

DACUM Panel

1. Mr. Amir Shrestha, Technician, Power Tech, Lalitpur
2. Mr. Subash Luintel, Technician, Motherland Energy Group, Balaju, KTM
3. Mr. Arjun Devkota, Technician, UCS, KTM
4. Mr. Bishwo Raj Gauli, Technician, Energy Prabadhan Company, Samakhusi, KTM
5. Mr. Shiva Shrestha, Technician, Energy Group, Mitrapark, Kathmandu
6. Mr. Keshav Karki, Technician, D. L. Energy Prabadhan Company, Samakhusi, Kathmandu
7. Mr. Lok Bahadur Sarki, Technician, Lumbini Engineering & Hydropower, Swambhu, KTM
8. Mr. Rajesh Shrestha, Technician, Lumbini Engineering & Hydropower, Swambhu, KTM

DACUM Coordinator

Mr. Tulsi K.C., Sr. Skill Testing Officer, NSTB

DACUM Facilitator

Mr. Suresh Maharjan, Skill Testing Officer, NSTB
Mr. Prem Chandra Pokhrel, Skill Testing Officer, NSTB

Verification Panel

1. Mr. Basanta Raj Lamichhane, MD, DL Energy Concern (P) Ltd., Mitranagar, KTM
2. Mr. Saurav Parajuli, Engineer, Rural & Alternative Energy (P) Ltd., Damauli, Tanahun
3. Mr. Ram Chandra Adhikari, Coordinator, Energy Prabardhan Company, Samakushi, KTM
4. Mr. Bishworaj Gauli, Civil Overseer, Energy Prabardhan Company, Samakushi, KTM
5. Mr. Shiva Shrestha, Civil Overseer, Energy Prabardhan Company, Samakushi, KTM
6. Mr. Prem Bahadur Shakya, MD, Housing and Hydro Services (P) Ltd., Pulchowk, Lalitpur
7. Mr. Subas Luintel, Engineer, Motherland Energy Group, Balaju, KTM
8. Mr. Yog Narayan Thakur, Technician, Tej Energy Solution Nepal (P) Ltd., Pepsicola, KTM

DACUM Coordinator

Mr. Tulsi K.C., Sr. Skill Testing Officer, NSTB

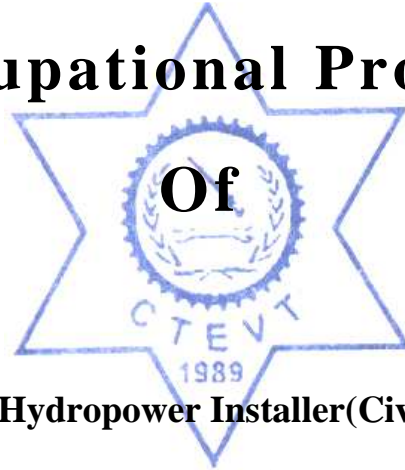
DACUM Facilitator

Mr. Suresh Maharjan, Skill Testing Officer, NSTB
Mr. Prem Chandra Pokhrel, Skill Testing Officer, NSTB

Technical Sub-Committee

1. Prof. Dr. Jagan Nath Shrestha, Coordinator, Renewable Energy
2. Dr. Kul Bahadur Basnet, Member, Director, NSTB, Bhaktapur
3. Prof. Dr. Triratna Bajracharya, Member, Center for Energy Studies, I.O.E., Pulchowk, Lalitpur
4. Mr. Krishna Bahadur Nakarmi, Member, UTSS, Kathmandu
5. Mr. Ashok Shrestha, Member, Road Department, Heavy Equipment Division, Kathmandu
6. Mr. Krishna Prasad Devkota, Member, NMHDA, Kathmandu
7. Mr. Madhu Sudhan Adhikari, Member, AEPC/NRREP, Kathmandu
8. Mr. Tulsi K.C., Member, Sr. Skill Testing Officer, NSTB, Bhaktapur
9. Mr. Prem Chandra Pokhrel, Skill Testing Officer, NSTB
10. Mr. Yam Bhandari, Member Secretary, Renewable Energy, NSTB

Occupational Profile



Micro Hydropower Installer(Civil), L-2

(DACUM Workshop on 19-20 June 2014)

(Customized DACUM on 4 July 2014)

(Technical Sub Committee Meeting on 28-29 July 2014)



Council For Technical Education and Vocational Training

NATIONAL SKILL TESTING BOARD

Madyapur Thimi 17, Sanothimi, Bhaktapur

Nepal

(NSTB approval date)

DUTIES and TASKS

A. Perform Preliminary Construction Works

A1. Conduct Meeting			A2. Observe Site			A3. Collect Resource (Manpower, Materials & Instruments/ Tools)			A4. Locate Structure (Intake to Tailrace)		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	3	3	1	1	3	3	2	3	3	1
A5. Measure Water Discharge			A6. Fix Alignment (Intake to Tailrace)			A7. Measure Head			A8. Calculate Installed Capacity		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	1	3	3	2	3	2	2	3	1	1

B. Fix Layout of Components

B1. Fix Benchmark			B2. Transfer Elevation			B3. Measure Dimension			B4. Perform Pegging		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	2	3	3	3	3	1	3	3	1	3
B5. Maintain Slope			B6. Estimate Materials								
Task rating			Task rating								
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency						
3	2	3	3	2	3						

C. Construct Sub-structure

C1. Perform Excavation			C2. Perform Compaction			C3. Perform Soling Work			C4. Construct PCC		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	3	3	2	3	3	2	3	3	2	3
C5. Construct RCC			C6. Construct Masonry			C7. Perform Back Filling					
Task rating			Task rating			Task rating					
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency			
3	2	3	3	2	3	2	1	3			

D. Construct Super-structure

D1. Construct Dry Wall			D2. Prepare Mortar			D3. Construct Stone Masonry Wall			D4. Construct Brick Masonry Wall		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
2	2	2	3	2	3	3	2	3	2	2	2
D5. Construct RCC Wall			D6. Construct RCC Slab			D7. Perform Plastering/Punning			D8. Perform Pointing		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	3	3	3	3	3	3	2	3	2	2	2
D9. Perform Curing											
Task rating											
Importance	Difficulty	Frequency									
3	1	3									

E. Construct Machine Foundation

E1. Fix Machine Layout			E2. Excavate Machine Foundation			E3. Perform Machine Foundation Compaction			E4. Perform Machine Foundation Soling		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	3	1	3	2	1	3	2	1	3	2	1
E5. Construct Tailrace Pit Base Slab			E6. Perform Formwork			E7. Fix Base Frame/Template			E8. Set Draft Tube		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	3	1	3	3	2	3	3	1	2	2	1
E9. Set Anchor Bolt			E10. Maintain Drainage			E11. Cast RCC			E12. Construct Cable Trench		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	3	1	3	2	1	3	2	1	3	2	1

DUTIES and TASKS

F. Install Hydro-Mechanical Component

F1. Fix Expansion Joint			F2. Set Penstock Pipe/Bend Pipe			F3. Construct Anchor Block			F4. Construct Support Pier		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	3	3	3	3	3	3	3	3	3	2	3
F5. Set Bell Mouth			F6. Set Air Vent Pipe			F7. Set Trash-rack			F8. Set Sluice Gate		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	1	3	1	1	3	2	2	3	2	2
F9. Set Flushing Cone											
Task rating											
Importance	Difficulty	Frequency									
3	2	2									

G. Inspect Civil Components

G1. Maintain Daily Record			G2. Inspect Weir/Dam			G3. Inspect Intake/Gravel Trap			G4. Inspect Headrace Canal		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	3	3	2	1	3	2	1	3	2	1
G5. Inspect De-silting Basin			G6. Inspect Fore Bay			G7. Inspect Penstock			G8. Inspect Machine foundation		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	1	3	2	1	3	2	1	3	2	1
G9. Inspect Tailrace			G10. Inspect Power House			G11. Prepare construction Report					
Task rating			Task rating			Task rating					
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency			
3	2	1	3	2	1	3	2	2			

H. Perform Testing & Commissioning

H1. Prepare Testing Plan			H2. Test Weir/Dam			H3. Test Intake/Gravel Trap			H4. Test Headrace Canal		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	3	3	2	1	3	2	1	3	2	1
H5. Test De-silting Basin			H6. Test Fore Bay			H7. Test Penstock			H8. Test Machine foundation		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	1	3	2	1	3	2	1	3	2	1
H9. Test Tailrace			H10. Test Power House			H11. Prepare Testing Commissioning Report					
Task rating			Task rating			Task rating					
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency			
3	2	1	3	2	1	3	2	2			

I. Perform Communication

I1. Communicate with client/ owner			I2. Communicate with consultant/contractor			I3. Communicate with senior/junior			I4. Communicate with peers		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	1	3	3	1	3	3	1	3	3	1	3
I5. Communicate with engineer/overseer			I6. Communicate with electro-mechanic technician			I7. Communicate with concern office/stake holder					
Task rating			Task rating			Task rating					
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency			
3	1	3	3	1	3	3	1	3			

DUTIES and TASKS

J. Develop Professionalism

J1. Participate in workshop/seminar			J2. Attend training			J3. Visit related site			J4. Work with expert		
Task rating			Task rating			Task rating			Task rating		
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency
3	2	1	3	2	1	3	2	1	3	1	2
J5. Read articles/books/newspaper			J6. Read completion Report			J7. Visit related web sites					
Task rating			Task rating			Task rating					
Importance	Difficulty	Frequency	Importance	Difficulty	Frequency	Importance	Difficulty	Frequency			
3	1	3	3	2	3	3	2	3			

Note: Duty I and J are not for testing purpose.

Rating options:

1= Low

2= Medium

3= High

Additional Information for Job Title

<p>Worker traits</p> <ul style="list-style-type: none"> • Honest • Convincing Power • Polite • Efficient • Punctual • Helpful • Sincere • Tactful • Social • Healthy • Hard Working • Confidential • Decisive • Co-operative • Confident 	<p>Entry Requirements</p> <ul style="list-style-type: none"> • Literate with 1 year (600+800 hrs OJT) Training <p style="text-align: center;">Or</p> <ul style="list-style-type: none"> • As per NSTB rules <p>Performance as well as written test will be conducted.</p>	<p>Career Path</p> <p>Senior Micro Hydropower Installer (Civil), L- 3</p>		
<p>Related Technical Knowledge</p> <ul style="list-style-type: none"> • Uses of Auto/ Abney Level Survey (Ranging Rod). • Tape Measurement Methodology • Flow Measurement Methodology • Head Measurement Methodology • Global Positioning System (GPS) • Auto Level Machine • Site Selection <ul style="list-style-type: none"> ○ Diversion ○ Intake site ○ Canal Alignment (Rout) ○ Fore Bay / De-silting / Gravel Trap ○ Penstock alignment selection ○ Power House Location ○ Spillway and tailrace • Basic Method of survey <ul style="list-style-type: none"> ○ Rise and Fall ○ Height of Instrument ○ Longitudinal ○ Cross Section ○ Compass • Estimate of Materials. • Basic Engineering Drawing & Contour map • Micro hydropower Technology • Technique of Installation • Function of Machine • Inter connection of civil and hydro mechanical component • Handling technique of Instrument • Technique of group Formation and mobilization • Basic knowledge of Recent Rate Analysis, Estimating and Costing • Construction Material and its Quality • Mixing Ratio of Construction Materials • Cable Ducting Practices • Use of personal protective equipments (PPE) 	<p>Tools/Equipment</p> <table style="width: 100%; border: none;"> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Measuring Tape • Screw driver Set • Auto Level set • Abney Level • Level Pipe • G.P.S • Conductivity meter • Theodolite • Sprit Level • Tacho Meter • Stop watch • Weighing machine • Heating Plate • Ranging Rod • Weir • Current Meter • Magnetic Compass • Jig Machine • Thermo chrome Chalk • Teflon Paper • Spanner • Wrench Set • Pipe Wrench • Combination Pliers • Nose Pliers • T wrench • Socket wrench set • Bearing Puller • Allen key Set • Round File • Flat File • Half Round File • Ikar (Barma) • Hammer • Safety Belt </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Hacksaw Set • Chisel • Trowel • Shovel • Bucket • Nole (Durmus) • Ruksa • Ladder • Gloves/Rain boot • Helmet • Scissor • Wooden Saw • Cutting Knife • Peak • Gal / Liver • Plumb-bob • String • Goggle • First Aid Box • Dial Gauge • Scientific Calculator </td> </tr> </table>		<ul style="list-style-type: none"> • Measuring Tape • Screw driver Set • Auto Level set • Abney Level • Level Pipe • G.P.S • Conductivity meter • Theodolite • Sprit Level • Tacho Meter • Stop watch • Weighing machine • Heating Plate • Ranging Rod • Weir • Current Meter • Magnetic Compass • Jig Machine • Thermo chrome Chalk • Teflon Paper • Spanner • Wrench Set • Pipe Wrench • Combination Pliers • Nose Pliers • T wrench • Socket wrench set • Bearing Puller • Allen key Set • Round File • Flat File • Half Round File • Ikar (Barma) • Hammer • Safety Belt 	<ul style="list-style-type: none"> • Hacksaw Set • Chisel • Trowel • Shovel • Bucket • Nole (Durmus) • Ruksa • Ladder • Gloves/Rain boot • Helmet • Scissor • Wooden Saw • Cutting Knife • Peak • Gal / Liver • Plumb-bob • String • Goggle • First Aid Box • Dial Gauge • Scientific Calculator
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