云南省陇川县
别乃河二级水电站工程
项目建议书

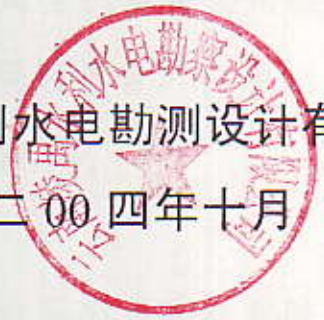
云南省凌禹水利水电勘测设计有限责任公司

二00四年十月

云 南 省 陇 川 县

别 乃 河 二 级 水 电 站 工 程

项 目 建 议 书



云南省凌禹水利水电勘测设计有限责任公司

二00四年十月

工程设计证书

丙　级

单位名称：云南凌禹水利水电勘察设计有限公司

业务范围：水利行业丙级；电力行业（水力发电）丙级

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证书编号：232051-sb

有效期：****

发证部门：

2004 年 10 月 14 日

中华人民共和国建设部印制

工程勘察证书

丙　级

单位名称：云南凌禹水利水电勘察设计有限公司

业务范围：工程勘察专业类（工程测量）丙级

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14、工程财务

别乃河二级水电站经济评价，以国家计委和建设部颁布的《建设项目经济评价方法与参数》、水利部颁发的《小水电建设项目经济评价规程》（SL16－95）等为依据，按国家现行有关财税制度进行。

1.2 财务评价

1.2.1 基础数据

1.2.1.1 生产规模及施工进度

别乃河二级水电站总容量 8MW，预计年利用小时数 4,256h，年上网电量 34,048MWh。

1.2.1.2 基准收益率

因本项目属于基础设施建设项目，财务基准收益率向下取值，采用 7%。

1.2.1.3 计算期

根据施工进度安排，电站总工期 2 年，生产经营期采用 25 年，计算期共 27 年。

1.2.2 投资计划与资金筹措

1.2.2.1 固定资产投资

根据对电站投资分析计算，工程静态总投资为 3892.30 万元，建设期利息 60.16 万元，价差预备费为零，固定资产投资 3892.30 万元。

1.2.2.3 流动资金

电站流动资金按 10 元/kW 计算，共需 8 万元，流动资金全部使用资本金。流动资金随机组投产投入使用，在年末一次回收。

1.2.2.4 总投资

别乃河二级水电站总投资为 3960.46 万元，其中固定资产投资为 3892.30 万元，暂不考虑无形资产及递延资产。

1.2.3 总成本费用计算

电站发电成本包括折旧费、修理费、工资福利、劳保统筹、保险费、住房基金、材料费、库区维护费、利息支出和其它费用等。发电经营成本指不包括折旧费和利息支出的全部费用。成本分析计算采用的参数和定额如下:

折旧费=固定资产价值 × 综合折旧率;
修理费=固定资产价值 × 修理费率;
保险费=固定资产价值 × 保险费率;

电站综合折旧率采用 5.0%，固定资产折旧年限 20 年，修理费率取 1%，保险费率取 0.25%。

工资=职工人数 × 年人均工资;

电站定员编制 20 人，职工年人均工资按 8000 元计。

职工福利费为工资总额的 14%；劳保统筹、医疗保险及住房公积金暂按工资总额的 36.5%（社保统筹为工资总额的 19%，医疗保险为工资总额的 4%，失业保险为工资总额的 1.5%，住房公积金为工资总额的 12%，合计费用为工资总额的 50.5%。

材料费定额取 5.0 元/kW。

生活区维护费按 0.001 元/kW.h 计算。

水资源费按 0.001 元/kW.h

其它费定额取 24.0 元/kW。

1.2.4 税金

按规定，水电建设项目应交纳增值税、销售税金附加和所得税，其中增值税为价外税，增值税税率为 6%，此处仅作为计算销售税金附加的基础。

1.2.4.1 销售税金附加

销售税金附加包括教育费附加和城市维护建设税，以增值税税额为计算基数，税率分别为 3%和 5%。

1.2.4.2 所得税

企业利润按规定依法缴纳所得税，税率为 33%。

1.2.5 发电效益计算

1.2.5.1 销售收入

销售收入=厂供电量×上网电价。

上网电价按 0.170 元/kW.h（已含增值税），并在计算期（经营期）内采用同一电价

1.2.5.2 利润

发电收入扣除发电成本和销售税金附加后卫发电利润，缴纳所得税后为税后利润，税后利润提取 10%的法定盈余公积金和 5%的公益金后，剩余部分为可分配利润，再扣除分配给投资者的应付利润后，即为未分配利润。

1.2.6 盈利能力分析

计算财务盈利指标，全部投资财务内部收益率为 7.68%，高于

序号	项目	合计	建设期（年）			生产期（年）						
				1	2	1	2	3	4	5	6	7
基本参数	装机容量(千瓦)	8000				8000	8000	8000	8000	8000	8000	8000
	发电利用小时(小时)	4256				4256	4256	4256	4256	4256	4256	4256
	发电量(万千瓦时)	85125				3405	3405	3405	3405	3405	3405	3405
	售电量(万千瓦时)	85125				3405	3405	3405	3405	3405	3405	3405
	售电价(元/千瓦时)	0.170				0.170	0.170	0.170	0.170	0.170	0.170	0.170
1	现金流入(CI)											
1.1	发电销售收入	14471.25				578.85	578.85	578.85	578.85	578.85	578.85	578.85
1.2	回收固定资产余值	0.06										
1.3	回收流动资金	8.00										
	流入小计	14479.31				578.85	578.85	578.85	578.85	578.85	578.85	578.85
2	现金流出(CO)											
2.1	固定资产投资(全投资)	3892.30		1150.00	2742.30							
2.2	流动资金(全投资)	8.00			8.00							
2.3	年运行费(经营成本)	2502.25				100.09	100.09	100.09	100.09	100.09	100.09	100.09
2.4	销售税金及附加	937.75				37.51	37.51	37.51	37.51	37.51	37.51	37.51
2.5	所得税	2336.05				80.40	80.40	80.40	80.40	80.40	80.40	80.40
	流出小计	9676.35		1150.00	2750.30	218.00	218.00	218.00	218.00	218.00	218.00	218.00
3	所得税前净现金流量	7139.01		-1150.00	-2750.30	441.25	441.25	441.25	441.25	441.25	441.25	441.25
4	所得税前累计净现金流量			-1150.00	-3900.30	-3459.05	-3017.80	-2576.55	-2135.30	-1694.05	-1252.80	-811.55
5	所得税后净现金流量	4802.96		-1150.00	-2750.30	360.85	360.85	360.85	360.85	360.85	360.85	360.85
6	所得税后累计净现金流量			-1150.00	-3900.30	-3539.45	-3178.60	-2817.75	-2456.90	-2096.05	-1735.20	-1374.35
	计算指标											
(1)	财务净现值											
	折现系数(Ic=)	10.00%	1	1	1	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645	0.5132
	净现值 FNPV=	-660.91		-1150.00	-2750.30	328.05	298.21	271.11	246.46	224.05	203.70	185.19
(2)	财务内部收益率(税后FIRR)											
	折现系数(i=)	7.68%	1	1	1	0.9287	0.8624	0.8009	0.7438	0.6908	0.6415	0.5957
	净现值 FNPV=	0.85		-1150.00	-2750.30	335.12	311.20	289.00	268.40	249.28	231.49	214.96
	折现系数(i=)	7.69%	1	1	1	0.9286	0.8623	0.8007	0.7435	0.6904	0.6411	0.5954
	净现值 FNPV=	-2.48		-1150.00	-2750.30	335.09	311.16	288.93	268.29	249.13	231.34	214.85
(3)	静态投资回收年限计算参数	10										
		360.85										
		-291.80										
	静态投资回收年限(包括建设期)	12.81										
(4)	财务内部收益率(FIRR)	7.68%				建设期 2 年 + 生产期 10 年 + |-291.8| ÷360.85 = 12.81 年						
						7.68% + 0.85 ÷ (0.85 + |-2.48|)×(7.69 − 7.68)% = 7.68%						

The Project Proposal Report of Yunnan Longchuan Bienai 2nd Level Hydropower Station

Yunnan Lingyu Water Conservancy and Hydroelectric Power Investigation and Design Co. Ltd.

October 2004

Engineering Design Certificate
C grade

The entity name: Yunnan Lingyu Water Conservancy and Hydroelectric Power Investigation and Design Co. Ltd

The business scale: C grade in water conservancy industry, electricity industry (hydro power) C degree
Number of the Certificate: 232051-sb
Period of validity: ****

This certificate issued by: Yunnan Province Construction Bureau
14th October 2004

Project reconnaissance certificate
C grade

The entity name: Yunnan Lingyu Water Conservancy and Hydroelectric Power Investigation and Design Co. Ltd

The business scale: C grade in engineering investigation industry (engineering survey)
Number of the Certificate: 232051-kb
Period of validity: ****

This certificate issued by: Yunnan Province Construction Bureau
14th October 2004

14. Engineering Finance

The economic evaluation of Bienaihe 2nd Level Hydropower Station has been carried out based on the laws and regulation as <Economic Evaluation Method and Parameters on Construction Project> issued by State Planning Commission and Ministry of Construction, <Economic Evaluation Regulation for Small Scale Hydropower Station Construction Project> (SL16-95) issued by Water Resources Ministry and the present finance and taxation regulations.

1.2 Financial Evaluation

1.2.1 Basic Data

12.1.1 The Manufacture Scale and Construction Schedule

The total installed capacity of Bienaihe 2nd Level Hydropower Station is 8MW, it is estimated that the annual utilization hours is 4,256 hours, the annual power supplied to grid is 34,048 MWh.

1.2.1.2 Reference Profit Ratio

This project is listed in the infrustration construction project, the reference profit ratio should be taken as 7%.

1.2.1.3 Calculation Period

According the construction schedule, the total construction period is 2 year, the manufacture and operation period is taken 25 years, the calculation period is totally 27 years.

1.2.2 The Investment Plan and Investment Finance

1.2.2.1 The fixed asset investment

Based on the investment analysis, the static total investment has been adjusted to 3892.30 ten thousand Yuan, and the interest in construction period is 60.16 ten thousand Yuan, the difference value prepare fee is zero, the fixed asset investment is 3892.30 ten thousand Yuan.

1.2.2.3 The floating capital

The floating fund is calculated as 10Yuan/kW, totally need 8 ten thousand Yuan. The floating capital will all use capital fund. The floating fund will be used when the turbines have been in operation, and collected back at the end of year.

1.2.2.4 The total investment

The total investment of Bienai 2nd Level Hydropower Station is 3960.46 ten thousand Yuan. Among them, the fixed asset investment is 3892.30 ten thousand Yuan, the intangible asset and deferred asset has not been considered.

1.2.3 The total cost and fee calculation

The generation cost includes deprecation cost, repair fee, salary and welfare, labor insurance plan, insurance fee, housing fund, material fee, reservoir maintenance fee, interest payment, and other fees. The power generation cost is the total fees exclude the depreciation fee and interest payment.

The parameters and designed value employed in cost analysis calculation is as following:

Depreciation fee =fixed asset value ×comprehensive depreciation rate;

Repair fee=fixed asset value ×repairing fee rate

Insurance fee=fixed asset value×insurance fee rate

The comprehensive depreciation rate is taken as 5.0%, the depreciation year for fixed asset is 20 years, the repair fee rate is taken as 1%, the insurance rate is taken as 0.25%.

Salary=the number of employee × annual average salary

The designed employee for this station is 20, the annual average salary per year is taken as 8000

Yuan.

Welfare fund amounts to 14% of the total salary; the social insurance plan, the medical insurance and housing accumulated fund amounts to 36.5% of the total salary, the social insurance amounts 19% of the total salary, the medical insurance amounts to 4% of the total salary, the unemployment insurance is taken as 1.5% of the total salary, and the housing accumulated fund taken as 12% of the total salary, the total fee amounts to 50.5%of the total salary.

The material fee designed value: 5.0Yuan/kW;

The maintenance fee in living district is taken as 0.001Yuan/kW;

Water resources fee is taken as 0.001Yuan/kW.h

Other fee designed value is taken as 24.0Yuan/kW.

1.2.4 Taxation

Based on the relative regulation, the construction of hydropower station should render Value Added tax (VAT), sales tax addition, and income tax. The VAT is price excluding tax, the ratio of VAT is 6%, this ratio is only the base to calculate sales tax addition.

1.2.4.1 Sales tax addition

Sales tax addition includes education fee addition and urban maintenance and construction fee. Take the VAT value as the calculating base, the ratio is 3% and 5%.

1.2.4.2 Income tax

The enterprise should render income tax based on relative regulation and laws, the ratio is 33%.

1.2.5 The calculation of power generation profit

1.2.5.1 Sales income

Sales income= power supplied ×grid price

Grid price is taken as 0.170yuan/kW.h(include VAT), and during the calculation period (the operation period), the unchanged grid price will be used.

1.2.5.2 Profit

After deducing power generation cost and sales tax addition, the power generation income is power generation profit; after rendering the income tax, the power generation income is the profit after tax. After taken 10% of the profit after tax as the statutory accumulated fund and 5% of the profit after tax as public welfare fund, the rest part is the distributive profit. After deducing the payable profit which should be distributed to investors, the rest part is undistributed profit.

1.2.6 The profit ability analysis

In order to calculate financial profit parameters, the total investment financial internal rate of return is 7.68%.

Table 1 **Statement of Cash Flows(Total Investment)**

No.	Items	Total	Construction period(years)			operation period (years)					
				1	2	1	2	3	4	5	6
Basic Parameter	Installed Capacity(kW)	8000				8000	8000	8000	8000	8000	8000
	Utilization hours(h)	4256				4256	4256	4256	4256	4256	4256
	Power generation(10MWh)	85125				3405	3405	3405	3405	3405	3405
	Sales of electricity (10MWh)	85125				3405	3405	3405	3405	3405	3405
	Grid price(yuan RMB/kWh)	0.170				0.170	0.170	0.170	0.170	0.170	0.170
1	cash inflows (CI)										
1.1	Income of saling power	14471.25				578.85	578.85	578.85	578.85	578.85	578.85
1.2	Residual value of fixed assets recovered	0.06									
1.3	Current funds recovered	8.00									
	Subtotal of cash inflows	14479.31				578.85	578.85	578.85	578.85	578.85	578.85
2	Cash outflows(CO)										
2.1	Investment in fixed assets(Total investment)	3892.30		1150.00	2742.30						
2.2	Current funds(Total investment)	8.00			8.00						
2.3	Annual operating cost	2502.25				100.09	100.09	100.09	100.09	100.09	100.09
2.4	Sales tax and surcharges	937.75				37.51	37.51	37.51	37.51	37.51	37.51
2.5	Income tax	2336.05				80.40	80.40	80.40	80.40	80.40	80.40
	Subtotal of cash outflows	9676.35		1150.00	2750.30	218.00	218.00	218.00	218.00	218.00	218.00
3	Net cash flows before income tax	7139.01		-1150.00	-2750.30	441.25	441.25	441.25	441.25	441.25	441.25
4	Accumulated net cash flows before income tax			-1150.00	-3900.30	-3459.05	-3017.80	-2576.55	-2135.30	-1694.05	-1252.80
5	Net cash flows after income tax	4802.96		-1150.00	-2750.30	360.85	360.85	360.85	360.85	360.85	360.85
6	Accumulated net cash flows after income tax			-1150.00	-3900.30	-3539.45	-3178.60	-2817.75	-2456.90	-2096.05	-1735.20
	Calculation indexes										
(1)	Net financial present value										
	Discount factor(Ic=)	10.00%	1	1	1	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645
	Net present value FNPV=	-660.91		-1150.00	-2750.30	328.05	298.21	271.11	246.46	224.05	203.70
(2)	Financial IRR (FIRR after tax)										
	Discount factor(i=)	7.68%	1	1	1	0.9287	0.8624	0.8009	0.7438	0.6908	0.6415
	Net present value = FNPV=	0.85		-1150.00	-2750.30	335.12	311.20	289.00	268.40	249.28	231.49
	Discount factor(i=)	7.69%	1	1	1	0.9286	0.8623	0.8007	0.7435	0.6904	0.6411
	Net present value = FNPV=	-2.48		-1150.00	-2750.30	335.09	311.16	288.93	268.29	249.13	231.34
(3)	Calculation parameters for static investment recovery period (years)	10									
		360.85									
		-291.80									
	Static investment recovery period (including	12.81				nstruction period 2 years + Operation period 10 years + |-291.8| ÷360.85 =					
(4)	Financial IRR(FIRR)	7.68%				7.68% + 0.85 ÷ (0.85 + |-2.48|)×(7.69 - 7.68)% = 7.68%					