

TALLO LIKHU JALAVIDHYUT AAYOJANA (28.1 MW)



MONTHLY PROGRESS REPORT # 51

JULY, 2022

(17 Ashad to 15 Shrawan, 2079)

Prepared By:



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1 PROJECT OVERVIEW AND INSTITUTIONAL ARRANGEMENT

Tallo Likhu Jalavidhyut Aayojana is a run-of-river (RoR) hydropower project which utilizes Gross Head 118 m and Design Discharge of 29.75 m³/s resulting to an installed capacity of 28.1 MW. The entire project area (Headworks to powerhouse) is located in Likhu-Tamakoshi Rural Municipality (Saipu, ward no. 2 and Bijulikot ward no. 4) of Ramechhap, Bagmati Province of Nepal. Geographically, the project lies between Longitudes 86°15'38" E to 86°13'17" E and Latitudes 27°25'56" N to 27°22'47"N. Geologically, the project area belongs to the Lesser Himalayas.

The project's Headworks area is accessible via two different road routes. One from Kathmandu-Dhulikhel-Charikot-Nayapul-Dhobi-Sirise (227 km) and another from Kathmandu-Dhulikhel-Khurkot-Manthali-Dhobi-Sirise (170 km).

CONSTRUCTION MANAGEMENT

The Employer/Owner	Swet Ganga Hydropower & Construction Ltd. (SGHCL)
The Engineer/ Consultant	Sanima Hydro and Engineering Pvt. Ltd. (SHEPL)
The Contractor (Civil Construction Works)	High Himalaya Hydro-Bavari Construction J.V.
The Contractor (Hydro-mechanical Works)	Machhapuchhre Metal & Machinery Works (P.) Ltd. (3MW)
The Contractor (Electro-mechanical Works)	Asia Pacific Power-Tech Co. Ltd., China
The Contractor (Transmission-line Works)	Aster Teleservices Nepal Pvt. Ltd.
Pre-construction works, camp facilities, social environment	Direct by the Employer

2 KEY DATES

Table 1: Key dates of major events of the project

Description	Date
Generation License issued by Department Electricity Development (DoED), Ministry of Energy (MoE), Government of Nepal (GoN)	2 Baisakh 2073 (14 April 2016)
	The license period of the project is from
	28 Chaitra 2072 to 27 Chaitra 2108 B. S.
Power Purchase Agreement (PPA) with Nepal Electricity Authority (NEA)	14 Poush 2073 (29 December 2016)
Financial Closure	10 Falgun 2074 (22 February 2018)
Contract of Main Civil Works	5 Chaitra 2074 (19 March 2018)
Contract of Hydro-mechanical Works	9 Poush 2075 (24 December 2018)
Contract of Electro-mechanical Works	18 Bhadra 2076 (4 September 2019)
Contract of Transmission Line Works	8 Shrawan 2077 (23 July 2020)
RCOD	1 Asoj 2079 (17 September 2022)

3 CONTRACT PACKAGES AND IMPLEMENTATION

Main civil construction works	Contract Package 1
Hydro-mechanical works	Contract Package 2
Electro-mechanical works	Contract Package 3
Transmission Line works	Contract Package 4
Pre-construction works, camp facilities, social environment	Direct by the Employer

4 FINANCING

Equity	Promoters	25% of the total Project Cost
Debt	Consortium of Banks	75% of the total Project Cost (Lead Bank: Laxmi Bank Ltd, Member Banks: Kumari Bank Ltd., Hydroelectricity Investment and Development Company Ltd. Century Commercial Bank Ltd., and Prabhu Bank Ltd.)

5 RESOURCES AT SITE

5.1 MANPOWER FROM EMPLOYER AND ENGINEER'S SIDE:

Table 2: Human Resource at site from the Employer and Engineer's side

Description	Number
General Manager	1
Resident Engineer	1
Environment and Social Officer	1
Finance/Admin Officer	1
Civil Engineer	3
Electrical Engineer	2
Mechanical Engineer	1
Engineering Geologist	1
Safety Coordinator	1
Civil Overseer/Sub-overseer	4
Mechanical Overseer	6
Electrical Overseer/Sub-overseer	6
Surveyor	2
Social Mobilizer	3
Admin Assistant	2
Driver	5
Cook	3
Office Helper	5
Construction Helper	5
Store keeper	1
Total:	54

5.2 MANPOWER FROM CIVIL CONTRACTOR'S SIDE:

Table 3: Human Resource at site from the Civil Contractor's side

Description	Number
Technical Manpower	19
Financial and Administrative manpower	24
Skilled workers(Machine Operators, Electricians, Heavy Drivers)	22
Semi-Skilled workers(Light Drivers, Civil workers)	23
Unskilled workers(Helpers, Kitchen workers, Pump operators)	22

Description	Number
Security guards	19
Total (A)	129
Other Workers (Sub-Contractors)	
DL/Bhimeshwor Construction (Headworks, Seti and Powerhouse)	30
Dreamland construction (Seti Outlet)	9
Gaiya Devi Construction (VB01)	12
Balaji Metal Works (Powerhouse, Main Outlet)	5
Total (B)	56
Grand Total (A+B)	185

Note: Data as per weekly report provided by the Main Civil Contractor on 31st July 2022.

5.3 MANPOWER FROM HYDRO-MECHANICAL CONTRACTOR'S SIDE:

Table 4: Human Resource at site from the Hydro-Mechanical Contractor's side

Description	Number
Site Project Engineer	1
Site Supervisor	3
Safety Officer	1
Store In-charge	1
Quality Controller	1
Electrician	1
Sand Blasting Operator	1
Hydra Operator	1
Tractor driver	1
Fitter	2
Welder	12
Helper	14
Cook	3
Total	43

5.4 EQUIPMENT MOBILIZED BY CIVIL CONTRACTOR

Table 5: Equipment mobilized by the Civil Contractor

S.N.	Equipment Name	Number	S.N.	Equipment Name	Number
1	Generator 62.5KVA	2	24	Pusher leg	37
2	Generator 30KVA	1	25	Blaster (Exploder)	6
3	Generator 125KVA	1	26	Siren	6
4	Generator 25 KVA	1	27	Core Cutting machine	2
5	Generator 160 KVA	3	28	Hand drilling machine	3
6	Generator 250 KVA	2	29	Air compressor	7
7	Air Receiver tank	4	30	Vibrators	8
8	Ohm meter	6	31	Water pump 10"	2
9	Excavator	4	32	Water pump 12"	1
10	Dump Truck	11	33	Water Pump 1.5"	6
11	Transportation Truck	1	34	Water pump 6"	4
12	Backhoe Loader (JCB)	3	35	Grinding machine(4")	6

S.N.	Equipment Name	Number	S.N.	Equipment Name	Number
13	Wheeled loader	4	36	Grinding machine(7")	1
14	Tractor	3	37	Welding machine	8
15	Light vehicle	6	38	Ply cutter machine (8"/7")	1
16	Concrete Batching Plant	1	39	Prism with tripod set	5
17	Concrete mixer	10	40	Leveling staff (5m)	4
18	Grouting pump	4	41	Total station (Topcon)	3
19	Concrete pump	3	42	Auto level with tripod set	4
20	Transit mixer	4	43	Shotcrete machine PZ5	3
21	Blower fan set	2	44	Compressive test machine	2
22	Pull out test machine	1	45	Lubricator	43
23	Shotcrete Robot (Jacon)	1	46	Diesel Tank 16000Ltr	3

5.5 EQUIPMENT MOBILIZED BY HYDRO-MECHANICAL CONTRACTOR

Table 6: Equipment mobilized by the Hydro-Mechanical Contractor

S.N.	Equipment	Number
1	Hydraulic Crane	1
2	Excavator	1
3	Tractor	1
4	Diesel Generator (200 KVA)	1
5	Diesel Generator (40 KVA)	1
6	Diesel Generator (12.5 KVA)	1
7	Welding Machine	14
8	Compressor	1
9	Grinding Machine (7")	14
10	Grinding Machine (4")	8
11	Master Oven	1
12	Portable Oven	14

5.6 CONSTRUCTION MATERIALS STORED BY CIVIL CONTRACTOR AT SITE:

Table 7: Construction material stored by the Main Civil Contractor

Materials	Unit	Balance Quantity
Diesel	Litres	4,120
Rebar (25mm dia.)	Ton	-
Rebar (20mm dia.)	Ton	2.50
Rebar (16mm dia.)	Ton	-
Rebar (12mm dia.)	Ton	5.00
Cement	Bags	4,540
Plasticizer	Kg	1,400.00
Steel Fibre	Kg	125.00
Micro Silica	Kg	400.00
Accelerator	Kg	275.00

Note: Data as per weekly report provided by the Main Civil Contractor on 31st July 2022.

6 CIVIL CONSTRUCTION WORK PROGRESS

6.1 HEADWORKS

The civil work progress at Headworks in July, 2022 is as follows:

- Concreting of the inside wall of the Fish passage has been completed from chainage 0+023 to 0+067.54.
- Concreting of the Fish passage has been completed for panel 1 (chainage 0+000 to 0+010.70).
- Base concreting of the Fish passage has been completed for panel 2 (chainage 0+010.70 to 0+023). Rebar and formwork installation works have been ongoing for the walls.

Table 8: Progress at Headworks in July, 2022

S. N.	Description	Unit	Quantity	Remarks
1	C25 concrete at Fish passage	m ³	40.00	
4	Rebar works at Fish passage	Ton	3.14	



Figure 1: Progress at the fish passage



Figure 2: Construction of stairs from settling basin to Headworks staff quarter

6.2 HEADRACE TUNNEL, SYPHON CROSSING AND SURGE SHAFT

HRT FROM MAIN INLET PORTAL TO SETI OUTLET PORTAL

The anchor block construction of main inlet portal and Seti outlet portal are ongoing. The second stage plum concrete above the pipe has been completed up to the level of 734.56m amsl out of 737.06m amsl for the Main Inlet Anchor Block and 726.35m amsl out of 732.35m amsl for the Seti Outlet Anchor Block.

Table 9: Civil Work progress for the Main Inlet Anchor Block and Seti Outlet Anchor Block

Location	Design Height (m)	Completed height (m)	Remaining height (m)	Remarks
Main Inlet Anchor Block	6.50	4.00	2.50	
Seti Outlet Anchor Block	9.75	3.75	6.00	



Figure 3: Plum concrete at the main inlet portal anchor block



Figure 4: Plum concrete works at Seti outlet anchor block

HRT FROM SETI INLET PORTAL TO POKU OUTLET PORTAL

All civil works have been completed at this portion.

HRT FROM POKU INLET PORTAL TO MAIN OUTLET PORTAL

All civil works have been completed at this portion.

SETI CROSSING

All civil works have been completed at this portion.

POKU CROSSING

All civil works have been completed at this portion.

SURGE SHAFT, ROCK TRAP AND CONNECTING TUNNEL

All civil works have been completed at this portion.

6.3 PENSTOCK, PPV HOUSE, POWERHOUSE AND TAILRACE

PENSTOCK ALIGNMENT:

The second stage plum concreting for the anchor block VB01 has been completed up to the level of 710 m amsl out of 715.82 m amsl. Drainage construction works have been completed at this area.

PPV HOUSE:

Installation of the steel plate for roofing is ongoing.

POWERHOUSE:

The concreting works of the powerhouse have been completed. Painting works have been completed at the outer walls of the powerhouse and is ongoing for the internal walls. Floor finishing has been completed at the service bay. Fencing works are ongoing at the peripherals of the powerhouse. Main door fabrication work is also been ongoing.

CONTROL ROOM AND OFFICE BUILDING:

The civil works of the control room and office block have been completed.

TAILRACE:

The construction of all civil works of the tailrace culvert has been completed.

SWITCHYARD:

All civil works of switchyard have been completed and fencing around the switchyard is ongoing.

Table 10: Progress at penstock and powerhouse in July, 2022

S.N.	Description	Unit	Quantity (Powerhouse and control building)	Quantity (Penstock alignment)
1	C25 concrete	m ³	-	50.00
2	Re-bar	ton	-	5.00
3	C25 Plum concrete	m ³	-	200.00



Figure 5: Construction of anchor block VB01 of penstock and PPV house roofing



Figure 6: Side drainage at the penstock alignment



Figure 7: Painting at the inner walls of powerhouse

7 HYDRO-MECHANICAL WORKS

The progress of hydro-mechanical works achieved in July 2022 is listed below:

- Final welding of the headrace pipe is ongoing at the remaining stretch (previously occupied by the rock crusher).
- Final welding of pipe has been completed at the main inlet portal bend (HP-AB03) and Seti outlet bend (SK-CB01).
- Final welding of pipe is ongoing at the main outlet bend (VB01).
- The Poku flushing valve, expansion joint bolts, manhole O-ring and bolts have arrived at site.



Figure 8: Headrace pipe



Figure 9: Penstock pipe bend (VB01)

8 ELECTRO-MECHANICAL WORK PROGRESS

The work progress of the electro-mechanical works in July 2022 is below:

Unit 1:

- All the machine installation works have been completed.
- Dry testing of unit 1 has been completed up to the Main Inlet valve (MIV).
- Red oxide painting work is ongoing in the pipeline system.

Unit 2:

- All the machine installation works have been completed.
- Dry testing of unit 2 has been completed up to the Main Inlet valve (MIV).
- Red oxide painting work is ongoing in the pipeline system.

Control room:

- DC panel testing has been completed.
- Unit protection panel testing has been completed.
- Transformer protection panel testing has been completed.
- AC panel testing has been completed.
- Testing of High Voltage Cubicle panel 1 to 5 has been completed.
- Testing of High Voltage Cubicle panel 6 to 11 is ongoing.
- Setting of Main transformer, line & units protection modules has been completed.
- PLC and SCADA system testing work is ongoing.

Switchyard:

- Insulation resistance testing of all switchyard equipment and transformers has been completed.

New Khimti Substation:

- Cable termination works have been completed.
- Preparation for communication system and bus bar protection system is ongoing.

PPV house:

- Installation of Penstock Protection Valve has been completed.



Figure 10: Red Oxide painting on cooling pipeline system



Figure 11: MIV control panel installation

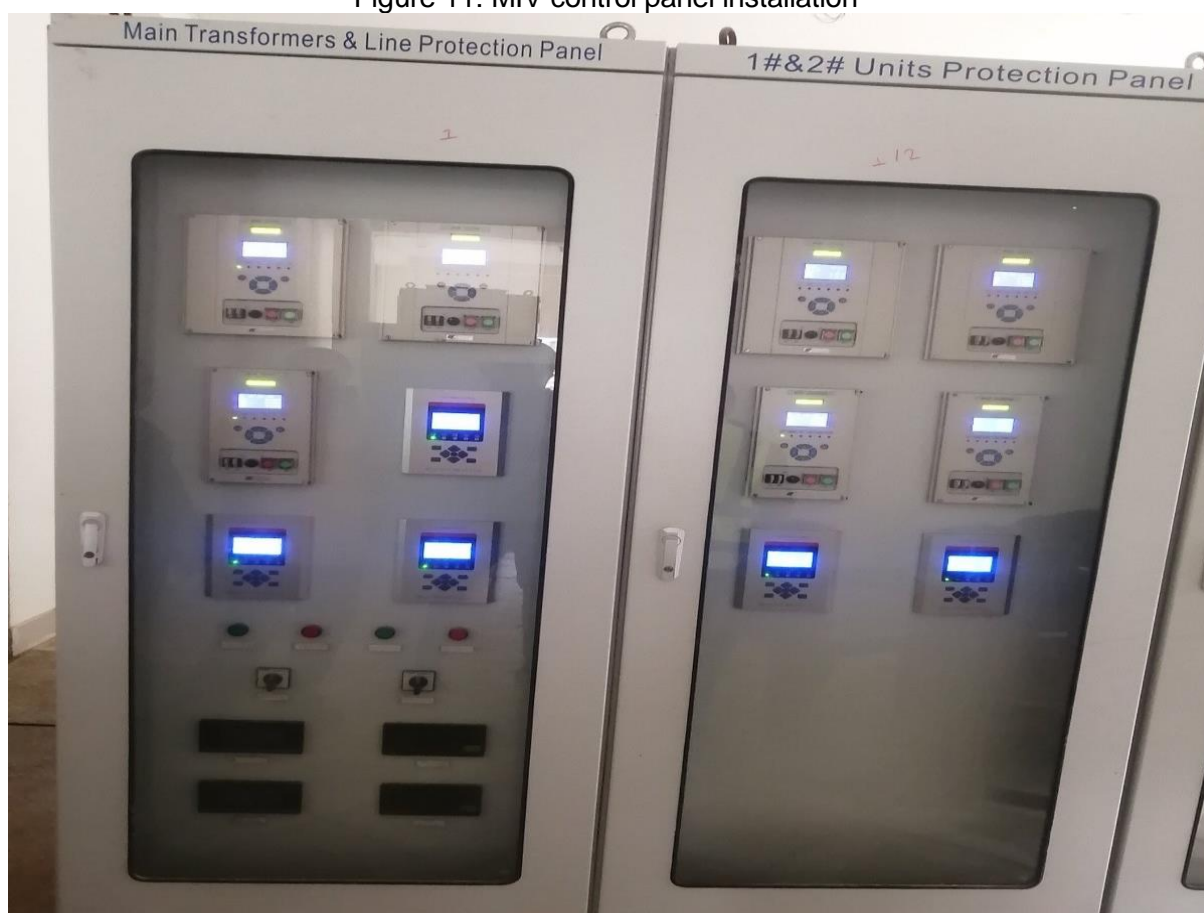


Figure 12: Setting of protection panels



Figure 13: PLC and SCADA system testing at control room



Figure 14: LLHP bay at New Khimti Substation

9 CONSTRUCTION POWER

The 12 km long construction power line has been erected from Headworks area to Sangutar in coordination with NEA and the public. The line has been charged from a 6 MVA transformer at Manthali on 16 Mangsir, 2076. The NEA's dedicated line has been made available to all working fronts. Regular monitoring and bush-cutting is ongoing.

10 TRANSMISSION LINE WORKS (132 KV)

The foundation works of the dead end tower AP00 have been completed. The conductor stringing works have been completed for 21.569 km stretch and OPGW cable has been installed for 21.159 km. Re-checking of earth resistance, copping and fencing at all tower locations is ongoing.



Figure 15: Foundation backfilling at AP00



Figure 16: Stringing of conductor at AP61-AP62

Table 11: Transmission line work progress

S.N	Description of Work	Design quantity	Completed till date	Remaining	Remarks
1	Foundation Excavation	62 Nos.	62 Nos.	-	
2	Foundation concreting	62 Nos.	62 Nos.	-	
3	Tower Erection	62 Nos.	61 Nos.	1 Nos.	
4	ACRS Conductor stringing	22.5 km	21.569km	0.931km	
5	OPGW cable stringing	22.5km	21.159km	1.341km	

11 SOCIAL AND PUBLIC

The major social activities undertaken in July 2022 are:

- Gabion walls have been constructed for the river training of Seti kholsi.
- Road repair has been done at landslide affected areas at Sisandu, Poku, etc.
- Steel pipe has been provisioned in the main inlet portal anchor block for irrigation canal crossing.
- Land reclamation has been done at lease land of Seti area and paddy plantation has been done at the reinstated area.
- Tree plantation has been done at several barren areas at Pokubesi and Main Outlet.



Figure 17: Road repair at Poku landslide area



Figure 18: Irrigation canal maintenance at downstream of Powerhouse area



Figure 19: Tree plantation program at Pokubesi

12 OCCUPATIONAL SAFETY AND HEALTH (OSH)

In addition to the construction activities, Occupational Safety & Health (OSH) has also been considered as one of the major prospects of the project. The OSH team at site promotes a safe and sound working environment at the working fronts by implementing safety and health standards and safe working procedure through awareness and monitoring. The OSH team ensures preparedness in mishaps and emergencies. Regular meeting with the contractors and workers are conducted for the enhancement of safety culture. The OSH team routinely screens the construction fronts to guarantee safe practice and deter the safety non-compliance.

The company has also hired an external consultant team (SMS Environment and Engineering Pvt. Ltd) for monitoring the safe working environment. The external consultant regularly performs safety audits at site to ensure the consistence of OSH and provide essential restorative methods.

12.1 OSH IMPLEMENTATION BY THE CONTRACTORS

Table 12: OSH implementation by the Civil Contractor

Particular	Description	Remarks
Safety during PPV house roofing	The PPV house roof truss installation workers were provided with safety harness and the use of the harness was made mandatory with special monitoring.	Installation has been completed without any mishap.
Compliance of PPE at all working fronts	Workers have been provided with appropriate PPE. The use of PPE is well monitored.	Ongoing
Site clinic	The site clinic has been proactively engaged in COVID prevention.	Ongoing

Table 13: OSH implementation by the Hydro-mechanical contractor

Particular	Description	Remarks
PPE compliance	Appropriate PPE has been provided to the welders, fitters, helpers and site supervisors as per work nature.	Ongoing
Safety during roofing works of gate hoists.	The gate hoist roof truss installation workers were provided with safety harness and the use of the harness was made mandatory with special monitoring.	Installation has been completed without any mishap.

Table 14: OSH implementation by the TL contractor

Particular	Description	Remarks
Toolbox talk and safety briefing	Toolbox talks and safety briefings have been organised regularly before start of work.	Ongoing
Use of safety harness	The workers have been provided with safety harness and it is utilized during stringing works.	Ongoing

12.2 TEST RESULTS

No test has been carried out for light, sound and oxygen inside the tunnel as the tunnel construction has been completed.

13 PROGRESS PHOTOGRAPHS



Figure 20: View of weir, undersluice and intake



Figure 21: Aerial view of settling basin and conveyance tank



Figure 22: Plum concrete works at anchor block VB01 of penstock



Figure 23: Welding works at PPV house



Figure 24: Welding at headrace pipe



Figure 25: Floor finishing at machine hall level



Figure 26: New Khimti Substation aerial view



Figure 27: Powerhouse machine hall



Figure 28: Fabrication of powerhouse main door



Figure 29: Plum concreting at Seti outlet using Transit Mixer

14 PROGRESS CHART

