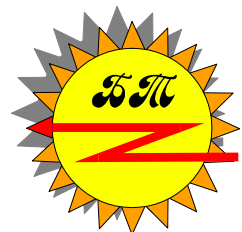




САНГТУДИНСКАЯ ГЭС
Технические Характеристики

Sangtudinskaya Hydro
Performance Characteristics



SANGTUDINSKAYA HYDRO

Sangtudinskaya Hydro №1 is the fifth step Vakhsh channel. The region of construction is Hatlonskaya oblast of Tajikistan, it has very favourable conditions for constructing Hydro. It supplies with approach roads of republic meaning, which are connecting the building construction with the towns: Dushanbe, Kafirnihon, Nurek, where are situated, the modern bases of building organizations, and also with towns of Kurgan-Tube, Dangara.

All the construction of hydroelectric scheme structure is in the wide Vakhsh valley of Vakhsh river. Quarries of building materials are near the construction.

The climate is hot and dry. The period without frost is 256 days per year.

Sangtudinskaya Hydro N 1 is working on the operating water from Nurek reservoir (transit through Baipasinskaya Hydro) and let to make the day surface water outlet. In covering winter, more hard charts of loading of Sangtudinskaya Hydro, which is taping up the basis and middlebasis zones. In summer period the regime of works is changing from pick till basis in dependence of waterobstacle year.

The Power output of Sangtudinskaya Hydro is foreseeing with the help of lines with the capacity of 200 and 500 KV mostly on the territory of the Republic of Tajikistan. We are looking to construate the lines with 500-765 KV through the Pianj river for transmission the energy to Pakistan. The power of Sangtudinskaya Hydro may be use the Leninobad oblast, which has a great needing of energy power.

THE PARAMETERS OF HYDROELECTRIC SCHEME

1.1. Normal headwater level, m	571,5
1.2. The level of death volume, m	569,9
1.3. Reservoir storage capacity,	
- full, mill. m ³	258
- usable, mill. m ³	18
1.4. Power station installed capacity of Hydro, MW	670
1.5. Water - retaining structure, m	
- max	62,3
- min	56,3
- discharge	58,0
1.6. Rated-head water discharge of Hydro, m ³ /sec	1284
1.7. Annual power output, bill. KW.h	2733
1.8. The number of hours of using the installed capacity	4080

THE MAIN CONSTRUCTION WORKS OF HYDROELECTRIC SCHEME

	Total		
2.1. Cut earth excavation, thous. m³			
2.1.1. Open - cut earth excavation	1887,7	927,02	960,68
2.1.2. Open - cut not rock excavation	3493,7	2086,92	1406,78
2.1.3. Underground rock excavation	274,8	91,48	183,32
2.2. Embankment, thous. m³			
2.2.1. Earth placement	466,3	31,62	434,68
2.2.2. Removing zones (filters)	413,2	-	413,2
2.2.3. Grouting in cement	3039,3	246,79	2493,01
2.2.4. Stone	1559,6	10,3	1549,3
2.3. Concrete – iron-concrete, thous. m ³			
2.3.1. Open	366,9	5,57	361,33
2.3.2. Underground	83,1	20,94	62,16
2.4. Grouting in cement, thous. m³:			
2.4.1. Area	4,8	-	4,8
2.4.2. Depth	17,0	-	17,0
2.4.3. Concrete saaddle	19,1	-	19,1
2.4.4. Consolidating grout	52,2	-	52,2
2.4.5. Fooling	110,3	-	110,3
2.5. Metalconstructions and equipment, ton			
2.5.1. Hydroforce equipment	8319	-	8319
2.5.2. Electrotechnical equipment	1604	-	1604
2.5.3. Mechanical equipment	2940	588,0	2352
2.5.4. Hydrotechnical metal-constructions	7880	2758,0	5122,0
2.5.5. Building and electrotechnical metal-construction	2493	872,6	1620,4

THE CONSTRUCTION COST OF HYDROELECTRIC DEVELOPMENT.

Look Table 1

Investments to the hydro, mill. US\$	482,7
The building-installation works, mill. US\$	274,7
Expenditures for building machines and mechanisms, mill.US\$	30,0

EFFECTIVENESS OF HYDROELECTRIC DEVELOPMENT.

By the minimum tariff of electric power as 3 cent/1 KW.h, the 15% of lossing in lines from the output and the production costs in the size of 2% from investments, the absolute repay of construction is compiling for four years.

TODAY'S CONDITIONS OF HYDROELECTRIC DEVELOPMENT. THE STRATEGY OF BUILDING IN MODERN CONDITIONS.

5.1. The fulfillment of works on the 01.01.2000

5.1.1. Investments, mill. US\$	112,2
5.1.2. The building installation works, mill. US\$	75,3
5.1.3. The distributions of investments for completing the construction, mill. US\$	tabl.1

The preparing period of building is finished. The construction is supplied with roads and communications. All the foundation pits are opened and concrete works of constructions and erecting the dam are begun.

The construction is supplied with working forces. According the contract the qualified workers may be invited from other countries mainly from Russia.

Table 1

Investments	Total	Rest	Financing years					
			I	II	III	IV	V	VI
I. Completing of the 1-st starting unit of Sangtudinskaya HPS's construction by the putting into operation of 1-st and 2-nd aggregates.								
Investments	234,9	135,4	30	37	40	28,4	-	-
- including construction works	150,8	90,5	18	23	30	19,5	-	-
The construction equipment	30	30	10	8	7	5	-	-
The objects of capacity's output:-LET 500 kV Sangtuda-Rogun (190 km) -LET 220 kV Sangtuda-Geran (120 km)	88	88	8	22	30	38		
LET 220 kV Sangtuda-Lolazor (45 km)	8	8	3	2	2	1	-	-
Total:	360,9	261,4	51	69	79	62,4	-	-
II. After completing of the Sangtudinskaja HPS's construction by the putting into operation of 3-rd and 4-th aggregates								
Investments	482,7	370,5	51,0	69,0	79,0	62,4	59,1	50,0
- including construction works	274,7	204,9	28,0	38,0	43,0	35,7	32,0	28,2
Total investments of starting complex	482,7	370,5	51,0	69,0	79,0	62,4	59,1	50,0

EXAMINATION, ASSERTION AND AGREEMENT OF PROJECT OF SANGTUDINSKAYA HYDRO.

1. Substantiated materials - 1986 year:
 - examination StatePlan of the USSR from 6.06.1986 year №12
2. Feasibility study:
 - the order of Ministry of Energy of the USSR from 7.08.86 №210-PS
3. The choosing of type of dam and componational resolutions:
 - examination of Hydroproject institute - the resolution of the chief engineer from 4.05.83 year №17.
 - examination of scientific-technical Council of Energy Ministry of the USSR - the protocol from 18.10.1988 year №65
4. The preparing period of construction:
 - the order of Ministry of Energy of the USSR from 26.08.87 year № 508
5. The working documents:
 - the order of Ministry of Energy of the USSR from 26.08.87 year № 508

HYDROENERGY EQUIPMENTS OF HYDRO.

1. Turbine (4 unit)
 - type - PO 75 /728m-v-600
 - the nominal capacity, MW - 171
 - diametres of operating wheel, m - 6,0
 - speed, rpm - 100
 - coefficient factor, min % - 95.0
2. Hydraulic-turbine generator (4 n) - type - CB-1260/185 - 60XJ14
3. Power transformer -ТЦ 400000/500