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APPROVALS

	Name	Designation	Signature
Prepared by	Umair Ahmed	AM PSM – CHSEQ	
	Yasir Tanveer	DGM – CHSEQ	
Reviewed by	Sheraz Ahmed	GM – CHSEQ	
	Asif Mateen	GM HSE – G&T	
	Muhammad Umar Ali	Head of HSEQ-D	
	Rizwan Ahmed	Head of CHSEQ	
	Abbas Husain	Chief Generation & Transmission Officer	
	Syed Fawad Ali Gilani	Chief Distribution Officer	
	Sheraz Kashif	Chief Supply Chain Officer	
	Wahid Asghar	Chief of Security	
Approved by	Syed Moonis Abdullah Alvi	Chief Executive Officer	

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1.0 **PURPOSE**

This procedure provides guidelines to protect personnel by preventing or controlling access to hazard/ high risk work areas by the installation and maintenances of barricades and safety signs. It defines the requirements for and appropriate methods and types of barricades and safety signs to be opt and utilized at K-Electric. This procedure details the application of:

- The requirement of hard/ soft barricades
- Types of Barricade Tape
- Types of Safety Signs
- Appropriate signs to be used to highlight the magnitude of hazard

2.0 **SCOPE**

This procedure shall be applicable to all KE, OSP, Contractors/ PQC employees across all Business Unit.

3.0 **BARRICADES**

Barricades can be classified as either soft barricade or hard (solid) barricade.

3.1 **Soft Barricade**

Soft barricades are those that use an appropriate tape to prevent or restrict access to an area. There are four types of soft barricades at K-Electric. They are to be used to identify and protect personnel from general hazards and also those which are high risk and may pose a risk to life and health.

3.1.1 **Caution Barricade Tape**

The caution tape shall be used to highlight minor hazards to other personnel that may need to access the area. Any person may access into a caution barricaded area as long as they have familiarized themselves with the hazards detailed on the barricade signage and implemented any controls indicated on the signage/ tags.



Figure 1 Caution Tape

3.1.2 **Restricted Access Barricade Tape**

This restricted access tape restricts access to the barricaded work area by any individual except area owner. This tape shall be used for high potential danger such as naked LT, HT or EHT wires/ lines uncovered hot surfaces, falling objects and unprotected edges.

Access inside restricted access barricaded area can only be made after seeking permission (at least verbal is must) from Respective Location or Area Owner/ Site Supervisor/ Shift In-charge/ Area Operator.

Location/Area owner or Site Supervisor must ensure all non-authorized individuals are kept outside this barricade while maintenance supervisors must ensure their manpower respects this barricade and does

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not tress pass it without seeking permission.



Figure 2 Restricted Access Barricade Tape

3.1.3 High Voltage Testing Barricade Tape

- A high voltage testing barricade shall be erected around electrical equipment that is under test to provide a minimum safe approach distance for untrained persons.
- Where testing is performed inside metal clad switchgear or similar enclosed spaces, barricading is not required, provided the testing area is not left unattended and a red flashing light is used when test voltages are applied.
- Flashing red lights shall be installed and activated when test voltages are applied



Figure 3 High Voltage Barricade Tape

3.1.4 Radiation Affected Zone Barricade Tape

This barricade tape must specifically be used to highlight radiation hazard to all individuals. Radiation affected zone barricade tape shall be placed by person who is supervising the activity from KE like Competent Person (in Generation Plants) or Shift In-Charge/ Area Owner (in other locations and facilities of KE). Barricade signage should specifically mention “Radiation Hazard” as a reason behind barricade.

NO INDIVIDUAL (including area owner) is allowed to tress pass this barricade without seeking permission from on duty person who is supervising the Radiography Activity from KE.

Competent Person (for Generation Plant) or Shift In-Charge/ Area Owner (in other locations and facilities of KE) shall inform Senior Authorized Person (SAP)/ Location Owner regarding the planned Radiography in specific area, date, and time period. SAP/ Location Owner shall issue an e-mail to all relevant regarding this planned activity.

All supervisors/ in charges are responsible for adequately informing their employees about the planned radiography.



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Figure 3 Radiation Affected Zone Barricade Tape

3.1.5 Safety Cones

- Orange/ White colored Safety cones can be opted as barricade where work is being carried out in public areas (roads) with the help of vehicle like MTL (Mobile Transport Ladder).
- All the works where MTL is not used as the primary source for the activity, other barricade shall be used as defined in the procedure

3.2 Hard (Solid) Barricade

A hard barricade is a physical structure such as scaffold pipes that prevent or restrict access to an area. If scaffold pipes are being used as barricade, then it should have top, mid and toe rail installed as per standard height used for scaffolds.

The purpose of a solid barricade is to provide a physical barrier capable of performing the same function as a permanent guardrail

Where solid barricades are used, they shall be accompanied with signs to communicate the hazard information. In addition, appropriate barricade tape may be used to highlight the existence of the barricaded area.

Hard (solid) Barricade installation shall be made mandatory for those areas where hazards are present for long tenure and cannot be rectified for days, weeks or month such as, trenches, excavations (highways, roads, streets), uncovered drain channels etc. Approach Roads, road crossing etc.



4.0 ERECTION AND USE OF BARRICADE

The barricade shall encompass the entire potentially affected area of the hazard and consider factors such as:

- possible deflection of an object if it falls
- slag or sparks created from hot work activities
- distance from the hazard
- creating an additional hazard, for example, access and egress. Sites shall make sure that barricades are erected so that all sides of the hazard are protected from unauthorized access

All barricades shall be accompanied by an appropriate sign, which is to be placed on all access points. For details, refer to **Section 6.0 – Barricade Tag/ Signage**

Signs or tags shall clearly display the following information:

- the name of the person in charge of the barricaded area
- the hazards that are within the barricaded area
- the date and time
- the contact details of the person in charge of the area

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It shall be ensured that where soft barricading is used to provide a means of restricted access around a penetration or an unprotected edge, it is to be located at least two (2) meters from the outside of the edge.

Note: Where work is being carried out in public areas, roads etc., soft barricade shall be located at a minimum of 01 meter from the outside edge.

5.0 METHOD OF BARRICADING

5.1 Caution Barricade

Caution barricade tape shall be erected to inform personnel of an uncontrolled hazard within the barricaded area. The caution barricade tape is not suitable for medium, high, or extreme risk hazards. It is only suitable for minor hazards where the main control is for personnel to be aware of the hazard.

Examples of suitable hazards that can be controlled by Caution barricades include:

- Trip hazards,
- Covered hot surfaces,
- Maintenance job on equipment
- Minor/ Drop wise leak
- Poor housekeeping zone

Caution barricades are not to prevent personnel from entering the barricaded area. They are to highlight the hazard so that personnel are well aware of the hazards while inside the barricade. This tape is not appropriate for height and unprotected edge hazards. The appropriate signage/ tag as mentioned in Section 6.0 of this procedure, shall always be attached to a caution barricade.

5.2 Restricted Access Barricade

Restricted access barricades shall be erected to prevent unauthorized personnel from accessing the barricaded area. The intent is that only the Area owner has access to the area while the hazard is present and uncontrolled.

This barricade is suitable to use to restrict access from hazards such as:

- Hot Work
- Persons working above / falling objects
- Medium/ Major Spills / leaks
- General delineation of a work area (e.g., cluttered access etc.)
- Unprotected edges creating a fall risk
- Electrical Hazard
- Excavation/ Trenches
- Around swing radius of equipment with a rotating superstructure
- Toxic Environment

Access inside restricted access barricaded can only be made after seeking permission from Respective Location or Area Owner/ Site Supervisor/ Shift In-charge/ Area Operator. The appropriate signage/ tag as mentioned in Section 6.0 of this procedure, shall always be attached to a caution barricade.

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5.3 High Voltage Testing Barricade

Refer to Section 3.1.3.

5.4 Radiation Affected Zone Barricade

Refer to Section 3.1.4.

5.5 Hard (Solid) Barricade

Refer to Section 3.2.

Note: Where barricades are installed across roadways and will remain in place during hours of darkness, the barricade shall be fitted with flashing lights to identify the barricade / traffic obstruction.

6.0 BARRICADE TAG/ SIGNAGE

All barricades must be fitted with tags to explain the hazards inside the barricade.

6.1 Caution Barricade Tag

This tag has to be signed and placed on caution barricade by respective Area Operator (for Generation Plant) and Location Supervisor (for other KE Locations)

Shift In-charge (for Generation & Transmission) and Location Owner (for other KE Locations) should ensure all vicinity of hazard has been properly cordoned off.

6.2 Restricted Access Barricade Tag

This tag has to be signed and placed on restricted access barricade by respective Area Operator (for Generation Plant) and Location Supervisor (for other KE Locations)

Shift In-charge (for Generation & Transmission) and Location Owner (for other KE Locations) should ensure all vicinity of hazard has been properly cordoned off.

6.3 High Voltage Testing Barricade Tag

This tag has to be signed and placed on Danger (restricted access) barricade – Electrical Hazard by respective Area Operator (for Generation Plant) and Location Supervisor (for other KE Locations)

Shift In-charge (for Generation & Transmission) and Location Owner (for other KE Locations) should ensure all vicinity of hazard has been properly cordoned off.

6.4 Radiation Affected Zone Barricade Tag

Radiation affected zone will be calculated and highlighted by a person who is supervising the activity from KE such as Competent Person (in Generation Plants) or Shift In-Charge/ Area Owner (in other locations and facilities of KE). He shall get the barricade tape placed.

This tag has to be signed and placed by Area Operator (for Generation Plant) and Location Supervisor (for other KE Locations) on Radiation Affected Zone Barricade after signature by a person who is supervising the activity from KE such as Competent Person (in Generation Plants) or Shift In-Charge/ Area Owner (in other locations and facilities of KE)

Person who is supervising the activity from KE such as Competent Person (in Generation Plants) or Shift In-

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Charge/ Area Owner (in other locations and facilities of KE) should ensure all vicinity of hazard has been properly cordoned off.

Note: Tags should be placed on barricade tape, at various entry points adequately so that all access points get covered

7.0 BARRICADE TAG SIZE

All barricade tag shall be standardized across KE with below measurement.



8.0 WATCH LIGHTS/ NIGHT LIGHTS

Where barricades are installed across roadways and will remain in place during night hours of darkness, the barricades shall be fitted with flashing lights (preferably Battery Operated/ Photocell) to identify the barricade/ traffic obstruction. This shall be in addition to the barricading and display of safety signage at the working location / area under work.

9.0 SAFETY SIGNS

Safety Professionals believes that it is critical to effectively communicate the safety. Safety signs plays a vital role in achieving this objective. They are the visual tools use to:

- Remind people of potential hazards and how to avoid them
- Point people to the location of emergency equipment
- Direct people's path to safety in an emergency situation
- Reinforce safety training programs
- Inform people of security and limited access policies

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9.1 Types of Safety Signs

9.1.1 Prohibition/ Danger Sign

A sign prohibiting behavior likely to increase or cause danger (e.g., no access for unauthorized persons'). Danger signs shall be used only where an immediate hazard exists.

Danger signs shall have red as the predominating color for the upper panel; black outline on the borders; and a white lower panel for additional sign wording.

Intrinsic features:

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



9.1.2 Caution Sign

A sign giving warning of a hazard or danger. Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices.

The standard color of the background shall be yellow, and the panel, black with yellow letters. Any letters used against the yellow background shall be black.

Intrinsic features:

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



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9.1.3 Notice and Mandatory Sign

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

Mandatory Sign Intrinsic features:

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



9.1.4 Safety Instruction Sign

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



9.1.5 Emergency Escape Sign

A sign giving information on emergency exits, first aid, or rescue facilities. i.e., emergency exit/ escape route.

Escape signs, when required, shall be lettered in legible red letters, not less than 6 inches high, on a white field and the principal stroke of the letters shall be at least three-fourths inch in width.

Intrinsic feature. rectangular or square shape.



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9.1.6 Directional Sign

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



9.1.7 Fire Safety Signs

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

Intrinsic features:

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



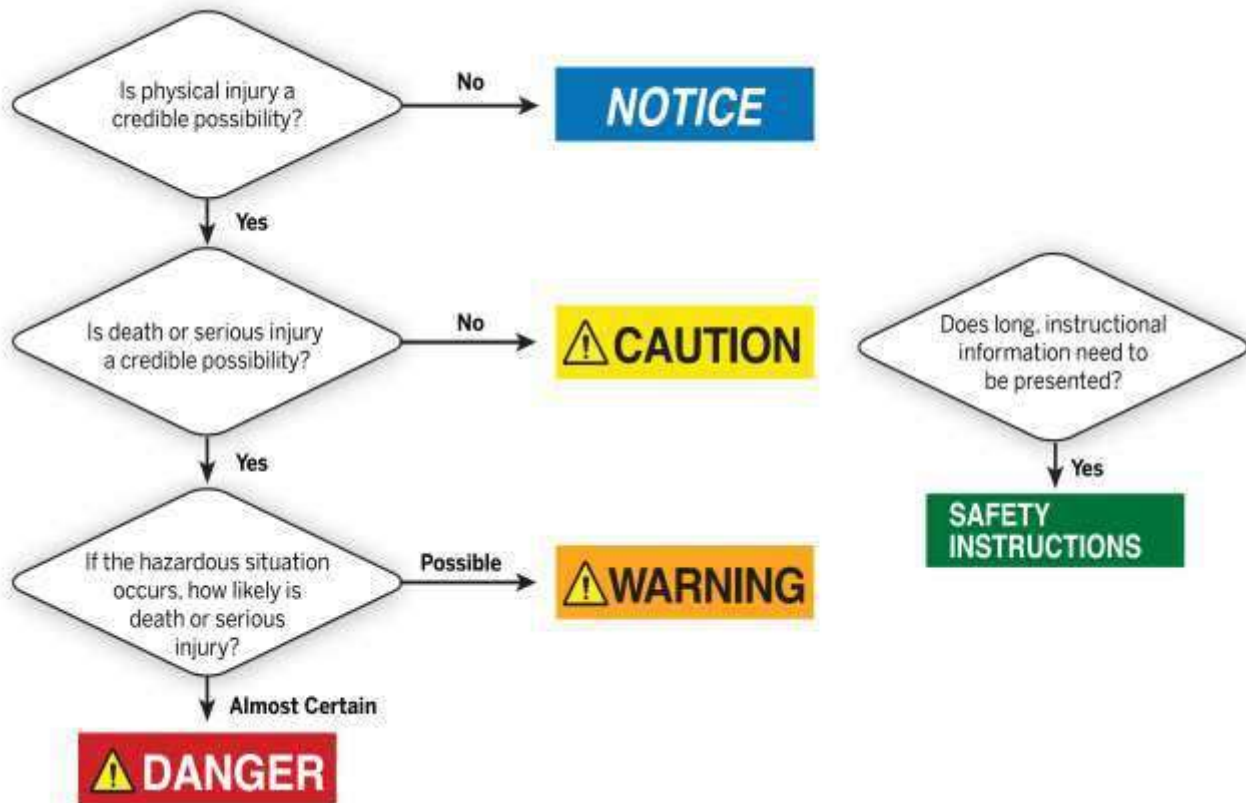
9.1.8 Traffic Directional Sign

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



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9.2 How to select a right sign to match risk level?



9.3 Safety Sign Format

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

Following are the standard formats of safety signs.



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9.4 Old Vs New Safety Sign

9.4.1 Old OSHA/ ANSI Sign



9.4.2 New OSHA/ ANSI Sign





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10.0 REFERENCES

- **OSHA 1910.144** - Safety color code for marking physical hazards.
- **OSHA 1910.145** – Specifications for accident prevention signs and tags.
- **ANSI Z535.5-2022** - Safety Tags and Barricade Tapes (For Temporary Hazards)

11.0 ATTACHMENTS

1. Caution Barricade Tag
2. Danger (Restricted Access) Barricade Tag
3. Radiation Effectuated Zone Barricade Tag
4. Danger Tag Electrical Hazard Barricade Tag



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Caution Barricade Tag

		
 CAUTION		
		
Detail of Hazards: _____		

Consequence: _____		

Special Precautions: _____		

Date: _____ Time: _____		
Area Operator/ Location Owner: _____		
PLEASE READ/ UNDERSTAND ALL HAZARDS BEFORE PROCEEDING		

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Danger (Restricted Access) Barricade Tag

DANGER	
Detail of Hazards: _____	

Consequence: _____	

Special Precautions: _____	

Date: _____	Time: _____
Area Operator/ Location Owner: _____	
DONOT TRESPASS THE BARRICADED AREA WITHOUT PERMISSION	

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Radiation Effected Zone Barricade Tag


 CAUTION
RADIATION HAZARD
Detail of Hazards: _____
Consequence: _____
Special Precautions: _____
Date: _____ Time: _____
Compotent Person (In Plants) _____
Area Operator _____
DONOT TRESPASS THE BARRICADED AREA WITHOUT PERMISSION

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Danger Tag Electrical Hazard Barricade Tag





DANGER



ELECTRICAL
HAZARD

Detail of Hazards: _____

Consequence: _____

Special Precautions: _____

Date: _____

Time: _____

Maintenance Engineer _____

Grid In-charge/ Shift In-Charge/ Area In-Charge _____

DONOT TRESPASS THE BARRICADED AREA WITHOUT
PERMISSION

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