

## PROJECT DETAILS

**ACTIVITY– MEDIUM-VOLTAGE SWITCHGEAR TESTING AND COMMISSIONING**

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Serial No.	Sub-Activities	Hazards Identified (Generic & Task)	Risks Involved (People & Property)	Risk Rating			Control Measures	Residual Risk
				Severity	Probability	Initial Risk		
1.	Prepare work area	<ul style="list-style-type: none"> <li>Unauthorized, untrained workers</li> </ul>	<ul style="list-style-type: none"> <li>Cuts</li> <li>Abrasions</li> </ul>	2	A	L	<ul style="list-style-type: none"> <li>TBT/DSTI shall be conducted by the foreman/ safety officer prior to work commencement</li> <li>Task specific safety training to be provided</li> <li>Authorized personnel to undertake the job</li> <li>Daily safety inspection should be carried and eliminate the hazard.</li> </ul>	Low (ALARP)
2.	Manual Handling	<ul style="list-style-type: none"> <li>Incorrect lifting of loads</li> <li>Sharp edges.</li> <li>Placing the object while fingers underneath.</li> <li>Slip/trip/fall ( same level )</li> <li>Unsafe posture</li> </ul>	<ul style="list-style-type: none"> <li>Back Injuries</li> <li>Cut to finger</li> <li>Strain</li> <li>Musculoskeletal Injuries</li> </ul>	3	C	M	<ul style="list-style-type: none"> <li>Any lifting tasks shall be carried out by persons physically capable to do so</li> <li>No employee should be asked to carry loads above his capacity and in any case no load shall exceed 30kg per man.</li> <li>Mass of the load is more then to be equally shared</li> <li>Deploy enough number of personnel for lifting shall be appointed to the task depending upon the type of load to be lifted.</li> <li>Use easy mode of transport like trolley etc.</li> <li>Load not to be lifted above your shoulder Height</li> <li>Keep your fingers away from pinch point While placing the load.</li> <li>Materials shall not be carried in pedestrian access.</li> <li>Area shall be illuminated with adequate lighting.</li> <li>Proper personal protective equipments to be used while manual handling of materials and loads.</li> </ul>	Low (ALARP)

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3.	Stacking and Storing	<ul style="list-style-type: none"> <li>Unauthorized, untrained workers</li> <li>Material fall from height</li> <li>Improper stacking</li> <li>Collapse of materials</li> </ul>	<ul style="list-style-type: none"> <li>Crush</li> <li>Cut and abrasion</li> <li>Damage to property</li> </ul>	3	B	M	<ul style="list-style-type: none"> <li>All materials shall be stored below 2 meter height.</li> <li>If the material is too heavy, use hydraulic trolley to shift the material.</li> <li>No storage of materials shall be done in the work place, only required quantity to be taken for the job.</li> <li>Personnel protective equipment must wear at all time during the activity. (Helmet, shoe, vest, overall, gloves, goggles, mask.)</li> </ul>	Low (ALARP)
4.	Testing & commissioning using by multi meter, megger insulator tester	<ul style="list-style-type: none"> <li>Unauthorized/ untrained Person</li> <li>Faulty Instrument</li> <li>Improper identification</li> <li>Electrocution</li> </ul>	<ul style="list-style-type: none"> <li>Electric shock and Burns</li> <li>Cut and abrasion</li> </ul>	3	B	M	<ul style="list-style-type: none"> <li>PTW shall be applied and obtained prior to start work</li> <li>Trained person only to do the testing.</li> <li>Ensure that the circuit is not live before using the instrument.</li> <li>Calibrated / certified instrument only shall be used.</li> <li>Warning boards should be provided and Barricaded.</li> <li>Lock out tag out ( LOTO) procedure to be followed during testing &amp; commissioning.</li> <li>Emergency procedure shall be briefed to all personnel prior to start the activity.</li> <li>Emergency evacuation plan shall be readily available according to site condition and briefed to the workforce prior to start.</li> <li>Trained first aider, fire warden and emergency vehicle shall be available at all times while during night work.</li> </ul>	Low (ALARP)

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5.	Working with electricity	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Conductors ( water, metal, concrete )</li> <li>• Broken wires</li> <li>• Improper plug, case</li> <li>• Overloading</li> </ul>	<ul style="list-style-type: none"> <li>• Electrocutation or death</li> <li>• Burns and shocks</li> <li>• Muscle contraction</li> <li>• Heart , lung Paralysis</li> <li>• Fire</li> </ul>	4	B	M	<ul style="list-style-type: none"> <li>• Only those persons who have been adequately trained and experienced in the work of electricity to allow for the same.</li> <li>• Electrical work shall not carry out in wet conditions.</li> <li>• Do not overload to the circuits.</li> <li>• Communicate to all personnel about testing &amp; commissioning.</li> <li>• Don't use homemade electrical accessories and use industrial type only.</li> <li>• Disconnect main supply before commencing of work.</li> <li>• Defective tools and equipment should not be used, report it and replaced it immediately.</li> <li>• Temporary power supply shall be taken through standard rated MCBs &amp; RCBs.</li> <li>• Temporary power supply cables shall not have joints.</li> <li>• Barricade the location and signage to be placed where circuits and equipment's are energized.</li> <li>• PPE should worn at all-time where working in energized circuits. ( Insulated gloves, Electric resistivity shoe )</li> </ul>	Low (ALARP)
6.	Working in near floor openings	<ul style="list-style-type: none"> <li>• Material/equipment fall from height</li> <li>• Slip/trip/fall</li> </ul>	<ul style="list-style-type: none"> <li>• Fatality</li> <li>• Property Damage</li> <li>• Fracture</li> </ul>	4	B	M	<ul style="list-style-type: none"> <li>• PTW shall be applied and obtained prior to start work</li> <li>• Authorized person to do the job.</li> <li>• Rigid barrication and toe board to be provided to all external edges and where a fall can occur.</li> </ul>	Low (ALARP)

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							<ul style="list-style-type: none"> <li>•Warning signboards shall be provided in those areas.</li> <li>•PPE shall be used at all times ( Helmet, Shoes, Vest, Overall, Harness )</li> </ul>	
7.	Working with ladder	<ul style="list-style-type: none"> <li>• Person/ material falling from height</li> <li>• Over reaching</li> <li>• Over loading</li> <li>• Obstructing the access way</li> <li>• Slippery or uneven surface</li> </ul>	<ul style="list-style-type: none"> <li>• Sprain and strain</li> <li>• Fracture</li> <li>• Injury to the person</li> </ul>	3	C	M	<ul style="list-style-type: none"> <li>• The ladder should extend minimum one meter from the top for safe movement</li> <li>• Heavy materials should not be carried</li> <li>• Do not erect in slippery, uneven surface</li> <li>• Should be set up with a 4 vertical to 1 horizontal slope ( 4:1 )</li> <li>• Inspection and maintenance to be registered and recorded by the store keeper</li> <li>• Step ladder must fully open and lock and the devices shall be as per manufacturer</li> <li>• Defective ladder should not be used and report it immediately</li> <li>• Do not work from the top of two rungs</li> <li>• Remember the 3 point contact</li> <li>• Do not work in front of the door. If work is carried then locked the door or blocked off</li> <li>• Ladder to be used for short duration works only limited to 15 min.</li> <li>• Colour coded system to be implemented</li> </ul>	Low (ALARP)
8.	Working with Hand tools ( Screw driver, pliers, spanner )	<ul style="list-style-type: none"> <li>• Slip, trip and fall</li> <li>• Damaged warn out hand tools</li> <li>• Flying objects</li> <li>• Mushroom Heads</li> <li>• Using incorrect type</li> </ul>	<ul style="list-style-type: none"> <li>• Fatigue</li> <li>• Trigger finger</li> <li>• Cuts and abrasions</li> </ul>	3	C	M	<ul style="list-style-type: none"> <li>• Defective tools should not be issued or used to perform the task, shall be checked by store keeper.</li> <li>• Don't extend the spanner by using a pipe as an extension bar.</li> </ul>	Low (ALARP)

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							<ul style="list-style-type: none"> <li>• Hand tools shall be free from oil, grease &amp; etc.</li> <li>• Chisel's head shall have safety cap to avoid finger injury.</li> <li>• Never use a file as a lever</li> <li>• Never use a screw driver as a chisel</li> <li>• Use eye/ face protection when there is flying materials hazard, wear gloves while required to protect the hands</li> <li>• Use right tools for the job</li> </ul>	
9.	While working at night shift	<ul style="list-style-type: none"> <li>• Poor illumination</li> <li>• Slip/trip/fall</li> </ul>	<ul style="list-style-type: none"> <li>• Fatality</li> <li>• Cuts</li> </ul>	3	B	M	<ul style="list-style-type: none"> <li>• Work notification shall be applied and obtained prior to start the night work from contractor.</li> <li>• Adequate illumination shall be provided</li> <li>• light post to be secured from fall</li> <li>• Proper cable management system shall be followed</li> <li>• All materials shall be staged in proper manner without obstacles.</li> </ul>	Low (ALARP)
10.	Working in hot weather	<ul style="list-style-type: none"> <li>• Heat Stress</li> </ul>	<ul style="list-style-type: none"> <li>• Dehydration</li> <li>• Sunburn</li> <li>• Skin Cancer</li> </ul>	2	B	M	<ul style="list-style-type: none"> <li>• Drink plenty of water</li> <li>• Employees shall be trained about heat stress symptoms &amp; first aid measures.</li> <li>• Avoid highly physical tasks during the hottest part of the day</li> <li>• Isotonic drinks to be provided</li> <li>• Provide sufficient rest breaks based on the humidity &amp; temperature conditions.</li> <li>• Heat stress management plan shall developed and implement during the activity.</li> </ul>	Low

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11.	Work Completion	<ul style="list-style-type: none"> <li>• Poor housekeeping</li> <li>• Slip/trip/fall</li> </ul>	<ul style="list-style-type: none"> <li>• Fire</li> </ul>	2	A	L	<ul style="list-style-type: none"> <li>• General housekeeping, Remove all surface, unwanted waste materials from the building</li> <li>• All necessary precautions will be adopted to prevent fire</li> </ul>	Low (ALARP)

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### RISK MATRIX

					Probability				
					A	B	C	D	E
Severity	People	Assets	Environment	Reputation	Improbable 1 in 100,000 Years	Remote 1 in 10,000 Years	Occasional 1 in 1000 years	Probable 1 in 100 years	Frequent 1 in 10 years
5-Catstrophic	Multiple fatalities or permanent total disabilities	Extensive damage	Massive effect	International impact	<b>Medium Risk (ALARP)</b>	<b>Medium Risk (ALARP)</b>	<b>Medium Risk (ALARP)</b>	<b>High Risk</b>	<b>High Risk</b>
4-Severe	Single fatalities or permanent total disabilities	Major damage	Major effect	National impact					
3-critical	Major injury or health effects	Local damage	Localised effect	Considerable impact					
2-Marginal	Minor injury or health effects	Minor damage	Minor effect	Minor impact					
1-Negligible	Slight injury or health effects	Slight Damage	Slight effect	Slight impact					
					<b>Low Risk</b>				

<b>HIGH</b>	<b>3-E</b> <b>4-C,D,E</b> <b>5-B,C,D,E</b>
<b>MEDIUM</b>	<b>1-D,E</b> <b>2-B,C,D,E</b> <b>3-A,B,C,D</b> <b>4-A,B</b> <b>5-A</b>
<b>LOW</b>	<b>1-A,B,C</b> <b>2A</b>