

# **SYARPU SMALL HYDROPOWER PROJECT**

**(3.3 MW)**

**Bafikot-03, West Rukum**

## **PROGRESS REPORT**



**FEBRUARY 2080**

**Submitted by**

**UNITS ENGINEERING CONSULTANCY PVT. LTD.**

**Table of Contents**

<b>1.0 PROJECT OVERVIEW &amp; INSTITUTIONAL ARRANGEMENT</b>	<b>3</b>
<b>2.0 RESOURCES AT SITE</b>	<b>6</b>
<b>2.1 MANPOWER FROM CLIENT</b>	<b>6</b>
<b>2.2 MANPOWER FROM CONSULTANT</b>	<b>6</b>
<b>2.3 MANPOWER FROM CIVIL CONTRACTOR'S</b>	<b>6</b>
<b>2.4 MANPOWER FROM HYDRO MECHANICAL CONTRACTOR</b>	<b>7</b>
<b>2.5 EQUIPMENT MOBILIZED BY CIVIL CONTRACTOR</b>	<b>7</b>
<b>2.5 EQUIPMENT MOBILIZED BY HYDROMECHANICAL CONTRACTOR</b>	<b>7</b>
<b>2.6 CONSTRUCTION MATERIAL STORED BY CIVIL CONTRACTOR AT SITE</b>	<b>7</b>
<b>3.0 CIVIL CONSTRUCTION WORK PROGRESS</b>	<b>7</b>
<b>3.1 HEADWORKS</b>	<b>8</b>
<b>3.1.1 DIVERSION WEIR</b>	<b>8</b>
<b>3.1.2 INTAKE &amp; GRAVEL TRAP</b>	<b>8</b>
<b>3.1.3 SETTLING BASIN</b>	<b>8</b>
<b>3.1.4 HEADPOND WORKS</b>	<b>8</b>
<b>3.1.5 SPILLWAY WORKS</b>	<b>8</b>
<b>3.2 HEADRACE AND PENSTOCK ALIGNMENT</b>	<b>10</b>
<b>3.2.1 EARTHWORK</b>	<b>10</b>
<b>3.2.2 ANCHOR BLOCKS</b>	<b>13</b>
<b>3.2.3 SADDLE SUPPORTS</b>	<b>13</b>
<b>3.3 POWERHOUSE, TAILRACE &amp; PROTECTION WORKS.</b>	<b>13</b>
<b>3.3.1 POWERHOUSE</b>	<b>13</b>
<b>3.3.2 TAILRACE &amp; PROTECTION WORKS</b>	<b>17</b>
<b>4.0 HYDROMECHANICAL PROGRESS</b>	<b>17</b>
<b>5.0 ELECTROMECHANICAL WORK PROGRESS</b>	<b>20</b>
<b>6.0 TRANSMISSION LINE WORK PROGRESS</b>	<b>23</b>
<b>7.0 ISSUES &amp; RECOMMENDATION</b>	<b>23</b>
<b>8.0 PROGRESS MONITORING</b>	<b>23</b>
<b>8.1 UPCOMING MONTH SCHEDULE</b>	<b>23</b>
<b>ANNEXES</b>	<b>24</b>

## 1.0 PROJECT OVERVIEW & INSTITUTIONAL ARRANGEMENT

This monthly progress report covers a progress status of the project and work accomplished upto February 31<sup>st</sup>, 2024. It represents all the key information of the project activities that have been implemented so far in the project. In order to ensure the project was achieving its intended goals and objectives, the interventions were carried out with their corresponding outputs and indicators in this report.

Syarpur small Hydropower Project is a run-of-river project located in Bafikot-3 of west Rukum district and utilizes the water from Darne Khola or Syarpur Daha lake, the project has an installed capacity of 3.3 MW. The project comprises diversion weir with Tyrolean intake arrangements followed by settling basin, headrace pressure pipe, followed by penstock pipe and powerhouse, tailrace canal and switchyards. The generated power will be connected to 33 kV/11kV Musikot Sub-station. The company has to construct 6 km long 33 kV transmission lines from powerhouse to the Musikot substation in West Rukum district.

The project's Headworks site is accessible from Bafikot, lies about 6 km north of Musikot City, the major city in the west Rukum district. Geographically, the project is located between latitude 28°40'10" N to 28°41'25" N and longitude 82°28'24" E to 82°29'25" E.

### Institutional arrangement

- The Employer/Owner: Syarpur Power Company Ltd. (SPCL)
- The Engineer/Consultant: Units Engineering Consultancy Pvt. Ltd. (UECPL)
- The Contractor (Civil Construction): Sakura Power – Sakura Builders JV
- The Contractor (Hydro-Mechanical): Sakura Power – Sakura Builders JV.
- The Contractor (Generating Equipment): Troyer AG
- The Contractor (Transmission line): Not finalized

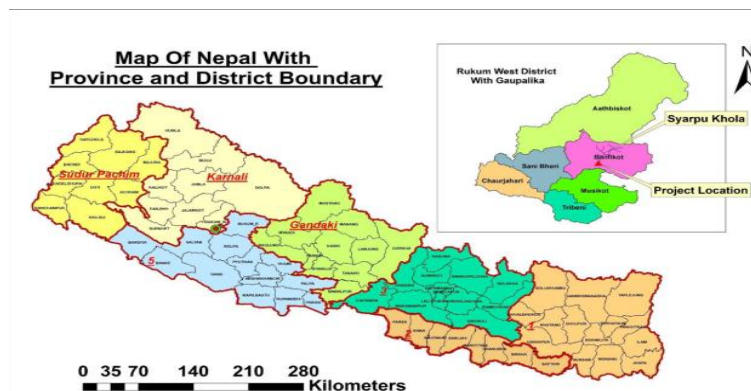


Figure: Project Location Map

**Salient Features of Syarpu small Hydropower Project (3.3MW)**

<b>1. General</b>		<b>Description</b>
Source River	:	Darne/Syarpu
VDC	:	Bafikot Rural Metropolitan City (Rukum)
District	:	West Rukum
Zone	:	Karnali
Development Region	:	Western
Location of the Project		28° 40' 10" to 28° 41' 25" N
		82° 28' 24" to 82° 29' 25" E
<b>2. Power Development</b>		
Type of Power Generation	:	Run-of-River
Turbine Discharge	:	1.4 m <sup>3</sup> /sec
Total Gross Head	:	280.2 m
Rated Net Head	:	269.27 m
Installed Capacity	:	3.3 MW
<b>3. Average Annual Energy</b>		
Total Energy	:	18.51 GWh
Dry Energy	:	4.18 GWh
Wet Energy	:	14.33 GWh
<b>4. Hydrology and Meteorology</b>		
Mean Annual Discharge	:	3.36 m <sup>3</sup> /sec
Design Discharge (at 55% POE)	:	1.40 m <sup>3</sup> /sec
Riparian Release	:	0.16 m <sup>3</sup> /sec
Design Flood Discharge	:	1.42 m <sup>3</sup> /sec
<b>6. Intake Structure</b>		
Type	:	Orifice Side Intake
No. of Opening	:	2
Crest Level	:	1211 masl
Width x High	:	1.7 m x 0.8 m (each)
<b>8. Approach Canal</b>		
Type	:	Box Canal
Length	:	6 m
Size (B x D)	:	5 m x 3.45 m
<b>9. Settling Basin</b>		
Type	:	Conventional, Single Bay
Size of Chamber (L x B x H)	:	22 m x 4 m x 3.5 m
Particle Size to be Removed	:	≥ 0.2 mm
No. of Flushing Channel	:	1

Trapping Efficiency	:	90%
<b>10. Headrace Pipe/Penstock pipe</b>		
Type	:	Pressurized MS Circular
Size	:	0.9 m, 0.8 m
Length	:	1921.66m
Thickness	:	6mm to 14 mm
<b>12. Powerhouse</b>		
Type	:	Surface
Size (L x B)	:	22.95 m x 13.6 m
Number of Units	:	2
<b>13. Type of Turbine</b>		
	:	Horizontal Pelton
Rated Capacity	:	2 x 1.685 MW
Turbine Axis Level	:	931.50 masl
Efficiency	:	91.00 %
<b>14. Tailrace Canal</b>		
Type	:	RCC Rectangular
Size (B x D)	:	1.50 m x 0.95 m
Length	:	55 m
Tailrace water Level	:	929.60 masl
<b>15. Generator</b>		
Type	:	Brushless, synchronous, 3 phase
Specification	:	1905 kVA, 6.6 kV, 50 Hz x 2 Nos.
<b>16. Transmission Line</b>		
Specification	:	33 KV single circuit line to Musikot Sub-station or Loop in Loop out to NEA transmission line.
Length	:	6 km
<b>17. Financial Indicators</b>		
Total cost of Project	:	NPR. 561,042,838.42
Construction Period	:	19 Months
IRR	:	16.26
B/C	:	1.54
Remaining Construction Period	:	19 Months
ROE	:	23.23
NPV	:	260.54 million NRs.

## 2.0 RESOURCES AT SITE

### 2.1 MANPOWER FROM CLIENT

Table: Human Resources of Client

S.N.	Description	Nos.
2	CEO	1
3	Civil Engineer ( <i>Site based</i> )	1
4	Finance Manager	1
5	Receptionist	1
6	Driver	1
	<b>Total:</b>	<b>5</b>

### 2.2 MANPOWER FROM CONSULTANT

Table: Human Resources at site from consultant

S.N.	Description	Nos.
1	Resident Engineer	1
2	Civil Engineer	1
3	Mechanical Engineer	1
4	Civil Supervisor	2
5	Cook	1
	<b>Total:</b>	<b>6</b>

### 2.3 MANPOWER FROM CIVIL CONTRACTOR'S

Table: Manpower from Civil Contractor side

SN.	Description	Nos.
1	Civil Technician	<b>7</b>
	Project Manager	1
	Civil Engineer	2
	Civil Overseer	3
	Supervisor	1
2	Civil Workers	<b>13</b>
	Skilled labor	4
	Unskilled labor	8
	Cook	1
3	Store Incharge	<b>1</b>
4	Accountant	<b>1</b>
5	Mechanical	<b>0</b>
6	Electrician	<b>0</b>
7	Driver	<b>3</b>
	Excavator operator	2

	Tipper Driver	1
8	Helper	3
9	Cook	1
	Others	0
	<b>Total:</b>	<b>29</b>

## 2.4 MANPOWER FROM HYDRO MECHANICAL CONTRACTOR

Not mobilized yet.

## 2.5 EQUIPMENT MOBILIZED BY CIVIL CONTRACTOR

Table: Equipment mobilized by Civil Contractor

S.N.	Equipment	Nos.	S.N	Equipment Name	Nos.
1	Excavator	2	2	Backhoe	0
3	Dump Truck	1	4	Monkey Jumper	1
5	Diesel Generator	2	6	Water Pump	2
7	Welding Machine	1	8	Concrete Mixture	3
9	Wheel Barrow	10	10	Rod Cutter	2
11	Total Station	1	12	Level Machine	1

## 2.5 EQUIPMENT MOBILIZED BY HYDROMECHANICAL CONTRACTOR

Not mobilized yet.

## 2.6 CONSTRUCTION MATERIAL STORED BY CIVIL CONTRACTOR AT SITE

Table: Construction material stored by Civil Contractor

S.N.	Materials	Received	Consumed	In Stock
1	Cement (bag)	990	0	0
2	Sand (m <sup>3</sup> )	32	0	0
3	Aggregate (m <sup>3</sup> )	50	0	0
4	Rebar (ton)	0	0	0
5	Diesel (litres)	3000	600	2400

## 3.0 CIVIL CONSTRUCTION WORK PROGRESS

### **3.1 HEADWORKS**

Excavation work in headworks is on progress. About 90% of excavation work is completed. Final Level of 1211.72masl for settling basin is achieved. Component wise detail is as follows.

#### **3.1.1 DIVERSION WEIR**

80% of work of weir is already constructed and remaining is not Started yet.

#### **3.1.2 INTAKE & GRAVEL TRAP**

Site clearance and excavation work of intake is completed. Hydraulics structure work has not been started yet.

#### **3.1.3 SETTLING BASIN**

Site clearance and excavation work of settling basin is completed. Hydraulics structure work has not been started yet.

#### **3.1.4 HEADPOND WORKS**

Site clearance and excavation work of headpond is completed. Hydraulics structure work has not been started yet.

#### **3.1.5 SPILLWAY WORKS**

Site clearance and excavation work of spillway is completed about 40%. Hydraulics structure work has not been started yet.





*During excavation work of settling basin.*



*Excavation work of Settling basin, Intake.*



*Excavation work of Spillway.*

### **3.2 HEADRACE AND PENSTOCK ALIGNMENT**

Civil works on Headrace alignment is in progress. Excavation works, is on-going on Headrace alignment. Component wise detail progress is as follows:

#### **3.2.1 EARTHWORK**

The excavation works at headrace alignment is completed for track opening. About 1440m of alignment excavation for track opening is completed. About 40% total excavation of alignment work is completed.



*During excavation works for track opening.*



*During excavation works for track opening.*



*Excavation works for track opening at AB5.*



*Excavation works for track opening at AB8.*



*Excavation works for track opening at AB9.*



*Excavation works for track opening at AB15.*

### **3.2.2 ANCHOR BLOCKS**

Not started yet.

### **3.2.3 SADDLE SUPPORTS**

Not started yet.

## **3.3 POWERHOUSE, TAILRACE & PROTECTION WORKS.**

### **3.3.1 POWERHOUSE**

Powerhouse land area acquisition is completed in the presence of NAAPI department employee, local people, client, consultant and contractor. Site Clearance at powerhouse area is completed. Excavation of powerhouse is completed with 929.295 masl for machine foundation. Laying of earthing plate (Earth Mat) is completed in powerhouse section (except service bay and control room).



*Powerhouse land area clarifying at presence of local people*



*During excavation of machine foundation at level 929.295.*



*During laying of Earth Mat in powerhouse.*



*During laying of Earth Mat in powerhouse.*





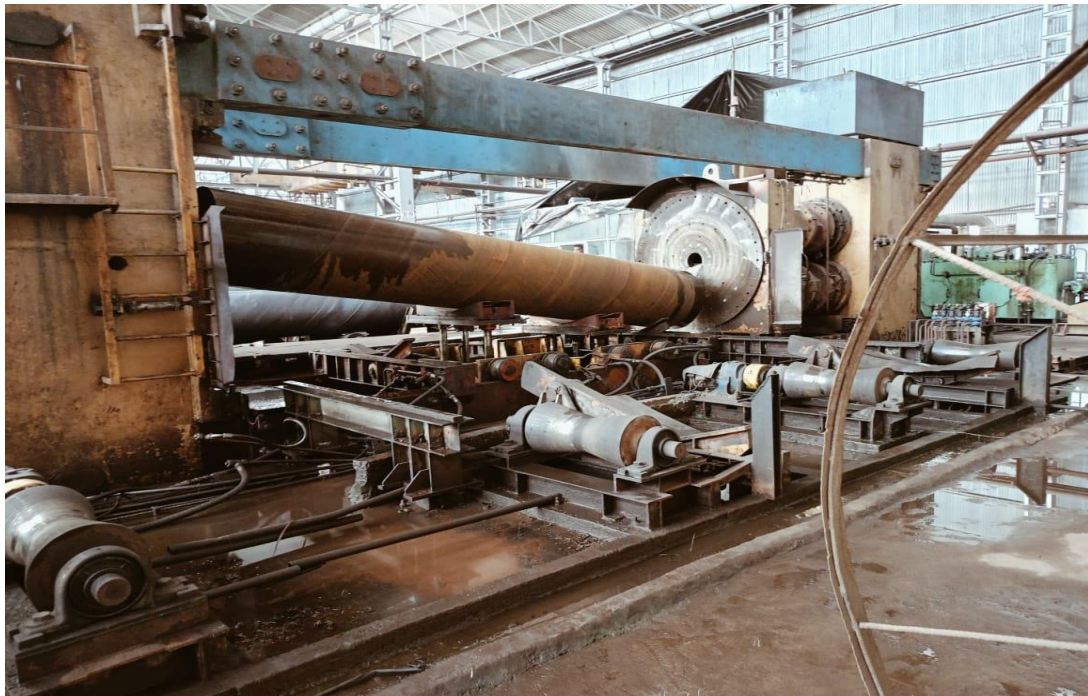
### 3.3.2 TAILRACE & PROTECTION WORKS

Not started yet.

### 4.0 HYDROMECHANICAL PROGRESS

Details of Hydromechanical works are pointed out below:

- Joint inspection of pipes at JCO was done between Client, Contractor and Consultant.
- Hydrostatic pressure test, sand blasting as well as prime coating(50 $\mu$ mm) is completed.
- Transportation of pipes from JCO to Nepal Bordar to Bhairahawa is completed(except Fabrication of 16meter pipe is remaining).
- About 291.720MT of ordered pipe 267.596MT of pipe is received at site.



*Testing of Pipe in JCO*



*Hydrostatic pressure testing of Pipe in JCO*



*During joint inspection carried out by Client, Consultant and Contractor.*



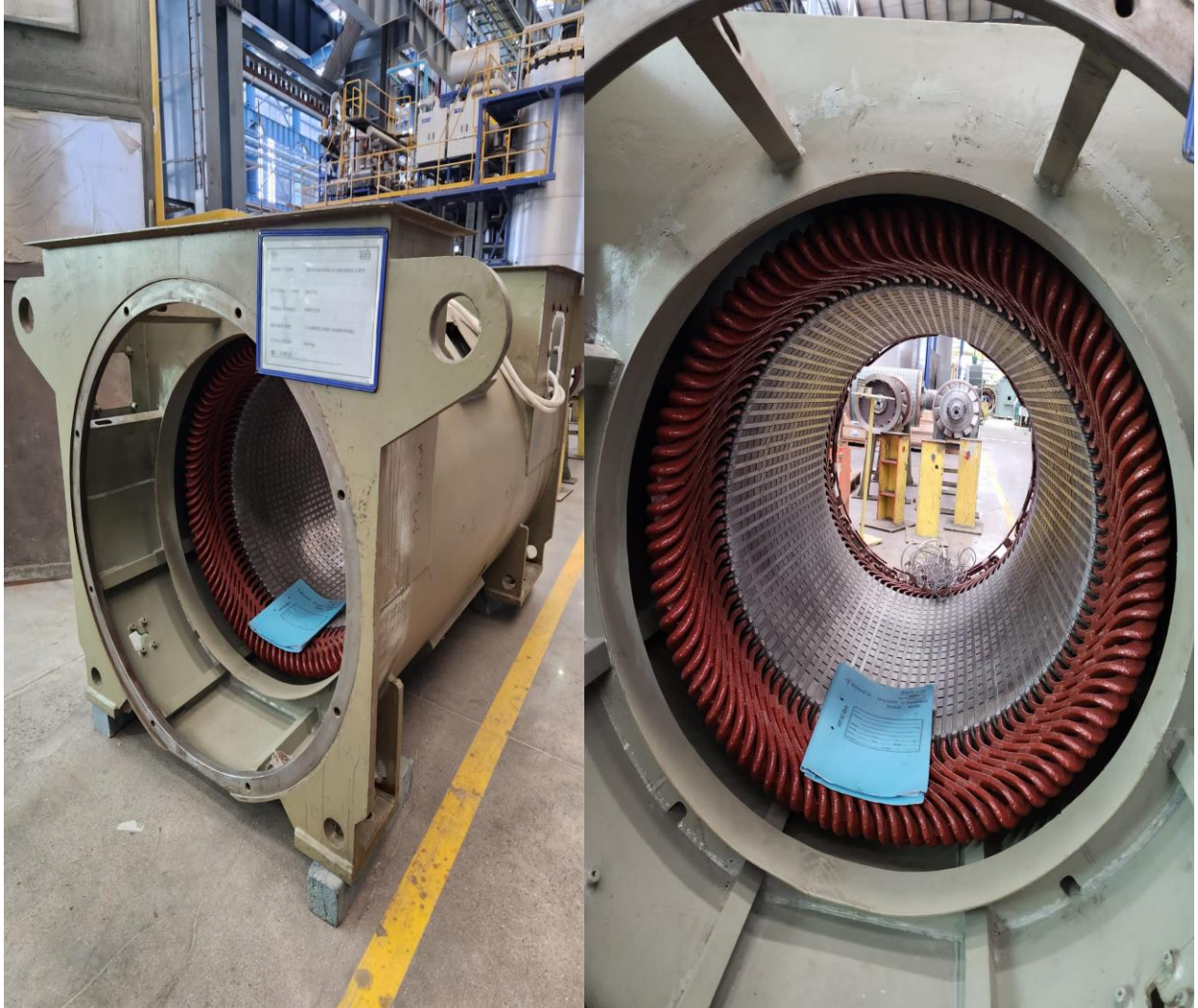
*Pictures of pipes received at site in the yard*



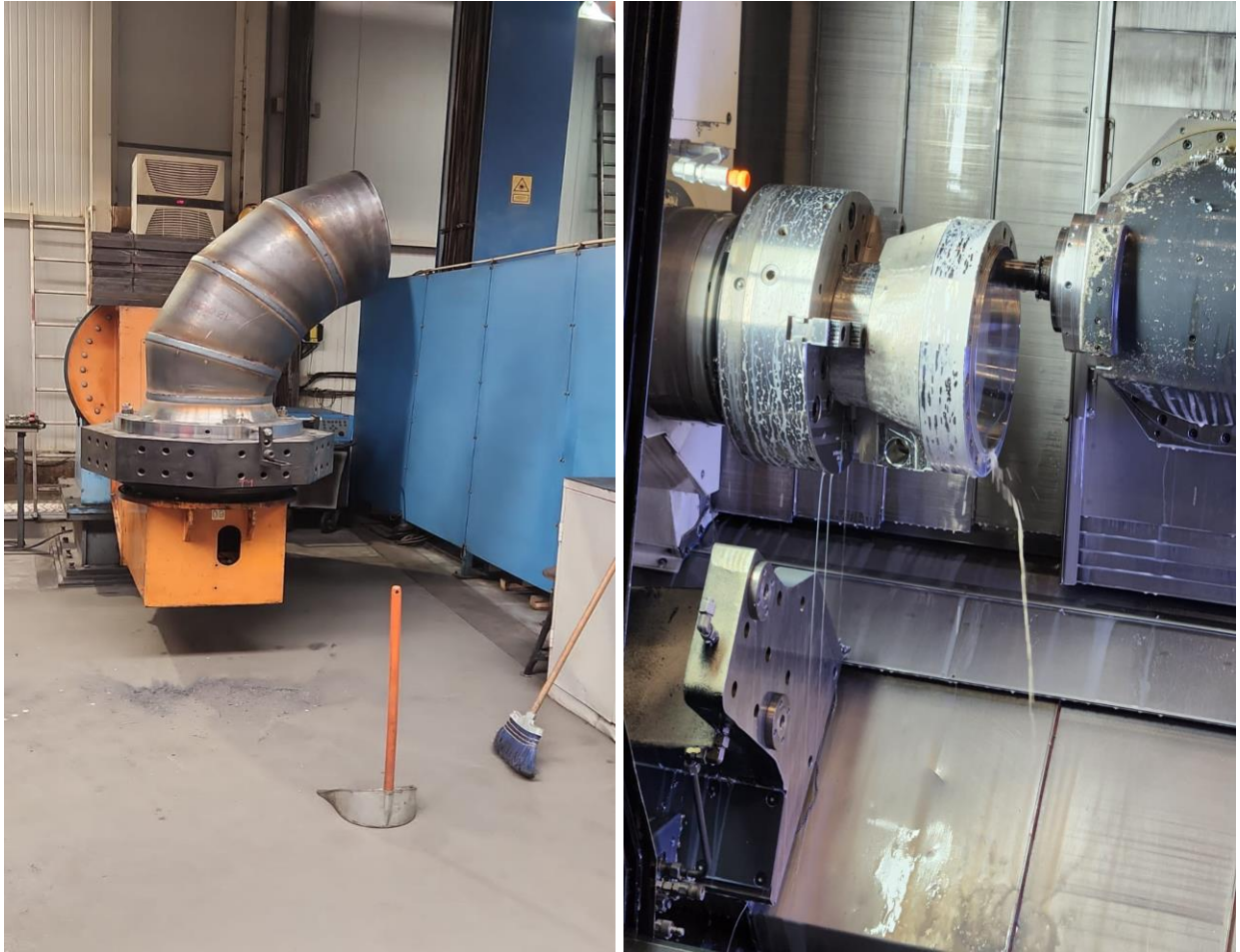
*Pictures of pipes in the yard*

## 5.0 ELECTROMECHANICAL WORK PROGRESS

Fabrication of Electromechanical materials has been started as per given letter of notice. Laying of earth plate is ongoing at site.



*Fabrication of EM materials*



*During fabrication of EM materials*



*During fabrication of EM materials*

## **6.0 TRANSMISSION LINE WORK PROGRESS**

The project has to construct 6 km long 33 kVA transmission line from powerhouse to musikot sub-station. Transmission line design is completed whereas tendering process is ongoing.

## **7.0 ISSUES & RECOMMENDATION**

While implementing project schedule, some issues arise which affected the working schedule and listed below with their recommendation.

- Civil works should start soon with appropriate schedule for commissioning of hydropower. Contractor is instructed formally to add manpower as soon as possible to avoid project delay.
- Transmission line work isn't finalized until now & it's recommended to finalize better option as soon as possible to avoid delay in project commissioning time.

## **8.0 PROGRESS MONITORING**

In this heading, work schedule and its achievement are compared so that planner has a clear idea about the progress achieved, delayed or expedited. The major components are compared rather than individual items of works.

### **8.1 UPCOMING MONTH SCHEDULE**

Civil works will primarily focus on Powerhouse & Alignment which are listed below.

- It is planned to complete excavation of AB9-AB11 waterway upto pipe bottom level(PBL).
- Transportation of pipes to site will be completed.
- PCC and rebar works of intake and settling basin will be completed.
- Concreting of saddle support will be carried out.
- Protection works for waterways will be carried out.
- 20nos. of labor will be implemented at site for protection works.

**ANNEXES**



*Protection works of access road for extra widening.*





*During silanyas puja at powerhouse*



*During silanyas puja at powerhouse*



*During silanyas puja at powerhouse*

**THE  
END**