MICRO HYDRO POWER PLANT TECHNOLOGY

Assessment Package

National Vocational Certificate Level 4 Version 1 - July 2015















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National Vocational Certificate Level 4 Version 1 - July 2015





ASSESSMENT MATERIAL EVIDENCE GUIDE Qualification code: LEN0294.v1 Level: 4 Credit: 45 Version: 1	APPLYMICRO HYDE OPERATIONS(TECHN	
CONTENTS	 Assessment Summary and Record Candidate Assessment Assessor Judgment Guide List of required tools/equipment, material and context of assessment 	ent
ASSESSMENT AND ASSESSOR	Competent Not Y	Yet Competent
DETAILS	Assessment	Re-Assessment
	Assessor's Name: Assess Assessor's Signature Da	te DD MM YYYY
CANDIDATE DETAILS	Candidate's Name:	Last Name
	Father's Name	
	Institute Name and District	
	CNIC/BFORM #	
	Registration Number issued by Assessment Body :	
	Gender Male Female Transgend	der 🗌
	Candidate's Consent I agree to the time and date of the ass of the assessment. I fully understand	sessment and am aware of the requirements
	Candidate's Signature:	
ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an <i>Assessment Results Summary Form</i> . S coversheet to NAVTTC	Simply post a photocopy of this completed
NAVTTC OFFICE ONLY	1. DATE 2. DATE ENTERED I FORM DATABASE: RECEIVED: DD MM YYYY	NTO DD MM YYYY

ASSESSMENT SUMMARY AND RECORD

ACTIVITY	METHOD			DESIRED OUTCOMES	RES	ULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF: APPLY MICRO HYDEL POWER OPERATIONS (TECHNICIAN) SKILLS FOR MHP PLANT		NOT YET COMPETENT
Practical Skill Demonstration				~	Complete supplied project brief related to the application of Micro Hydel Power Operations (Technician)skills for MHP plant:		
Knowledge Assessment		~			 Answer all questions Assessment Panel will have following oral presentation of completed project brief 		
Other Requirements			~		All completed course assignments Completed work forms Completed job records Completed plan for career options related to Micro Hydel Power operations All learner log books and formative assessments completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers		

Candidate's Name...... Father's Name

ALL WORK ASSESSED FOR THESE COMPETENCY STANDARDS MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to perform the following task within 4(four) hours timeframe:

- Prepare emergency shutdown electrical system of MHP •
- Prepare emergency shutdown electrical system of MHP •
- Connect generator with control panel •
- Remove the jam bearing of main shaft of turbine •
- Fix the speed governor haunting •
- Fix the leakage of fore bay tank •
- Conduct site assessment •
- Planning of civil construction works •
- Determine physical requirements of MHP plant

ACTIVITIES	CANDIDATE RESPONSE
 Complete project brief of applying Micro Hydel Power Operations (Technician) skills for MHP plant under observation by Instructor 	 During a practical assessment, under observation by an assessor, I will correctly perform the following task: Prepare emergency shutdown electrical system of MHP Turn off circuit breaker of generator Turn off circuit breaker of control panel Isolate MHP electrical system from distribution network Turn off circuit breaker of control panel Isolate MHP electrical system form distribution network Turn off circuit breaker of control panel Connect generator with control panel Connect generator with control panel Turn on power switch of generator Remove the jam bearing of main shaft of turbine Remove cover from bearing bracket Use puller to remove bearing from main shaft Fix the Speed Governor Haunting Adjust the frequency of generator (55Hz) from the tuner of speed Governor. Check the frequency from control panel (55Hz) Fix the leakage of fore bay tank Divert the water direction from flushing gates of spillway Add concrete to the leakage point Conduct site assessment Measure flow with the use of Salt Dilution method Measure flow with the use of Salt Dilution method Planning of civil construction works Dimension main civil construction structure of MHP plant Measure the total length of power channel Determine physical requirements of MHP plant Identify procurement requirements for mechanical and electrical equipment of MHP plant Prepare powerhouse floor plan to arrange for electro-mechanical equipment Carry out initial planning of distribution network layout

2. Present completed project brief supplied by Instructor	 Oral presentation of project brief and completed project work to Assessment Panel. Presentation to include: Requirements of brief Planning and preparation of project Problems encountered and how they were dealt with Project outcome/s Lessons learnt from undertaking project (reflective thinking) Presentation to take no longer than 10 minutes
3. Answer all questions Assessor Panel will have following project presentation	My answers to questions are correct and demonstrate my understanding of the topics and their application.

ASSESSOR JUDGEMENT GUIDE

Candidate's Name		s Name	
INSTRCUTIONS FOR ASSESSOR	HIS SECTION CONTAINS MINIMUM EVIDENCE REQU	IREMENTS.	
ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS ON CANDIDATE PERFORMANCE
2: Complete project brief of applying Micro Hydel Power Operations (Technician)skills for MHP plant under observation by Instructor			
Prepare emergency shutdown electrical system of MHP	Turn off circuit breaker of generator Turn off power switch of control panel		
Isolate MHP electrical system from distribution network	Turn off circuit breaker of control panel		
Connect generator with control panel	Joint wire connections of generator with control panel Turned on power switch of generator		
Remove the jam bearing of main shaft of turbine	Removed cover from bearing bracket Used puller to remove bearing from main shaft		
Fix the speed governor haunting	Adjusted the frequency of generator (55Hz) from the tuner of speed Governor. Checked the frequency from control panel (55Hz)		
Fix the leakage of fore bay tank	Diverted the water direction from flushing gates of spillway Added concrete to the leakage point		
Conduct site assessment	Measured head with the use of water level method Measured flow with the use of Salt Dilution method		
Planning of civil construction works	Dimensioned main civil construction structure of MHP plant Measured the total length of power channel		
Determine physical requirements of MHP plant	Identified procurement requirements for mechanical and electrical equipment of MHP plant Prepared powerhouse floor plan to arrange for electro-mechanical equipment Carried out initial planning of distribution network layout		
3. Present completed project brief supplied by Instructor	 Oral presentation of project brief and completed project work to Assessment Panel. Presentation to include: Reguirements of brief 		

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/	NO	ASSESSOR COMMENTS ON CANDIDATE PERFORMANCE
4. Answer any	 Planning and preparation of project Problems encountered and how they were dealt with Project outcome/s Lessons learnt from undertaking project (reflective thinking) Presentation to take no longer than 10 minutes Candidate confidently answered questions 			
questions their Assessor may have during the practical assessment	correctly and demonstrated understanding of the topics and their application. Assessor to document all questions asked, if any, and the answers here:			

LIST OF TOOLS , EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

	This section contains information regarding;
INSTRUCTIONS	Context of the assessment
	List of required tools and equipment's.
	List of consumable items required during the service
	This task will be performed in MHP plant lab/workshop environment
1. Context of Assessment	Required tools, equipment and consumables will vary according to project brief

SR#	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				
1	Electrical				
1	Clamp Meter				

3 Earth Tester 5 Medger 6 Mult Neter 7 Nose Piler 9 Strew Driver Set 10 Stde Cotter 2 Strew Driver Set 10 Stde Cotter 2 First Ald Box 3 Hard Copes 4 Hard Copes 5 Mass. 6 Overall contribution (Dress) 7 Safety Cogles 9 Safety Cogles 10 Af Ven Pipe 2 Bell Mouth 2 Control Coster 2 Bell Mouth 3 Control Coster 4 Control Valves 5 Eopartion Lonito	2	Combination Plier	
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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			
14Metal Clad Main Switch15Pin Insulator16Pole17Power Cable18Pressure Transducer19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
15Pin Insulator16Pole17Power Cable18Pressure Transducer19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
16Pole17Power Cable18Pressure Transducer19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
17Power Cable18Pressure Transducer19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
18Pressure Transducer19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
19Shackle Insulator20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
20Stay Insulator21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
21Stay Plate22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
22Stay Rod23Stay Wire24Thimble25Transformer26Turn Buckle27Ultra Sonic Flow Meter			
23 Stay Wire 24 Thimble 25 Transformer 26 Turn Buckle 27 Ultra Sonic Flow Meter			
24 Thimble 25 Transformer 26 Turn Buckle 27 Ultra Sonic Flow Meter			ļ
25 Transformer 26 Turn Buckle 27 Ultra Sonic Flow Meter			ļ
26 Turn Buckle 27 Ultra Sonic Flow Meter			
27 Ultra Sonic Flow Meter	25		
	27		
Mechanical		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





ASSESSMENT MATERIAL EVIDENCE GUIDE Qualification LEN0294.v1 Level: 4 Credit: 10 Version: 1	APPLY ENTREPRENEURIAL SKILLS
CONTENTS	 Assessment Summary and Record Candidate Assessment Assessor Judgement Guide List of required tools/ equipment's, material and context of assessment
ASSESSMENT AND ASSESSOR	Competent Not Yet Competent
DETAILS	Assessment Re-Assessment
	Assessor's Name: Assessor's Code
	Assessor's Signature Date DD MM YYYY
CANDIDATE DETAILS	Candidate's Name Last Name Last Name
	Father's Name
	Institute Name and District
	CNIC/BFORM #
	Registration Number issued by Assessment Body:
	Gender Male Female Transgender
	Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.
	Candidate's Signature:
ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC
NAVTTC OFFICE ONLY LEN0294A.v1 Apply entrepreneurial	1. DATE 2. DATE ENTERED INTO FORM DATABASE: RECEIVED: DD MM YYYY skills_ © NAVTTC July 2015 Page 1 of 5

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ASSESSMENT SUMMARY & RECORD

Candidate's Name	Candidate's Name:							
ACTIVITY	METHOD)	DESIRED OUTCOMES	RES	ULT		
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: APPLY ENTREPRENEURIAL SKILLLS		NOT YET COMPETENT	
Knowledge Assessment		~			 Answer all questions in the knowledge assessment on the following topics: Introduction to entrepreneurship Conduct business start-up activities Develop a financial strategy Develop a marketing strategy 			
Other Requirements				~	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Evidence of: Researching potential business premises Researching requirements for business operating clearance development of business plan which includes: Financial plan Service and product delivery Marketing strategy 			

GUIDANCE TO CANDIDATE

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

IntroCondDevelopment	rd you are required to complete knowledge assessments of the following topics within 1 (one) hour of timeframe: duction to entrepreneurship duct business start-up activities elop a financial strategy elop a marketing strategy
ACTIVITIES	CANDIDATE RESPONSE
1. Complete knowledge assessment	Answer all questions in the knowledge assessment on the following topics: Introduction to entrepreneurship Identify the importance of entrepreneurs for Pakistan Identify challenges of being an entrepreneur Confirm and implement strategies for improving personal entrepreneurship qualities Conducting business start-up activities Select and secure business premises Secure business operating clearance Secure business support service Developing a financial strategy Project profit and loss and cash flow, including total cost of set-up Identify sources of funding Establish and follow bank requirements Developing a marketing strategy Identify potential profitable opportunities and target markets Plan service and product delivery Identify competitors operating in the industry Identify methods of promotion
2. Other requirements	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Evidence of: Researching potential business premises Researching requirements for business operating clearance development of business plan which includes: Financial plan Service and product delivery Marketing strategy

ASSESSOR JUDGEMENT GUIDE

 Candidate's Name:
 Father's Name:

 INSTRUCTIONS FOR ASSESSOR
 This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Knowledge assessment	Answer all questions in the knowledge assessment on the following topics:		
Introduction to entrepreneurship	Identify the importance of entrepreneurs for Pakistan		
	Identify challenges of being an entrepreneur Confirm and implement strategies for improving personal entrepreneurship qualities		_
Conducting business start-up activities	Select and secure business premises Secure business operating clearance Secure business support service		
Developing a financial strategy	Project profit and loss and cash flow including total cost of set-up Identify sources of funding		_
	Establish and follow bank requirements		_
Developing a marketing strategy	Identify potential profitable opportunities and target markets Plan service and product delivery Identify competitors operating in the industry		
2. Other requirements	Identify methods of promotion All candidate formative assessments completed by Instructor including; Observations Observations Ouestions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Evidence of: OResearching potential business premises OResearching requirements for business operating clearance Odevelopment of business plan which includes: Financial plan Service and product delivery Marketing strategy		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

instructions	 This section contains information regarding; Context of the assessment List of required tools and equipment. List of consumable items required during the service
1. Context of Assessment	This practical skill demonstration will be conducted in a Micro Hydel Power plant lab/workshop environment

2. Lis	2. List of consumable items required					
S. No	No Consumable Items Quantity					
1	Pen	1 per candidate				
2	Knowledge assessment with sufficient space for answers	1 per candidate				





ASSESSMENT MATERIAL EVIDENCE GUIDE Qualification LEN0294.v1 Level: 4 Credit: 9 Version: 1	MANAGE WORK AND PERSONNEL IN A MHP PLANT
CONTENTS	 Assessment Summary and Record Candidate Assessment Assessor Judgement Guide List of required tools/equipment, material and context of assessment
ASSESSMENT AND ASSESSOR	Competent Not Yet Competent
DETAILS	Assessment Re-Assessment
	Assessor's Name: Assessor's Code
	Assessor's Signature Date DD MM YYYY
CANDIDATE DETAILS	Candidate's Name:
	Father's Name
	Institute Name and District
	CNIC/BFORM #
	Registration Number issued by Assessment Body :
	Gender Male Female Transgender
	Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.
ASSESSMENT	Candidate's Signature:
ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC
NAVTTC OFFICE ONLY	1. DATE FORM RECEIVED: DD MM YYYY 2. DATE ENTERED INTO DATABASE: DD MM YYYY DD MM YYYY

ASSESSMENT SUMMARY & RECORD

CANDIDATE NAM	CANDIDATE NAME: FATHER NAME:						
ACTIVITY			METHO)	DESIRED OUTCOMES		
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: MANAGE WORK AND PERSONNEL IN A MHP PLANT	COMPETENT	NOT YET COMPETENT
Practical skill demonstration			~		 Induct new employees Receive and disseminate information Motivate employees and monitor performance Provide technical support to individuals 		
Knowledge Assessment		~			Answer all questions your assessor may have during the practical assessment		
Other Requirements				~	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records 		

Candidate Name:..... Father Name:.....

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within **one (1) hour** of timeframe:

- Induct new employees ٠
- Receive and disseminate information •
- Motivate employees and monitor performance ٠
- Provide technical support to individuals ٠

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of managing work and personnel in a MHP plant under observation by an assessor	 During a practical assessment, under observation by an assessor, I will correctly: Induct new employees Communicate workplace operational and safety procedures, and policies to employees Induct staff on MHP design and structure, and technical operations Receive and disseminate information Receive and disseminate information and instructions Communicate instructions to employees Assign roles and responsibilities Ensure instructions, roles and responsibilities are understood Motivate employees and monitor performance Maintain a positive and challenging working climate Monitor performance of employees and teams, and take corrective actions Provide constructive feedback Assist staff in identifying their development needs Provide technical support to individuals Analyse report or other feedback from individual or team Identify and analyse backlog or problem Identify problem-solving method Solve problem in collaboration with individual or team Meet set timeframes required for tasks of managing work and personnel in a MHP plant
2. Answer any questions your Assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application:
3. Other Requirements	 All candidate formative assessments completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records



ASSESSOR JUDGEMENT GUIDE

Candidate Name:

Father Name:

INSTRUCTIONS FOR ASSESSOR

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Complete practical task of managing work and personnel in a MHP plant under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out:		
Induct new	Communicate workplace operational and safety		
employees	procedures, and policies to employees		
	Inductd staff on MHP design and structure, and technical operations		
Receive and	Received and disseminate information and instructions		
disseminate	Communicate instructions to employees		
information	Assigned roles and responsibilities		
	Ensured instructions, roles and responsibilities are		
	understood		
Motivate	Maintained a positive and challenging working climate		
employees and	Monitored performance of employees and teams, and take		
monitor performance	corrective actions Provide constructive feedback		
penormance			
Provide technical	Assisted staff in identifying their development needs Analysed report or other feedback from individual or team		
support to	Identified and analyse backlog or problem		
individuals	Identified problem-solving method		
	Solved problem in collaboration with individual or team		
	Met set timeframes required for tasks of managing work and personnel in a MHP plant		
2. Answer any	Candidate's answers to questions are correct and		2
questions	demonstrate understanding of the topics and their		
their	application.		
assessor			
may have	Assessor to document below all questions asked and		
during the	candidate answers. Use extra sheets if required and		
practical	attached.		
3. Any other	All candidate formative assessments completed by		
requirement	 All candidate formative assessments completed by Instructor including; 		
S	o Observations		
	o Demonstrations		
	 Questions and recorded answers 		
	All work produced as module projects and		
	assignments		
	Completed learner logbooks		
	Completed work records		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

	This section contains information regarding;
INSTRUCTIONS	Context of the assessment
	List of required tools and equipment.
	List of consumable items required during the service
1. Context of	This practical skill demonstration will be conducted in a Micro Hydel Power Plant lab/workshop environment
Assessment	

SR#	Consumable	Qty
1	pen	1
2	Interview format	1





ASSESSMENT MATERIAL							
EVIDENCE GUIDE Qualification LEN0294.v1 Level: 4 Credit: 3 Version: 1	CONTROL MHP PLANT SHUTDOWN FOR EMERGENCY STANDBY ELECTRICAL SYSTEMS						
CONTENTS	 Assessment Summary and Record Candidate Assessment Assessor Judgement Guide List of required tools/equipment, material and context of assessment 						
ASSESSMENT AND ASSESSOR	Competent Not Yet Competent						
DETAILS	Assessment Re-Assessment						
	Assessor's Name: Assessor's Code Assessor's Signature Date DD MM YYYY						
CANDIDATE DETAILS	Candidate's Name Last Name						
	Father's Name						
	Institute Name and District						
	CNIC/BFORM #						
	Registration Number issued by Assessment Body :						
	Gender Male Female Transgender						
	Candidate Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.						
ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC						

NAVTTC OFFICE					2. DATE ENTERED INTO			
	1. DATE FORM				DATABASE:			
ONLY	RECEIVED:	DD	MM	YYYY	DATADASE.	DD	MM	YYYY

ASSESSMENT SUMMARY & RECORD							
Candidate Name:.					Father Name:		
ACTIVITY			METHO)	DESIRED OUTCOMES	RES	ULT
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: CONTROL MHP PLANT SHUTDOWN FOR EMERGENCY STANDBY ELECTRICAL SYSTEMS	COMPETENT	NOT YET COMPETENT
Practical skill demonstration			~	 Prepare emergency shutdown electrical system of MHP Prepare MHP plant for work Isolate MHP electrical system from distribution network Connect generator with control panel 			
Knowledge Assessment		~			Answer all questions your assessor may have during the practical assessment		
Other Requirements				~	Provide verified evidence of ELC connection with MHP Electricity		

Page 2 of 5

Candidate Name:

Father Name:

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within one hour of timeframe:

- Prepare emergency shut down electrical system of MHP
- Isolate MHP electrical system from distribution network
- Connect generator with control panel

ACTIVITIES	CANDIDATE RESPONSE
 Complete practical task of controlling MHP plant shutdown for emergency standby electrical systems under observation by an assessor Answer any 	 During a practical assessment, under observation by an assessor, I will correctly: Prepare emergency shutdown electrical system of MHP Turn off circuit breaker of generator Turn off power switch of control panel Isolate MHP electrical system from distribution network Turn off circuit breaker of control panel Connect generator with control panel Join wire connections of generator with control panel Turn on power switch of generator My answers to questions are correct and demonstrate my understanding of the topics and their application:
questions your Assessor may have during the practical assessment	
3. Other Requirements	All candidate formative assessments completed by Instructor including; Observations
Acquirements	o Demonstrations
	 Questions and recorded answers All work produced on modulo projects and assignments
	 All work produced as module projects and assignments Completed learner logbooks
	Completed work records
	Documented plant shutdown, isolation and servicing procedures

ASSESSOR JUDGEMENT GUIDE

Candidate's Name:.	Father's Name:
INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Complete practical task of controlling MHP plant shutdown for emergency standby electrical systems under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out:		
Prepare emergency	Turned off circuit breaker of generator		
shutdown electrical system of MHP	Turned off power switch of control panel		
Isolate MHP electrical system from distribution network	Turned off circuit breaker of control panel		
Connect generator	Joined wire connections of generator with control panel		
with control panel	Turned on power switch of generator		
2. Answer any questions their assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attached.		
3. Any other requirements	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Documented plant shutdown, isolation and servicing procedures 		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

	This section contains information regarding;
INSTRUCTIONS • Context of the assessment	
List of required tools and equipment.	
List of consumable items required during the service	
1. Context of	
Assessment	This practical skill demonstration will be conducted in a Micro Hydel Power Plant lab/workshop environment

SR#	Mechanical			
1	Adjustable wrench set			
2	Allen Keys Set			
3	Combination Pliers			
4	Crimping Tool			
5	Nose Pliers			
6	Pipe Wrench [18" & 24"]			
7	Side Cutting Pliers			
8	Spanner Set (Open)			
9	Spanner Set (Ring)			
10	Stainless Steel Slogging Ring Spanner			
	Electrical			
1	Clamp Meter			
2	Line Tester			
3	Mugger			
4	Multi Meter			
5	Screw Driver Set			





ASSESSMENT MATERIAL EVIDENCE GUIDE Qualification LEN0294.v1 Level: 4 Credit: 3 Version: 1	ANALYZE FAULTS IN MHP PLANT OPERATION
	 Assessment Summary and Record Candidate Assessment Assessor Judgement Guide List of required tools/equipment, material and context of assessment
ASSESSMENT AND ASSESSOR	Competent Not Yet Competent
DETAILS	Assessment Re-Assessment
	Assessor's Name: Assessor's Code
	Assessor's Signature Date Date DD MM YYYY
	Candidate's Name:
	Father's Name
	Institute Name and District
CANDIDATE DETAILS	CNIC/BFORM #
	Registration Number issued by Assessment Body :
	Gender Male Female Transgender
	Candidate's Consent I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.
	Candidate's Signature:
ASSESSMENT RESULTS SUMMARY FORM	You can use this coversheet as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC
NAVTTC OFFICE ONLY	1. DATE FORM RECEIVED: DD MM YYYY 2. DATE ENTERED INTO DATABASE: DD MM YYYY DD MM YYYY

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ASSESSMENT SUMMARY & RECORD

Candidate's Name:								
ACTIVITY		METHOD)	DESIRED OUTCOMES		RESULT	
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: ANALYZE FAULTS IN MHP PLANT OPERATION	COMPETENT	NOT YET COMPETENT	
Practical skill Demonstration			~		Analyse the common faults of MHP plant			
Knowledge Assessment		~			 Answer all questions your assessor may have during the practical assessment 			
Other Requirements				\checkmark	Provide the verified evidence of changing runner			

Candidate's Name:

Father's Name:

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within 5(five) hours timeframe:

- Change the jam bearing of main shaft of turbine
- Fix the Haunting of Speed Governor
- Fix the leakage of fore bay tank

ACTIVITIES	CANDIDATE RESPONSE
1. Complete practical task of analysing faults in MHP plant operation under observation by an assessor	 During a practical assessment, under observation by an assessor, I will correctly: Remove the jam bearing of main shaft of turbine Remove cover from bearing bracket Use puller to remove bearing from main shaft Fix the Speed Governor Haunting Adjust the frequency of generator (55Hz) from the tuner of speed Governor. Check the frequency from control panel (55Hz) Fix the leakage of fore bay tank Divert the water direction from flushing gates of spillway Add concrete to the leakage point
2. Answer any questions your Assessor may have during the practical assessment	My answers to questions are correct and demonstrate my understanding of the topics and their application:
3. Other Requirements	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Documented fault analysis records



ASSESSOR JUDGEMENT GUIDE

Candidate's Name:

Father's Name:

INSTRUCTIONS FOR ASSESSOR

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Complete practical task of analysing faults in MHP plant operation under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out:		
Remove the jam bearing of main shaft of turbine	Removed cover from bearing bracket Used puller to remove bearing from main shaft		
Fix the Speed Governor Haunting	Adjusted the frequency of generator (55Hz) from the tuner of speed Governor. Checked the frequency from control panel (55Hz)		
Fix the leakage of fore bay tank	Diverted the water direction from flushing gates of spillway Added concrete to the leakage point		
2. Answer any questions their assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attached.		
3. Any other requirements	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Documented fault analysis records 		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

This section contains information regarding;
Context of the assessment
List of required tools and equipment.
List of consumable items required during the service
This practical skill demonstration will be conducted in a Micro Hydel Power Plant lab/workshop environment

SR#	Mechanical/Electrical
1	Adjustable wrench set
2	Allen Keys Set
3	Bench Workstation
4	Clamp Meter
5	Claw hammer with wood handle
6	Combination Pliers
7	Crimping Tool
8	Hand Grease Gun
9	Measuring tape
10	Micro Meter [Screw Gauge]
11	Nose Pliers
12	Oil Can
13	Pipe Wrench [18" & 24"]
14	Bearing Puller
15	Screw Driver Set (-)[6"-18"]
16	Screw Driver Set (+) [6"-18"]
17	Side Cutting Pliers
18	Spanner Set (Ring)
19	Stainless Steel Slogging Ring Spanner
20	Vernier Calliper

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ASSESSMENT MATERIAL		
EVIDENCE GUIDE		
Qualification LEN0294.v1	PLAN	AND DESIGN MHP PLANT
Level: 4		
Credit: 20		
Version: 1		
CONTENTS	 Assessment Summary Candidate Assessmen Assessor Judgement (List of required tools/e 	t
ASSESSMENT AND ASSESSOR	Competent	Not Yet Competent
DETAILS	Assessment	Re-Assessment
	Assessor's Name:	Assessor's Code
	Assessor's Signature	Date Date DD MM YYYY
	Candidate's Name:	First Name Last Name
	Father's Name	
	Institute Name and District	
CANDIDATE DETAILS	CNIC/BFORM #	
DETAILS	Registration Number issued by Assessment Body :	
	Gender	Male Female Transgender
	Candidate's Consent	I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.
	Candidate's Signature:	
ASSESSMENT RESULTS SUMMARY FORM	You can use this covershee	et as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC

NAVTTC OFFICE	1. DATE						2. DATE ENTERED INTO							
	FORM						DATABASE:							
ONLY	RECEIVED:	DD	MM	Y	'YYY		DATADASE.	D	D	MN	N	Y١	ΥY	

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ASSESSMENT SUMMARY & RECORD

Candidate's Name					Father's Name:		
ACTIVITY		I	METHOD)	DESIRED OUTCOMES	RES	ULT
NATURE OF ACTIVITY	WRITTEN	ORAL	OBSERVATION	PORTFOLIOS	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF COMPETENCY STANDARD: PLAN AND DESIGN MHP PLANT	COMPETENT	NOT YET COMPETENT
Practical Skill Demonstration			~		Conduct site assessment		
Knowledge Assessment		~			Answer all questions your assessor may have during the practical assessment		
Other Requirements				\checkmark	Provide verified evidence of designing power channel of MHP		

ALL WORK ASSESSED IN THIS COMPETENCY STANDARD MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to complete the following tasks within set timeframe:

- Conduct site assessment •
- Conduct initial planning of civil construction works •
- Determine physical requirements of MHP plant

ACTIVITIES	CANDIDATE RESPONSE
 Complete practical task of planning and designing MHP plant under observation by an assessor Answer any 	During a practical assessment, under observation by an assessor, I will correctly: • Conduct site assessment ✓ Measure head with the use of water level method ✓ Measure flow with the use of Salt Dilution method • Planning of civil construction works ✓ Dimension main civil construction structure of MHP plant ✓ Measure the total length of power channel • Determine physical requirements of MHP plant ✓ Identify procurement requirements for mechanical and electrical equipment of MHP plant ✓ Prepare powerhouse floor plan to arrange for electro-mechanical equipment ✓ Carry out initial planning of distribution network layout • Meet set timeframes required for tasks of planning and designing MHP plant My answers to questions are correct and demonstrate my understanding of the topics and their application:
questions your Assessor may have during the practical assessment	
3. Other Requirements	 All candidate formative assessments completed by Instructor including; ✓ Observations ✓ Demonstrations ✓ Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Recorded planning data Head and flow measurements and power calculations Cost estimates Powerhouse floor plans identifying dimensions, and locations of electro-mechanical equipment

Candidate's Name:	Father's Name:
INSTRUCTIONS FOR ASSESSOR	This section contains minimum evidence requirements. Oral questioning may be used to clarify candidate understanding of the topic and its application.

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS
1. Complete practical task of planning and designing MHP plant under observation by an assessor	During a practical assessment, under observation by an assessor, the candidate correctly carried out the following tasks:		
Conduct site	Measured head with the use of water level method		
assessment	Measured flow with the use of Salt Dilution method		
Planning of civil construction works	Dimension main civil construction structure of MHP plant Measured the total length of power channel		
Determine physical requirements of MHP plant	Identified procurement requirements for mechanical and electrical equipment of MHP plant Prepared powerhouse floor plan to arrange for electro- mechanical equipment Carried out initial planning of distribution network layout Met set timeframes required for tasks of planning and designing MHP plant		
2. Answer any questions their assessor may have during the practical assessment	Candidate's answers to questions are correct and demonstrate understanding of the topics and their application. Assessor to document below all questions asked and candidate answers. Use extra sheets if required and attached.		
3. Any other requirements	 All candidate formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers All work produced as module projects and assignments Completed learner logbooks Completed work records Recorded planning data Head and flow measurements and power calculations Cost estimates Completed powerhouse floor plans identifying dimensions, and locations of electro-mechanical equipment 		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

	This section contains information regarding;
INSTRUCTIONS	Context of the assessment
	List of required tools and equipment.
	List of consumable items required during the service
1. Context of	
Assessment	This practical skill demonstration will be conducted in a Micro Hydel Power Plant lab/workshop environment

SR#	Mechanical/Civil	
1	Aluminium Spirit Level (levelling instrument)	
2	Measuring tape	
3	Plastic Pipe	
4	Conductivity meter	
5	Pressure quage	
6		





ASSESSMENT MATERIAL EVIDENCE GUIDE Qualification code: LEN0294.v1 Level: 4 Credit: 45 Version: 1		pply Micro Hydel Power erations(Technician)skills
CONTENTS	 Assessment Summ Candidate Assessn Assessor Judgeme List of required too 	nent
ASSESSMENT AND ASSESSOR	Competent	Not Yet Competent
DETAILS	Assessment	Re-Assessment
	Assessor Name: Assessor Signature	Assessor Code
	Candidate Name:	First Name Last Name
CANDIDATE	Father Name Institute Name and District	
DETAILS	OR Registration Number:	Male Female
	Candidate Consent Candidate Signature:	I agree to the time and date of the assessment and am aware of the requirements of the assessment. I fully understand my rights of appeal.
ASSESSMENT RESULTS SUMMARY FORM	You can use this covershe	eet as an Assessment Results Summary Form. Simply post a photocopy of this completed coversheet to NAVTTC
	DATE FORM	2. DATE ENTERED INTO DATABASE: 2. DATE ENTERED INTO DATABASE:

ASSESSMENT SUMMARY AND RECORD

ACTIVITY	METHOD			DESIRED OUTCOMES	RESULT		
NATURE OF ACTIVITY	WRITTEN	ORAL	PORTFOLIO	OBSERVATION	DESIRED OUTCOMES FOR SUCCESSFUL ASSESSMENT OF: APPLY MICRO HYDEL POWER OPERATIONS (TECHNICIAN) SKILLS FOR MHP PLANT	COMPETENT	NOT YET COMPETENT
Practical skill demonstration			~	~	 Complete supplied project brief related to the application of Micro Hydel Power Operations (Technician)skills for MHP plant: Apply entrepreneurial skills Manage work and personnel in a MHP plant Control MHP plant shutdown for emergency standby electrical systems Analyze faults in MHP plant operation Plan and design MHP plant 		
Knowledge assessment		✓			 Answer all questions Assessment Panel will have following oral presentation of completed project brief 		
Other requirements	~	~	~	~	 All completed course assignments Completed work forms Completed job records Completed plan for career options related to Micro Hydel Power operations All learner log books and formative assessments completed by Instructor including; Observations Demonstrations Questions and recorded answers 		

ALL WORK ASSESSED FOR THESE COMPETENCY STANDARDS MUST BE YOUR OWN WORK.

GUIDANCE TO CANDIDATE

To meet this standard you are required to:

- Prepare emergency shut down electrical system of MHP •
- Prepare emergency shut down electrical system of MHP •
- Connect generator with control panel •
- Remove the jam bearing of main shaft of turbine
- Fix the Speed Governor Haunting
- Fix the leakage of fore bay tank
- Conduct site assessment •
- Planning of civil construction works .
- Determine physical requirements of MHP plant

 Complete portfolio of evidence e e	 Turn off circuit breaker of generator Turn off power switch of control panel Isolate MHP electrical system from distribution network Turn off circuit breaker of control panel 	;
2. Complete project brief of applying Micro Hydel Power Operations (Technician) skills for MHP plant under observation by	 Turn off circuit breaker of generator Turn off power switch of control panel Isolate MHP electrical system from distribution network Turn off circuit breaker of control panel 	
•	 Join wire connections of generator with control panel Turn on power switch of generator Remove the jam bearing of main shaft of turbine Remove cover from bearing bracket Use puller to remove bearing from main shaft Fix the Speed Governor Haunting Adjust the frequency of generator (55Hz) from the tuner of speed G Check the frequency from control panel (55Hz) Fix the leakage of fore bay tank Divert the water direction from flushing gates of spillway Add concrete to the leakage point Conduct site assessment Measure head with the use of water level method Measure flow with the use of Salt Dilution method Planning of civil construction works Dimension main civil construction structure of MHP plant Measure the total length of power channel Determine physical requirements of MHP plant Identify procurement requirements for mechanical and electrical equipant 	

	 Prepare powerhouse floor plan to arrange for electro-mechanical equipment Carry out initial planning of distribution network layout
3. Present completed project brief supplied by Instructor	 Oral presentation of project brief and completed project work to Assessment Panel. Presentation to include: Requirements of brief Planning and preparation of project Problems encountered and how they were dealt with Project outcome/s Lessons learnt from undertaking project (reflective thinking) Presentation to take no longer than 10 minutes
4. Answer all questions Assessor Panel will have following project presentation	My answers to questions are correct and demonstrate my understanding of the topics and their application.

ASSESSOR JUDGEMENT GUIDE

Candidate Name		me	
INSTRCUTIONS FOR ASSESSMENT PANEL	 THIS SECTION CONTAINS MINIMUM EVIDENCE REQUIREMENTS. The Assessment Panel will consist of a registered Assessor, the candidate's Instructor, and a private sector expert The project brief will consist of integrated task requirements to enable the candidate to supply sufficient evidence of their competence in the skills required to work as Micro Hydel Power Operations (Technician) The project brief must be suitable for the level of knowledge and skills required (i.e. Level 4) The timeframe for completion of assigned project brief is 5 working days The candidate may work in a team or as an individual to complete the project brief. If in a team, the contribution of each candidate must be clearly defined and observable. 		
ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS ON CANDIDATE PERFORMANCE
1. Present portfolio of evidence	 All completed course assignments Completed work forms Completed job records Completed plan for career options related to Micro Hydel Power operations All learner log books and formative assessments completed by Instructor including; Observations Demonstrations 		
2: Complete project brief of applying Micro Hydel Power Operations (Technician)s kills for MHP plant under observation by	 Questions and recorded answers Prepare emergency shut down electrical system of MHP Turn off circuit breaker of generator Turn off power switch of control panel Isolate MHP electrical system from distribution network Turn off circuit breaker of control panel 		
Instructor	 Connect generator with control panel ✓ Join wire connections of generator with control panel ✓ Turn on power switch of generator Remove the jam bearing of main shaft of turbine ✓ Remove cover from bearing 		
	 bracket ✓ Use puller to remove bearing from main shaft Fix the Speed Governor Haunting ✓ Adjust the frequency of generator (55Hz) from the tuner of speed Governor. ✓ Check the frequency from control panel (55Hz) 		
	 Fix the leakage of fore bay tank ✓ Divert the water direction from flushing gates of spillway 		

ACTIVITIES	MINIMUM EVIDENCE REQUIRED	YES/NO	ASSESSOR COMMENTS ON CANDIDATE PERFORMANCE
AUTIVITIES	✓ Add concrete to the leakage point ● Conduct site assessment ✓ Measure head with the use of water level method ✓ Measure flow with the use of Salt Dilution method ● Planning of civil construction works ✓ Dimension main civil construction structure of MHP plant ✓ Measure the total length of power		
	 channel Determine physical requirements of MHP plant ✓ Identify procurement requirements for mechanical and electrical equipment of MHP plant ✓ Prepare powerhouse floor plan to arrange for electro-mechanical equipment 		
3. Present completed project brief supplied by Instructor	 Carry out initial planning of distribution network layout Oral presentation of project brief and completed project work to Assessment Panel. Presentation to include: Requirements of brief Planning and preparation of project Problems encountered and how they were dealt with Project outcome/s Lessons learnt from undertaking project (reflective thinking) 		Image: Section 1.1 Image: Section 1.1 Image: Section
4. Answer any questions their Assessor may have during the practical assessment	 Presentation to take no longer than 10 minutes Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application. Assessor to document all questions asked, if any, and the answers here: 		

LIST OF TOOLS, EQUIPMENT, MATERIAL AND CONTEXT OF ASSESSMENT

	This section contains information regarding;
Instructions	Context of the assessment
	List of required tools and equipment.
	List of consumable items required during the service
	This task will be performed in MHP plant lab/workshop environment
1. Context of Assessment	Required tools, equipment and consumables will vary according to project brief

SR#	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 35	Spanner Set (Ring)	
35 36	Stainless Steel Slogging Ring Spanner	
	Thread Gauge	
37 38	Tong/Monkey Plier	
38	Vernier Caliper Wheel Grinder	
40	Wreel Grinder Wire Gauge	
40	Wile Gauge Welding Plant	
41	Electrical	
1	Clamp Meter	
		<u> </u>

0	Combination Bline	
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	
10	Safety Tools	
1	Fire Extinguisher	
	First Aid Box	
2		
3	Hand Gloves	
4	Hard top Hat	
5	Mask	
6	Overall combination [Dress]	
7	Safety Belt	
8	Safety Goggles	
9	Steel Toe Shoes	
	EQUIPMENT	
<u> </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	Pilton Turbine
15	Propeller/Kaplan Turbine
16	Single Phase Variac [Auto Transformer]
17	Tachometer
18	V Belt
19	V-Pulleys

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