

MICRO HYDRO POWER PLANT TECHNOLOGY

Competency Standards

National Vocational
Certificate Level 2

Version 1 - July 2015

Published by

National Vocational and Technical Training Commission
Government of Pakistan

Headquarter

Plot 38, Kirthar Road, Sector H-9/4, Islamabad, Pakistan
www.navttc.org

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Layout & design

SAP Communications

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This document has been produced with the technical assistance of the TVET Reform Support Programme, which is funded by the European Union, the Embassy of the Kingdom of the Netherlands, the Federal Republic of Germany and the Royal Norwegian Embassy and has been commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in close collaboration with the National Vocational and Technical Training Commission (NAVTTTC) as well as provincial Technical Education and Vocational Training Authorities (TEVTAs), Punjab Vocational Training Council (PVTC), Qualification Awarding Bodies (QABs) and private sector organizations.

Document Version

July, 2015

Islamabad, Pakistan

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Competency Standards: Micro Micro Hydel Power Plant operations and maintenance (Assistant) - Level 2

Competency Standard A: Maintain workplace safety

Overview: This competency standard is intended for those who carry out work in a range of different contexts. People holding credit for this competency standard are able to: Follow workplace safety practices; apply tools and equipment safety measures; and follow workplace emergency procedures.

Competency Unit	Performance Criteria	Knowledge and Understanding
A1: Follow workplace safety practices	Trainee will be able to: P1- Organise and arrange duties, tools, equipment materials and work area P2- Use and store PPE P3- Perform tasks in a safe manner P4- Identify safety signs, barricades and symbols P5- Follow safety signs, barricades and symbols P6- Carry out manual handling in line with health and safety guidelines P7- Report workplace hazards, accidents and emergencies	K1- Company safety SOP/policy; Housekeeping practices; Factors that may influence safety at the workplace, such as anger and stress K2- Types of personal protective equipment K3- Safety signs, barricades and symbols; Isolation and lockout procedures
A2: Apply tools & equipment safety measures	Trainee will be able to: P1- Check earthing for safety of equipment P2- Use tools and equipment for the designed purpose P3- Store tools and equipment securely	K1- Method of earthing and its effects on safety K2- Storage and stacking methods of tools & equipment

<p>A3: Follow workplace emergency procedures</p>	<p>Trainee will be able to:</p> <p>P1- Follow safe workplace procedures for dealing with accidents, and emergencies within scope of responsibility</p> <p>P2- Follow workplace evacuation procedures</p> <p>P3- Carry out basic fire fighting procedures</p>	<p>K1- Scope of responsibility; First aid procedures; Risk control measures</p> <p>K2- Evacuation procedures</p> <p>K3- Types of fire, Fire safety and fire fighting procedures</p>
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Competency Standard B: Produce a plan for career options related to Micro Hydro Power operations and maintenance

Overview: This competency standard is intended to assist people in planning for their career by developing an own plan for future directions. People holding credit for this competency standard are able to: Gather information for a personal profile; and produce a plan for achieving future directions.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>B1: Gather information for a personal profile</p>	<p>Trainee will be able to:</p> <p>P1- Gather information in a field related toMHP generationfor future directions decision-making</p> <p>P2- Identify options compatible with personal profile</p> <p>P3- Investigate sources of current career information in terms of planning for future directions</p> <p>P4- Select information sufficient and relevant to the identified options in terms of producing a plan for future directions</p> <p>P5- Prioritise and justify options on the basis of gathered information</p>	<p>K1-Analysis of own knowledge, skills, and abilities</p> <p>K2- Description of personal profile and compatible options</p> <p>K3- Methods of research work</p> <p>K4- Recognition of best available options</p> <p>K5- Methods of prioritising the options</p>
<p>B2: Produce a plan for achieving future direction</p>	<p>Trainee will be able to:</p> <p>P1- Produce a plan using identified information sources</p>	<p>K1- Career guidance plan</p>

Competency Standard C: Perform general routine maintenance on machinery, equipment and infrastructure

Overview: This competency standard is intended for those who perform general routine maintenance on machinery, equipment and infrastructure in a variety of contexts. 'Routine maintenance' in this context refers to simple, small-scale activities associated with general upkeep of machinery, equipment and infrastructure against normal wear and tear. People holding credit for this competency standard are able to: Plan and prepare for preventive maintenance; perform routine inspections; perform general routine maintenance; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
C1: Plan and prepare for preventive maintenance	Trainee will be able to: P1- Obtain safety and other regulatory requirements for maintenance P2- Interpret engineering drawings P3- Identify and select tools and equipment	K1- Safety requirements; Specifications; Hazard identification K2- Drawings and symbols specifications K3- Tools and equipment and calibration thereof
C2: Perform routine inspection	Trainee will be able to: P1- Check for safety hazards P2- Carry out procedures for routine inspections P3- Document results	K1- Inspection requirements K2- Types of common faults in electrical and mechanical systems, and civil structure components K3- Maintenance reports
C3: Perform general routine maintenance	Trainee will be able to: P1- Perform basic measurement tests P2- Perform general routine maintenance procedures P3- Perform minor adjustments and calibrations	K1- Measurement and calculation of electrical & mechanical parameters K2- Adjustment procedures K3- General maintenance procedures for machinery, equipment and infrastructure K4- Safety hazards
C4: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation K2- Importance of quality K3- Waste disposal procedures K4- Care of tools and equipment

Competency Standard D: Perform welding at introductory level

Overview: This competency standard is intended for those who carry out a range of welding operations at introductory level in a variety of contexts. People holding credit for this competency standard are able to: Plan and prepare for welding; demonstrate safe welding practice; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>D1: Plan and prepare for welding</p>	<p>Trainee will be able to:</p> <p>P1- Identify worksite for potential hazards</p> <p>P2- Select and use personal protective equipment</p> <p>P3- Identify appropriate welding method to be applied in line with job requirements</p> <p>P4- identify and select welding tools and equipment</p>	<p>K1- Safety requirements; Specifications; Hazard identification</p> <p>K2- Personal protective equipment (PPE)</p> <p>K3- Different welding methods, application, and procedures</p> <p>K4- Welding tools and equipment, and calibration thereof</p>
<p>D2: Demonstrate safe welding practice</p>	<p>Trainee will be able to:</p> <p>P1- Welding operations comply with safe working practice</p> <p>P2- Check and prepare welding equipment and materials</p> <p>P3- Prepare and join metals</p> <p>P4- Check for defects and welding faults</p> <p>P5- Carry out corrective measures</p>	<p>K1- Source and nature of hazards associated with welding: - electric shock, burns (arc radiation, heat), fumes, noise, hard and/or hot particles, chemical (cleaning, pickling), dust</p> <p>K2- Welding equipment may include, but is not limited to: -connections, hose, regulator, torch, cables, gas cylinder, cable insulation, condition of welding torches and/or guns, condition of material and filler metals</p> <p>K3- Factors affecting weld quality</p> <p>K4- Identification of defective welds</p>

D3: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation K2- Importance of quality assurance and control K3- Waste disposal procedures; Care of tools and equipment
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Competency Standard E: Perform basic metal processing operations using hand-held power tools

Overview: This competency standard is intended for those who perform basic metal processing operations using hand-held power tools in a variety of contexts. People holding credit for this competency standard are able to: Plan and prepare for work; perform grinding operations; perform drilling operations; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>E1: Plan and prepare for work</p>	<p>Trainee will be able to:</p> <p>P1- Determine job requirements from specifications</p> <p>P2- Identify and select auxiliary tools, devices and/or equipment to carry out work processes in a safe manner</p> <p>P3- Identify and minimise hazards and risks associated with job requirements</p>	<p>K1- Safety procedures, including PPE</p> <p>K2- Auxiliary tools, devices and equipment</p> <p>K3: Potential risks and hazards for self and others associated with metal processing</p>
<p>E2: Perform grinding and cutting operations</p>	<p>Trainee will be able to:</p> <p>P1- Select grinding/cutting tools & equipment according to job requirements</p> <p>P2- Apply safe grinding/cutting process</p> <p>P3- Check for conformance with job requirements</p>	<p>K1- Types and application of grinding/cutting disks, and accessories</p> <p>K2- Metal types and properties</p> <p>K3- Safe working procedures</p>
<p>E3: Perform drilling operations</p>	<p>Trainee will be able to:</p> <p>P1- Select drilling tools & equipment according to job requirements</p> <p>P2- Apply safe drilling process</p> <p>P3- Check for conformance with job requirements</p>	<p>K1- Types and application of drills, accessories, and lubricants</p> <p>K2- Drilling speed and feed</p> <p>K3- Safe working procedures</p>

E4: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation K2- Importance of quality assurance K3- Waste disposal procedures; care of tools and equipment
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Competency Standard F: Assemble and install machines and mechanical components

Overview: This competency standard is intended for those who carry out machine assembling operations in a variety of contexts. People holding credit for this competency standard are able to: Plan and prepare for assembling; assemble and install machine and mechanical components, test operation, and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>F1: Plan and prepare for assembling</p>	<p>Trainee will be able to:</p> <p>P1- Identify and obtain safety and other regulatory requirements for assembling</p> <p>P2- Prepare tools, equipment, machine and mechanical components to be assembled</p>	<p>K1- Safety requirements; Specifications; hazard identification</p> <p>K2- Types of tools, equipment and material</p>
<p>F2: Assemble and install machine and mechanical components</p>	<p>Trainee will be able to:</p> <p>P1- Interpret and confirm assembling and installation specifications</p> <p>P2- Assemble machine and mechanical components using tools in accordance with best industry practice</p> <p>P3- Carry out adjustment to assembled components and/or parts</p> <p>P4- Perform earthing</p> <p>P5- Perform pre-commissioning test</p> <p>P6- Confirm installation</p>	<p>K1- Assembling and installation requirements</p> <p>K2- Assembling procedures, to include but not limited to: -levers, bearings, seals, shafts, motors/generators, chains, belts, pulleys, sprockets, frames, fasteners, keys.</p> <p>K3- Earthing requirements</p> <p>K4- Pre-commissioning procedure</p>
<p>F3: Test operation</p>	<p>Trainee will be able to:</p> <p>P1- Commission machine and mechanical components</p> <p>P2- Perform permit closing</p>	<p>K1- Functional tests and adjustments</p> <p>K2- Safety procedures</p> <p>K3- Basic operation of machine and settings for adjustment</p>

F4: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation K2- Importance of quality K3- Waste disposal procedures; care of tools and equipment
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Competency Standard G: Use and maintain hand tools and hand-held powered tools and equipment

Overview: This competency standard is intended for those who work with a range of hand tools and hand-held powered tools and equipment in a variety of contexts. People holding credit for this competency standard are able to: Use and maintain tools and equipment for electrical works; use and maintain tools and equipment for mechanical works; use and maintain tools and equipment for civil construction works; and store tools and equipment.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>G1: Use and maintain tools and equipment for electrical works</p>	<p>Trainee will be able to: P1- Identify and select tools and equipment P2- Demonstrate safe use of tools and equipment P3- Demonstrate maintenance procedures for tools and equipment</p>	<p>K1- Purpose of tools & equipment for electrical works K2- Use of tools & equipment for electrical works K3- Maintenance procedures for tools & equipment</p>
<p>G2: Use and maintain tools and equipment for mechanical works</p>	<p>Trainee will be able to: P1- Identify and select tools and equipment P2- Demonstrate safe use of tools and equipment P3- Demonstrate maintenance procedures for tools and equipment</p>	<p>K1- Purpose of tools & equipment for mechanical works K2- Use of tools & equipment for mechanical works K3- Maintenance procedures for tools & equipment</p>
<p>G3: Use and maintain tools and equipment for civil construction works</p>	<p>Trainee will be able to: P1- Identify and select tools and equipment P2- Demonstrate safe use of tools and equipment P3- Demonstrate maintenance procedures for tools and equipment</p>	<p>K1- Purpose of tools & equipment for civil construction works K2- Use of tools & equipment for civil construction works K3- Maintenance procedures for tools & equipment</p>

<p>G4: Store tools and equipment</p>	<p>Trainee will be able to:</p> <p>P1- Clean and calibrate tools and equipment</p> <p>P2- Label tools and equipment</p> <p>P3- Store tools and equipment</p>	<p>K1- Methods of cleaning tools & equipment</p> <p>K2-Methods of calibrating tools & equipment</p> <p>K2- Types and methods of labelling</p> <p>K3- Storing procedures</p>
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Competency Standard H: Test electrical machines and mechanical components

Overview: This competency standard is intended for those who test electrical machines and mechanical components in a variety of contexts. People holding credit for this competency standard are able to: Test machine and/or component for faults; diagnose faults; and remove faults.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>H1: Test machine and/or component for faults</p>	<p>Trainee will be able to:</p> <p>P1- Obtain and interpret testing procedures</p> <p>P2- Conduct visual inspection</p> <p>P3- Implement testing procedures</p> <p>P4- Record test results</p>	<p>K1- Damage identification in terms of cracks, noise, disorder in shape and structure, broken parts</p> <p>K2- Electrical machines may include but are not limited to: - Alternator/Generator; load control governor, control panel & protection; transformer; power lines</p> <p>K3- Mechanical components may include but are not limited to: - Turbine and drive system components</p> <p>K4- Procedures for different tests; Electrical and mechanical parameters</p>
<p>H2: Diagnose faults</p>	<p>Trainee will be able to:</p> <p>P1- Interpret test results</p> <p>P2- Implement troubleshooting procedures</p> <p>P3- Locate and identify fault</p>	<p>K1- Interpretation of drawings and circuit diagrams</p> <p>K2- Troubleshooting procedures; Electrical and mechanical parameters</p>

H3: Remove faults	Trainee will be able to: P1- Repair or replace component parts P2- Carry out operational testing P3- Record repair process P4- Report to supervisor	K1- Interpretation of engineering drawings and circuit diagrams; product knowledge K2- Product knowledge; Testing procedures and equipment
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Competency Standard I: Apply basic knowledge of Micro Hydro Power operations and Maintenance

Overview: This competency standard is intended for those who may wish to pursue a career in Micro Hydro Power [MHP] operations. People holding credit for this competency standard are able to: Apply knowledge of main electrical and mechanical components in MHP operations; and apply knowledge of civil structures in MHP operations.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>I1: Apply knowledge of main electrical components in MHP operations</p>	<p>Trainee will be able to: P1- Apply knowledge of the purpose of Generators/Alternators P2- Apply knowledge of the purpose of electronic load controllers P3- Apply knowledge of the purpose of power transformers P4-Apply knowledge of transmission and distribution lines P5-Apply knowledge of the distribution network</p>	<p>K1- Types of Generator/Alternator K2- Types of mechanical/hydraulic load controllers K3- Types of power transformers K4- Transmission and distribution line requirements K5- Network design</p>
<p>I2: Apply knowledge of main mechanical components in MHP operations</p>	<p>Trainee will be able to: P1- Apply knowledge of the purpose of turbines P2- Apply knowledge of the purpose drive systems P3- Apply knowledge of mechanical speed governors used for load control P4- Apply knowledge of valves and pressure gauges</p>	<p>K1- Types of turbines K2- Drive system components K3- Basic principles of mechanical speed governors</p>
<p>I3: Apply knowledge of civil structures in MHP operations</p>	<p>Trainee will be able to: P1- Apply knowledge of the purpose of weirs and water intakes P2:Apply knowledge of the purpose of channels P3: Apply knowledge of the purpose of settling basins P4: Apply knowledge of the purpose of spillways</p>	<p>K1- Design and features of weirs and intake K2- Design and features of channels K3- Design and features of settling basins K4- Design and features of spillways K5- Design and features of force bay tanks</p>

	<p>P5:Apply knowledge of the purpose of force bay tanks</p> <p>P6:Apply knowledge of the purpose of penstocks</p>	<p>K6- Design and features of penstocks</p>
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Competency Standard J: Perform basic concreting operations

Overview: This competency standard is intended for those who perform basic concreting operations in a variety of contexts. People holding credit for this competency standard are able to: Plan and prepare for work; dig excavation by hand; cast concrete; level concrete; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>J1: Plan and prepare for work</p>	<p>Trainee will be able to: P1- Identify and obtain safety requirements for excavation P2- Interpret layout plan and confirm location for excavation P3- Arrange tools and equipment P4- Locate excavation site</p>	<p>K1- Safety requirements; Specifications; Hazard identification K2- Layout plans and site drawings K3- Tools and equipment requirements</p>
<p>J2: Dig excavation by hand</p>	<p>Trainee will be able to: P1- Use site pegs and profiles to identify excavation area P2- Erect safety signs and barriers around excavation area P3- Install trench and excavation support P4- Perform safe working practice</p>	<p>K1- Safety signs and barricades K2- Procedures for trench and excavation support</p>
<p>J3: Cast concrete</p>	<p>Trainee will be able to: P1- Mix materials according to job requirements and specifications P2- Transport and place concrete using appropriate tools and equipment P3- Hand-compact poured concrete</p>	<p>K1- Concrete materials and mixing ratio K2- Properties of concrete K3- Concrete casting process K4- Concrete reinforcement</p>

<p>J4: Level concrete</p>	<p>Trainee will be able to:</p> <p>P1- Hand-screed concrete to correct levels</p> <p>P2- Finish concrete</p> <p>P3- Cure concrete</p>	<p>K1- Tools for finishing concrete</p> <p>K2- Curing procedures may include hosing, sprinklers, ponding, plastic sheeting</p>
<p>J5: Complete work</p>	<p>P1- Complete work related documents and procedures</p> <p>P2- Perform final quality inspection</p> <p>P3- Clean up and store tools, equipment and materials</p>	<p>K1- Importance of documentation</p> <p>K2- Importance of quality; handing over to client</p> <p>K3- Waste disposal procedures; care of tools and equipment</p>

Competency Standard K: Perform basic bricklaying and plastering operations

Overview: This competency standard is intended for those who perform basic bricklaying and plastering operations in a variety of contexts. People holding credit for this competency standard are able to: Plan and prepare for work; lay bricks; plaster masonry; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>K1: Plan and prepare for work</p>	<p>Trainee will be able to: P1- Identify and obtain safety requirements P2- Interpret layout plan P3- Arrange tools and equipment</p>	<p>K1- Safety requirements; Specifications; Hazard identification K2- Layout plans and site drawings K3- Tools and equipment requirements</p>
<p>K2: Lay bricks</p>	<p>Trainee will be able to: P1- Confirm construction specification P2- Select materials and mix mortar according to job requirements and specifications P3- Use levelling devices to transfer heights to required location P4- Confirm construction in line with job requirements</p>	<p>K1- Mortar materials and mixing ratio K2- Properties of cement and mortar K3- Bricklaying process K4- Masonry reinforcement</p>
<p>K3: Plaster masonry</p>	<p>Trainee will be able to: P1- Prepare masonry surface P2- Establish screed lines or guides P3- Mix mortar and apply first coat plaster P4- Apply second coat plaster</p>	<p>K1- Types of coats K2- Tools and equipment requirements</p>

K4: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation K2- Importance of quality K3- Waste disposal procedures; Care of tools and equipment
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Competency Standard L: Install single and three-phase wiring

Overview: This competency standard is intended for those who install single and three-phase wiring in a variety of contexts. People holding credit for this competency standard are able to: Plan wiring layout; lay cable; perform wiring test; and complete work.

Competency Unit	Performance Criteria	Knowledge and Understanding
<p>L1: Plan wiring layout</p>	<p>Trainee will be able to:</p> <p>P1- Draw wiring layout</p> <p>P2- Measure distance to connection points</p> <p>P3- Estimate material</p> <p>P4- Prepare tools, equipment and materials</p>	<p>K1- Interpretation of drawings, symbols, cable number according to load, and colour coding</p> <p>K2- Measuring of units and conversion</p> <p>K3- Quality of different conductor and insulator types</p> <p>K4- Application of tools, equipment and materials</p>
<p>L2: Lay cables</p>	<p>Trainee will be able to:</p> <p>P1- Prepare installation of cable</p> <p>P2- Install conduit, GI pipes, PVCpipesand/or ducts</p> <p>P3- Pull-in cables</p> <p>P4- Connect cables</p> <p>P5- Connect fixtures</p>	<p>K1- Chiselling, ducting, PVC and GI pipe wiring procedures</p> <p>K2- Properties of materials</p> <p>K3- Application of cables and tools</p> <p>K4- Types of joints</p> <p>K5- Types and purpose of fixtures</p>
<p>L3: Perform wiring test</p>	<p>Trainee will be able to:</p> <p>P1- Inspect wiring and distribution board</p> <p>P2- Conduct tests</p> <p>P3- Document test results</p>	<p>K1- Importance of continuity and factors of loose fittings</p> <p>K2- Application of equipment and tools used for testing; Importance of earthing</p> <p>K3- Importance of documenting compliance and noncompliance of test results and subsequent steps to be taken</p>

L5: Complete work	Trainee will be able to: P1- Complete work related documents and procedures P2- Perform final quality inspection P3- Clean up and store tools, equipment and materials	K1- Importance of documentation; K2- Importance of quality; handing over to client K3- Waste disposal procedures; Care of tools and equipment
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Competency Standard M: Monitor constant electricity supply under supervision

Overview: This competency standard is intended for those who are responsible for monitoring constant electricity supply under different load conditions in a variety of contexts. People holding credit for this competency standard are able to: review electrical load schedule, set distribution priority, monitor main and ballast load.

Competency Unit	Performance Criteria	Knowledge and Understanding
M1: Review electrical load schedule	Trainee will be able to: P1- Check layout plan P2- Check input & output voltages P3- Check voltage drops	K1- Interpretation of drawings, symbols, cable number, colour coding and electrical load schedule K2- Maintenance of input and output voltages K3- Methods of calculation of voltage drops, overloading and load balance
M2: Set distribution priority	Trainee will be able to: P1- Review distribution priority plan P2- Reschedule electrical load as per distribution priority	K1- Interpretation of distribution priority plan K2- Methods of rescheduling of electrical loads
M3: Monitor main and ballast load	Trainee will be able to: P1- Monitor electrical load (current) P2- Monitor power consumption (energy) P3- Monitor voltage drops P4- Perform logout/tagout	K1- Methods of current measurement (Amperes) K2- Methods of energy measurement in (KWH) K3- Methods of voltage drop measurement (Volt) K4- Methods of log out / tag out and labelling K5- Control panels and protection devices K6- Electronic Load Controller (ELC)

Documents, policies, guidelines:

- International Labour Organisation (ILO) Standards on Occupational Health and Safety
- Pakistan Electricity Act, 1910 and subsequent amendments
- Institute of Electrical and Electronics Engineers Standards Association (IEEE-SA)
- Industry code of practice

Tools and Equipment:

No.	Description	Quantity
	Tools	
	Mechanical	
1	7 pieces screwdriver set	
2	Adjustable wrench set	
3	Allen Keys Set	
4	Aluminum Spirit Level (leveling instrument)	
5	Bastard File with wood handle (Flat)	
6	Bastard File with wood handle (Round)	
7	Bench Vice	
8	Bench Workstation	
9	Chisel	
10	Clamp Meter	
11	Claw hammer with wood handle	
12	Combination Pliers	

13	Crimping Tool	
14	Hack Saw with Blades	
15	Hand Drill [1/8" – 1/8"]	
16	Hand Grease Gun	
17	Hand Grinding Machine	
18	Hot Air Blower	
19	Measuring tape	
20	Micro Meter [Screw Gauge]	
21	Nose Plier	
22	Oil Can	
23	Pedestal Drill	
24	Pen Grinder	
25	Pipe Wrench [18" & 24"]	
26	Portable Welding Plant [100 – 300 Amperes]	
27	Puller	
28	Punch Set	
29	Retched Block with Grip	
30	Screw Driver Set (-)[6"-18"]	
31	Screw Driver Set (+) [6"-18"]	
32	Side Cutting Plier	
33	Spanner Set (Open)	
34	Spanner Set (Ring)	
35	Stainless Steel Slogging Ring Spanner	
36	Thread Gauge	

37	Tong/Monkey Plier	
38	Vernier Calliper	
39	Wheel Grinder	
40	Wire Gauge	
41	Welding Plant	
	Electrical	
1	Clamp Meter	
2	Combination Plier	
3	Earth Tester	
4	Line Tester	
5	Megger	
6	Multi Meter	
7	Nose Plier	
8	Pin Plier	
9	Screw Driver Set	
10	Side Cutter	
	Safety Tools	
1	Fire Extinguisher	
2	First Aid Box	
3	Hand Gloves	
4	Hard top Hat	
5	Mask	
6	Overall combination [Dress]	
7	Safety Belt	

8	Safety Goggles	
9	Steel Toe Shoes	
<u>EQUIPMENT</u>		
Civil		
1	Air Vent Pipe	
2	Bell Mouth	
3	Control Gates	
4	Control Valves	
5	Expansion Joint	
6	Flanges	
7	Flushing Gates	
8	Flushing Pipe	
9	Penstock	
10	Reducer	
11	Rubber Seal	
12	Trash Rack	
Electrical		
1	Ballast Tank with Heaters	
2	Binding wire	
3	Cable Shoe	
4	Channel Iron	
5	Conductors	
6	D-Iron Set	
7	Disc Insulator [With Tension Set]	

8	Earth Wire	
9	Earthing Plate	
10	Electrical Panels	
11	Electronic Load Controller	
12	Energy Meter	
13	Generator[Brushed and Brush-less]	
14	Metal Clad Main Switch	
15	Pin Insulator	
16	Pole	
17	Power Cable	
18	Pressure Transducer	
19	Shackle Insulator	
20	Stay Insulator	
21	Stay Plate	
22	Stay Rod	
23	Stay Wire	
24	Thimble	
25	Transformer	
26	Turn Buckle	
27	Ultra Sonic Flow Meter	
	Mechanical	
1	Angle Iron [Cross Arm]	
2	Butterfly Valve	
3	Coupling [Flexible/Rigid]	

4	Crossflow Turbine	
5	Flat Belt	
6	Flat Pulleys	
7	Fly Wheel	
8	Francis Turbine	
9	Gate Valve	
10	Gear Box	
11	Governor	
12	Hydraulic Jack	
13	Operating Rod	
14	Pelton Turbine	
15	Propeller/Kaplan Turbine	
16	Single Phase Variac [Auto Transformer]	
17	Tachometer	
18	V Belt	
19	V-Pulleys	

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