58 MW TURTONAS UZGHOR HYDROPOWER PROJECT

PROJECT PROFILE

PRIVATE POWER & INFRASTRUCTURE BOARD
MINISTRY OF WATER & POWER
GOVERNMENT OF PAKISTAN

November 2015

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ABBREVIATIONS:

GOP	Government of Pakistan
PPIB	Private Power and Infrastructure Board
MW	Mega Watt
GWh	Giga Watt Hours
masl	Meters Above Sea Level
mm	Millimeter
m	meter
km	kilo Meter
km^2	Square kilometer
m^3/s	Cubic Meter per Second
^oC	Degree Celsius
BOOT	Build-Own-Operate-Transfer
%	Percentage
HEPO	Hydro Electric Planning Organization
GTZ	German Agency for Technical Cooperation

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1. INTRODUCTION

Pakistan is presently facing acute shortages of electricity while the Government of Pakistan (GOP) is targeting for substantial economic growth in the medium to long term. To achieve these high targets, electricity sector, which is a major input in the industrial production has to grow. Such a high growth rate warrants that all possible resources for power generation be used to sustain the economy. It is estimated that Pakistan would require 4000-5000 MW immediately and around 2000 additional Megawatts (MW) annually for the next few years. The international geopolitical situation and volatile Oil and Gas prices have compelled Pakistan to look for additional resources for diversity and security of supply of power to the country.

Pakistan is a water-rich country and is endowed with a hydropower potential of more than 60000 MW. The GOP is trying to facilitate and encourage private investors for promoting hydropower generation in the country and has allowed private sector to develop hydropower projects on Build-Own-Operate-Transfer (BOOT) basis. First private sector hydropower project – 84 MW has been commissioned in March 2013, second private sector hydropower project of 147 MW is under construction since 2013 and is to be commissioned in March 2017, whereas third private sector hydropower project-102 MW has also entered into construction phase after achieving its financial close successfully in October 2015. Other hydropower projects with accumulative capacity of about 5000 MW are at advance stages of development. 58 MW Turtonas-Uzghor Hydropower Project is one of the

projects ready to enter into development phase in private sector under Policy for Power Generation Projects 2002.

2. LOCATION & ACCESS TO PROJECT SITE

The proposed Turtonas-Uzghor is located on River Golen Gol which is a left bank tributary of Mastuj River. It joins with Mastuj River about 22 km north-east of Chitral Town. The identified weir site on Golen Gol is approx. 11 km upstream of Golen Gol. The power house site is proposed on right bank of Golan Gol River near Uzghor Village. The powerhouse site is located north-east of Chitral Town at a distance of about 33 km.

The weir site is accessible from Chitral Town by truckable road (Chitral-Buni Road) up to the confluence of Golen Gol and Mustuj River. A jeepable road runs along Golen Gol up to the weir site. The road in the whole valley is very narrow and in some portions very steep also. The average speed to the weir site is not more than 10 km/h. The road needs to be improved for the execution of the project.

3. GENERAL TERRAIN

Golen Gol is a left bank tributary of Mastuj River and originates from glaciers namely Lohigal and Shachiokoh. It flows through narrow gorges and joins Mastuj River near Kaghozi. The main tributaries of Golen Gol are Shachiokoh, Lohigal, Dok Gol, Birmogoh Gol and Chitral Gol. The height of

the catchment varies from 1918 m to 4629 m approximately. The catchment area lies between latitude 35° 48' to 36° 30' and longitude 71° 58' to 72° 18'. The mean elevation of the catchment is 3950 m a.s.l. the catchment area of the project up to the confluence of Mastuj River is 518 Km^2. The area is enclosed by mountains ranging from 4875 m to 5800 m.

Chitral is situated in the extreme northern part of Pakistan, which is sandwitched between Hindu Kush Range in the north and the Hindu Raj Range in the South and has an approximate NE-SE trend. The entire valley is mountainous region cut into deep and steep sided valleys by Chitral River and its numerous tributaries.

4. CLIMATE

The weather of the Project Area is characterized by moderate summer and severe winter. Wide spread snow fall occurs in winter. The mean maximum temperature is 41°C in July the hottest month and 13.5 °C in January the coldest month. The monsoon hardly penetrates the Project Area and the main mechanism for producing rain is western disturbances. Chitral like other areas in extreme north-west of Pakistan receives only 476 mm precipitation of which 75% occurs in Winter and Spring. Climatological data in the form of average monthly precipitation, maximum and minimum temperature of Chitral Valley is highlighted in Table.

Month	Mean Temperature(^{O}C)		Mean Rainfall (mm)
	Daily Minimum	Daily Maximum	
Jan	-4.80	13.5	67.9
Feb	-3.3	15.8	67.8
Mar	-0.7	22.1	101.0
Apr	3.1	30.0	83.2
May	6.9	34.6	36.2
Jun	11.4	39.5	6.1
Jul	14.4	41.0	7.3
Aug	13.9	39.1	12.3
Sep	8.3	36.2	11.9
Oct	3.7	31.2	21.7
Nov	-1.0	24.3	23.0
Dec	-3.7	16.8	37.6

5. HYDROLOGY

The discharge data and the water level records of Golen Gol stream at Babuka Bridge hydrological station are available since Nov, 1992. The mean annual suspended sediment discharge is 0.088 Million tons/year. The flood estimated by Regional method is highlighted in Table below.

Return Period (Years)	Golen Gol (m^3/s)	Mastuj River (m^3/s)
5	470	2600
10	540	2830
100	910	3870
1000	1190	4660
10000	1480	5630

6. PREVIOUS STUDIES

The Turtonas-Uzghor Hydropower Project was identified by GTZ/HEPO-WAPDA and presented in their report "Identification of Hydropower Development Potential in Chitral Valley" in February 2001.

7. SALIENT FEATURES

The tentative salient features of the Project are as under: -

General

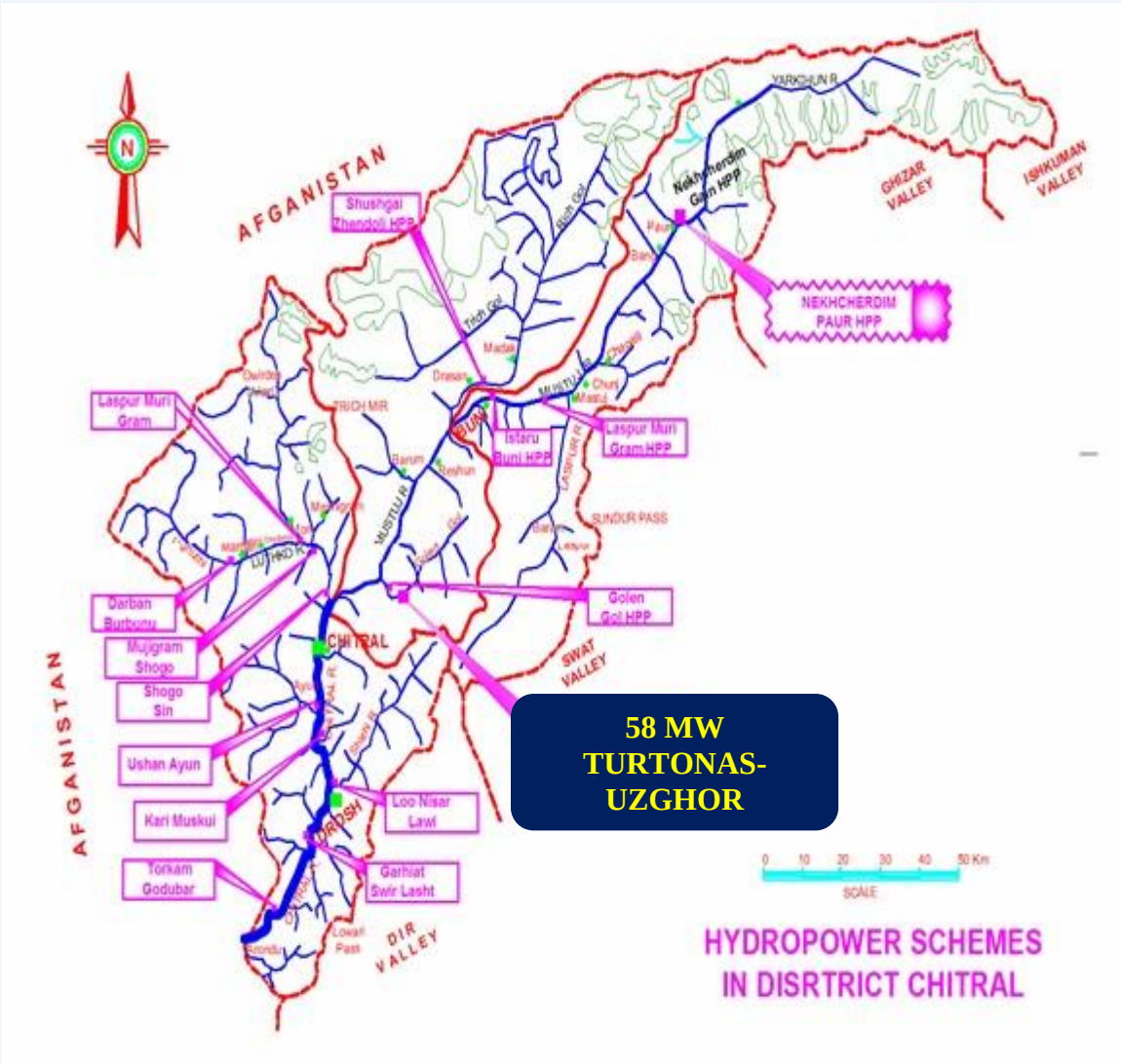
○ Project Name	:	Turtonas-Uzghor Hydropower Project
○ River	:	Golen Gol
○ Distance	:	33 Km from Chitral Town
○ Status	:	Raw Site

Technical

○ Type of Project	:	Run of River
○ Design Discharge	:	20.0 m^3/sec
○ Gross Head	:	351 m
○ Design Capacity	:	58 MW
○ Mean Annual Energy	:	254 GWh
○ Plant Factor	:	50.0 %
○ Type of Weir	:	Weir with Lateral Intake

○ Height of Weir	:	12 m
○ Length of Weir Foundation	:	70 m
○ No. of Flood Gates	:	1
○ Tunnel Length	:	4.0 Km
○ Diameter of Tunnel	:	5.0 m
○ No. of Units	:	2 Pelton Turbines

8. LOCATION MAP



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