المساعد لشبكات النقل الكهربائية	المهندس
AUS for TEN	**The Engineer**

تعتمد وتصدر طبقا لشروط العقد

Approved and issued as per Contract Conditions

وكيل الوزارة

Under Secretary

3- F/F Isolation & Normalization Requests

وزارة الكهرباء والماء والطاقة المتجددة
Ministry of Electricity & Water & Renewable Energy
State of Kuwait | دولة الكويت

Primary Substation Maintenance Department

F/F Isolation Request

F/F Isolation is required for the following S/stn for Preventive Maintanence/Overhauling/Repair Works/General Checking

Name of S/stn. : .....

Date of Isolation Required : .....

F/F Isolation carried out by : .....

Any Precaution suggested or Remarks for F/F Isolation:

Any Remarks :

Engineer Name: .....

Mobile No.: .....

Signature: .....

Date: .....

Note : 1) This request form has to be submitted at least 7 working days before the date of isolation to F/F Section Head.

2) Please submit Normalization request immediately after completing the work. If not submitted, the concerned Engineer will be responsible for any abnormal incident in the Substation.

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Ministry of Electricity and Water

Primary Substation Maintenance Department

F/F Normalization Request

F/F Normalization is required for the following S/stn after Preventive Maintanence/Overhauling/Repair Works/General Checking

Name of S/stn. : .....

Date of Normalization Required : .....

F/F Normalization carried out by : .....

Any Precaution suggested or Remarks for F/F Normalization:

Any Remarks :

Engineer Name: .....

Mobile No.: .....

Signature: .....

Date: .....

4-LOTO (lockout/Tagout)

5- Safety Signs:


DANGER
Explosions and fire hazards.
NO smoking or open flames.

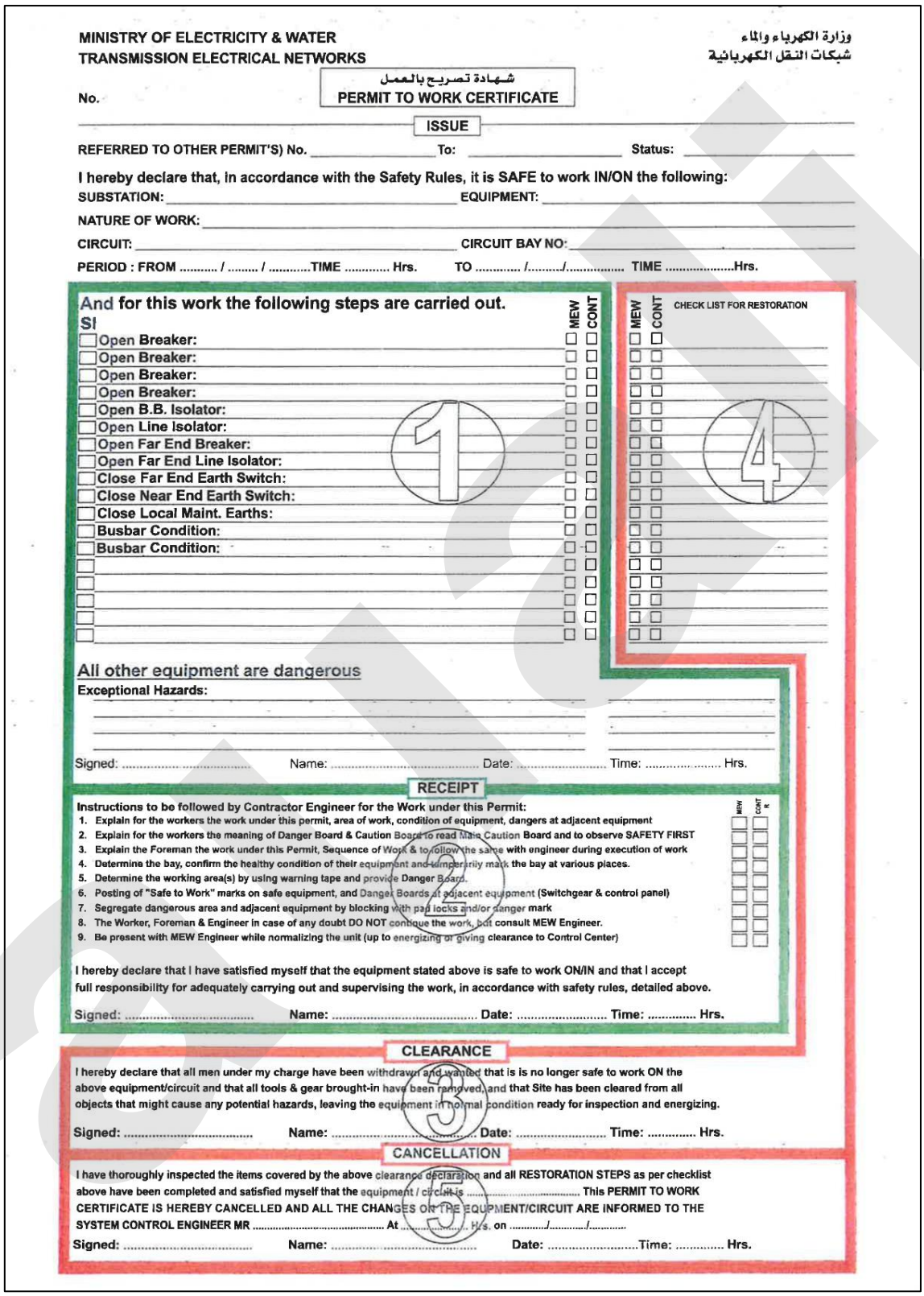

CAUTION
Do not operate


WARNINIG
Renovation Work
Do not enter
work area.


منطقة عمل
WORKING AREA


تحذير
دائرة أحادية التغذية
ممنوع العمل
WARNING
SFC - SINGLE FEED CIRCUIT
NO WORK ALLOWED

5- Permit to Work (PTW):



MINISTRY OF ELECTRICITY & WATER
TRANSMISSION ELECTRICAL NETWORKS

وزارة الكهرباء والماء
شبكات النقل الكهربائية

No.

شهادة تصريح بالعمل
PERMIT TO WORK CERTIFICATE

ISSUE

REFERRED TO OTHER PERMIT'S) No. _____ To: _____ Status: _____

I hereby declare that, in accordance with the Safety Rules, it is SAFE to work IN/ON the following:

SUBSTATION: _____ EQUIPMENT: _____

NATURE OF WORK: _____

CIRCUIT: _____ CIRCUIT BAY NO: _____

PERIOD : FROM ..... / ..... / .....TIME ..... Hrs. TO ..... /...../..... TIME .....Hrs.

And for this work the following steps are carried out.

SI

	MEW	CONT
☐ Open Breaker:	☐	☐
☐ Open Breaker:	☐	☐
☐ Open Breaker:	☐	☐
☐ Open Breaker:	☐	☐
☐ Open B.B. Isolator:	☐	☐
☐ Open Line Isolator:	☐	☐
☐ Open Far End Breaker:	☐	☐
☐ Open Far End Line Isolator:	☐	☐
☐ Close Far End Earth Switch:	☐	☐
☐ Close Near End Earth Switch:	☐	☐
☐ Close Local Maint. Earths:	☐	☐
☐ Busbar Condition:	☐	☐
☐ Busbar Condition:	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐

1

CHECK LIST FOR RESTORATION

MEW	CONT
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐
☐	☐

4

All other equipment are dangerous

Exceptional Hazards:

Signed: ..... Name: ..... Date: ..... Time: ..... Hrs.

RECEIPT

Instructions to be followed by Contractor Engineer for the Work under this Permit:

	MEW	CONT R
1. Explain for the workers the work under this permit, area of work, condition of equipment, dangers at adjacent equipment	☐	☐
2. Explain for the workers the meaning of Danger Board & Caution Board to read Main Caution Board and to observe SAFETY FIRST	☐	☐
3. Explain the Foreman the work under this Permit, Sequence of Work & to follow the same with engineer during execution of work	☐	☐
4. Determine the bay, confirm the healthy condition of their equipment and temporarily mark the bay at various places.	☐	☐
5. Determine the working area(s) by using warning tape and provide Danger Board.	☐	☐
6. Posting of "Safe to Work" marks on safe equipment, and Danger Boards at adjacent equipment (Switchgear & control panel)	☐	☐
7. Segregate dangerous area and adjacent equipment by blocking with pad locks and/or danger mark	☐	☐
8. The Worker, Foreman & Engineer in case of any doubt DO NOT continue the work, but consult MEW Engineer.	☐	☐
9. Be present with MEW Engineer while normalizing the unit (up to energizing or giving clearance to Control Center)	☐	☐

I hereby declare that I have satisfied myself that the equipment stated above is safe to work ON/IN and that I accept full responsibility for adequately carrying out and supervising the work, in accordance with safety rules, detailed above.

Signed: ..... Name: ..... Date: ..... Time: ..... Hrs.

2

CLEARANCE

I hereby declare that all men under my charge have been withdrawn and warned that is is no longer safe to work ON the above equipment/circuit and that all tools & gear brought-in have been removed, and that Site has been cleared from all objects that might cause any potential hazards, leaving the equipment in normal condition ready for inspection and energizing.

Signed: ..... Name: ..... Date: ..... Time: ..... Hrs.

3

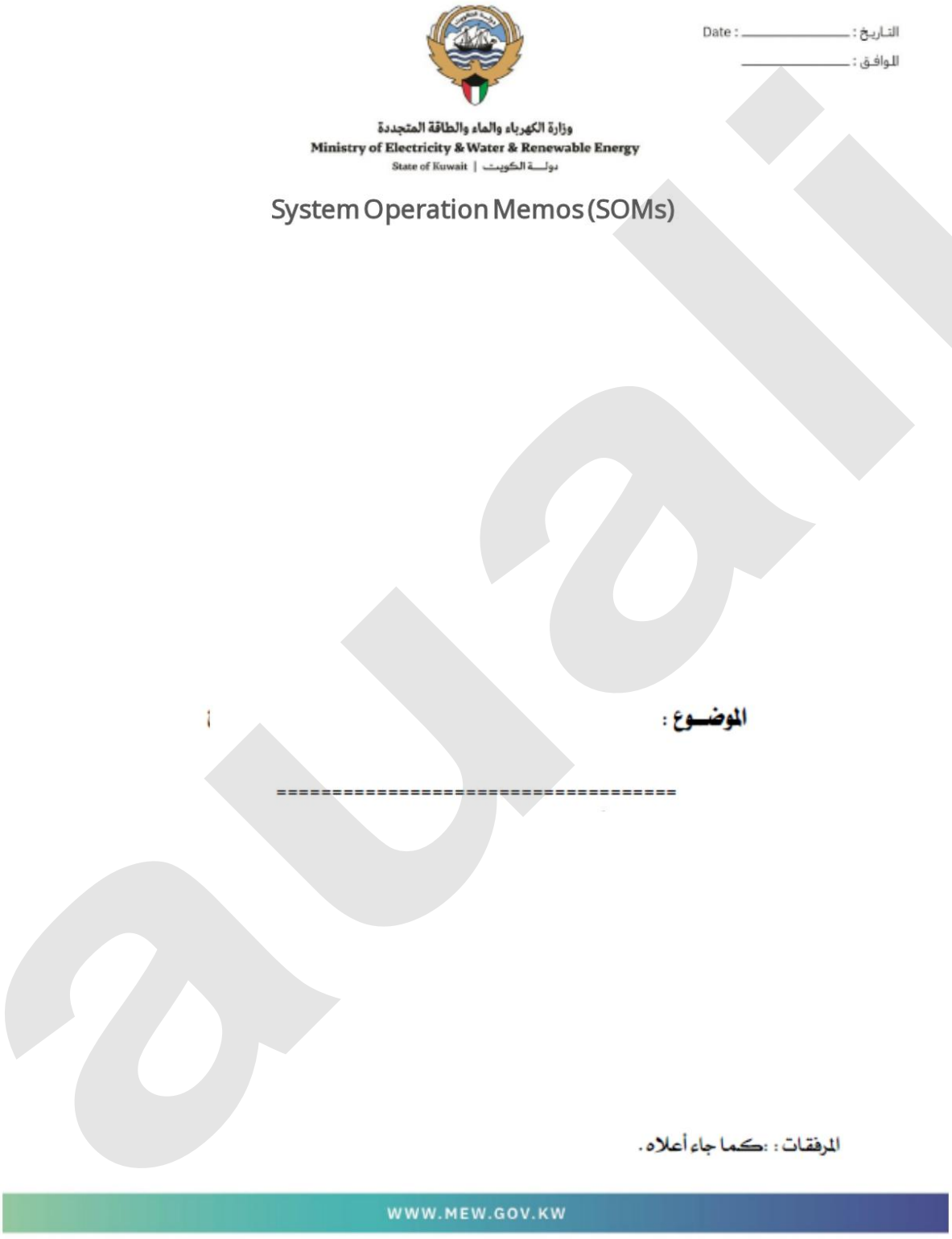
CANCELLATION

I have thoroughly inspected the items covered by the above clearance declaration and all RESTORATION STEPS as per checklist above have been completed and satisfied myself that the equipment / circuit is ..... This PERMIT TO WORK CERTIFICATE IS HEREBY CANCELLED AND ALL THE CHANGES ON THE EQUIPMENT/CIRCUIT ARE INFORMED TO THE SYSTEM CONTROL ENGINEER MR ..... At ..... Hrs. on ...../...../.....

Signed: ..... Name: ..... Date: .....Time: ..... Hrs.

5

6- System Operation Memos (SOM):



التاريخ : _____ :Date

الموافق : _____

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System Operation Memos (SOMs)

الموضـوع :

==========

المرفقات : :كما جاء أعلاه.

WWW.MEW.GOV.KW

7- Emergency Response Plan (ERP):

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Emergency Response Plan (ERP) Form

1. General Information

Date	
Time of Incident	
Location	
Site Supervisor	
ERP Coordinator	
Project Name	

2. Emergency Contacts

Fire Department / Civil Defense	Phone:
Ambulance / EMS	Phone:
Local Police	Phone:
Nearby Hospital	Phone:
MEW Control Center	Phone:
HSE Department Contact	Phone:
Other	Phone

3. Nature of Emergency

☐ Fire
☐ Electrical Shock
☐ Explosion
☐ Gas Leak
☐ Structural Collapse
☐ Environmental Hazard
☐ Other: _____

4. Initial Emergency Actions

☐ Alarm activated
☐ Control Center Informed
☐ Area Evacuated
☐ First Aid Given
☐ Firefighting Started
☐ Emergency Services Contacted

5. Evacuation & First Aid

Assembly Point Location: _____

First Aid Provided By: _____

7- Emergency Response Plan (ERP):

Injured Persons (Name, Injury Type, Action Taken):

6. Additional Notes / Observations

8. Signatures

MEWRE Engineer	Signature: _____ Date: _____
Site Supervisor Engineer	Signature: _____ Date: _____

8- Safety precautions example:

9- Personal Protective Equipment's examples (PPE) :