

**PROJECT NAME & LOGO**

**ACTIVITY– Transformer 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 to 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>Area to 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.	Working with Hand tools.	<ul style="list-style-type: none"> <li>• Slip, trip and fall</li> <li>• Damaged worn 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, to be checked by store keeper</li> <li>• Don't extend the spanner by using a pipe as an extension bar</li> <li>• Never use a file as a lever</li> <li>• Never use a screw driver as a chisel</li> <li>• Don't work with oily or greased hands</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> <li>• Keep hammer heads tightly wedged on their shafts.</li> <li>• Replace split or damaged wooden handles, do not wire or tape up.</li> <li>• Keep tools in racks or boxes when not in use.</li> </ul>	Low (ALARP)
4.	Working with ladder	<ul style="list-style-type: none"> <li>• Person/ material falling from ladder</li> <li>• Over reaching</li> <li>• Over loading</li> <li>• Obstructions overhead/ adjacent to work location</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 to be as per manufacturer</li> </ul>	Low (ALARP)

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							<ul style="list-style-type: none"> <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> <li>Beware of overhead protrusions while climbing up the ladder.</li> </ul>	
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> <li>Fire</li> </ul>	<ul style="list-style-type: none"> <li>Electrocution or death</li> <li>Burns and shocks</li> <li>Muscle contraction</li> <li>Heart , lung Paralysis</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>LOTO procedure to be followed during testing &amp; commissioning.</li> <li>Do not overload to the circuits.</li> <li>Provide adequate no's of DCP &amp; CO2 fire extinguishers in the testing area.</li> <li>Do not keep any flammable materials around the testing area.</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 replace it immediately.</li> </ul>	Low (ALARP)

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							<ul style="list-style-type: none"> <li>• Barricade the location and signage to be placed where circuits and equipments are energized.</li> <li>• PPE should be worn at all time where working in energized circuits. ( Insulated gloves, Electric resistivity shoe, insulated mat )</li> </ul>	
6.	Testing by used with multi meter and megger	<ul style="list-style-type: none"> <li>• Unauthorized/ untrained Person</li> <li>• Faulty Instrument</li> <li>• Improper identification</li> <li>• Electricity</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>• Trained person only to do the megger testing</li> <li>• PTW to be applied and obtained prior to start work</li> <li>• Ensure that the circuit is not live before using the megger.</li> <li>• Calibrated / certified megger only shall be used.</li> <li>• Warning boards should be provided and Barricaded.</li> </ul>	Low (ALARP)
7.	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>• Proper awareness training shall be done on heat stress symptoms and 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> </ul>	Low (ALARP)

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8.	Testing and commissioning	<ul style="list-style-type: none"> <li>•Unauthorized/ untrained Personnel</li> <li>•Electricity</li> <li>•Faulty Instrument</li> <li>•Poor identification</li> </ul>	<ul style="list-style-type: none"> <li>•Electric shock and Burns</li> <li>•Fatality</li> <li>•Muscle contraction</li> <li>•Heart , lung Paralysis</li> </ul>	4	B	M	<ul style="list-style-type: none"> <li>•Only qualified and trained person to do the job.</li> <li>• PTW to be applied and obtained prior to start work</li> <li>• Close supervision to be done at all time while During testing and commissioning.</li> <li>• Provide adequate no's of DCP &amp; CO2 fire extinguishers in the testing area.</li> <li>• Trained first aider to be available at the site and emergency arrangement shall be available during the activity.</li> <li>• Defective tools and instrument should not be used, report it and replace it immediately.</li> <li>• All personnel shall be aware of electric injuries and first aid treatment.</li> <li>• Ensure isolation was effective (LOTO).</li> <li>• Area to be barricaded and warning signage to be provided ( DANGER : ELECTRIC HAZARD )</li> <li>• Ensure suitable PPE ( Insulated gloves, electric resistivity, mat )used by all personnel at workplace.</li> </ul>	Low (ALARP)
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>• Proper illumination to be provided</li> <li>• light post to be secured from fall</li> <li>• Proper cable management system to be Followed</li> <li>• All materials to be staged in proper manner without obstacles</li> </ul>	Low (ALARP)
10.	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	<p align="center"><b>High Risk</b></p> <p align="center"><b>Medium Risk (ALARP)</b></p> <p align="center"><b>Low Risk</b></p>				
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>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>