

フィリピン共和国

ルソン島包蔵水力調査

附属報告書 - C

1987年8月

国際協力事業団

鉦計資

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フィリピン共和国

ルソン島包蔵水力調査

附属報告書 - C

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1987年8月

国際協力事業団

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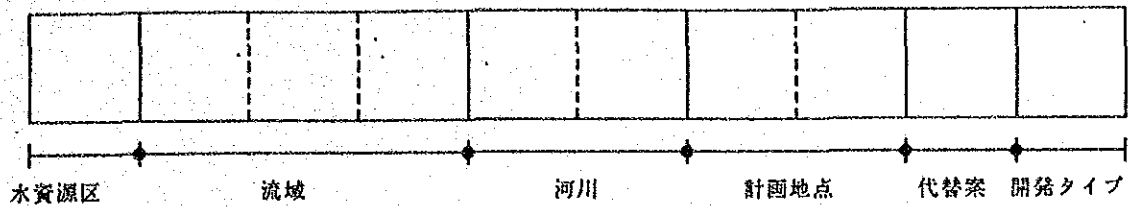


## C-1 水力地点コード番号システム





## 水力地点コード番号システム



水資源区 : 1から5

流域 : 各水資源区ごとに通し番号(時計回り)。

河川 : 一般に00。各流域ごとに大支川がある場合は01から99まで。

水力地点 : 各流域ごとに通し番号。一河川内では下流から上流側とする。

代替案 : 一般に0。近傍で代替案がある場合には1から9まで。

開発タイプ : 貯水池式 --- 1  
流れ込み式 --- 2



C-2 水力地点一覽



# 水力地点一覽

NO.	PROJECT ID #	PROJECT NAME	NO.	PROJECT ID #	PROJECT NAME	NO.	PROJECT ID #	PROJECT NAME	NO.	PROJECT ID #	PROJECT NAME
1	1-2-0-1-0	RIZAL	41	1-22-7-31-0	SUYSUAN	61	8-8-26-0	DABBA	121	3-13-0-1-0	MALUPA
2	1-3-0-1-0	BAJULIN	42	1-31-0-1-0	DINGRAS	82	8-8-26-0	DALAYA	122	3-25-0-1-0	UNIRAY-3
3	1-3-0-2-0	MAGUILIAN	43	1-39-0-1-0	YINTAR	83	8-8-27-0	TUGUEGARAO	123	3-25-0-2-0	UPPER UMIRAY
4	1-10-0-1-0	LUYA	44	1-39-0-2-0	TAMDAGAN	84	8-9-26-0	SAN PABLO	124	3-25-1-1-0	CATMON
5	1-10-0-1-1	LUYA (ROR ALT.)	45	1-47-0-1-0	BULU-1 (ILOCOS)	85	8-11-29-0	TUMAUINI-1	125	3-25-2-2-0	BALHITINGON
6	1-10-0-2-0	BAKUM	46	1-47-0-2-0	BULU-2 (ILOCOS)	86	8-12-30-0	NATONIN	126	3-25-2-3-0	PAPAYA
7	1-10-1-3-0	TIBUNEC	47	2-5-0-1-0	LUNA	87	8-12-31-0	PASTOR	127	3-25-3-4-0	LUBINGAN
8	1-10-1-4-0	ANSURAYAN	48	2-5-0-2-0	ZIMIGUI	88	8-13-32-0	TABUK	128	3-27-0-1-0	GUMAIN
9	1-11-0-1-0	USC	49	2-6-0-1-0	SISIRITAN	89	8-13-33-0	BANATAO	129	3-77-0-2-0	PILA
10	1-11-0-2-0	CHICO-R	50	2-6-0-2-0	SUBULAYAN	90	8-14-34-0	MALIANO	130	3-77-0-3-0	SAN NICOLAS
11	1-22-0-1-0	BANADANG	51	2-6-0-3-0	BULU	91	8-14-35-0	ILAGAN-1	131	3-77-0-4-0	TABU
12	1-22-0-2-0	LANGIDEN	52	2-6-1-4-0	NABARAYAN	92	8-14-36-0	ILAGAN-2	132	3-77-0-5-0	AGNO-1
13	1-22-0-3-0	BANDI	53	2-6-1-5-0	DIDAGAT	93	8-14-37-0	DINAPIGUI	133	3-77-0-6-0	AGNO-2
14	1-22-0-4-0	ALIP	54	2-6-1-6-0	AGSULU	94	8-15-38-0	BALLASANG	134	3-77-0-7-0	AGNO-3
15	1-22-0-5-0	SUPO	55	2-6-1-7-0	AGAN	95	8-15-39-0	ABUAN-1	135	3-77-1-6-0	CAMILING-1
16	1-22-0-6-0	ETEB	56	2-6-1-8-0	APAYAO	96	8-16-40-0	CATALANGAN	136	3-77-1-9-0	CAMILING-2
17	1-22-0-7-0	BUCHIT	57	2-6-1-9-0	ZIMUNDUNGAN	97	8-16-41-0	DISUSUAN	137	3-77-4-10-0	PAMPANG
18	1-22-0-8-0	UPPER BUCHIT	58	2-6-2-2-0	CAPISAYAN	98	8-16-42-0	MARIANO	138	4-7-0-1-0	KANAR
19	1-22-0-9-0	DAYAPAN	59	2-6-3-3-0	BASAO	99	8-19-43-0	ALIMIT-1	139	4-7-0-2-0	DARAITAN
20	1-22-0-10-0	ABRA	60	2-6-3-4-0	CHICO-1R	100	8-19-44-0	ALIMIT-2	140	4-7-0-3-0	UPPER AGOS-1M
21	1-22-1-11-0	NAGLIBACAN	61	2-6-3-5-0	SADANGA	101	8-20-45-0	HUDAB	141	4-7-0-4-0	UPPER AGOS-1S
22	1-22-1-12-0	TINEG-1	62	2-6-3-6-0	CHICO-2R	102	8-20-46-0	IBULAO	142	4-7-0-5-0	UPPER AGOS-2
23	1-22-1-13-0	TINEG-2	63	2-6-3-7-0	CHICO-3R	103	8-22-47-0	MATUNO-1R	143	4-115-1-1-0	MAWA
24	1-22-1-14-0	TINEG-3	64	2-6-3-8-0	BORTOC	104	8-22-48-0	MATUNO-2R	144	5-14-1-1-0	DOSIGON
25	1-22-2-15-0	BINGANGAN-R	65	2-6-3-9-0	CHICO-4R	105	8-22-49-0	STA. CRUZ	145	5-20-0-1-0	PULANTUNA
26	1-22-3-16-0	PASANAQ	66	2-6-4-10-0	MATALAO	106	8-26-50-0	PINARIPAD			
27	1-22-3-17-0	MALANAS (LICUANO)	67	2-6-4-11-0	NABUANGAN	107	8-27-51-0	DIBULUAN			
28	1-22-4-18-0	TAPING	68	2-6-5-12-0	PINUKPUK	108	8-28-52-0	CABINGATAN			
29	1-22-5-19-0	UPPER MAGUYEPYEP	69	2-6-5-13-0	ADAGA	109	8-28-53-0	GAKIP			
30	1-22-5-20-0	BUCLOC	70	2-6-5-14-0	SALTAN-4	110	8-29-54-0	OAKGAN			
31	1-22-5-21-0	DAGUIONAN	71	2-6-5-15-0	SALTAN	111	8-29-55-0	MADDELA			
32	1-22-5-22-0	BOYAN	72	2-6-5-16-0	SALTAN-5	112	8-29-56-0	KAGIPISSIPAN			
33	1-22-5-23-0	IKMIN	73	2-6-5-17-0	BABACA-R	113	8-29-57-0	GADENG			
34	1-22-5-24-0	TORUENG	74	2-6-5-18-0	DABACA	114	8-29-58-0	CASECHAN			
35	1-22-5-25-0	DANAC	75	2-6-6-19-0	NANENG	115	8-29-59-0	UPPER CASECHAN			
36	1-22-6-26-0	ARLUADAN	76	2-6-6-20-0	MT. BOLONTOC				116	2-6-29-60-0	UPPER CASECHAN-2
37	1-22-6-27-0	DAWANIT	77	2-6-6-21-0	LOWER PASTIL				117	2-6-29-61-0	UPPER CASECHAN-3
38	1-22-6-28-0	NAINA	78	2-6-6-22-0	PASIL				118	2-32-0-1-0	TABOAN
39	1-22-6-29-0	UTIP	79	2-6-6-23-0	TANUDAN				119	2-39-0-1-0	DIKATAYAN
40	1-22-7-30-0	KUMANGA	80	2-6-7-24-0	BANTAY				120	2-47-0-1-0	PALAMAN



## C-3 発電力計算





PROJECT NAME : RIZAL  
 PROJECT ID : 1-2-0-10-1  
 TYPE : RESERVOIR

BASIN NAME : ARINGAY  
 RIVER NAME : GALIANO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.75	0.62	0.62	0.62	0.52	0.52	0.52	0.42	0.42	0.42
FULL SUPPLY LEVEL (M) :	200.0	179.5	185.8	200.0	172.0	180.9	200.0	163.6	175.0	200.0
MIN. OPERATING LEVEL (M) :	140.7	83.5	119.9	156.3	83.3	124.5	165.7	83.0	128.4	173.8
POWER										
FIRM DISCHARGE (M3/S) :	9.4	8.9	8.9	8.8	8.4	8.4	8.3	7.5	7.5	7.4
PLANT PEAK DIS. (M3/S) :	18.9	17.9	17.8	17.6	16.8	16.7	16.5	15.2	15.1	14.9
AVERAGE NET HEAD (M) :	128.1	95.3	111.9	133.1	90.7	110.0	136.0	84.5	107.2	138.4
INSTALLED CAPACITY (MW) :	19.9	14.1	16.4	19.3	12.6	15.1	18.5	10.6	13.3	16.9
GUARANTEED POWER (MW) :	13.1	4.5	9.5	14.4	4.2	9.5	14.7	3.7	9.0	14.1
AVERAGE FIRM POWER (MW) :	10.0	7.0	8.2	9.6	6.3	7.6	9.3	5.3	6.7	8.5
FIRM ENERGY (MIL KWH/Y) :	87.	62.	72.	85.	55.	66.	81.	47.	58.	74.
SECONDARY ENERGY (%) :	14.	14.	15.	17.	16.	17.	20.	18.	20.	24.
ANNUAL AVERAGE E-GY (" ) :	101.	76.	87.	102.	71.	83.	101.	64.	78.	98.
D A M										
DAM HEIGHT (M) :	159.3	138.8	145.1	159.3	131.3	140.2	159.3	122.9	134.3	159.3
EMBANKMENT VOL. (MIL M3) :	13.010	8.667	9.898	13.010	7.383	8.900	13.010	6.100	7.891	13.010
EVALUATION INDICES										
CH/V :	3384.	4156.	3788.	3151.	4329.	3817.	2957.	4395.	3700.	2652.
C/V :	23.	33.	28.	21.	36.	30.	20.	39.	30.	18.
P/(20VT+VD) :	1.3	1.3	1.4	1.3	1.3	1.4	1.2	1.3	1.3	1.1
E(FIRM)/(20VT+VD) :	5.8	5.8	6.0	5.6	5.8	6.1	5.4	5.7	5.9	4.9
E(F+SEC*0.3)/(20VT+VD) :	6.1	6.1	6.4	5.9	6.3	6.5	5.8	6.4	6.5	5.4

PROJECT NAME : BAGULIN  
 PROJECT ID : 1- 3- 0- 1-0-1  
 TYPE : RESERVOIR

BASIN NAME : NAGUILIAN  
 RIVER NAME : NAGUILIAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.70	0.57	0.57	0.57	0.52	0.52	0.52	0.47	0.47	0.47
FULL SUPPLY LEVEL (M) :	298.0	266.7	277.4	298.0	261.7	274.1	298.0	256.3	270.9	298.0
MIN. OPERATING LEVEL(M) :	229.3	163.2	205.1	246.9	163.1	207.9	252.8	162.8	210.6	258.4
POWER										
FIRM DISCHARGE (M3/S) :	22.6	21.2	21.1	21.0	20.5	20.5	20.3	19.6	19.5	19.4
PLANT PEAK DIS. (M3/S) :	135.9	127.0	126.5	125.8	123.3	122.7	121.9	117.8	117.2	116.3
AVERAGE NET HEAD (M) :	164.3	121.9	142.6	169.9	118.5	141.4	171.8	114.8	140.1	173.5
INSTALLED CAPACITY (MW) :	183.8	127.4	143.5	175.8	120.2	142.8	172.3	111.3	135.2	166.2
GUARANTEED POWER (MW) :	126.6	52.6	93.5	133.9	50.9	93.5	135.3	48.5	91.8	134.2
AVERAGE FIRM POWER (MW) :	30.6	21.2	24.7	29.3	20.0	23.8	28.7	18.6	22.5	27.7
FIRM ENERGY (MIL KWH/Y) :	268.	186.	217.	257.	176.	208.	252.	163.	197.	243.
SECONDARY ENERGY (") :	75.	76.	82.	93.	79.	87.	101.	85.	94.	111.
ANNUAL AVERAGE E-GY (") :	343.	262.	299.	350.	255.	295.	352.	247.	291.	354.

D A M

DAM HEIGHT (M) :	197.0	165.7	176.4	197.0	160.7	173.1	197.0	155.3	169.9	197.0
EMBANKMENT VOL. (MIL M3) :	22.142	13.425	16.080	22.142	12.312	15.250	22.142	11.114	14.416	22.142

EVALUATION INDICES

CH/V :	6033.	7774.	6891.	5579.	7964.	6912.	5405.	8131.	6845.	5156.
C/V :	32.	50.	41.	30.	53.	42.	29.	56.	43.	28.
P/(20VT+VD) :	6.8	7.0	7.1	6.5	7.0	7.1	6.4	7.0	7.1	6.2
E(FIRM)/(20VT+VD) :	9.9	10.2	10.4	9.5	10.3	10.4	9.3	10.3	10.3	9.0
E(F+SEC*0.3)/(20VT+VD) :	10.8	11.5	11.6	10.6	11.7	11.7	10.5	11.9	11.8	10.3

PROJECT NAME : MAGUILLIAN  
 PROJECT ID : 1-3-0-2-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
<b>HEAD PONDAGE</b>						
OUTPUT FACTOR	0.936	0.900	0.800	0.700	0.600	0.508
FULL SUPPLY LEVEL (M)	483.0	483.1	483.4	483.7	484.2	484.9
NORMAL OPERATING LEVEL (M)	482.5	482.6	482.8	483.2	483.7	484.3
MINIMUM OPERATING LEVEL (M)	481.9	482.0	482.3	482.6	483.1	483.7
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.0	6.1	6.4	6.7	7.2	7.9
WATER DEPTH AT TRASHRACK (M)	3.0	3.1	3.4	3.7	4.2	4.9
CHANNEL WIDTH AT TRASHRACK (M)	3.6	4.0	5.0	6.4	8.4	11.0
PONDAGE STORAGE VOLUME (1000 M3)	76.0	78.5	84.7	93.1	105.9	121.8
<b>WATERWAY</b>						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.9	2.5	3.0
HEADRACE TUNNEL LENGTH (M)	8800.0	8800.0	8800.0	8800.0	8800.0	8800.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.4	1.7	2.1
PENSTOCK LENGTH (HORIZONTAL) (M)	1050.0	1050.0	1050.0	1050.0	1050.0	1050.0
EXCAVATION VOLUME (1000 M3)	24.0	24.0	24.0	28.0	44.5	66.2
<b>POWER</b>						
FIRM DISCHARGE (M3/S)	1.0	1.0	1.0	1.0	1.0	1.0
DEPENDABLE DISCHARGE (M3/S)	1.6	1.6	1.6	1.6	1.6	1.6
PLANT PEAK DISCHARGE (M3/S)	1.6	2.0	3.1	5.1	8.8	15.0
TAIL WATER LEVEL (M)	159.0	159.0	159.0	159.0	159.0	159.0
NET HEAD (M)	316.5	314.7	307.1	297.3	299.9	301.1
INSTALLED CAPACITY (MW)	4.3	5.2	7.9	12.4	21.8	37.2
DEPENDABLE PEAK POWER (MW)	4.3	4.3	4.1	4.0	4.1	4.1
FIRM POWER (MW)	2.6	2.6	2.5	2.4	2.4	2.4
GUARANTEED POWER OUTPUT (MW)	2.3	2.3	2.2	2.2	2.2	2.2
FIRM ENERGY/YEAR (10**6 KWH)	22.5	22.3	21.8	21.1	21.3	21.4
SECONDARY ENERGY/YEAR (10**6 KWH)	11.5	17.3	30.6	49.7	84.3	130.2
ANNUAL ENERGY (MIL KWH/YR)	33.9	39.6	52.4	70.8	105.6	151.6
<b>PARAMETERS</b>						
P(INSTALLED)/(20VT) (W/M3)	8.9	10.9	16.5	22.1	24.6	28.1
P(DEPENDABLE)/(20VT) (W/M3)	8.9	8.9	8.7	7.2	4.6	3.1
E(FIRM)/(20VT) (KWH/M3)	46.9	46.6	49.5	37.6	23.9	16.2
E(F+0.3*SECONDARY)/(20VT) (%)	54.0	57.4	64.6	64.2	52.4	45.7

PROJECT NAME : LUYA  
 PROJECT ID : 1- 10- 0- 1-0-1  
 TYPE : RESERVOIR

BASIN NAME : AMBURAYAN  
 RIVER NAME : AMBURAYAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.57	0.57	0.57	0.52	0.52	0.52	0.47	0.47	0.47
FULL SUPPLY LEVEL (M) :	310.0	269.7	286.2	310.0	263.5	282.4	310.0	256.7	278.4	310.0
MIN. OPERATING LEVEL (M) :	219.1	139.5	191.6	243.7	139.3	195.3	251.2	139.1	196.9	258.7
POWER										
FIRM DISCHARGE (M3/S) :	45.8	40.9	40.8	40.6	39.7	39.6	39.3	37.9	37.8	37.5
PLANT PEAK DIS. (M3/S) :	262.8	245.5	244.7	243.4	238.2	237.4	236.0	227.6	226.8	225.3
AVERAGE NET HEAD (M) :	190.3	137.7	165.6	198.3	133.5	164.3	200.7	128.9	162.8	203.1
INSTALLED CAPACITY (MW) :	411.7	278.2	333.5	397.3	261.8	321.0	389.9	241.6	303.9	376.7
GUARANTEED POWER (MW) :	267.2	98.0	196.7	294.0	94.8	197.6	298.8	90.2	195.2	298.4
AVERAGE FIRM POWER (MW) :	68.6	46.4	55.6	66.2	43.6	53.5	65.0	40.3	50.6	62.8
FIRM ENERGY (MIL KWH/Y) :	601.	406.	487.	580.	382.	469.	569.	353.	444.	550.
SECONDARY ENERGY (") :	167.	169.	185.	210.	176.	196.	228.	187.	212.	250.
ANNUAL AVERAGE E-GY (") :	768.	575.	672.	790.	558.	655.	796.	540.	656.	800.

D A M

DAM HEIGHT (M) :	231.0	190.7	207.2	231.0	184.5	203.4	231.0	177.7	199.4	231.0
EMBANKMENT VOL. (MIL M3) :	60.705	38.103	46.506	60.705	35.264	44.521	60.705	32.135	42.395	60.705

EVALUATION INDICES

CH/V	5019.	6130.	5450.	4645.	6210.	5417.	4501.	6261.	5321.	4296.
C/V	23.	34.	28.	21.	36.	28.	20.	37.	28.	20.
P/(20VT+VD)	6.1	6.2	6.3	5.9	6.3	6.3	5.8	6.3	6.2	5.6
E(FIRM)/(20VT+VD)	9.9	9.1	9.2	8.6	9.2	9.2	8.5	8.2	9.1	8.2
E(F+SEC+0.3)/(20VT+VD)	9.7	10.3	10.2	9.6	10.4	10.4	9.5	10.6	10.4	9.3

PROJECT NAME : LUYA (ROR ALT.)  
 PROJECT ID : 1-10-0-1-1-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.936	0.900	0.800	0.700	0.600
FULL SUPPLY LEVEL (M)	272.0	272.1	272.2	272.4	272.7
NORMAL OPERATING LEVEL (M)	268.3	268.9	269.1	269.5	270.1
MINIMUM OPERATING LEVEL (M)	265.5	265.5	266.1	266.6	267.4
DIVERSION WEIR HEIGHT INC. 3M F-B	12.0	12.1	12.2	12.4	12.7
WATER DEPTH AT TRASHRACK (M)	9.0	9.1	9.2	9.4	9.7
CHANNEL WIDTH AT TRASHRACK (M)	5.9	5.6	8.2	10.4	13.8
PONDAGE STORAGE VOLUME (1000 M3)	101.0	102.7	106.7	112.3	120.7

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	2.0	2.4	2.9	3.6
HEADRACE TUNNEL LENGTH (M)	6750.0	6750.0	6750.0	6750.0	6750.0
INSIDE DIAMETER OF PENSTOCK (M)	1.4	1.5	1.8	2.2	2.7
PENSTOCK LENGTH (HORIZONTAL) (M)	200.0	200.0	200.0	200.0	200.0
EXCAVATION VOLUME (1000 M3)	18.5	21.7	30.1	45.1	68.5

POWER

FIRM DISCHARGE (M3/S)	2.6	2.6	2.6	2.6	2.6
DEPENDABLE DISCHARGE (M3/S)	4.4	4.4	4.4	4.4	4.4
PLANT PEAK DISCHARGE (M3/S)	4.4	5.4	8.4	13.6	23.8
TAIL WATER LEVEL (M)	140.0	140.0	140.0	140.0	140.0
NET HEAD (M)	115.8	115.9	116.3	117.9	118.6
INSTALLED CAPACITY (MW)	4.2	5.2	8.1	13.2	23.2
DEPENDABLE PEAK POWER (MW)	4.2	4.2	4.2	4.3	4.3
FIRM POWER (MW)	2.5	2.5	2.5	2.6	2.6
GUARANTEED POWER OUTPUT (MW)	2.2	2.2	2.2	2.3	2.3
FIRM ENERGY/YEAR (10**6 KWH)	22.1	22.1	22.2	22.5	22.6
SECONDARY ENERGY/YEAR (10**6 KWH)	11.6	17.5	31.9	54.2	91.3
ANNUAL ENERGY (MIL KWH/YR)	33.6	39.6	54.1	76.7	114.0

PARAMETERS

P(INSTALLED)/(20VT) (W/M3)	11.4	12.0	13.4	14.7	16.9
P(DEPENDABLE)/(20VT) (W/M3)	11.4	9.7	7.0	4.7	3.1
E(FIRM)/(20VT) (KWH/M3)	59.7	51.0	36.9	24.9	16.5
E(F+0.3*SECONDARY)/(20VT) (")	69.1	63.1	52.7	43.0	36.5

PROJECT NAME : BAKJIM  
 PROJECT ID : 1- 10- 0- 2-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.935	0.900	0.800	0.700	0.600	0.508
FULL SUPPLY LEVEL (M)	687.7	687.8	688.0	688.3	688.7	689.2
NORMAL OPERATING LEVEL (M)	687.2	687.3	687.5	687.8	688.2	688.7
MINIMUM OPERATING LEVEL (M)	686.7	686.8	687.0	687.3	687.7	688.2
DIVERSION WEIR HEIGHT INC. 3M F-B:	5.7	5.8	6.0	6.3	6.7	7.2
WATER DEPTH AT TRASHRACK (M)	2.7	2.8	3.0	3.3	3.7	4.2
CHANNEL WIDTH AT TRASHRACK (M)	3.0	3.3	4.1	5.2	6.9	9.0
PONDAGE STORAGE VOLUME (1000 M3)	54.0	55.7	59.7	65.3	73.7	84.1

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	2.1	2.5
HEADRACE TUNNEL LENGTH (M)	4650.0	4650.0	4650.0	4650.0	4650.0	4650.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.3	1.5	1.8
PENSTOCK LENGTH (HORIZONTAL) (M)	350.0	350.0	350.0	350.0	350.0	350.0
EXCAVATION VOLUME (1000 M3)	12.5	12.5	12.5	12.5	16.6	25.8

POWER

FIRM DISCHARGE (M3/S)	0.7	0.7	0.7	0.7	0.7	0.7
DEPENDABLE DISCHARGE (M3/S)	1.1	1.1	1.1	1.1	1.1	1.1
PLANT PEAK DISCHARGE (M3/S)	1.1	1.4	2.1	3.4	6.0	10.1
TAIL WATER LEVEL (M)	267.0	267.0	267.0	267.0	267.0	267.0
NET HEAD (M)	415.2	414.8	413.3	408.6	405.4	407.0
INSTALLED CAPACITY (MW)	3.8	4.7	7.2	11.5	19.9	33.9
DEPENDABLE PEAK POWER (MW)	3.8	3.8	3.8	3.7	3.7	3.7
FIRM POWER (MW)	2.3	2.3	2.3	2.2	2.2	2.2
GUARANTEED POWER OUTPUT (MW)	2.0	2.0	2.0	2.0	2.0	2.0
FIRM ENERGY/YEAR (10**6 KWH)	19.9	19.9	19.8	19.6	19.4	19.5
SECONDARY ENERGY/YEAR (10**6 KWH)	10.1	15.3	27.7	46.1	76.8	118.6
ANNUAL ENERGY (MIL KWH/YR)	30.0	35.2	47.5	65.6	96.2	138.1

PARAMETERS

P(INSTALLED)/(20VT) (W/M3)	15.1	16.6	28.7	45.8	60.0	65.8
P(DEPENDABLE)/(20VT) (W/M3)	15.1	15.1	15.0	14.8	11.1	7.2
E(FIRM)/(20VT) (KWH/M3)	79.2	79.2	78.9	76.0	58.5	37.8
E(F+0.3*SECONDARY)/(20VT) (")	91.4	97.5	112.0	133.1	127.9	106.9

PROJECT NAME : TIBUNEC  
 PROJECT ID : 1- 10- 1- 3-0-1  
 TYPE : RESERVOIR

BASIN NAME : AMBURAYAN  
 RIVER NAME : BAKUM

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.57	0.57	0.57	0.52	0.52	0.52	0.47	0.47	0.47
FULL SUPPLY LEVEL (M) :	246.0	215.7	226.6	246.0	211.0	223.5	246.0	205.9	220.5	246.0
MIN. OPERATING LEVEL (M) :	179.6	121.5	158.8	196.0	121.3	161.5	201.6	121.1	163.9	206.8
POWER										
FIRM DISCHARGE (M3/S) :	16.1	15.1	15.0	14.9	14.6	14.5	14.5	14.0	13.9	13.8
PLANT PEAK DIS. (M3/S) :	96.6	90.3	89.9	89.5	87.7	87.2	86.7	83.8	83.3	82.8
AVERAGE NET HEAD (M) :	156.7	117.7	137.1	162.1	114.6	136.0	163.9	111.1	134.7	165.6
INSTALLED CAPACITY (MW) :	124.7	87.6	101.5	119.4	82.7	97.7	117.0	76.6	92.4	112.8
GUARANTEED POWER (MW) :	85.2	38.9	64.8	90.3	37.7	64.7	91.3	35.8	63.4	90.5
AVERAGE FIRM POWER (MW) :	20.5	14.6	16.9	19.9	13.8	16.3	19.5	12.8	15.4	18.8
FIRM ENERGY (MIL. KWH/Y) :	182.	128.	148.	174.	121.	143.	171.	112.	135.	165.
SECONDARY ENERGY (") :	51.	52.	56.	64.	54.	59.	69.	58.	64.	76.
ANNUAL AVERAGE E-GY (") :	233.	180.	204.	238.	175.	202.	239.	169.	199.	240.

D A M

DAM HEIGHT (M) :	188.0	157.7	168.6	188.0	153.0	165.5	188.0	147.9	162.5	188.0
EMBANKMENT VOL. (MIL M3) :	21.712	13.423	16.098	21.712	12.397	15.282	21.712	11.337	14.547	21.712

EVALUATION INDICES

CH/V :	4183.	5274.	4690.	3871.	5369.	4701.	3751.	5414.	4625.	3579.
C/V :	23.	35.	29.	22.	37.	30.	21.	39.	30.	20.
P/(20VT+VD) :	5.2	5.5	5.5	5.0	5.6	5.5	4.9	5.6	5.5	4.7
E(FIRM)/(20VT+VD) :	7.5	8.1	8.0	7.2	8.2	8.1	7.1	8.2	8.0	6.8
E(F+SEC*0.3)/(20VT+VD) :	8.2	9.1	8.9	8.0	9.3	9.1	7.9	9.4	9.1	7.8

PROJECT NAME : AMBURAYAN  
 PROJECT ID : 1-10-1-4-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.936	0.900	0.800	0.700	0.600	0.508
FULL SUPPLY LEVEL (M)	514.6	514.7	515.1	515.6	516.4	517.3
NORMAL OPERATING LEVEL (M)	513.5	513.6	514.0	514.5	515.3	516.3
MINIMUM OPERATING LEVEL (M)	512.4	512.5	512.9	513.4	514.2	515.2
DIVERSION WEIR HEIGHT INC. 3M F-B	7.6	7.7	8.1	8.6	9.4	10.3
WATER DEPTH AT TRASHRACK (M)	4.6	4.7	5.1	5.6	6.4	7.3
CHANNEL WIDTH AT TRASHRACK (M)	5.5	6.1	7.6	9.7	12.8	16.7
PONDAGE STORAGE VOLUME (1000 M3)	136.8	141.4	152.6	168.1	191.5	220.4

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.9	2.2	2.7	3.4	4.1
HEADRACE TUNNEL LENGTH (M)	12800.0	12800.0	12800.0	12800.0	12800.0	12800.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.4	1.6	2.0	2.5	3.1
PENSTOCK LENGTH (HORIZONTAL) (M)	365.0	365.0	365.0	365.0	365.0	365.0
EXCAVATION VOLUME (1000 M3)	33.2	36.6	50.8	76.2	115.8	172.1

POWER

FIRM DISCHARGE (M3/S)	2.3	2.3	2.3	2.3	2.3	2.3
DEPENDABLE DISCHARGE (M3/S)	3.8	3.8	3.8	3.8	3.8	3.8
PLANT PEAK DISCHARGE (M3/S)	3.8	4.7	7.2	11.7	20.4	34.7
TAIL WATER LEVEL (M)	280.0	280.0	280.0	280.0	280.0	280.0
NET HEAD (M)	211.6	208.4	208.0	211.9	213.0	214.2
INSTALLED CAPACITY (MW)	6.6	8.0	12.5	20.4	35.8	61.1
DEPENDABLE PEAK POWER (MW)	6.6	6.5	6.5	6.6	6.6	6.7
FIRM POWER (MW)	4.0	3.9	3.9	4.0	4.0	4.0
GUARANTEED POWER OUTPUT (MW)	3.5	3.5	3.5	3.6	3.6	3.6
FIRM ENERGY/YEAR (10**6 KWH)	34.7	34.2	34.3	34.8	34.9	35.1
SECONDARY ENERGY/YEAR (10**6 KWH)	17.8	26.5	48.3	82.2	138.8	214.7
ANNUAL ENERGY (MIL KWH/YR)	52.5	60.7	82.6	116.9	173.7	249.8

PARAMETERS

P (INSTALLED)/(20VT) (W/M3)	10.0	11.0	12.3	13.4	15.5	17.8
P (DEPENDABLE)/(20VT) (W/M3)	10.0	8.9	6.4	4.3	2.9	1.9
E (FIRM)/(20VT) (KWH/M3)	52.3	46.7	33.7	22.8	15.1	10.2
E (F+0.3*SECONDARY)/(20VT) (")	60.4	57.5	48.0	39.0	33.1	28.9





PROJECT NAME : CHICO-R  
 PROJECT ID : 1-11-0-2-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
<b>HEAD PONDAGE</b>						
OUTPUT FACTOR	0.936	0.900	0.800	0.700	0.600	0.508
FULL SUPPLY LEVEL (M)	302.9	303.0	303.2	303.4	303.8	304.3
NORMAL OPERATING LEVEL (M)	302.3	302.4	302.6	302.8	303.2	303.7
MINIMUM OPERATING LEVEL (M)	301.7	301.8	302.0	302.3	302.7	303.2
DIVERSION WEIR HEIGHT INC. 3M F-8:	5.9	6.0	6.2	6.4	6.8	7.3
WATER DEPTH AT TRASHRACK (M)	2.9	3.0	3.2	3.4	3.8	4.3
CHANNEL WIDTH AT TRASHRACK (M)	2.9	3.2	4.0	5.0	6.6	8.6
PONDAGE STORAGE VOLUME (1000 M3)	43.3	44.5	47.4	51.5	57.5	65.0
<b>WATERWAY</b>						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	2.0	2.5
HEADRACE TUNNEL LENGTH (M)	10780.0	10780.0	10780.0	10780.0	10780.0	10780.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.3	1.5	1.8
PENSTOCK LENGTH (HORIZONTAL) (M)	685.0	685.0	685.0	685.0	685.0	685.0
EXCAVATION VOLUME (1000 M3)	28.5	28.5	28.5	28.4	35.5	55.1
<b>POWER</b>						
FIRM DISCHARGE (M3/S)	0.6	0.6	0.6	0.6	0.6	0.6
DEPENDABLE DISCHARGE (M3/S)	1.0	1.0	1.0	1.0	1.0	1.0
PLANT PEAK DISCHARGE (M3/S)	1.0	1.3	2.0	3.2	5.5	9.3
TAIL WATER LEVEL (M)	96.0	96.0	96.0	96.0	96.0	96.0
NET HEAD (M)	202.8	202.2	199.4	191.5	183.0	185.8
INSTALLED CAPACITY (MW)	1.7	2.1	3.2	5.0	8.3	14.3
DEPENDABLE PEAK POWER (MW)	1.7	1.7	1.7	1.6	1.5	1.6
FIRM POWER (MW)	1.0	1.0	1.0	1.0	0.9	0.9
GUARANTEED POWER OUTPUT (MW)	0.9	0.9	0.9	0.9	0.8	0.8
FIRM ENERGY/YEAR (10**6 KWH)	9.0	8.9	8.8	8.5	8.1	8.2
SECONDARY ENERGY/YEAR (10**6 KWH)	4.6	6.9	12.4	19.9	32.0	50.0
ANNUAL ENERGY (MIL KWH/YR)	13.5	15.8	21.2	28.4	40.1	58.2
<b>PARAMETERS</b>						
P (INSTALLED)/(20VT) (W/M3)	3.0	3.7	5.6	8.7	11.7	13.0
P (DEPENDABLE)/(20VT) (W/M3)	3.0	3.0	2.9	2.8	2.2	1.4
E (FIRM)/(20VT) (KWH/M3)	15.7	15.7	15.5	14.9	11.4	7.4
E (F+0.3*SECONDARY)/(20VT) (%)	18.2	19.3	22.0	25.4	24.9	21.1

PROJECT NAME : BANAOANG  
 PROJECT ID : 1-22-0-1-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	77.0	71.0	73.6	77.0	69.3	72.5	77.0	67.3	71.5	77.0
MIN. OPERATING LEVEL (M) :	50.1	37.7	45.2	52.6	37.5	46.3	55.1	37.3	47.5	57.6
POWER										
FIRM DISCHARGE (M3/S) :	183.8	161.3	180.3	179.2	176.2	174.9	173.6	169.9	168.5	166.9
PLANT PEAK DIS. (M3/S) :	551.5	544.1	541.1	537.8	528.5	524.9	520.9	509.8	505.5	500.8
AVERAGE NET HEAD (M) :	58.3	50.2	54.4	59.1	49.0	54.0	59.9	47.7	53.7	60.7
INSTALLED CAPACITY (MW) :	264.5	224.9	242.1	261.5	219.3	233.5	256.7	200.0	223.5	250.1
GUARANTEED POWER (MW) :	174.3	119.7	150.3	180.5	115.5	150.5	184.9	110.5	149.5	187.5
AVERAGE FIRM POWER (MW) :	98.1	75.0	80.7	87.1	71.1	77.8	85.6	66.7	74.5	83.4
FIRM ENERGY (MIL KWH/Y) :	772.	657.	707.	763.	623.	682.	750.	584.	653.	730.
SECONDARY ENERGY (") :	153.	147.	156.	168.	157.	170.	186.	170.	186.	207.
ANNUAL AVERAGE E-GY (") :	925.	803.	863.	931.	780.	851.	935.	754.	839.	936.
D A M										
DAM HEIGHT (M) :	75.0	69.0	71.6	75.0	67.3	70.5	75.0	65.3	69.5	75.0
EMBANKMENT VOL. (MIL M3) :	4.293	3.612	3.880	4.293	3.439	3.773	4.293	3.239	3.666	4.293
EVALUATION INDICES										
CH/V :	90758.	97029.	93544.	88463.	96294.	91788.	85652.	95410.	89455.	82304.
C/V :	1350.	1563.	1466.	1317.	1615.	1462.	1275.	1654.	1449.	1226.
P/(20VT+VD) :	14.8	13.1	13.9	14.6	12.6	13.5	14.4	12.0	13.1	14.1
E(FIRM)/(20VT+VD) :	43.1	38.2	40.5	42.7	36.7	39.4	42.1	35.0	38.1	41.2
E(F+SEC*0.3)/(20VT+VD) :	45.6	40.7	43.2	45.5	39.5	42.4	45.2	38.0	41.4	44.7

PROJECT NAME : LANGIDEN  
 PROJECT ID : 1-22-0-2-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : MALAPAAO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.84	0.65	0.65	0.60	0.60	0.60	0.60	0.60	0.55	0.55
FULL SUPPLY LEVEL (M) :	202.0	193.8	202.0	191.6	193.5	195.9	198.7	202.0	189.3	202.0
MIN. OPERATING LEVEL (M) :	137.2	137.2	165.3	137.2	145.4	153.7	152.0	170.2	137.2	173.5
FIRM DISCHARGE (M3/S) :	2.4	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.1	2.1
PLANT PEAK DIS. (M3/S) :	4.8	4.5	4.5	4.4	4.4	4.4	4.3	4.3	4.2	4.2
AVERAGE NET HEAD (M) :	72.9	67.6	82.1	66.1	70.1	74.3	78.9	83.8	64.5	84.9
INSTALLED CAPACITY (MW) :	2.9	2.5	3.0	2.4	2.5	2.7	2.8	3.0	2.3	2.9
GUARANTEED POWER (MW) :	1.1	1.1	2.0	1.0	1.3	1.6	1.9	2.1	1.0	2.2
AVERAGE FIRM POWER (MW) :	1.5	1.3	1.5	1.2	1.3	1.3	1.4	1.5	1.1	1.5
FIRM ENERGY (MIL KWH/Y) :	13.	11.	13.	10.	11.	12.	12.	13.	10.	13.
SECONDARY ENERGY (") :	1.	2.	2.	2.	2.	2.	2.	2.	2.	3.
ANNUAL AVERAGE E-GY (") :	14.	13.	15.	12.	13.	14.	15.	15.	12.	15.

D A M

DAM HEIGHT (M) :	102.4	94.2	102.4	92.0	93.9	96.3	99.1	102.4	89.7	102.4
EMBANKMENT VOL. (MIL M3) :	3.534	2.800	3.534	2.630	2.778	2.992	3.240	3.534	2.450	3.534

EVALUATION INDICES

CH/V :	2041.	2202.	1882.	2220.	2141.	2040.	1939.	1823.	2236.	1753.
C/V :	22.	25.	20.	26.	25.	23.	21.	19.	27.	19.
P/(20VT+VD) :	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
E(FIRM)/(20VT+VD) :	2.9	3.0	3.0	3.0	3.1	3.1	3.0	3.0	3.0	2.9
E(F+SEC*0.3)/(20VT+VD) :	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.1

PROJECT NAME : BANDI  
 PROJECT ID : 1-22-0-3-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : SAQUET-SOOT

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.73	0.55	0.65	0.55	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	178.0	168.4	172.4	178.0	166.2	171.2	178.0	164.0	170.0	178.0
MIN. OPERATING LEVEL (M) :	143.6	125.3	137.3	149.3	125.3	138.8	152.2	125.3	140.1	154.9
POWER										
FIRM DISCHARGE (M3/S) :	2.8	2.7	2.7	2.7	2.7	2.7	2.6	2.6	2.6	2.5
PLANT PEAK DIS. (M3/S) :	5.7	5.5	5.5	5.4	5.3	5.3	5.3	5.1	5.1	5.1
AVERAGE NET HEAD (M) :	67.6	55.3	61.9	69.5	59.9	61.6	70.5	52.5	61.2	71.4
INSTALLED CAPACITY (MW) :	3.1	2.5	2.8	3.1	2.4	2.7	3.1	2.2	2.6	3.0
GUARANTEED POWER (MW) :	2.0	1.1	1.7	2.1	1.1	1.7	2.2	1.1	1.7	2.2
AVERAGE FIRM POWER (MW) :	1.6	1.3	1.4	1.6	1.2	1.3	1.5	1.1	1.3	1.5
FIRM ENERGY (MIL KWH/Y) :	14.	11.	12.	14.	10.	12.	13.	10.	11.	13.
SECONDARY ENERGY (") :	2.	2.	2.	2.	2.	2.	2.	2.	2.	3.
ANNUAL AVERAGE E-GY (") :	16.	13.	14.	15.	12.	14.	16.	12.	14.	16.
D A M										
DAM HEIGHT (M) :	87.0	77.4	81.4	87.0	75.2	80.2	87.0	73.0	79.0	87.0
EMBANKMENT VOL. (MIL M3) :	12.346	9.729	10.772	12.346	9.179	10.437	12.346	8.629	10.126	12.346
EVALUATION INDICES										
CH/V :	571.	621.	589.	549.	619.	580.	531.	615.	567.	511.
C/V :	7.	9.	8.	7.	9.	8.	7.	9.	8.	6.
P/(20VT+VD) :	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
E(FIRM)/(20VT+VD) :	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
E(F+SEC*0.3)/(20VT+VD) :	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.1	1.1	1.0

PROJECT NAME : ALIP  
 PROJECT ID : 1- 22- 0- 4-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : PALSIGUAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.95	0.80	0.80	0.75	0.75	0.75	0.75	0.75	0.72	0.72
FULL SUPPLY LEVEL (M) :	293.0	284.8	293.0	281.8	283.8	285.3	289.5	293.0	280.4	293.0
MIN. OPERATING LEVEL (M) :	193.5	193.5	226.2	193.4	203.4	213.4	223.4	233.4	193.4	236.7
POWER										
FIRM DISCHARGE (M3/S) :	9.2	8.9	8.9	8.8	8.8	8.8	8.8	8.7	8.7	8.5
PLANT PEAK DIS. (M3/S) :	18.4	17.8	17.7	17.6	17.6	17.5	17.5	17.5	17.4	17.3
AVERAGE NET HEAD (M) :	105.1	99.7	115.8	97.7	102.3	107.2	112.6	118.1	96.7	119.2
INSTALLED CAPACITY (MW) :	16.0	14.6	16.9	14.2	14.8	15.5	16.2	17.0	13.9	17.0
GUARANTEED POWER (MW) :	5.6	5.4	9.9	5.4	6.7	8.1	9.4	10.7	5.3	11.1
AVERAGE FIRM POWER (MW) :	8.0	7.3	8.5	7.1	7.4	7.7	8.1	8.5	6.9	8.5
FIRM ENERGY (MIL KWH/Y) :	70.	64.	74.	62.	65.	68.	71.	74.	61.	74.
SECONDARY ENERGY (") :	6.	7.	8.	8.	8.	8.	9.	9.	8.	9.
ANNUAL AVERAGE E-GY (") :	76.	72.	82.	70.	73.	76.	80.	83.	69.	84.
D A M										
DAM HEIGHT (M) :	147.7	139.5	147.7	136.5	138.5	141.0	144.3	147.7	135.1	147.7
EMBANKMENT VOL. (MIL M3) :	8.290	7.173	8.290	6.771	7.034	7.381	7.826	8.290	6.591	8.290
EVALUATION INDICES										
CH/V	4851.	5102.	4658.	5214.	5085.	4929.	4753.	4569.	5235.	4534.
C/V	35.	39.	34.	41.	39.	37.	35.	33.	42.	33.
P/(20VT+VD)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
E(FIRM)/(20VT+VD)	6.4	6.5	6.7	6.6	6.7	6.7	6.8	6.8	6.5	6.8
E(F+SEC*0.3)/(20VT+VD)	6.5	6.7	7.0	6.8	6.9	7.0	7.0	7.0	6.8	7.0

PROJECT NAME : SUPO  
 PROJECT ID : 1-22-0-5-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.50	0.43	0.43	0.43	0.43	0.43	0.37	0.37	0.37	0.37
FULL SUPPLY LEVEL (M) :	320.0	316.1	317.0	317.9	318.9	320.0	311.8	313.2	317.3	320.0
MIN. OPERATING LEVEL (M) :	261.5	263.5	267.3	271.1	275.0	278.8	263.1	269.8	283.1	289.8
POWER										
FIRM DISCHARGE (M3/S) :	45.9	43.5	43.4	43.4	43.3	43.3	40.7	40.6	40.4	40.3
PLANT PEAK DIS. (M3/S) :	183.7	174.0	173.7	173.5	173.3	173.0	162.8	162.4	161.5	161.0
AVERAGE NET HEAD (M) :	94.1	92.2	94.0	95.9	97.8	99.8	89.2	92.3	99.4	103.3
INSTALLED CAPACITY (MW) :	142.3	132.1	134.5	136.9	139.5	142.1	119.5	123.4	132.1	137.0
GUARANTEED POWER (MW) :	79.4	77.9	83.0	88.0	93.0	98.1	72.4	80.6	97.0	105.0
AVERAGE FIRM POWER (MW) :	35.6	33.0	33.6	34.2	34.9	35.5	29.9	30.8	33.0	34.2
FIRM ENERGY (MIL KWH/Y) :	312.	289.	294.	300.	306.	311.	252.	270.	289.	300.
SECONDARY ENERGY (") :	111.	122.	123.	124.	126.	127.	133.	135.	141.	148.
ANNUAL AVERAGE E-GY (") :	423.	411.	417.	424.	431.	438.	394.	405.	431.	448.

D A M  
 DAM HEIGHT (M) : 122.0 118.1 119.0 119.9 120.9 122.0 113.8 115.2 119.3 122.0  
 EMBANKMENT VOL. (MIL M3) : 5.685 5.220 5.321 5.430 5.557 5.685 4.728 4.880 5.359 5.685

EVALUATION INDICES										
CH/V	28943.	28844.	28467.	28078.	27648.	27236.	28604.	28014.	28319.	25329.
C/V	255.	263.	257.	252.	246.	240.	271.	262.	238.	223.
P/(20VT+VD)	13.6	13.3	13.4	13.5	13.6	13.7	12.7	12.9	13.2	13.2
E(FIRM)/(20VT+VD)	29.9	29.1	29.3	29.6	29.7	29.9	27.8	28.3	28.9	29.0
E(F+SEC*0.3)/(20VT+VD)	33.1	32.8	33.0	33.2	33.4	33.6	32.1	32.5	33.1	33.2

PROJECT NAME : ETES  
 PROJECT ID : 1-22-0-6-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	ITEMS	CASE											
		1	2	3	4	5	6	7	8	9	10		
	RESERVOIR DEVELOP. COEF :	0.65	0.60	0.60	0.60	0.55	0.55	0.55	0.50	0.50	0.50	0.50	0.50
	FULL SUPPLY LEVEL (M) :	371.0	353.3	361.5	371.0	349.9	359.6	371.0	348.2	357.7	371.0	371.0	371.0
	MIN. OPERATING LEVEL (M) :	327.4	304.1	317.7	331.4	303.9	319.5	335.1	303.7	321.3	338.9	338.9	338.9
	FIRM DISCHARGE (M3/S) :	40.7	39.6	39.5	39.4	38.2	38.1	38.0	36.7	36.6	36.5	36.5	36.5
	PLANT PEAK DIS. (M3/S) :	162.6	158.3	158.1	157.8	152.6	152.3	152.0	146.9	146.6	146.2	146.2	146.2
	AVERAGE NET HEAD (M) :	81.2	61.9	71.8	82.5	59.5	71.1	83.7	57.1	70.4	84.9	84.9	84.9
	INSTALLED CAPACITY (MW) :	108.7	80.6	93.4	107.1	74.8	89.1	104.7	69.0	84.9	102.2	102.2	102.2
	GUARANTEED POWER (MW) :	66.5	36.1	52.8	69.3	34.6	52.9	71.2	33.0	53.0	72.8	72.8	72.8
	AVERAGE FIRM POWER (MW) :	27.2	20.2	23.3	26.8	18.7	22.3	26.2	17.3	21.2	25.5	25.5	25.5
	FIRM ENERGY (MIL KWH/Y) :	238.	177.	204.	235.	164.	195.	229.	151.	186.	224.	224.	224.
	SECONDARY ENERGY (%) :	56.	50.	55.	62.	54.	61.	69.	57.	66.	77.	77.	77.
	ANNUAL AVERAGE E-OY (%) :	294.	227.	260.	296.	217.	256.	299.	208.	252.	301.	301.	301.

D A M

DAM HEIGHT (M) :	104.0	85.3	94.5	104.0	82.9	92.6	104.0	79.2	90.7	104.0
EMBANKMENT VOL. (MIL M3) :	6.063	3.826	4.774	6.063	3.461	4.550	6.063	3.111	4.320	6.063

EVALUATION INDICES

CH/V :	20235.	25941.	22536.	19627.	26031.	22294.	16899.	26530.	22061.	18171.
C/V :	211.	326.	261.	205.	348.	264.	198.	372.	267.	190.
P/(20VT+VD) :	9.7	9.0	9.4	9.5	8.7	9.2	9.3	8.4	9.0	9.1
E(FIRM)/(20VT+VD) :	21.1	19.6	20.5	20.9	19.0	20.1	20.4	18.3	19.7	20.0
E(F+SEC*0.3)/(20VT+VD) :	22.6	21.3	22.2	22.5	20.9	22.0	22.3	20.4	21.8	22.0



PROJECT NAME : BUCNIT  
 PROJECT ID : 1-22-0-7-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.91	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	460.0	452.3	460.0	450.0	460.0	447.1	449.5	451.9	455.2	460.0
MIN. OPERATING LEVEL (M) :	377.7	377.6	410.4	377.5	415.8	377.3	388.2	399.1	410.0	420.9
POWER										
FIRM DISCHARGE (M3/S) :	28.8	27.8	27.5	27.1	26.9	26.5	26.5	26.4	26.3	26.2
PLANT PEAK DIS. (M3/S) :	173.1	156.5	165.1	162.9	161.2	159.2	158.8	158.3	157.8	157.3
AVERAGE NET HEAD (M) :	100.3	95.1	110.9	93.5	112.7	91.6	96.7	101.9	107.6	114.4
INSTALLED CAPACITY (MW) :	142.6	130.4	150.8	125.4	149.6	120.1	126.4	132.8	139.8	148.1
GUARANTEED POWER (MW) :	61.6	59.2	100.8	57.7	105.2	56.3	69.6	82.8	95.9	108.9
AVERAGE FIRM POWER (MW) :	23.8	21.7	25.1	20.9	24.9	20.0	21.1	22.1	23.3	24.7
FIRM ENERGY (MIL KWH/Y) :	209.	190.	220.	183.	218.	175.	185.	194.	204.	216.
SECONDARY ENERGY (%) :	34.	39.	44.	43.	49.	46.	48.	49.	51.	54.
ANNUAL AVERAGE E-GY (%) :	242.	230.	264.	226.	267.	222.	232.	243.	255.	270.

D A M

DAM HEIGHT (M) :	136.0	128.3	136.0	126.0	136.0	123.1	125.5	127.9	131.2	136.0
EMBANKMENT VOL. (MIL M3) :	16.847	14.412	16.847	13.742	16.847	12.935	13.596	14.300	15.281	16.847

EVALUATION INDICES

CH/V :	6694.	7290.	6568.	7332.	6409.	7433.	7189.	6954.	6661.	6251.
C/V :	54.	61.	52.	62.	50.	65.	61.	58.	54.	49.
P/(20VT+VD) :	6.8	7.0	7.1	7.0	7.1	7.0	7.1	7.2	7.2	7.0
E(FIRM)/(20VT+VD) :	9.9	10.2	10.4	10.2	10.3	10.2	10.3	10.4	10.4	10.2
E(F+SEC*0.3)/(20VT+VD) :	10.3	10.8	11.0	10.9	11.0	11.0	11.1	11.2	11.2	11.0

PROJECT NAME : UPPER BUCNIT  
 PROJECT ID : 1- 22- 0- 8-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE										
	1	2	3	4	5	6	7	8	9	10	
RESERVOIR DEVELOP. COEF :	0.92	0.77	0.77	0.75	0.75	0.75	0.75	0.75	0.75	0.70	0.70
FULL SUPPLY LEVEL (M) :	473.0	466.6	473.0	465.4	466.7	468.6	470.7	473.0	463.1	473.0	473.0
MIN. OPERATING LEVEL (M) :	404.3	404.2	426.5	404.2	410.4	416.7	423.0	429.2	404.1	433.7	433.7
POWER											
FIRM DISCHARGE (M <sup>3</sup> /S) :	28.0	27.1	26.9	26.9	26.8	26.8	26.7	26.6	26.3	26.3	26.0
PLANT PEAK DIS. (M <sup>3</sup> /S) :	167.9	162.3	161.2	161.1	160.9	160.6	160.2	159.8	157.6	156.0	156.0
AVERAGE NET HEAD (M) :	87.3	83.0	94.5	82.3	85.1	86.4	91.9	95.4	80.7	96.9	96.9
INSTALLED CAPACITY (MW) :	120.7	111.0	125.4	109.1	112.8	116.9	121.2	125.6	104.7	124.4	124.4
GUARANTEED POWER (MW) :	54.7	52.8	80.3	52.3	60.1	67.8	75.4	83.0	51.0	86.4	86.4
AVERAGE FIRM POWER (MW) :	20.1	18.5	20.9	18.2	18.8	19.5	20.2	20.9	17.4	20.7	20.7
FIRM ENERGY (MIL KWH/Y) :	176.	162.	183.	159.	165.	171.	177.	183.	153.	182.	182.
SECONDARY ENERGY (") :	28.	33.	36.	33.	34.	35.	36.	37.	36.	41.	41.
ANNUAL AVERAGE E-GY (") :	205.	195.	219.	193.	199.	206.	213.	221.	189.	223.	223.

D A M

DAM HEIGHT (M) :	119.0	112.6	119.0	111.4	112.7	114.6	116.7	119.0	109.1	119.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	10.903	9.486	10.903	9.231	9.508	9.932	10.403	10.903	8.746	10.903

EVALUATION INDICES

CH/V :	8920.	9338.	8550.	9420.	9240.	8986.	8727.	8477.	9505.	8271.
C/V :	81.	90.	78.	92.	89.	85.	81.	77.	95.	75.
P/(20VT+VD) :	7.4	7.4	7.7	7.5	7.6	7.6	7.7	7.7	7.4	7.6
E(FIRM)/(20VT+VD) :	10.8	10.9	11.2	10.9	11.0	11.1	11.2	11.2	10.8	11.1
E(F+SEC*0.3)/(20VT+VD) :	11.3	11.5	11.9	11.6	11.7	11.8	11.9	11.9	11.6	11.9

PROJECT NAME : DAYAPAN  
 PROJECT ID : 1-22-0-9-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ABRA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	746.0	726.4	734.2	746.0	722.0	731.4	746.0	717.2	728.5	746.0
MIN. OPERATING LEVEL (M) :	662.7	601.6	636.9	672.1	601.6	641.3	681.1	601.5	644.9	688.2
POWER										
FIRM DISCHARGE (M3/S) :	9.4	9.3	9.3	9.2	9.1	9.0	9.0	8.8	8.8	8.7
PLANT PEAK DIS. (M3/S) :	18.9	18.6	18.5	18.5	18.1	18.1	18.0	17.6	17.6	17.5
AVERAGE NET HEAD (M) :	154.7	121.9	138.5	157.7	118.9	138.0	160.6	115.7	137.2	162.8
INSTALLED CAPACITY (MW) :	24.1	18.6	21.1	23.9	17.7	20.6	23.8	16.8	19.9	23.4
GUARANTEED POWER (MW) :	14.7	5.6	10.7	15.7	5.5	11.1	16.6	5.3	11.2	17.0
AVERAGE FIRM POWER (MW) :	12.0	9.3	10.6	12.0	8.9	10.3	11.9	8.4	9.9	11.7
FIRM ENERGY (MIL KWH/Y) :	105.	82.	92.	105.	73.	90.	104.	73.	87.	103.
SECONDARY ENERGY (%) :	12.	12.	12.	13.	13.	14.	15.	14.	15.	17.
ANNUAL AVERAGE E-GY (%) :	117.	93.	105.	118.	90.	104.	119.	67.	102.	119.

D A M	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	196.0	178.4	134.2	196.0	172.0	181.4	196.0	167.2	178.5	196.0
EMBANKMENT VOL. (MIL M3) :	23.130	17.533	19.627	23.130	16.371	18.815	23.130	15.204	18.075	23.130

EVALUATION INDICES	1	2	3	4	5	6	7	8	9	10
CH/V :	2349.	2729.	2543.	2293.	2778.	2549.	2237.	2819.	2531.	2169.
C/V :	13.	17.	15.	13.	17.	15.	12.	18.	15.	12.
P/(20VT+VD) :	0.9	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	0.9
E(FIRM)/(20VT+VD) :	4.1	4.0	4.2	4.1	4.1	4.2	4.1	4.1	4.2	4.0
E(F+SEC*0.3)/(20VT+VD) :	4.2	4.2	4.3	4.2	4.3	4.4	4.2	4.4	4.4	4.2

PROJECT NAME : ABRA  
 PROJECT ID : 1-22-0-10-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.600	0.571
FULL SUPPLY LEVEL (M)	803.3	803.5	803.7	803.9	804.2	804.3
NORMAL OPERATING LEVEL (M)	802.6	802.8	803.0	803.2	803.5	803.6
MINIMUM OPERATING LEVEL (M)	801.9	802.0	802.2	802.5	802.8	802.9
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.3	6.5	6.7	6.9	7.2	7.3
WATER DEPTH AT TRASHRACK (M)	3.3	3.5	3.7	3.9	4.2	4.3
CHANNEL WIDTH AT TRASHRACK (M)	3.5	4.1	4.9	5.8	7.1	7.4
PONDAGE STORAGE VOLUME (1000 M3)	58.5	61.2	64.7	68.9	74.3	75.9
WATERWAY						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	2.1	2.2
HEADRACE TUNNEL LENGTH (M)	6000.0	6000.0	6000.0	6000.0	6000.0	6000.0
INSIDE DIAMETER OF PENSTOCK (M)	1.2	1.3	1.3	1.3	1.5	1.6
PENSTOCK LENGTH (HORIZONTAL) (M)	360.0	360.0	360.0	360.0	360.0	360.0
EXCAVATION VOLUME (1000 M3)	15.9	15.9	15.9	15.3	21.7	23.4
POWER						
FIRM DISCHARGE (M3/S)	0.9	0.9	0.9	0.9	0.9	0.9
DEPENDABLE DISCHARGE (M3/S)	1.5	1.5	1.5	1.5	1.5	1.5
PLANT PEAK DISCHARGE (M3/S)	1.5	2.1	3.0	4.3	6.2	6.9
TAIL WATER LEVEL (M)	600.0	600.0	600.0	600.0	600.0	600.0
NET HEAD (M)	198.9	197.5	194.3	188.5	189.1	189.2
INSTALLED CAPACITY (MW)	2.4	3.4	4.8	6.6	9.7	10.7
DEPENDABLE PEAK POWER (MW)	2.5	2.4	2.4	2.3	2.3	2.3
FIRM POWER (MW)	1.5	1.5	1.4	1.4	1.4	1.4
GUARANTEED POWER OUTPUT (MW)	1.3	1.3	1.3	1.3	1.3	1.3
FIRM ENERGY/YEAR (10**6 KWH)	12.9	12.8	12.6	12.2	12.3	12.3
SECONDARY ENERGY/YEAR (10**6 KWH)	7.1	12.5	18.7	25.6	34.9	37.5
ANNUAL ENERGY (MIL KWH/YR)	20.0	25.3	31.3	37.8	47.2	49.8
PARAMETERS						
P (INSTALLED)/(20VT) (W/M3)	7.7	10.6	15.0	20.3	22.3	22.9
P (DEPENDABLE)/(20VT) (W/M3)	7.7	7.7	7.5	7.1	5.4	5.0
E (FIRM)/(20VT) (KWH/M3)	40.7	40.4	39.7	37.5	28.3	26.2
E (F+0.3*SECONDARY)/(20VT) (")	47.3	52.2	57.4	61.1	52.4	50.2

PROJECT NAME : NAGLIBACAN  
 PROJECT ID : 1-22-1-11-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : ANAYAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.94	0.80	0.80	0.80	0.75	0.75	0.75	0.70	0.70	0.70
FULL SUPPLY LEVEL (M) :	494.0	486.8	489.7	494.0	483.9	487.7	494.0	481.1	485.7	494.0
MIN. OPERATING LEVEL (M) :	398.1	397.0	413.9	430.9	397.0	417.4	437.9	397.0	420.4	443.9
FIRM DISCHARGE (M <sup>3</sup> /S) :	6.3	6.1	6.1	6.1	6.1	6.0	6.0	5.9	5.9	5.9
PLANT PEAK DIS. (M <sup>3</sup> /S) :	12.7	12.3	12.2	12.2	12.1	12.1	12.0	11.8	11.8	11.7
AVERAGE NET HEAD (M) :	108.8	103.7	111.2	119.6	101.9	111.1	121.9	100.1	110.8	123.9
INSTALLED CAPACITY (MW) :	11.3	10.5	11.2	12.0	10.2	11.0	12.1	9.8	10.8	12.0
GUARANTEED POWER (MW) :	4.5	4.2	5.8	7.4	4.2	6.1	8.0	4.1	6.2	8.3
AVERAGE FIRM POWER (MW) :	5.7	5.2	5.6	6.0	5.1	5.5	6.0	4.9	5.4	6.0
FIRM ENERGY (MIL KWH/Y) :	50.	46.	49.	53.	45.	48.	53.	43.	47.	52.
SECONDARY ENERGY (%) :	5.	5.	6.	6.	6.	6.	6.	6.	6.	7.
ANNUAL AVERAGE E-GY (%) :	54.	51.	55.	58.	50.	54.	59.	49.	54.	59.

D A M

DAM HEIGHT (M) :	150.0	142.8	145.7	150.0	139.9	143.7	150.0	137.1	141.7	150.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	8.520	7.398	7.356	8.520	6.988	7.548	8.520	6.579	7.228	8.520

EVALUATION INDICES

CH/V :	3299.	3497.	3353.	3175.	3593.	3393.	3129.	3639.	3411.	3055.
C/V :	23.	26.	25.	23.	27.	25.	22.	28.	26.	22.
P/(20VT+VD) :	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
E(FIRM)/(20VT+VD) :	4.8	5.0	5.1	5.1	5.1	5.2	5.2	5.1	5.3	5.1
E(F+SEC*0.3)/(20VT+VD) :	5.0	5.2	5.3	5.3	5.3	5.4	5.3	5.4	5.5	5.3

PROJECT NAME : TINEG-1  
 PROJECT ID : 1-22-1-12-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : TINEG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	324.0	306.3	313.4	324.0	302.4	310.9	324.0	298.1	308.3	324.0
MIN. OPERATING LEVEL (M) :	249.4	204.7	230.9	257.0	204.6	234.3	264.1	204.4	237.6	270.8
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	46.7	45.9	45.8	45.7	44.9	44.8	44.6	43.6	43.5	43.2
PLANT PEAK DIS. (MG/S) :	280.5	275.4	274.9	273.9	269.2	268.5	267.4	261.4	260.7	259.4
AVERAGE NET HEAD (M) :	159.4	133.1	146.3	161.8	130.4	145.7	164.1	127.5	145.1	166.3
INSTALLED CAPACITY (MW) :	367.9	301.6	330.9	364.9	289.0	322.1	361.3	274.4	311.3	355.1
GUARANTEED POWER (MW) :	241.1	141.1	195.7	251.6	137.6	199.4	260.3	133.3	200.2	266.0
AVERAGE FIRM POWER (MW) :	61.3	50.3	55.2	60.6	48.2	53.7	60.2	45.7	51.9	59.2
FIRM ENERGY (MIL KWH/Y) :	537.	440.	483.	533.	422.	470.	527.	401.	455.	518.
SECONDARY ENERGY (") :	102.	101.	106.	114.	109.	116.	126.	116.	127.	141.
ANNUAL AVERAGE E-GY (") :	640.	542.	589.	647.	531.	596.	654.	519.	582.	659.

D A M

DAM HEIGHT (M) :	193.7	176.0	183.1	193.7	172.1	180.6	193.7	167.8	178.0	193.7
EMBANKMENT VOL. (MIL M3) :	30.070	23.372	25.955	30.070	22.074	24.981	30.070	20.632	24.015	30.070

EVALUATION INDICES

CH/V :	9031.	10338.	9671.	8818.	10449.	9675.	3605.	10571.	9821.	8344.
C/V :	49.	62.	56.	48.	64.	57.	47.	57.	57.	45.
P/(20VT+VD) :	9.5	9.4	9.5	9.4	9.4	9.6	9.3	9.4	9.5	9.2
E(FIRM)/(20VT+VD) :	13.8	13.7	13.9	13.7	13.7	14.0	13.6	13.7	13.9	13.4
E(F+SEC*0.3)/(20VT+VD) :	14.6	14.7	14.8	14.6	14.8	15.0	14.6	14.9	15.1	14.5

PROJECT NAME : TINEG-2  
 PROJECT ID : 1-22-1-13-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : TINEG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	514.0	489.8	499.6	514.0	484.9	496.1	514.0	480.1	492.5	514.0
MIN. OPERATING LEVEL (M) :	430.1	378.8	412.9	446.9	378.6	416.4	454.1	378.4	419.7	450.9
FIRM DISCHARGE (M3/S) :	15.0	14.4	14.3	14.3	14.0	13.9	13.9	13.5	13.4	13.4
PLANT PEAK DIS. (M3/S) :	89.9	86.4	86.1	85.8	83.9	83.6	83.3	80.9	80.6	80.2
AVERAGE NET HEAD (M) :	181.7	149.0	166.6	187.2	145.7	165.4	189.5	142.4	164.2	191.7
INSTALLED CAPACITY (MW) :	134.5	105.9	118.1	132.2	100.6	113.8	129.9	94.9	108.9	126.6
GUARANTEED POWER (MW) :	88.7	50.8	73.4	95.9	49.2	73.6	97.6	47.4	73.0	98.3
AVERAGE FIRM POWER (MW) :	22.4	17.7	19.7	22.0	16.8	19.0	21.7	15.8	18.1	21.1
FIRM ENERGY (MIL KWH/Y) :	196.	155.	172.	193.	147.	166.	190.	139.	159.	185.
SECONDARY ENERGY (%) :	37.	40.	42.	46.	43.	46.	51.	47.	51.	57.
ANNUAL AVERAGE E-GY (%) :	234.	194.	215.	239.	190.	212.	241.	186.	210.	242.

D A M

DAM HEIGHT (M) :	220.0	195.8	205.6	220.0	190.9	202.1	220.0	186.1	198.5	220.0
EMBANKMENT VOL. (MIL M3) :	26.308	18.649	21.623	26.308	17.310	20.484	26.308	16.020	19.402	26.308

EVALUATION INDICES

CH/V :	3768.	4527.	4091.	3593.	4615.	4117.	3485.	4681.	4113.	3356.
C/V :	18.	24.	21.	17.	25.	21.	17.	27.	22.	16.
P/(20VT+VD) :	4.4	4.6	4.5	4.3	4.7	4.6	4.2	4.7	4.5	4.1
E(FIRM)/(20VT+VD) :	6.4	6.7	6.6	6.3	6.8	6.7	6.2	6.8	6.7	6.0
E(F+SEC*0.3)/(20VT+VD) :	6.8	7.2	7.1	6.7	7.4	7.3	6.7	7.5	7.4	6.6

PROJECT NAME : TINEG-3  
 PROJECT ID : 1-22-1-14-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : TINEG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.94	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	645.0	635.2	645.0	632.5	645.0	629.7	632.4	635.9	640.2	645.0
MIN. OPERATING LEVEL (M) :	551.3	551.2	589.6	551.1	596.1	551.0	563.8	576.5	589.3	602.0
POWER										
FIRM DISCHARGE (M3/S) :	10.0	9.6	9.5	9.4	9.3	9.1	9.1	9.1	9.1	9.0
PLANT PEAK DIS. (M3/S) :	20.0	19.1	19.0	18.7	18.5	18.3	18.3	18.2	18.1	18.1
AVERAGE NET HEAD (M) :	101.8	95.3	114.3	93.5	116.4	91.6	97.5	104.0	111.0	118.3
INSTALLED CAPACITY (MW) :	16.8	15.0	17.9	14.4	17.8	13.8	14.7	15.6	16.8	17.6
GUARANTEED POWER (MW) :	6.2	5.9	11.5	5.7	12.2	5.6	7.4	9.2	11.0	12.7
AVERAGE FIRM POWER (MW) :	8.4	7.5	8.9	7.2	8.9	6.9	7.3	7.8	8.3	8.8
FIRM ENERGY (MIL KWH/Y) :	73.	66.	78.	63.	78.	60.	64.	68.	73.	77.
SECONDARY ENERGY (%) :	7.	8.	9.	9.	10.	10.	10.	10.	11.	11.
ANNUAL AVERAGE E-GY (%) :	80.	74.	87.	72.	88.	70.	74.	78.	83.	88.

D A M	CASE									
	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	143.8	134.0	143.8	131.3	143.8	128.5	131.2	134.7	139.0	143.8
EMBANKMENT VOL. (MIL M3) :	13.932	11.493	13.932	10.868	13.932	10.273	10.841	11.647	12.727	13.932

EVALUATION INDICES

CH/V :	3015.	3236.	2851.	3272.	2782.	3305.	3195.	3050.	2877.	2714.
C/V :	23.	26.	21.	27.	21.	28.	27.	25.	22.	20.
P/(20VT+VD) :	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0
E(FIRM)/(20VT+VD) :	4.3	4.5	4.6	4.5	4.6	4.5	4.6	4.6	4.6	4.5
E(F+SEC*0.3)/(20VT+VD) :	4.4	4.7	4.8	4.7	4.7	4.7	4.8	4.8	4.8	4.7



PROJECT NAME : 81NONGAN-R  
 PROJECT ID : 1- 22- 2-15-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.600	0.571
FULL SUPPLY LEVEL (M)	521.0	521.2	521.5	521.8	522.3	522.4
NORMAL OPERATING LEVEL (M)	519.6	519.8	520.1	520.5	520.9	521.0
MINIMUM OPERATING LEVEL (M)	518.2	518.5	518.8	519.1	519.5	519.7
DIVERSION WEIR HEIGHT INC. 3M F-B	8.0	8.2	8.5	8.8	9.3	9.4
WATER DEPTH AT TRASHRACK (M)	5.0	5.2	5.5	5.8	6.3	6.4
CHANNEL WIDTH AT TRASHRACK (M)	5.0	5.9	7.0	8.4	10.2	10.7
PONDAGE STORAGE VOLUME (1000 M3)	99.1	103.6	109.3	116.3	125.1	127.6
WATERWAY						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	2.1	2.5	2.5	2.9
HEADRACE TUNNEL LENGTH (M)	17500.0	17500.0	17500.0	17500.0	17500.0	17500.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.4	1.6	1.8	2.1	2.2
PENSTOCK LENGTH (HORIZONTAL) (M)	265.0	265.0	265.0	265.0	265.0	265.0
EXCAVATION VOLUME (1000 M3)	44.9	46.8	61.3	84.0	111.6	120.7
POWER						
FIRM DISCHARGE (M3/S)	1.9	1.9	1.9	1.9	1.9	1.9
DEPENDABLE DISCHARGE (M3/S)	3.1	3.1	3.1	3.1	3.1	3.1
PLANT PEAK DISCHARGE (M3/S)	3.1	4.3	6.2	8.9	13.0	14.4
TAIL WATER LEVEL (M)	380.0	380.0	380.0	380.0	380.0	380.0
NET HEAD (M)	121.7	110.3	110.7	114.1	114.6	114.8
INSTALLED CAPACITY (MW)	3.1	3.9	5.7	8.3	12.3	13.6
DEPENDABLE PEAK POWER (MW)	3.1	2.8	2.9	2.9	3.0	3.0
FIRM POWER (MW)	1.9	1.7	1.7	1.8	1.8	1.8
GUARANTEED POWER OUTPUT (MW)	1.7	1.5	1.5	1.6	1.6	1.6
FIRM ENERGY/YEAR (10**6 KWH)	16.5	14.9	15.0	15.5	15.5	15.6
SECONDARY ENERGY/YEAR (10**6 KWH)	9.1	14.7	22.5	32.6	44.5	47.9
ANNUAL ENERGY (MIL KWH/YR)	25.6	29.6	37.5	48.1	60.1	63.5
PARAMETERS						
P (INSTALLED)/(20VT) (W/M3)	3.5	4.2	4.6	5.0	5.5	5.6
P (DEPENDABLE)/(20VT) (W/M3)	3.5	3.0	2.9	1.8	1.3	1.2
E (FIRM)/(20VT) (KWH/M3)	18.3	16.0	12.2	9.2	7.0	6.4
E (F+0.3*SECONDARY)/(20VT) (")	21.4	20.7	17.7	15.0	12.9	12.4

PROJECT NAME : PAGANAO  
 PROJECT ID : 1-22-3-16-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : MALANAS

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.94	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	273.0	264.6	273.0	262.3	273.0	260.0	262.0	264.7	268.4	273.0
MIN. OPERATING LEVEL (M) :	197.8	197.8	229.2	197.8	233.7	197.3	207.8	217.9	227.9	238.0
POWER										
FIRM DISCHARGE (M3/S) :	6.5	6.2	6.2	6.1	6.0	6.0	5.9	5.9	5.9	5.9
PLANT PEAK DIS. (M3/S) :	13.0	12.5	12.3	12.2	12.0	11.9	11.9	11.8	11.8	11.7
AVERAGE NET HEAD (M) :	90.2	84.8	100.6	83.3	102.2	81.9	86.5	91.6	97.3	103.6
INSTALLED CAPACITY (MW) :	9.7	8.7	10.2	8.4	10.1	8.0	8.5	8.9	9.4	10.0
GUARANTEED POWER (MW) :	4.1	3.9	6.9	3.9	7.2	3.8	4.7	5.6	6.5	7.4
AVERAGE FIRM POWER (MW) :	4.8	4.3	5.1	4.2	5.1	4.0	4.2	4.5	4.7	5.0
FIRM ENERGY (MIL KWH/Y) :	42.	38.	45.	37.	44.	35.	37.	39.	41.	44.
SECONDARY ENERGY (") :	4.	5.	5.	5.	6.	6.	6.	6.	6.	7.
ANNUAL AVERAGE E-GY (") :	46.	43.	50.	42.	50.	41.	43.	45.	48.	51.

RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	125.4	117.0	125.4	114.7	125.4	112.4	114.4	117.1	120.8	125.4
EMBANKMENT VOL. (MIL M3) :	7.096	5.801	7.096	5.478	7.096	5.181	5.445	5.819	6.344	7.096

RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
EVALUATION INDICES										
CH/V :	3336.	3624.	3156.	3675.	3082.	3718.	3594.	3436.	3285.	3008.
C/V :	29.	34.	27.	35.	27.	36.	34.	32.	29.	26.
P/(20VT+VD) :	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
E(FIRM)/(20VT+VD) :	4.6	4.8	4.8	4.8	4.8	4.8	4.9	4.9	4.9	4.7
E(F+SEC*0.3)/(20VT+VD) :	4.7	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.1	5.0

PROJECT NAME : MALANAS (LICUANO)  
 PROJECT ID : 1-22-3-17-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : KAWAYAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
<b>RESERVOIR</b>										
RESERVOIR DEVELOP. COEF :	0.93	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	432.0	424.6	432.0	422.5	432.0	420.4	422.3	424.9	428.2	432.0
MIN. OPERATING LEVEL (M) :	363.5	363.5	389.4	363.5	394.0	363.5	372.2	380.9	389.7	398.4
<b>POWER</b>										
FIRM DISCHARGE (M <sup>3</sup> /S) :	4.0	3.8	3.8	3.7	3.7	3.7	3.6	3.6	3.6	3.6
PLANT PEAK DIS. (M <sup>3</sup> /S) :	8.0	7.6	7.6	7.5	7.4	7.3	7.3	7.3	7.2	7.2
AVERAGE NET HEAD (M) :	75.7	70.9	84.3	69.6	85.8	68.2	72.3	76.9	82.0	87.3
INSTALLED CAPACITY (MW) :	5.0	4.5	5.3	4.3	5.2	4.1	4.3	4.6	4.9	5.2
GUARANTEED POWER (MW) :	1.9	1.8	3.3	1.8	3.5	1.7	2.2	2.7	3.2	3.7
AVERAGE FIRM POWER (MW) :	2.5	2.2	2.6	2.1	2.6	2.1	2.2	2.3	2.4	2.6
FIRM ENERGY (MIL KWH/Y) :	22.	20.	23.	19.	23.	18.	19.	20.	21.	23.
SECONDARY ENERGY (") :	2.	3.	3.	3.	3.	3.	3.	3.	3.	4.
ANNUAL AVERAGE E-GY (") :	24.	22.	26.	21.	25.	21.	22.	23.	25.	26.
<b>D A M</b>										
DAM HEIGHT (M) :	107.2	99.8	107.2	97.7	107.2	95.6	97.5	100.1	103.4	107.2
EMBANKMENT VOL. (MIL M3) :	5.631	4.692	5.661	4.440	5.661	4.201	4.416	4.730	5.177	5.661
<b>EVALUATION INDICES</b>										
CH/V :	2184.	2345.	2069.	2368.	2019.	2390.	2317.	2218.	2089.	1969.
C/V :	22.	25.	21.	27.	20.	27.	26.	24.	22.	20.
P/(20VT+VD) :	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
E(FIRM)/(20VT+VD) :	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.3	3.2	3.2
E(F+SEC*0.3)/(20VT+VD) :	3.1	3.3	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.3

PROJECT NAME : TAPING  
 PROJECT ID : 1-22-4-18-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : BAAY

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR

ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	218.0	204.2	210.0	218.0	201.5	208.1	218.0	198.6	206.3	218.0
MIN. OPERATING LEVEL (M) :	171.3	143.2	161.9	180.5	143.2	163.8	184.3	143.2	165.7	188.1

POWER

FIRM DISCHARGE (M3/S) :	4.5	4.3	4.3	4.2	4.2	4.1	4.1	4.0	4.0	4.0
PLANT PEAK DIS. (M3/S) :	8.9	8.6	8.5	8.5	8.3	8.3	8.2	8.0	8.0	7.9
AVERAGE NET HEAD (M) :	91.6	73.4	83.3	94.7	71.7	82.8	96.0	69.9	82.2	97.3
INSTALLED CAPACITY (MW) :	6.7	5.2	5.9	6.6	4.9	5.6	6.5	4.6	5.4	6.3
GUARANTEED POWER (MW) :	4.2	2.2	3.4	4.6	2.1	3.5	4.7	2.1	3.5	4.8
AVERAGE FIRM POWER (MW) :	3.4	2.6	2.9	3.3	2.5	2.8	3.2	2.3	2.7	3.2
FIRM ENERGY (MIL KWH/Y) :	29.	23.	26.	29.	22.	25.	28.	20.	24.	28.
SECONDARY ENERGY (%) :	4.	4.	4.	4.	4.	4.	5.	4.	5.	6.
ANNUAL AVERAGE E-GY (%) :	33.	26.	30.	33.	25.	29.	33.	25.	28.	33.

D A M

DAM HEIGHT (M) :	117.0	103.2	109.0	117.0	100.5	107.1	117.0	97.6	105.3	117.0
EMBANKMENT VOL. (MIL M3) :	13.578	9.494	11.113	13.578	8.867	10.599	13.578	8.195	10.086	13.578

EVALUATION INDICES

CR/V :	1108.	1335.	1202.	1056.	1350.	1202.	1024.	1365.	1195.	988.
C/V :	10.	14.	12.	10.	15.	12.	10.	15.	12.	9.
P/(20VT+VD) :	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
E(FIRM)/(20VT+VD) :	1.9	1.9	1.9	1.8	1.9	1.9	1.8	1.9	1.9	1.7
E(F+SEC*0.3)/(20VT+VD) :	1.9	2.0	2.0	1.9	2.0	2.0	1.9	2.1	2.0	1.9

PROJECT NAME : UPPER MAGUYEYEP  
 PROJECT ID : 1-22-5-19-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : BUCLOC

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.93	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	336.0	327.6	336.0	325.0	336.0	322.4	324.8	327.9	331.6	336.0
MIN. OPERATING LEVEL (M) :	258.2	258.2	287.8	258.2	292.9	258.2	268.0	277.8	287.7	297.5
FIRM DISCHARGE (M <sup>3</sup> /S) :	6.6	6.3	6.3	6.2	6.1	6.0	6.0	6.0	6.0	6.0
PLANT PEAK DIS. (M <sup>3</sup> /S) :	13.2	12.6	12.6	12.4	12.3	12.1	12.1	12.0	12.0	12.0
AVERAGE NET HEAD (M) :	88.8	83.5	98.7	81.8	100.4	80.2	85.0	90.3	95.9	102.0
INSTALLED CAPACITY (MW) :	9.7	8.7	10.2	8.3	10.1	8.0	8.4	8.9	9.5	10.0
GUARANTEED POWER (MW) :	3.8	3.7	6.5	3.6	6.9	3.5	4.5	5.4	6.3	7.2
AVERAGE FIRM POWER (MW) :	4.8	4.3	5.1	4.2	5.1	4.0	4.2	4.5	4.7	5.0
FIRM ENERGY (MIL KWH/Y) :	42.	30.	45.	37.	44.	35.	37.	39.	42.	44.
SECONDARY ENERGY (%) :	4.	5.	5.	5.	6.	6.	6.	6.	6.	7.
ANNUAL AVERAGE E-GY (%) :	46.	43.	50.	42.	50.	41.	43.	45.	48.	51.

D A M

DAM HEIGHT (M) :	125.6	117.2	125.6	114.6	125.6	112.0	114.4	117.5	121.2	125.6
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	7.499	6.100	7.499	5.695	7.499	5.324	5.659	6.143	6.723	7.499

EVALUATION INDICES

CH/V :	3185.	3486.	3029.	3566.	2959.	3639.	3492.	3303.	3112.	2859.
C/V :	28.	33.	26.	34.	26.	36.	34.	31.	28.	25.
P/(20VT+VD) :	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
E(FIRM)/(20VT+VD) :	4.4	4.7	4.7	4.7	4.7	4.7	4.8	4.8	4.7	4.6
E(F+SEC*0.3)/(20VT+VD) :	4.6	4.9	4.8	4.9	4.8	5.0	5.0	5.0	4.9	4.8

PROJECT NAME : BUCLOC  
 PROJECT ID : 1-22-5-20-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : SULDEN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.94	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	437.0	429.9	437.0	427.6	437.0	425.3	427.1	429.7	432.8	437.0
MIN. OPERATING LEVEL (M) :	367.1	367.1	396.7	367.1	401.2	367.1	376.6	386.0	395.4	404.8
FIRM DISCHARGE (M3/S) :	4.4	4.2	4.1	4.1	4.0	4.0	4.0	4.0	3.9	3.9
PLANT PEAK DIS. (M3/S) :	8.7	8.3	8.3	8.2	8.1	8.0	7.9	7.9	7.9	7.9
AVERAGE NET HEAD (M) :	82.7	78.1	92.5	76.6	94.0	75.1	79.4	84.2	89.3	95.2
INSTALLED CAPACITY (MW) :	5.9	5.4	6.3	5.1	6.2	4.9	5.2	5.5	5.8	6.2
GUARANTEED POWER (MW) :	2.5	2.4	4.2	2.3	4.4	2.3	2.8	3.4	4.0	4.5
AVERAGE FIRM POWER (MW) :	3.0	2.7	3.1	2.6	3.1	2.5	2.6	2.7	2.9	3.1
FIRM ENERGY (MIL KWH/Y) :	26.	23.	28.	23.	27.	22.	23.	24.	25.	27.
SECONDARY ENERGY (") :	2.	3.	3.	3.	4.	3.	4.	4.	4.	4.
ANNUAL AVERAGE E-GY (") :	29.	26.	31.	26.	31.	25.	26.	28.	29.	31.

D A M

DAM HEIGHT (M) :	114.6	107.5	114.6	105.2	114.6	102.9	104.7	107.3	110.4	114.6
EMBANKMENT VOL. (MIL M3) :	8.922	7.519	8.922	7.105	8.922	6.690	7.016	7.482	8.073	8.922

EVALUATION INDICES

CH/V :	1634.	1732.	1545.	1752.	1508.	1776.	1719.	1649.	1569.	1471.
C/V :	15.	17.	15.	18.	14.	19.	18.	17.	15.	14.
P/(20VT+VD) :	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
E(FIRM)/(20VT+VD) :	2.5	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.6	2.6
E(F+SEC*0.3)/(20VT+VD) :	2.6	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.7

PROJECT NAME : DAGUIOMAN  
 PROJECT ID : 1-22-5-21-0-1  
 TYPE : RESERVOIR

BASIN NAME : ASRA  
 RIVER NAME : BUCLOC

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	521.0	511.3	515.1	521.0	509.4	513.9	521.0	507.0	512.8	521.0
MIN. OPERATING LEVEL (M) :	489.1	465.1	479.3	492.4	466.1	480.8	455.5	466.1	482.4	498.6
POWER										
FIRM DISCHARGE (M3/S) :	2.5	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.3
PLANT PEAK DIS. (M3/S) :	5.1	5.1	5.1	5.0	4.9	4.9	4.8	4.8	4.7	4.7
AVERAGE NET HEAD (M) :	68.1	54.2	61.0	69.2	53.0	60.8	70.2	51.4	60.6	71.3
INSTALLED CAPACITY (MW) :	2.9	2.3	2.5	2.9	2.1	2.5	2.8	2.0	2.4	2.7
GUARANTEED POWER (MW) :	1.9	1.0	1.5	2.0	0.9	1.5	2.0	0.9	1.5	2.1
AVERAGE FIRM POWER (MW) :	1.4	1.1	1.3	1.4	1.1	1.2	1.4	1.0	1.2	1.4
FIRM ENERGY (MIL KWH/Y) :	13.	10.	11.	12.	9.	11.	12.	9.	10.	12.
SECONDARY ENERGY (") :	2.	2.	2.	2.	2.	2.	2.	2.	2.	2.
ANNUAL AVERAGE E-GY (") :	14.	12.	13.	14.	11.	13.	14.	11.	12.	14.

D A M	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	87.0	77.3	81.1	87.0	75.4	79.9	87.0	73.0	78.8	87.0
EMBANKMENT VOL. (MIL M3) :	5.033	3.614	4.113	5.033	3.380	3.933	5.033	3.094	3.802	5.033

EVALUATION INDICES	1	2	3	4	5	6	7	8	9	10
CH/V :	1267.	1535.	1413.	1235.	1550.	1411.	1196.	1576.	1385.	1149.
C/V :	16.	22.	19.	16.	23.	20.	15.	24.	20.	15.
P/(20VT+VD) :	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
E(FIRM)/(20VT+VD) :	1.9	1.9	1.9	1.8	1.8	1.9	1.8	1.8	1.9	1.8
E(F+SEC*0.3)/(20VT+VD) :	1.9	1.9	2.0	1.9	1.9	2.0	1.9	1.9	2.0	1.9

PROJECT NAME : BOYAN  
 PROJECT ID : 1-22-5-22-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : IKMIN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	393.0	379.7	385.0	393.0	376.3	383.1	393.0	373.0	381.1	393.0
MIN. OPERATING LEVEL (M) :	334.1	298.7	319.6	340.5	298.7	322.3	345.9	298.7	325.0	351.2
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	7.5	7.4	7.4	7.3	7.2	7.2	7.1	7.0	7.0	6.9
PLANT PEAK DIS. (M <sup>3</sup> /S) :	15.0	14.8	14.7	14.7	14.4	14.4	14.3	14.0	14.0	13.9
AVERAGE NET HEAD (M) :	123.4	103.1	113.4	125.5	101.0	113.2	127.4	99.0	112.9	129.3
INSTALLED CAPACITY (MW) :	15.2	12.5	13.7	15.1	12.0	13.4	15.0	11.4	13.0	14.8
GUARANTEED POWER (MW) :	9.9	5.7	8.1	10.4	5.6	8.2	10.8	5.4	8.3	11.0
AVERAGE FIRM POWER (MW) :	7.6	6.3	6.9	7.6	6.0	6.7	7.5	5.7	6.5	7.4
FIRM ENERGY (MIL KWH/Y) :	67.	55.	60.	66.	53.	59.	66.	50.	57.	65.
SECONDARY ENERGY (%) :	8.	8.	8.	9.	8.	9.	10.	9.	10.	11.
ANNUAL AVERAGE E-GY (%) :	75.	63.	68.	75.	61.	67.	75.	59.	67.	75.

D A M

DAM HEIGHT (M) : 155.7 142.4 147.7 155.7 139.0 145.8 155.7 135.7 143.8 155.7  
 EMBANKMENT VOL. (MIL MS) : 21.268 16.410 19.218 21.268 15.291 17.534 21.268 14.219 16.895 21.268

EVALUATION INDICES

CH/V : 1592. 1845. 1722. 1553. 1888. 1725. 1517. 1923. 1715. 1472.  
 C/V : 11. 14. 13. 11. 15. 13. 11. 15. 13. 10.  
 P/(20VT+VD) : 0.6 0.6 0.6 0.6 0.7 0.7 0.6 0.7 0.7 0.6  
 E(FIRM)/(20VT+VD) : 2.8 2.8 2.8 2.7 2.9 2.9 2.7 2.9 2.9 2.7  
 E(F+SECS0.3)/(20VT+VD) : 2.9 3.0 3.0 2.8 3.0 3.0 2.8 3.1 3.0 2.8



PROJECT NAME : IKMIN  
 PROJECT ID : 1-22-5-23-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.600	0.571
FULL SUPPLY LEVEL (M)	341.5	341.7	341.9	342.1	342.2	342.2
NORMAL OPERATING LEVEL (M)	339.8	339.9	340.2	340.4	340.6	340.7
MINIMUM OPERATING LEVEL (M)	338.0	338.2	338.4	338.7	339.1	339.2
DIVERSION WEIR HEIGHT INC. 3M F-B:	8.5	8.7	8.9	9.1	9.2	9.2
WATER DEPTH AT TRASHRACK (M)	5.5	5.7	5.9	6.1	6.2	6.2
CHANNEL WIDTH AT TRASHRACK (M)	4.0	4.7	5.7	6.8	8.2	8.7
PONDAGE STORAGE VOLUME (1000 M3)	55.2	57.0	59.3	62.1	65.7	66.8

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	2.0	2.4	2.5
HEADRACE TUNNEL LENGTH (M)	10650.0	10650.0	10650.0	10650.0	10650.0	10650.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.5	1.8	1.9
PENSTOCK LENGTH (HORIZONTAL) (M)	350.0	350.0	350.0	350.0	350.0	350.0
EXCAVATION VOLUME (1000 M3)	27.6	27.6	27.7	35.8	47.5	53.7

POWER

FIRM DISCHARGE (M3/S)	1.2	1.2	1.2	1.2	1.2	1.2
DEPENDABLE DISCHARGE (M3/S)	2.0	2.0	2.0	2.0	2.0	2.0
PLANT PEAK DISCHARGE (M3/S)	2.0	2.8	4.0	5.8	8.4	9.4
TAIL WATER LEVEL (M)	190.0	190.0	190.0	190.0	190.0	190.0
NET HEAD (M)	143.6	139.4	130.5	130.3	130.7	132.6
INSTALLED CAPACITY (MW)	2.4	3.2	4.3	6.2	9.1	10.2
DEPENDABLE PEAK POWER (MW)	2.4	2.3	2.2	2.2	2.2	2.2
FIRM POWER (MW)	1.4	1.4	1.3	1.3	1.3	1.3
GUARANTEED POWER OUTPUT (MW)	1.3	1.2	1.2	1.2	1.2	1.2
FIRM ENERGY/YEAR (10**6 KWH)	12.6	12.3	11.5	11.5	11.5	11.7
SECONDARY ENERGY/YEAR (10**6 KWH)	7.0	12.1	17.2	24.2	33.0	35.9
ANNUAL ENERGY (MIL KWH/YR)	19.6	24.3	28.7	35.7	44.5	47.6

PARAMETERS

P(INSTALLED)/(20VT) (W/M3)	4.3	5.8	7.8	8.7	9.5	9.5
P(DEPENDABLE)/(20VT) (W/M3)	4.3	4.2	3.9	3.0	2.3	2.1
E(FIRM)/(20VT) (KWH/M3)	22.9	22.2	20.8	16.0	12.1	10.9
E(F+0.3*SECONDARY)/(20VT) (")	25.6	28.7	30.1	25.2	22.5	20.9

PROJECT NAME : TOUENG  
 PROJECT ID : 1-22-5-24-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : IKMIN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.92	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	539.0	530.4	539.0	527.5	539.0	524.5	527.2	530.6	534.3	539.0
MIN. OPERATING LEVEL (M) :	456.9	456.9	485.6	456.9	491.4	456.9	466.7	476.6	486.4	496.3
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	5.8	5.5	5.5	5.4	5.4	5.3	5.3	5.3	5.3	5.3
PLANT PEAK DIS. (M <sup>3</sup> /S) :	11.6	11.1	11.0	10.9	10.8	10.6	10.6	10.6	10.5	10.5
AVERAGE NET HEAD (M) :	92.0	86.4	101.5	84.6	103.4	82.7	87.7	93.1	98.8	105.1
INSTALLED CAPACITY (MW) :	8.7	7.9	9.2	7.6	9.2	7.2	7.6	8.1	8.6	9.1
GUARANTEED POWER (MW) :	3.4	3.3	5.7	3.2	6.1	3.1	3.9	4.7	5.5	6.2
AVERAGE FIRM POWER (MW) :	4.4	3.9	4.6	3.8	4.6	3.6	3.8	4.0	4.3	4.5
FIRM ENERGY (MIL KWH/Y) :	38.	35.	40.	33.	40.	32.	33.	35.	38.	40.
SECONDARY ENERGY (") :	4.	4.	5.	5.	5.	5.	5.	5.	6.	6.
ANNUAL AVERAGE E-GY (") :	42.	39.	45.	38.	45.	37.	39.	41.	43.	46.

D A M

DAM HEIGHT (M) :	129.6	121.0	129.6	118.1	129.6	115.1	117.8	121.2	124.9	129.6
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	12.352	10.307	12.352	9.678	12.352	9.033	9.611	10.346	11.225	12.352

EVALUATION INDICES

CR/V	1760.	1883.	1679.	1911.	1640.	1948.	1872.	1788.	1699.	1601.
C/V	15.	17.	14.	18.	14.	19.	17.	18.	15.	13.
P/(20VT+VD)	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6
E(FIRM)/(20VT+VD)	2.7	2.8	2.8	2.8	2.8	2.9	2.9	2.9	2.8	2.8
E(F+SEC*0.3)/(20VT+VD)	2.7	2.9	2.9	2.9	2.9	3.0	3.0	3.0	3.0	2.9

PROJECT NAME : DANAC  
 PROJECT ID : 1- 22- 5-25-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : TKMIN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.93	0.75	0.75	0.70	0.70	0.65	0.65	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	641.0	632.7	641.0	630.4	641.0	627.7	630.0	632.8	636.5	641.0
MIN. OPERATING LEVEL(M) :	565.2	565.2	593.6	585.2	598.8	565.2	574.7	584.2	593.7	603.2
FIRM DISCHARGE (M3/S) :	3.7	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.3
PLANT PEAK DIS. (M3/S) :	7.3	7.0	7.0	6.9	6.8	6.7	6.7	6.7	6.7	6.6
AVERAGE NET HEAD (M) :	92.8	87.4	102.1	85.9	103.9	84.1	88.7	93.7	99.3	105.3
INSTALLED CAPACITY (MW) :	5.6	5.1	5.9	4.9	5.8	4.7	4.9	5.2	5.4	5.8
GUARANTEED POWER (MW) :	2.4	2.3	3.9	2.3	4.0	2.2	2.7	3.2	3.7	4.2
AVERAGE FIRM POWER (MW) :	2.8	2.5	2.9	2.4	2.9	2.3	2.4	2.6	2.7	2.9
FIRM ENERGY (MIL KWH/Y) :	25.	22.	25.	21.	26.	20.	21.	23.	24.	25.
SECONDARY ENERGY (%) :	2.	3.	3.	3.	3.	3.	3.	3.	4.	4.
ANNUAL AVERAGE E-GY (") :	27.	25.	29.	24.	29.	24.	25.	26.	27.	29.

D A M

DAM HEIGHT (M) :	127.0	118.7	127.0	116.4	127.0	113.7	116.0	118.6	122.5	127.0
EMBANKMENT VOL. (MIL M3) :	5.237	4.332	5.237	4.105	5.237	3.847	4.064	4.336	4.733	5.237

EVALUATION INDICES

CH/V :	2605.	2813.	2478.	2841.	2419.	2890.	2787.	2673.	2522.	2360.
C/V :	22.	26.	21.	26.	21.	28.	26.	24.	22.	20.
P/(20VT+VD) :	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
E(FIRM)/(20VT+VD) :	3.6	3.6	3.8	3.8	3.8	3.8	3.9	3.9	3.8	3.8
E(F+SEC*0.3)/(20VT+VD) :	3.7	3.9	4.0	4.0	3.9	4.0	4.0	4.1	4.0	3.9

PROJECT NAME : AVLUAGAN  
 PROJECT ID : 1- 22- 6-26-0-1  
 TYPE : RESERVOIR

BASIN NAME : ADRA  
 RIVER NAME : DAMANIT

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.60	0.60	0.60	0.55	0.55	0.55	0.50	0.50	0.50
FULL SUPPLY LEVEL (M) :	311.0	292.0	299.6	311.0	286.6	297.5	311.0	295.1	295.4	311.0
MIN. OPERATING LEVEL (M) :	261.7	227.2	249.3	271.4	227.2	251.4	275.6	227.2	253.5	279.7
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	4.4	4.2	4.2	4.2	4.1	4.0	4.0	3.9	3.9	3.9
PLANT PEAK DIS. (M <sup>3</sup> /S) :	8.8	8.4	8.4	8.3	8.1	8.1	8.0	7.8	7.8	7.7
AVERAGE NET HEAD (M) :	99.4	75.7	88.0	102.6	73.6	87.3	104.0	71.3	86.7	105.4
INSTALLED CAPACITY (MW) :	7.2	5.2	6.1	7.0	4.9	5.8	6.9	4.6	5.5	6.7
GUARANTEED POWER (MW) :	4.6	2.2	3.6	5.0	2.1	3.6	5.1	2.0	3.6	5.1
AVERAGE FIRM POWER (MW) :	3.6	2.6	3.0	3.5	2.5	2.9	3.4	2.3	2.8	3.3
FIRM ENERGY (MIL KWH/Y) :	32.	23.	27.	31.	22.	29.	30.	20.	24.	29.
SECONDARY ENERGY (%) :	4.	4.	5.	5.	5.	5.	6.	5.	5.	7.
ANNUAL AVERAGE E-GY (%) :	36.	27.	31.	36.	26.	31.	36.	25.	30.	36.

D A M

DAM HEIGHT (M) :	126.0	107.0	114.6	126.0	103.6	112.5	126.0	100.1	110.4	126.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	14.038	9.260	11.023	14.038	8.582	10.512	14.038	7.846	10.018	14.038

EVALUATION INDICES

CH/V :	1145.	1394.	1255.	1084.	1403.	1283.	1044.	1423.	1231.	1004.
C/V :	10.	14.	12.	9.	15.	12.	9.	16.	12.	9.
P/(20VT+VD) :	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4
E(FIRM)/(20VT+VD) :	1.9	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.0	1.8
E(F+SEC*0.3)/(20VT+VD) :	2.0	2.1	2.1	2.0	2.1	2.1	2.0	2.2	2.1	1.9

PROJECT NAME : DAMANIT  
 PROJECT ID : 1-22-6-27-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
<b>HEAD PONDAGE</b>						
OUTPUT FACTOR	0.965	0.900	0.800	0.700	0.600	0.571
FULL SUPPLY LEVEL (M)	706.1	706.2	706.3	706.5	706.6	706.7
NORMAL OPERATING LEVEL (M)	705.8	705.9	706.0	706.1	706.3	706.4
MINIMUM OPERATING LEVEL (M)	705.5	705.6	705.7	705.8	706.0	706.0
DIVERSION WEIR HEIGHT INC. 3M F-8:	5.1	5.2	5.3	5.5	5.6	5.7
WATER DEPTH AT TRASHRACK (M)	2.1	2.2	2.3	2.5	2.6	2.7
CHANNEL WIDTH AT TRASHRACK (M)	1.9	2.3	2.7	3.3	4.0	4.2
PONDAGE STORAGE VOLUME (1000 M3)	26.8	27.9	29.3	31.0	33.1	33.8

**WATERWAY**

NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	1.8	1.8
HEADRACE TUNNEL LENGTH (M)	4250.0	4250.0	4250.0	4250.0	4250.0	4250.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.3	1.3	1.3
PENSTOCK LENGTH (HORIZONTAL) (M)	790.0	790.0	790.0	790.0	790.0	790.0
EXCAVATION VOLUME (1000 M3)	12.1	12.1	12.1	12.1	12.1	12.1

**POWER**

FIRM DISCHARGE (M3/S)	0.3	0.3	0.3	0.3	0.3	0.3
DEPENDABLE DISCHARGE (M3/S)	0.5	0.5	0.5	0.5	0.5	0.5
PLANT PEAK DISCHARGE (M3/S)	0.5	0.7	0.9	1.3	2.0	2.2
TAIL WATER LEVEL (M)	346.0	346.0	346.0	346.0	346.0	346.0
NET HEAD (M)	356.0	355.9	355.7	355.0	352.7	352.7
INSTALLED CAPACITY (MW)	1.4	1.9	2.8	3.9	5.7	6.3
DEPENDABLE PEAK POWER (MW)	1.4	1.4	1.4	1.4	1.4	1.4
FIRM POWER (MW)	0.8	0.8	0.8	0.8	0.8	0.8
GUARANTEED POWER OUTPUT (MW)	0.8	0.8	0.7	0.7	0.7	0.7
FIRM ENERGY/YEAR (10**6 KWH)	7.3	7.3	7.3	7.3	7.3	7.2
SECONDARY ENERGY/YEAR (10**6 KWH)	4.0	7.1	10.8	15.2	20.6	22.1
ANNUAL ENERGY (MIL KWH/YR)	11.3	14.4	18.1	22.5	27.9	29.3

**PARAMETERS**

P(INSTALLED)/(20VT) (W/M3)	5.7	8.0	11.4	16.3	23.7	26.3
P(DEPENDABLE)/(20VT) (W/M3)	5.8	5.8	5.8	5.7	5.7	5.7
E(FIRM)/(20VT) (KWH/M3)	30.3	30.3	30.2	30.2	30.0	30.0
E(F+0.3*SECONDARY)/(20VT) (")	35.2	39.1	43.7	49.1	55.6	57.4

PROJECT NAME : NAINA  
 PROJECT ID : 1-22-6-28-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : UTIP

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

RESERVOIR	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.65	0.50	0.50	0.50	0.45	0.45	0.45	0.40	0.40	0.40
FULL SUPPLY LEVEL (M) :	433.0	399.1	412.2	433.0	394.3	403.4	433.0	389.3	406.2	433.0
MIN. OPERATING LEVEL(M) :	378.4	318.2	356.5	394.8	318.1	358.9	399.7	318.0	361.0	404.0
POWER										
FIRM DISCHARGE (M3/S) :	9.7	8.8	8.8	8.7	8.5	8.4	8.4	8.1	8.0	7.9
PLANT PEAK DIS. (M3/S) :	19.4	17.6	17.5	17.4	16.9	16.9	16.7	16.1	16.0	15.9
AVERAGE NET HEAD (M) :	133.2	91.0	112.1	138.2	87.6	110.9	139.7	84.2	109.3	140.9
INSTALLED CAPACITY (MW) :	21.2	13.2	16.2	19.8	12.2	15.4	19.2	11.2	14.4	18.4
GUARANTEED POWER (MW) :	14.7	5.1	10.3	15.4	4.9	10.2	15.4	4.6	10.0	15.1
AVERAGE FIRM POWER (MW) :	10.6	6.6	8.1	9.9	6.1	7.7	9.6	5.6	7.2	9.2
FIRM ENERGY (MIL KWH/Y) :	93.	58.	71.	87.	54.	67.	84.	49.	63.	81.
SECONDARY ENERGY (%) :	14.	14.	16.	19.	15.	17.	21.	16.	19.	23.
ANNUAL AVERAGE E-GY (%) :	107.	72.	87.	106.	69.	85.	105.	65.	82.	104.

D A M

DAM HEIGHT (M) :	164.0	130.1	143.2	164.0	125.3	140.4	164.0	120.3	137.2	164.0
EMBANKMENT VOL. (MIL M3) :	25.938	13.871	17.940	25.938	12.511	16.978	25.938	11.295	15.989	25.938

EVALUATION INDICES

CH/V :	1781.	2362.	2013.	1596.	2413.	1999.	1531.	2430.	1967.	1453.
C/V :	12.	20.	15.	11.	21.	16.	10.	23.	16.	10.
P/(20VT+VD) :	0.7	0.8	0.8	0.7	0.8	0.8	0.7	0.8	0.8	0.6
E(FIRM)/(20VT+VD) :	3.3	3.5	3.5	3.0	3.6	3.5	3.0	3.5	3.4	2.8
E(F+SEC*0.3)/(20VT+VD) :	3.4	3.8	3.7	3.2	3.9	3.7	3.2	3.9	3.7	3.1

PROJECT NAME : UTIP  
 PROJECT ID : 1- 22- 6-29-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
<b>HEAD PONDAGE</b>						
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.600	0.571
FULL SUPPLY LEVEL (M)	557.5	557.6	557.9	558.1	558.4	558.5
NORMAL OPERATING LEVEL (M)	556.7	556.9	557.1	557.3	557.7	557.8
MINIMUM OPERATING LEVEL (M)	555.9	556.1	556.3	556.6	556.9	557.0
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.5	6.6	6.9	7.1	7.4	7.5
WATER DEPTH AT TRASHRACK (M)	3.5	3.6	3.9	4.1	4.4	4.5
CHANNEL WIDTH AT TRASHRACK (M)	3.8	4.4	5.3	6.3	7.7	8.1
PONDAGE STORAGE VOLUME (1000 M3)	69.3	72.7	77.1	82.3	88.9	90.9
<b>WATERWAY</b>						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.9	2.2	2.3
HEADRACE TUNNEL LENGTH (M)	7330.0	7330.0	7330.0	7330.0	7330.0	7330.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.4	1.7	1.7
PENSTOCK LENGTH (HORIZONTAL) (M)	540.0	540.0	540.0	540.0	540.0	540.0
EXCAVATION VOLUME (1000 M3)	19.5	19.5	19.5	22.7	30.2	32.6
<b>POWER</b>						
FIRM DISCHARGE (M3/S)	1.1	1.1	1.1	1.1	1.1	1.1
DEPENDABLE DISCHARGE (M3/S)	1.8	1.8	1.8	1.8	1.8	1.8
PLANT PEAK DISCHARGE (M3/S)	1.8	2.4	3.5	5.0	7.3	8.1
TAIL WATER LEVEL (M)	370.0	370.0	370.0	370.0	370.0	370.0
NET HEAD (M)	181.9	179.3	173.5	169.8	170.4	170.6
INSTALLED CAPACITY (MW)	2.6	3.6	5.0	7.0	10.3	11.4
DEPENDABLE PEAK POWER (MW)	2.6	2.6	2.5	2.5	2.5	2.5
FIRM POWER (MW)	1.6	1.6	1.5	1.5	1.5	1.5
GUARANTEED POWER OUTPUT (MW)	1.4	1.4	1.4	1.3	1.3	1.3
FIRM ENERGY/YEAR (10**6 KWH)	13.9	13.7	13.3	13.0	13.1	13.1
SECONDARY ENERGY/YEAR (10**6 KWH)	7.6	13.4	19.7	27.2	37.2	39.9
ANNUAL ENERGY (MIL KWH/YR)	21.5	27.1	33.0	40.2	50.2	53.0
<b>PARAMETERS</b>						
P (INSTALLED)/(20VT) (W/M3)	6.8	9.3	12.9	15.5	17.1	17.5
P (DEPENDABLE)/(20VT) (W/M3)	6.8	6.7	6.5	5.5	4.1	3.8
E (FIRM)/(20VT) (KWH/M3)	35.8	35.3	34.1	28.7	21.6	20.0
E (F+0.3*SECONDARY)/(20VT) (")	41.6	45.6	49.3	46.6	40.1	38.4

PROJECT NAME : KUMANGA  
 PROJECT ID : 1- 22- 7-30-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : DITONG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.75	0.65	0.65	0.65	0.60	0.60	0.60	0.60	0.55	0.55
FULL SUPPLY LEVEL (M) :	450.0	431.8	438.8	450.0	428.5	436.7	450.0	425.0	434.5	450.0
MIN. OPERATING LEVEL(M) :	397.5	366.5	386.6	406.6	366.5	388.7	410.9	366.5	390.6	414.8
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	3.9	3.8	3.6	3.8	3.7	3.7	3.5	3.5	3.5	3.5
PLANT PEAK DIS. (M <sup>3</sup> /S) :	7.9	7.6	7.5	7.5	7.3	7.3	7.3	7.1	7.1	7.0
AVERAGE NET HEAD (M) :	104.3	82.2	93.4	107.3	80.1	92.7	108.7	77.8	92.0	110.0
INSTALLED CAPACITY (MW) :	6.8	5.1	5.8	6.6	4.8	5.6	6.5	4.5	5.3	6.4
GUARANTEED POWER (MW) :	4.3	2.3	3.5	4.6	2.2	3.5	4.7	2.2	3.5	4.8
AVERAGE FIRM POWER (MW) :	3.4	2.6	2.9	3.3	2.4	2.8	3.3	2.3	2.7	3.2
FIRM ENERGY (MIL KWH/Y) :	30.	22.	25.	29.	21.	24.	29.	20.	23.	28.
SECONDARY ENERGY (%) :	4.	4.	4.	4.	4.	4.	5.	4.	5.	5.
ANNUAL AVERAGE E-GY (%) :	33.	26.	28.	33.	25.	29.	33.	24.	28.	33.

D A M

DAM HEIGHT (M) :	130.7	112.5	119.5	130.7	109.2	117.4	130.7	105.7	115.2	130.7
EMBANKMENT VOL. (MIL M3) :	9.380	6.260	7.378	9.380	5.790	7.021	9.380	5.294	6.664	9.380

EVALUATION INDICES

CH/V :	1612.	1981.	1785.	1537.	2016.	1786.	1491.	2055.	1779.	1436.
C/V :	13.	19.	16.	13.	20.	16.	12.	21.	17.	12.
P/(20VT+VD) :	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.7	0.6	0.6
E(FIRM)/(20VT+VD) :	2.7	2.8	2.8	2.6	2.9	2.8	2.6	2.9	2.8	2.5
E(F+SEC#0.3)/(20VT+VD) :	2.8	3.0	2.9	2.8	3.0	3.0	2.7	3.1	3.0	2.7



PROJECT NAME : SUYSUYAN  
 PROJECT ID : 1-22-7-31-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABRA  
 RIVER NAME : BALASEAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	505.0	489.1	495.1	505.0	485.8	493.1	505.0	482.5	491.1	505.0
MIN. OPERATING LEVEL (M) :	456.4	417.8	439.7	461.5	417.8	441.9	466.0	417.8	444.1	470.4
POWER										
FIRM DISCHARGE (M3/S) :	6.2	6.1	6.1	6.0	5.9	5.9	5.8	5.7	5.7	5.6
PLANT PEAK DIS. (M3/S) :	12.3	12.2	12.1	12.0	11.8	11.8	11.7	11.4	11.3	11.2
AVERAGE NET HEAD (M) :	98.9	75.8	87.0	100.7	73.8	86.5	102.2	71.7	86.0	103.7
INSTALLED CAPACITY (MW) :	10.0	7.6	8.7	10.0	7.2	8.4	9.8	6.7	8.0	9.6
GUARANTEED POWER (MW) :	6.4	2.7	4.7	6.8	2.6	4.8	7.0	2.6	4.9	7.1
AVERAGE FIRM POWER (MW) :	5.0	3.8	4.3	5.0	3.6	4.2	4.9	3.4	4.0	4.8
FIRM ENERGY (MIL KWH/Y) :	44.	33.	38.	44.	31.	37.	43.	29.	35.	42.
SECONDARY ENERGY (%) :	6.	6.	6.	7.	6.	7.	7.	6.	7.	8.
ANNUAL AVERAGE E-GY (%) :	50.	39.	44.	50.	37.	43.	50.	36.	42.	50.

D A M

DAM HEIGHT (M) :	125.0	109.1	115.1	125.0	105.8	113.1	125.0	102.5	111.1	125.0
EMBANKMENT VOL. (MIL M3) :	10.768	7.531	8.650	10.768	6.948	8.254	10.768	6.365	7.899	10.768

EVALUATION INDICES

CH/V :	2080.	2536.	2328.	2030.	2586.	2325.	1970.	2634.	2298.	1898.
C/V :	18.	25.	22.	18.	27.	22.	17.	28.	23.	16.
P/(20VT+VD) :	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
E(FIRM)/(20VT+VD) :	3.5	3.6	3.6	3.5	3.6	3.7	3.4	3.6	3.6	3.4
E(F+SEC*0.3)/(20VT+VD) :	3.6	3.7	3.8	3.6	3.8	3.8	3.6	3.9	3.8	3.5

PROJECT NAME : DINGRAS  
 PROJECT ID : 1-37-0-1-0-1  
 TYPE : RESERVOIR

BASIN NAME : LAOAG  
 RIVER NAME : MADONGAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.66	0.51	0.51	0.51	0.46	0.46	0.46	0.41	0.41	0.41
FULL SUPPLY LEVEL (M) :	234.0	207.1	218.5	234.0	203.3	216.3	234.0	199.6	214.1	234.0
MIN. OPERATING LEVEL (M) :	189.3	151.6	176.3	201.9	151.6	178.6	205.7	151.6	180.5	209.4
POWER										
FIRM DISCHARGE (M3/S) :	4.5	4.3	4.3	4.2	4.2	4.2	4.1	4.1	4.0	4.0
PLANT PEAK DIS. (M3/S) :	9.1	8.6	8.5	8.4	8.4	8.3	8.2	8.1	8.1	8.0
AVERAGE NET HEAD (M) :	90.3	60.3	76.1	94.5	57.9	75.3	95.7	55.5	74.5	97.0
INSTALLED CAPACITY (MW) :	6.8	4.3	6.3	6.6	4.0	5.1	6.5	3.7	4.9	6.3
GUARANTEED POWER (MW) :	4.3	1.6	3.2	4.8	1.5	3.3	5.0	1.5	3.3	5.0
AVERAGE FIRM POWER (MW) :	3.4	2.1	2.7	3.3	2.0	2.6	3.2	1.9	2.5	3.2
FIRM ENERGY (MIL KWH/Y) :	30.	19.	23.	29.	17.	23.	28.	16.	22.	28.
SECONDARY ENERGY (") :	15.	12.	13.	16.	11.	13.	16.	11.	13.	17.
ANNUAL AVERAGE E-GY (") :	44.	30.	37.	45.	29.	36.	45.	27.	35.	45.

D. A. M.

DAM HEIGHT (M) : 114.4 87.5 98.9 114.4 83.7 95.7 114.4 80.0 94.5 114.4  
 EMBANKMENT VOL. (MIL M3) : 9.088 4.471 6.198 9.028 3.969 5.824 9.088 3.540 5.459 9.088

EVALUATION INDICES

CH/V : 1659. 2385. 1951. 1539. 2500. 1975. 1499. 2586. 1993. 1451.  
 C/V : 16. 30. 22. 15. 33. 22. 14. 36. 23. 14.  
 P/(20VT+VD) : 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6  
 E(FIRM)/(20VT+VD) : 2.7 3.0 2.9 3.1 3.0 3.0 2.6 3.1 3.0 2.6  
 E(F+SEC\*0.3)/(20VT+VD) : 3.1 3.5 3.4 3.1 3.6 3.5 3.1 3.7 3.5 3.0

PROJECT NAME : VINTAR  
 PROJECT ID : 1-39-0-1-0-1  
 TYPE : RESERVOIR

BASIN NAME : VINTAR  
 RIVER NAME : VINTAR

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.65	0.55	0.55	0.55	0.50	0.50	0.50	0.45	0.45	0.45
FULL SUPPLY LEVEL (M) :	116.0	107.2	111.2	116.0	105.6	110.4	116.0	104.0	109.5	116.0
MIN. OPERATING LEVEL (M) :	96.9	82.3	91.7	101.0	82.3	92.4	102.6	82.3	93.2	104.2
POWER										
FIRM DISCHARGE (M3/S) :	4.0	3.9	3.9	3.8	3.9	3.8	3.7	3.8	3.7	3.6
PLANT PEAK DIS. (M3/S) :	8.0	7.9	7.8	7.6	7.7	7.6	7.4	7.5	7.4	7.2
AVERAGE NET HEAD (M) :	37.7	27.1	32.8	32.1	26.0	32.6	39.6	25.0	32.3	40.1
INSTALLED CAPACITY (MW) :	2.5	1.8	2.1	2.4	1.7	2.0	2.4	1.6	2.0	2.4
GUARANTEED POWER (MW) :	1.6	0.6	1.2	1.7	0.6	1.2	1.8	0.6	1.2	1.8
AVERAGE FIRM POWER (MW) :	1.2	0.9	1.1	1.2	0.8	1.0	1.2	0.8	1.0	1.2
FIRM ENERGY (MIL KWH/Y) :	11.	8.	9.	11.	7.	9.	11.	7.	9.	10.
SECONDARY ENERGY (") :	6.	5.	6.	6.	5.	6.	7.	5.	6.	7.
ANNUAL AVERAGE E-GY (") :	17.	13.	15.	17.	12.	14.	17.	11.	14.	17.

D A M

DAM HEIGHT (M) :	51.8	43.0	47.0	51.8	41.4	46.2	51.8	39.8	45.3	51.8
EMBANKMENT VOL. (MIL M3) :	1.913	1.256	1.538	1.913	1.145	1.486	1.913	1.035	1.424	1.913

EVALUATION INDICES

CH/V :	2922.	3506.	3134.	2761.	3591.	3104.	2683.	3703.	3084.	2805.
C/V :	66.	99.	80.	63.	106.	80.	61.	115.	82.	59.
P/(20VT+VD) :	0.8	0.7	0.8	0.8	0.7	0.7	0.8	0.7	0.7	0.8
E(FIRM)/(20VT+VD) :	3.5	3.1	3.3	3.4	3.0	3.3	3.3	3.0	3.2	3.3
E(F+SEC*0.3)/(20VT+VD) :	4.0	3.7	3.9	4.0	3.6	3.9	4.0	3.6	3.8	3.9

PROJECT NAME : TAMDAGAN  
 PROJECT ID : 1-39-0-2-0-1  
 TYPE : RESERVOIR

BASIN NAME : VINTAR  
 RIVER NAME : TAMDAGAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.56	0.56	0.56	0.46	0.46	0.46	0.36	0.36	0.36
FULL SUPPLY LEVEL (M) :	224.0	198.7	209.1	224.0	190.4	204.0	224.0	180.9	198.4	224.0
MIN. OPERATING LEVEL (M) :	168.8	122.4	159.2	169.9	122.3	157.6	193.0	122.0	161.5	201.0
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	9.9	9.4	9.4	9.3	9.0	8.9	8.8	8.2	8.1	7.9
PLANT PEAK DIS. (M <sup>3</sup> /S) :	19.9	18.9	18.7	18.5	18.0	17.8	17.5	16.3	16.1	15.9
AVERAGE NET HEAD (M) :	106.3	74.4	91.3	111.1	69.8	89.3	114.0	62.3	86.7	116.5
INSTALLED CAPACITY (MW) :	17.4	11.5	14.1	17.0	10.2	13.1	16.5	8.4	11.5	15.2
GUARANTEED POWER (MW) :	10.8	3.5	7.9	12.3	3.3	8.2	12.9	2.9	7.9	12.6
AVERAGE FIRM POWER (MW) :	6.7	5.8	7.0	8.5	5.1	6.5	8.3	4.2	5.8	7.6
FIRM ENERGY (MIL KWH/Y) :	76.	51.	62.	74.	45.	57.	72.	37.	50.	67.
SECONDARY ENERGY (%) :	36.	30.	34.	39.	29.	34.	41.	29.	35.	45.
ANNUAL AVERAGE E-GY (%) :	112.	81.	95.	113.	74.	91.	113.	65.	86.	111.

D A M

DAM HEIGHT (M) :	135.0	109.7	120.1	135.0	101.4	115.0	135.0	91.9	109.4	135.0
EMBANKMENT VOL. (MIL MG) :	12.863	7.905	9.772	12.863	6.610	8.785	12.863	5.299	7.872	12.863

EVALUATION INDICES

CH/V :	3037.	3754.	3321.	2830.	3926.	3350.	2683.	3972.	3199.	2412.
C/V :	24.	38.	30.	23.	43.	32.	22.	49.	32.	19.
P/(20VT+VD) :	1.2	1.1	1.2	1.1	1.2	1.2	1.1	1.1	1.1	1.0
E(FIRM)/(20VT+VD) :	5.0	5.0	5.1	4.9	5.1	5.2	4.8	4.9	5.0	4.4
E(F+SEC*0.3)/(20VT+VD) :	5.8	5.9	6.0	5.7	6.0	6.1	5.6	6.0	6.0	5.3

PROJECT NAME : BULU-1(ILOCOS)  
 PROJECT ID : 1-47-0-1-0-1  
 TYPE : RESERVOIR

BASIN NAME : BULU  
 RIVER NAME : BULU

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.75	0.51	0.51	0.51	0.41	0.41	0.41	0.31	0.31	0.31
FULL SUPPLY LEVEL (M) :	233.0	199.5	210.8	233.0	189.2	203.7	233.0	176.8	196.3	233.0
MIN. OPERATING LEVEL (M) :	162.9	95.5	144.8	194.1	95.4	149.6	203.0	95.4	153.9	212.4
POWER										
FIRM DISCHARGE (M3/S) :	8.2	7.4	7.4	7.3	7.1	7.0	6.9	6.1	6.1	5.9
PLANT PEAK DIS. (M3/S) :	16.4	14.9	14.8	14.6	14.1	14.0	13.8	12.3	12.1	11.9
AVERAGE NET HEAD (M) :	153.4	109.2	132.7	163.4	102.6	129.9	166.8	95.1	127.0	170.2
INSTALLED CAPACITY (MW) :	20.7	13.4	16.1	19.6	11.9	14.9	18.9	9.6	12.7	16.6
GUARANTEED POWER (MW) :	13.7	4.6	10.3	15.7	4.4	10.3	15.9	3.9	9.4	14.6
AVERAGE FIRM POWER (MW) :	10.4	6.7	8.1	9.8	6.0	7.5	9.5	4.8	6.3	8.3
FIRM ENERGY (MIL KWH/Y) :	91.	59.	71.	86.	52.	65.	83.	42.	55.	73.
SECONDARY ENERGY (%) :	39.	36.	39.	45.	35.	39.	48.	36.	42.	54.
ANNUAL AVERAGE E-OY (%) :	130.	95.	110.	131.	88.	105.	130.	78.	98.	127.
D A M										
DAM HEIGHT (M) :	189.0	155.5	166.8	189.0	145.2	159.7	189.0	132.8	152.3	189.0
EMBANKMENT VOL. (MIL M3) :	17.196	9.921	12.068	17.196	8.230	10.690	17.196	6.456	9.359	17.196
EVALUATION INDICES										
CH/V :	2658.	3404.	2987.	2360.	3619.	3051.	2230.	3658.	2880.	1926.
C/V :	15.	24.	19.	13.	27.	21.	13.	30.	20.	11.
P/(20VT+VD) :	1.1	1.1	1.1	1.0	1.1	1.1	1.0	1.1	1.1	0.8
E(FIRM)/(20VT+VD) :	4.6	4.8	4.9	4.4	4.9	5.0	4.2	4.8	4.7	3.7
E(F+SEC*0.3)/(20VT+VD) :	5.2	5.6	5.7	5.1	5.9	5.9	5.0	6.0	5.8	4.5

PROJECT NAME : BULU-2(ILOCOS)  
 PROJECT ID : 1-47-0-2-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE					
	1	2	3	4	5	6
HEAD PONDAGE						
OUTPUT FACTOR	0.985	0.900	0.800	0.700	0.600	0.512
FULL SUPPLY LEVEL (M)	185.8	185.1	186.3	186.7	187.1	187.6
NORMAL OPERATING LEVEL (M)	185.7	185.0	185.3	186.6	187.0	187.5
MINIMUM OPERATING LEVEL (M)	185.6	186.0	186.2	186.5	187.0	187.5
DIVERSION WEIR HEIGHT INC. 3M F-B:	4.8	5.1	5.3	5.7	6.1	6.6
WATER DEPTH AT TRASHRACK (M)	1.8	2.1	2.3	2.7	3.1	3.6
CHANNEL WIDTH AT TRASHRACK (M)	2.5	3.8	4.8	6.1	7.9	9.9
PONDAGE STORAGE VOLUME (1000 M3)	175.7	209.7	234.3	265.3	311.0	361.6

ITEMS	CASE					
	1	2	3	4	5	6
WATERWAY						
NUMBER OF WATERWAY	1	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.3	1.8	1.8	1.9	2.3	2.8
HEADRACE TUNNEL LENGTH (M)	4900.0	4900.0	4900.0	4900.0	4900.0	4900.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.4	1.8	2.1
PENSTOCK LENGTH (HORIZONTAL) (M)	220.0	220.0	220.0	220.0	220.0	220.0
EXCAVATION VOLUME (1000 M3)	12.3	12.8	12.8	14.0	20.8	30.6

ITEMS	CASE					
	1	2	3	4	5	6
POWER						
FIRM DISCHARGE (M3/S)	0.5	0.5	0.5	0.5	0.5	0.5
DEPENDABLE DISCHARGE (M3/S)	0.8	0.8	0.8	0.8	0.8	0.8
PLANT PEAK DISCHARGE (M3/S)	0.8	1.8	2.9	4.6	7.8	12.3
TAIL WATER LEVEL (M)	60.0	60.0	60.0	60.0	60.0	60.0
NET HEAD (M)	124.1	122.9	120.2	116.3	116.9	118.3
INSTALLED CAPACITY (MW)	0.8	1.9	2.9	4.4	7.5	11.9
DEPENDABLE PEAK POWER (MW)	0.8	0.8	0.8	0.8	0.8	0.8
FIRM POWER (MW)	0.5	0.5	0.5	0.5	0.5	0.5
GUARANTEED POWER OUTPUT (MW)	0.4	0.4	0.4	0.4	0.4	0.4
FIRM ENERGY/YEAR (10**6 KWH)	4.3	4.3	4.2	4.1	4.1	4.1
SECONDARY ENERGY/YEAR (10**6 KWH)	2.4	9.3	14.3	20.7	31.6	44.5
ANNUAL ENERGY (MIL KWH/YR)	6.7	13.6	18.5	24.8	35.7	48.6

PARAMETERS	CASE					
	1	2	3	4	5	6
P(INSTALLED)/(20VT) (W/M3)	3.1	7.2	11.2	15.7	18.0	19.5
P(DEPENDABLE)/(20VT) (W/M3)	3.2	3.2	3.1	2.8	1.9	1.3
E(FIRM)/(20VT) (KWH/M3)	16.9	16.7	16.4	14.5	9.8	6.8
E(F+0.3*SECONDARY)/(20VT) (%)	19.7	27.6	33.1	36.6	32.7	28.6

PROJECT NAME : LUNA  
 PROJECT ID : 2- 5- 0- 1-0-1  
 TYPE : RESERVOIR

BASIN NAME : GATTU  
 RIVER NAME : ZIJUANAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.53	0.48	0.48	0.48	0.43	0.43	0.43	0.38	0.38	0.38
FULL SUPPLY LEVEL (M) :	100.0	87.3	92.3	100.0	84.1	90.5	100.0	80.8	88.3	100.0
MIN. OPERATING LEVEL (M) :	65.4	37.4	53.8	70.3	37.1	55.6	74.2	36.6	57.4	78.1
POWER										
FIRM DISCHARGE (M3/S) :	20.6	19.9	19.7	19.6	18.9	18.8	18.6	17.5	17.4	17.2
PLANT PEAK DIS. (M3/S) :	82.5	79.4	79.0	78.5	75.6	75.1	74.5	70.1	69.6	68.8
AVERAGE NET HEAD (M) :	76.2	58.6	67.3	77.7	56.3	66.6	79.0	54.0	65.7	80.2
INSTALLED CAPACITY (MW) :	51.7	38.3	43.8	50.2	35.0	41.2	48.4	31.2	37.6	45.4
GUARANTEED POWER (MW) :	34.3	15.7	25.8	35.6	14.8	25.6	36.1	13.5	24.6	35.4
AVERAGE FIRM POWER (MW) :	12.9	9.6	10.9	12.6	8.8	10.3	12.1	7.8	9.4	11.4
FIRM ENERGY (MIL KWH/Y) :	113.	84.	96.	110.	77.	90.	106.	68.	82.	100.
SECONDARY ENERGY (%) :	32.	31.	33.	37.	33.	37.	42.	37.	41.	48.
ANNUAL AVERAGE E-GY (%) :	145.	115.	129.	147.	110.	127.	148.	105.	124.	148.

D A M	CASE									
	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	96.0	83.3	88.3	96.0	80.1	86.5	96.0	76.8	84.3	96.0
EMBANKMENT VOL. (MIL M3) :	7.337	5.139	5.953	7.337	4.680	5.657	7.337	4.232	5.307	7.337

EVALUATION INDICES

CH/V :	7772.	9158.	8384.	7389.	9166.	8191.	7008.	8977.	7859.	6472.
C/V :	89.	122.	105.	84.	127.	105.	80.	131.	103.	74.
P/(20VT+VD) :	5.9	5.8	5.9	5.7	5.7	5.0	5.5	5.5	5.6	5.2
E(FIRM)/(20VT+VD) :	12.8	12.7	12.9	12.5	12.5	12.7	12.1	12.1	12.2	11.4
E(F+SEC*0.3)/(20VT+VD) :	13.9	14.1	14.2	13.7	14.1	14.2	13.5	14.0	14.1	13.0

PROJECT NAME : ZIMIGUI  
 PROJECT ID : 2- S- 0- 2-0-1  
 TYPE : RESERVOIR

BASIN NAME : GATTU  
 RIVER NAME : ZIMUGUI

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.57	0.52	0.52	0.52	0.47	0.47	0.47	0.42	0.42	0.42
FULL SUPPLY LEVEL (M) :	74.0	55.8	64.6	74.0	52.9	53.1	74.0	49.9	61.6	74.0
MIN. OPERATING LEVEL(M) :	44.9	21.5	34.7	47.9	21.2	36.0	50.8	20.9	37.3	53.6
POWER										
FIRM DISCHARGE (M3/S) :	34.9	33.4	33.3	33.2	31.9	31.7	31.6	30.2	30.0	29.9
PLANT PEAK DIS. (M3/S) :	139.5	133.7	133.3	133.0	127.4	127.0	126.5	120.6	120.1	119.4
AVERAGE NET HEAD (M) :	56.3	36.7	46.7	57.3	34.6	48.2	58.2	32.5	45.6	59.1
INSTALLED CAPACITY (MW) :	64.7	40.3	51.3	62.7	36.3	48.3	60.6	32.3	45.0	58.1
GUARANTEED POWER (MW) :	40.4	14.4	28.0	41.6	13.5	28.0	42.4	12.5	27.6	42.6
AVERAGE FIRM POWER (MW) :	16.2	10.1	12.8	15.7	9.1	12.1	15.1	8.1	11.3	14.5
FIRM ENERGY (MIL KWH/Y) :	142.	88.	112.	137.	79.	106.	133.	71.	99.	127.
SECONDARY ENERGY (%) :	36.	30.	36.	42.	32.	39.	47.	34.	43.	54.
ANNUAL AVERAGE E-GY (%) :	178.	118.	148.	179.	111.	145.	180.	104.	142.	181.

D A M

DAM HEIGHT (M) :	74.0	55.8	64.6	74.0	52.9	63.1	74.0	49.9	61.6	74.0
EMBANKMENT VOL. (MIL M3) :	5.603	2.998	4.124	5.603	2.654	3.920	5.603	2.358	3.725	5.603

EVALUATION INDICES

CH/V :	12958.	16915.	14453.	12348.	17089.	14100.	11734.	17001.	13634.	11073.
C/V :	195.	352.	255.	187.	378.	255.	178.	403.	254.	168.
P/(20VT+VD) :	8.7	8.4	8.6	8.4	8.2	8.4	8.2	7.8	8.2	7.9
E(FIRM)/(20VT+VD) :	18.0	18.3	18.9	18.5	17.8	18.5	17.9	17.1	17.9	17.3
E(F+SEC*0.3)/(20VT+VD) :	20.4	20.2	20.7	20.2	20.0	20.5	19.8	19.6	20.3	19.4



PROJECT NAME : SISIRITAN  
 PROJECT ID : 2- 5- 0- 1-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : ABULOG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	ITEMS	CASE									
		1	2	3	4	5	6	7	8	9	10
	RESERVOIR DEVELOP. COEF :	0.35	0.30	0.30	0.30	0.25	0.25	0.25	0.20	0.20	0.20
	FULL SUPPLY LEVEL (M) :	100.0	81.4	90.2	100.0	74.8	86.7	100.0	58.4	83.4	100.0
	MIN. OPERATING LEVEL (M) :	58.0	35.4	50.3	65.2	34.7	53.4	72.1	34.9	56.7	78.5
	POWER										
	FIRM DISCHARGE (M3/S) :	122.4	111.9	111.7	111.4	100.7	100.4	100.0	87.8	87.4	86.9
	PLANT PEAK DIS. (M3/S) :	734.3	671.4	670.1	668.6	604.3	602.5	600.3	526.5	524.3	521.5
	AVERAGE NET HEAD (M) :	73.6	54.0	64.7	76.0	49.4	63.3	78.2	45.2	62.2	80.3
	INSTALLED CAPACITY (MW) :	444.8	298.5	355.6	418.3	245.8	314.2	386.3	195.9	268.6	344.7
	GUARANTEED POWER (MW) :	252.4	122.7	200.1	276.9	107.4	194.3	280.3	94.3	182.5	269.6
	AVERAGE FIRM POWER (MW) :	74.1	49.8	59.4	69.7	41.0	52.4	64.4	32.6	44.8	57.4
	FIRM ENERGY (MIL KWH/Y) :	649.	436.	521.	611.	359.	459.	564.	286.	392.	503.
	SECONDARY ENERGY (%) :	413.	371.	418.	471.	378.	450.	530.	383.	485.	599.
	ANNUAL AVERAGE E-GY (%) :	1063.	807.	939.	1082.	737.	908.	1094.	669.	877.	1102.

D A M

DAM HEIGHT (M) :	96.0	77.4	86.2	96.0	70.8	82.7	96.0	64.4	79.4	96.0
EMBANKMENT VOL. (MIL M3) :	11.449	7.021	8.941	11.449	5.747	8.147	11.449	4.687	7.397	11.449

EVALUATION INDICES

CH/V :	29529.	34864.	30703.	26882.	34695.	28943.	24111.	33276.	26499.	20938.
C/V :	337.	503.	394.	307.	553.	389.	276.	590.	373.	239.
P/(20VT+VD) :	24.7	22.6	23.5	23.7	21.1	22.4	22.3	19.3	20.8	20.4
E(FIRM)/(20VT+VD) :	36.1	32.9	34.4	34.6	30.9	32.7	32.5	28.1	30.4	29.7
E(F+SEC*0.3)/(20VT+VD) :	43.0	41.3	42.6	42.6	40.6	42.3	41.7	39.4	41.7	40.3

PROJECT NAME : BUBULAYAN  
 PROJECT ID : 2- 6- 0- 2-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : ABULOG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR  
 -----  
 CASE  
 -----  
 1 2 3 4 5 6 7 8 9 10

ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.80	0.75	0.75	0.75	0.70	0.70	0.70	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	206.0	192.6	198.0	206.0	189.1	195.5	206.0	185.6	193.0	206.0
MIN. OPERATING LEVEL(M) :	134.8	93.2	117.9	142.7	93.1	121.4	149.6	93.0	124.2	155.5
POWER -----										
FIRM DISCHARGE (M3/S) :	150.1	148.2	147.7	147.2	145.5	144.9	144.3	142.0	141.4	140.7
PLANT PEAK DIS. (M3/S) :	450.2	444.6	443.1	441.5	436.4	434.7	432.8	426.2	424.3	422.1
AVERAGE NET HEAD (M) :	155.7	153.3	144.9	158.3	130.9	144.4	160.5	128.5	143.6	162.4
INSTALLED CAPACITY (MW) :	577.1	487.9	528.5	575.2	470.4	516.7	571.9	451.0	501.7	564.4
GUARANTEED POWER (MW) :	382.1	233.7	318.1	401.7	229.0	323.6	417.2	223.2	325.3	426.0
AVERAGE FIRM POWER (MW) :	192.4	162.6	176.2	191.7	156.8	172.2	190.6	150.3	167.2	188.1
FIRM ENERGY (MIL KWH/Y) :	1685.	1424.	1543.	1679.	1373.	1509.	1670.	1317.	1465.	1648.
SECONDARY ENERGY (") :	185.	186.	196.	210.	204.	216.	235.	225.	241.	265.
ANNUAL AVERAGE E-GY (") :	1870.	1611.	1739.	1889.	1577.	1725.	1904.	1542.	1705.	1913.

D A M

DAM HEIGHT (M) :	190.0	176.6	182.0	190.0	173.1	179.5	190.0	169.6	177.0	190.0
EMBANKMENT VOL. (MIL M3) :	27.407	22.494	24.410	27.407	21.353	23.493	27.407	20.211	22.604	27.407

EVALUATION INDICES

CH/V :	30985.	34578.	32735.	30373.	35002.	32837.	29764.	35335.	32865.	29021.
C/V :	173.	208.	191.	169.	215.	194.	165.	222.	197.	162.
P/(20VT+VD) :	16.6	16.4	16.7	16.6	16.5	16.8	16.5	16.5	16.9	16.3
E(FIRM)/(20VT+VD) :	48.5	47.8	48.7	48.4	48.1	48.1	48.2	48.1	49.2	47.7
E(F+SEC*0.3)/(20VT+VD) :	50.1	49.7	50.5	50.2	50.2	51.2	50.2	50.6	51.6	50.0

PROJECT NAME : 8ULU  
 PROJECT ID : 2-6-0-3-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : ABULOG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.70	0.65	0.65	0.65	0.60	0.60	0.60	0.55	0.55	0.55
FULL SUPPLY LEVEL (M) :	218.0	198.7	206.1	218.0	194.9	203.8	218.0	191.4	201.7	218.0
MIN. OPERATING LEVEL (M) :	161.5	113.5	140.4	167.3	113.3	143.0	172.8	114.5	146.1	177.8
POWER										
FIRM DISCHARGE (M3/S) :	139.8	137.5	137.0	136.4	133.7	133.2	132.4	129.1	128.5	127.7
PLANT PEAK DIS. (M3/S) :	419.5	412.6	411.1	409.1	401.3	399.6	397.4	387.4	385.6	383.1
AVERAGE NET HEAD (M) :	118.1	89.7	103.4	120.0	87.1	102.8	121.9	85.3	102.4	123.6
INSTALLED CAPACITY (MW) :	408.0	304.6	349.9	404.3	287.7	338.3	398.8	271.9	325.1	389.7
GUARANTEED POWER (MW) :	264.7	106.3	192.0	276.7	102.9	195.2	285.9	103.2	197.7	290.7
AVERAGE FIRM POWER (MW) :	136.0	101.5	116.6	134.8	95.9	112.7	132.9	90.6	108.4	129.9
FIRM ENERGY (MIL KWH/Y) :	1191.	889.	1022.	1180.	840.	908.	1165.	794.	949.	1138.
SECONDARY ENERGY (") :	174.	163.	176.	197.	179.	195.	223.	198.	219.	254.
ANNUAL AVERAGE E-OY (") :	1365.	1053.	1198.	1377.	1019.	1183.	1387.	992.	1159.	1392.

D A M

DAM HEIGHT (M) :	145.7	126.4	133.8	145.7	122.6	131.5	145.7	119.1	129.4	145.7
EMBANKMENT VOL. (MIL M3) :	15.908	11.286	12.929	15.908	10.462	12.374	15.908	9.769	11.918	15.908

EVALUATION INDICES

CH/V	37967.	45385.	41875.	37015.	46083.	41783.	35972.	46221.	41134.	34658.
C/V	277.	384.	334.	270.	403.	339.	263.	417.	340.	253.
P/(20VT+VD)	19.5	18.7	19.5	19.3	18.7	19.5	19.1	18.6	19.4	18.7
E(FIRM)/(20VT+VD)	56.8	54.6	56.9	56.4	54.5	57.0	55.8	54.2	56.5	54.7
E(F+SEC*0.3)/(20VT+VD)	59.3	57.6	59.9	59.2	58.0	60.4	59.0	58.3	60.4	58.4

PROJECT NAME : NABABARAYAN  
 PROJECT ID : 2- 6- 1- 4-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : APAYAO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.45	0.40	0.40	0.40	0.35	0.35	0.35	0.30	0.30	0.30
FULL SUPPLY LEVEL (M) :	240.0	220.6	228.2	240.0	214.6	224.5	240.0	208.8	220.7	240.0
MIN. OPERATING LEVEL (M) :	186.8	144.1	169.7	195.3	143.6	173.1	202.7	143.0	176.2	209.3
POWER										
FIRM DISCHARGE (M3/S) :	77.9	73.5	73.2	72.9	67.9	67.6	67.2	62.0	61.6	61.2
PLANT PEAK DIS. (M3/S) :	311.4	293.9	282.7	291.5	271.7	270.3	268.8	247.9	246.4	244.7
AVERAGE NET HEAD (M) :	118.6	91.9	105.3	121.5	87.9	104.0	123.8	83.7	102.4	125.9
INSTALLED CAPACITY (MW) :	304.0	222.4	253.7	291.5	196.6	231.3	274.1	170.7	207.7	253.7
GUARANTEED POWER (MW) :	202.9	94.2	152.2	209.6	86.0	147.7	208.6	77.4	140.4	202.4
AVERAGE FIRM POWER (MW) :	76.0	55.6	63.4	72.9	49.1	57.8	68.5	42.7	51.9	63.4
FIRM ENERGY (MIL KWH/Y) :	666.	487.	556.	638.	430.	507.	600.	374.	455.	556.
SECONDARY ENERGY ("") :	242.	236.	253.	279.	258.	282.	320.	278.	311.	364.
ANNUAL AVERAGE E-GY ("") :	907.	723.	809.	917.	688.	789.	920.	652.	766.	920.

D A M

DAM HEIGHT (M) :	145.0	125.6	133.2	145.0	119.8	129.5	145.0	113.8	125.7	145.0
EMBANKMENT VOL. (MIL M3) :	16.819	11.796	13.622	16.819	10.454	12.687	16.819	9.282	11.813	16.819

EVALUATION INDICES

CH/V :	19895.	23068.	21143.	18634.	22767.	20341.	17175.	22234.	19281.	15623.
C/V :	146.	196.	169.	137.	204.	168.	126.	211.	164.	115.
P/(20VT+VD) :	14.5	14.2	14.5	14.1	13.9	14.1	13.4	13.3	13.5	12.4
E(FIRM)/(20VT+VD) :	32.1	31.2	31.9	30.9	30.3	30.9	29.2	29.1	29.6	27.3
E(F*SEC*0.3)/(20VT+VD) :	35.5	35.7	36.2	35.0	35.8	36.1	33.9	35.6	35.6	32.6

PROJECT NAME : DIBAGAT  
 PROJECT ID : 2- 6- 1- 5-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : APAYAO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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 CASE  
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ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.90	0.80	0.80	0.80	0.75	0.75	0.75	0.70	0.70	0.70
FULL SUPPLY LEVEL (M) :	341.0	327.9	332.7	341.0	324.2	330.1	341.0	320.4	327.5	341.0
MIN. OPERATING LEVEL (M) :	240.3	210.7	236.3	261.8	210.6	240.4	270.3	210.5	244.0	277.4
POWER										
FIRM DISCHARGE (M3/S) :	80.7	78.6	78.4	78.1	77.1	76.9	76.6	75.7	75.4	75.1
PLANT PEAK DIS. (M3/S) :	242.2	235.7	235.1	234.4	231.4	230.7	229.9	227.1	226.3	225.4
AVERAGE NET HEAD (M) :	149.3	131.0	142.5	156.4	128.5	142.2	159.1	126.0	141.6	161.4
INSTALLED CAPACITY (MW) :	297.7	254.1	275.9	301.7	244.7	270.0	301.1	235.5	263.8	299.5
GUARANTEED POWER (MW) :	156.0	97.7	144.2	190.3	95.7	149.0	201.8	93.8	152.4	210.4
AVERAGE FIRM POWER (MW) :	99.2	84.7	91.9	100.6	81.6	90.0	100.4	78.5	87.9	99.8
FIRM ENERGY (MIL KWH/Y) :	869.	742.	805.	881.	715.	788.	879.	688.	770.	875.
SECONDARY ENERGY (") :	74.	87.	91.	97.	96.	101.	110.	105.	112.	123.
ANNUAL AVERAGE E-GY (") :	943.	829.	896.	978.	811.	890.	989.	793.	882.	998.

D A M  
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DAM HEIGHT (M) :	192.0	178.9	183.7	192.0	175.2	181.1	192.0	171.4	178.5	192.0
EMBANKMENT VOL.(MIL M3) :	18.602	15.280	16.407	18.602	14.413	15.793	18.602	13.832	15.181	18.602

EVALUATION INDICES  
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CH/V :	25027.	27567.	26311.	24206.	28069.	26417.	23731.	26479.	26548.	23261.
C/V :	137.	162.	151.	132.	169.	154.	130.	175.	157.	127.
P/(20VT+VD) :	13.6	13.7	14.0	13.8	13.9	14.2	13.8	14.0	14.3	13.7
E(FIRM)/(20VT+VD) :	39.6	40.0	40.9	40.2	40.4	41.4	40.2	40.8	41.8	40.0
E(F+SEC*0.3)/(20VT+VD) :	40.7	41.4	42.3	41.6	42.1	43.0	41.7	42.7	43.6	41.7

PROJECT NAME : AGBULU  
 PROJECT ID : 2- 6- 1- 6-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : APAYAO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.75	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	346.0	327.7	334.0	346.0	323.8	331.3	346.0	319.5	328.7	346.0
MIN. OPERATING LEVEL(M) :	278.1	227.8	256.3	284.8	227.6	259.3	291.0	227.4	262.2	296.9
PLANT DISCHARGE (M3/S) :	64.6	63.8	63.6	63.4	62.3	62.1	61.8	60.6	60.4	60.0
PLANT PEAK DIS. (M3/S) :	193.9	191.5	190.8	190.1	187.0	186.3	185.5	181.9	181.1	180.2
AVERAGE NET HEAD (M) :	135.6	107.0	120.5	137.7	104.4	119.7	139.8	101.5	118.8	141.6
INSTALLED CAPACITY (MW) :	216.4	168.6	189.2	215.5	160.6	183.5	213.4	151.9	177.2	210.1
GUARANTEED POWER (MW) :	137.3	60.6	102.7	144.4	59.0	104.7	149.9	57.1	105.8	153.8
AVERAGE FIRM POWER (MW) :	72.1	56.2	63.1	71.8	53.5	61.2	71.1	50.6	59.1	70.0
FIRM ENERGY (MIL KWH/Y) :	632.	492.	553.	629.	469.	536.	623.	443.	517.	613.
SECONDARY ENERGY (") :	81.	77.	82.	90.	85.	91.	102.	93.	101.	115.
ANNUAL AVERAGE E-GY (") :	713.	569.	634.	720.	554.	627.	725.	536.	618.	729.

D A M

DAM HEIGHT (M) : 167.0 148.7 155.0 167.0 144.8 152.3 167.0 140.5 149.7 167.0  
 EMBANKMENT VOL. (MIL M3) : 10.090 7.429 8.278 10.090 6.940 7.884 10.090 6.397 7.553 10.090

EVALUATION INDICES

CH/V : 31953. 37996. 35466. 31319. 36630. 35674. 30541. 39490. 35539. 29661.  
 C/V : 202. 271. 242. 193. 283. 248. 193. 299. 252. 188.  
 P/(20VT+VD) : 16.3 15.9 16.5 16.2 15.9 16.6 16.1 15.9 16.6 15.9  
 E(FIRM)/(20VT+VD) : 47.5 48.4 48.2 47.4 48.4 48.5 47.0 46.5 48.4 46.4  
 E(F+SEC0.3)/(20VT+VD) : 49.3 48.5 50.3 49.4 48.9 50.9 49.3 49.5 51.2 49.0

PROJECT NAME : AOAN  
 PROJECT ID : 2- 6- 1- 7-0-1  
 TYPE : RESERVOIR

BASIN NAME : ABULOG  
 RIVER NAME : APAYAO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

RESERVOIR	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.90	0.80	0.80	0.80	0.70	0.70	0.70	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	520.0	510.2	513.9	520.0	504.3	509.7	520.0	497.6	505.1	520.0
MIN. OPERATING LEVEL (M) :	414.3	384.2	413.4	442.5	384.0	423.0	462.0	383.7	429.8	475.9
POWER										
FIRM DISCHARGE (M3/S) :	24.4	23.7	23.7	23.6	22.9	22.8	22.6	21.7	21.6	21.4
PLANT PEAK DIS. (M3/S) :	146.3	142.3	142.0	141.4	137.1	136.7	135.6	130.2	129.7	128.3
AVERAGE NET HEAD (M) :	160.6	144.5	156.4	170.0	140.5	156.8	176.3	135.9	155.9	180.8
INSTALLED CAPACITY (MW) :	193.7	169.3	182.9	197.9	158.6	176.4	196.8	145.7	166.5	180.9
GUARANTEED POWER (MW) :	103.6	67.5	98.6	131.2	64.8	106.1	146.3	61.3	107.5	152.2
AVERAGE FIRM POWER (MW) :	32.3	28.2	30.5	33.0	26.4	29.4	32.8	24.3	27.7	31.8
FIRM ENERGY (MIL KWH/Y) :	283.	247.	267.	289.	231.	258.	287.	213.	243.	279.
SECONDARY ENERGY (") :	29.	35.	36.	39.	43.	45.	50.	54.	57.	64.
ANNUAL AVERAGE E-GY (") :	312.	282.	303.	328.	275.	303.	337.	267.	300.	343.

D A M

DAM HEIGHT (M) :	206.0	196.2	199.9	206.0	190.3	195.7	206.0	183.6	191.1	206.0
EMBANKMENT VOL. (MIL M3) :	27.572	24.195	25.470	27.572	22.356	23.998	27.572	20.347	22.588	27.572

EVALUATION INDICES

CH/V :	5468.	5766.	5568.	5278.	5821.	5558.	5058.	5849.	5463.	4781.
C/V :	28.	31.	29.	27.	32.	30.	26.	34.	30.	24.
P/(20VT+VD) :	6.4	6.3	5.5	6.5	6.3	6.6	6.5	6.3	6.6	6.3
E(FIRM)/(20VT+VD) :	9.3	9.2	9.5	9.5	9.2	9.6	9.5	9.2	9.6	9.2
E(F+SEC*0.3)/(20VT+VD) :	9.6	9.6	9.8	9.9	9.7	10.1	10.0	9.9	10.3	9.8

PROJECT NAME : APAYAO  
 PROJECT ID : 2- 6- 1- 8-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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 CASE  
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ITEMS	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.975	0.900	0.800	0.700	0.676
FULL SUPPLY LEVEL (M)	453.4	454.0	454.5	455.0	455.1
NORMAL OPERATING LEVEL (M)	452.7	453.3	453.8	454.3	454.4
MINIMUM OPERATING LEVEL (M)	452.0	452.6	453.1	453.5	453.6
OVERFLOW WEIR HEIGHT INC. 3M F-B	6.4	7.0	7.5	8.0	8.1
WATER DEPTH AT TRASHRACK (M)	3.4	4.0	4.5	5.0	5.1
CHANNEL WIDTH AT TRASHRACK (M)	4.0	6.3	8.3	10.2	10.6
PONDAGE STORAGE VOLUME (1000 M3)	85.8	99.3	112.7	124.3	126.9

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 WATERWAY  
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NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.9	2.4	2.8	2.9
HEADRACE TUNNEL LENGTH (M)	8120.0	8120.0	8120.0	8120.0	8120.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.4	1.8	2.1	2.2
PENSTOCK LENGTH (HORIZONTAL) (M)	175.0	175.0	175.0	175.0	175.0
EXCAVATION VOLUME (1000 M3)	21.0	24.1	36.4	52.0	55.2

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 POWER  
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FIRM DISCHARGE (M3/S)	1.2	1.2	1.2	1.2	1.2
DEPENDABLE DISCHARGE (M3/S)	2.1	2.1	2.1	2.1	2.1
PLANT PEAK DISCHARGE (M3/S)	2.0	4.9	8.6	12.9	14.0
TAIL WATER LEVEL (M)	305.0	305.0	305.0	305.0	305.0
NET HEAD (M)	142.8	133.1	135.1	135.7	135.8
INSTALLED CAPACITY (MW)	2.4	5.4	9.6	14.5	15.7
DEPENDABLE PEAK POWER (MW)	2.4	2.3	2.3	2.3	2.3
FIRM POWER (MW)	1.5	1.4	1.4	1.4	1.4
GUARANTEED POWER OUTPUT (MW)	1.3	1.2	1.2	1.2	1.2
FIRM ENERGY/YEAR (10**6 KWH)	12.3	11.9	12.1	12.1	12.1
SECONDARY ENERGY/YEAR (10**6 KWH)	7.0	27.9	50.1	69.4	73.1
ANNUAL ENERGY (MIL KWH/YR)	19.7	39.8	62.2	81.5	85.3

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 PARAMETERS  
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P (INSTALLED) / (20VT) (W/M3)	5.7	11.2	12.5	13.9	14.2
P (DEPENDABLE) / (20VT) (W/M3)	5.8	4.7	3.0	2.2	2.1
E (FIRM) / (20VT) (KWH/M3)	30.4	24.7	15.7	11.7	11.0
E (F+0.3*SECONDARY) / (20VT) (")	35.4	42.1	35.3	31.7	30.9



PROJECT NAME : ZINUNDUNGAN  
 PROJECT ID : 2-3-1-1-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : ZINUNDUNGAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

ITEMS	1	2	3	4	5	6	7	8	9	10
RESERVOIR										
RESERVOIR DEVELOP. COEF :	0.67	0.65	0.65	0.65	0.55	0.55	0.55	0.45	0.45	0.45
FULL SUPPLY LEVEL (M) :	89.0	93.1	85.3	89.0	80.2	83.6	89.0	76.5	81.8	89.0
MIN. OPERATING LEVEL (M) :	55.9	53.0	60.0	67.0	52.8	62.2	71.6	52.7	64.0	75.2
POWER										
FIRM DISCHARGE (M3/S) :	8.0	8.0	7.9	7.9	7.5	7.4	7.4	6.8	6.7	6.6
PLANT PEAK DIS. (M3/S) :	16.0	16.0	15.9	15.8	15.0	14.9	14.7	13.7	13.5	13.3
AVERAGE NET HEAD (M) :	42.8	34.7	38.4	43.1	32.6	37.9	44.5	30.4	37.6	46.1
INSTALLED CAPACITY (MW) :	5.6	4.6	5.0	5.6	4.0	4.6	5.4	3.4	4.2	5.0
GUARANTEED POWER (MW) :	3.4	1.8	2.7	3.5	1.7	2.8	3.6	1.6	2.7	3.8
AVERAGE FIRM POWER (MW) :	2.8	2.3	2.5	2.8	2.0	2.3	2.7	1.7	2.1	2.5
FIRM ENERGY (MIL KWH/Y) :	25.	20.	22.	25.	18.	20.	24.	15.	18.	22.
SECONDARY ENERGY (%) :	3.	3.	3.	4.	4.	4.	5.	4.	5.	6.
ANNUAL AVERAGE E-GY (%) :	28.	23.	25.	28.	21.	24.	25.	19.	23.	28.
D A M										
DAM HEIGHT (M) :	60.0	54.1	56.3	60.0	51.2	54.6	60.0	47.5	52.8	60.0
EMBANKMENT VOL. (MIL M3) :	1.144	0.881	0.972	1.144	0.784	0.900	1.144	0.659	0.837	1.144
EVALUATION INDICES										
CH/V	11125.	12799.	12086.	10985.	12619.	11759.	10224.	12536.	11069.	9281.
C/V	220.	286.	258.	218.	302.	261.	203.	327.	254.	183.
P/(20VT+VD)	2.6	2.3	2.5	2.5	2.2	2.4	2.5	2.0	2.2	2.3
E(FIRM)/(20VT+VD)	11.2	10.3	10.8	11.1	9.6	10.4	10.7	8.7	9.7	10.0
E(F+SEC*0.3)/(20VT+VD)	11.6	10.8	11.3	11.6	10.2	11.0	11.4	9.5	10.4	10.9

PROJECT NAME : CAPI SAYAN  
 PROJECT ID : 2- 8- 2- 2-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : DUMNON

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.47	0.45	0.45	0.45	0.45	0.45	0.40	0.40	0.40	0.40
FULL SUPPLY LEVEL (M) :	100.0	99.4	99.5	99.6	99.8	100.0	97.8	96.1	99.4	100.0
MIN. OPERATING LEVEL (M) :	78.9	78.9	79.4	79.9	80.3	80.8	78.9	80.2	82.8	84.1
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	5.4	5.4	5.4	5.4	5.3	5.3	5.2	5.2	5.1	5.1
PLANT PEAK DIS. (M <sup>3</sup> /S) :	10.9	10.7	10.7	10.7	10.7	10.7	10.3	10.3	10.2	10.2
AVERAGE NET HEAD (M) :	37.0	36.7	36.9	37.1	37.4	37.7	35.7	36.3	38.0	38.8
INSTALLED CAPACITY (MW) :	3.3	3.2	3.3	3.3	3.3	3.3	3.0	3.1	3.2	3.3
GUARANTEED POWER (MW) :	2.0	1.9	2.0	2.0	2.0	2.1	1.9	2.0	2.2	2.3
AVERAGE FIRM POWER (MW) :	1.7	1.6	1.6	1.6	1.6	1.7	1.5	1.5	1.6	1.6
FIRM ENERGY (MIL KWH/Y) :	15.	14.	14.	14.	14.	15.	13.	13.	14.	14.
SECONDARY ENERGY (%) :	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
ANNUAL AVERAGE E-SY (%) :	20.	20.	20.	20.	20.	20.	19.	19.	20.	20.

D A M	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	52.0	51.4	51.5	51.6	51.8	52.0	49.8	50.1	51.4	52.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	2.063	2.006	2.014	2.022	2.040	2.063	1.847	1.876	2.001	2.063

EVALUATION INDICES	1	2	3	4	5	6	7	8	9	10
CH/V :	3661.	3670.	3658.	3647.	3625.	3600.	3703.	3660.	3510.	3441.
C/V :	83.	84.	84.	84.	83.	82.	89.	87.	81.	78.
P/(20VT+VD) :	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
E(FIRM)/(20VT+VD) :	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
E(F+SECK0.3)/(20VT+VD) :	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5

PROJECT NAME : BASAC  
 PROJECT ID : 2- 8- 3- 3-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : CHICO

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 \* SUMMARY TABLE OF OUTPUTS \*  
 \*\*\*\*\*

CASE

RESERVOIR	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.85	0.75	0.75	0.75	0.70	0.70	0.70	0.65	0.65	0.65
FULL SUPPLY LEVEL (M) :	768.0	749.9	757.2	768.0	745.1	753.7	768.0	740.3	750.3	768.0
MIN. OPERATING LEVEL (M) :	644.9	596.4	635.2	674.1	596.3	640.7	685.2	596.2	645.5	694.8
POWER										
FIRM DISCHARGE (M3/S) :	48.6	47.9	47.6	47.6	47.5	47.4	47.2	46.8	46.7	46.5
PLANT PEAK DIS. (M3/S) :	291.5	287.4	286.7	285.9	284.9	284.1	283.2	280.8	280.0	278.9
AVERAGE NET HEAD (M) :	211.0	183.3	200.7	220.5	180.1	200.2	224.1	176.9	199.5	227.2
INSTALLED CAPACITY (MW) :	506.2	433.5	473.8	518.9	422.3	468.3	522.4	408.9	459.9	521.7
GUARANTEED POWER (MW) :	294.5	182.2	268.4	353.8	180.6	278.3	375.0	177.9	284.7	390.1
AVERAGE FIRM POWER (MW) :	84.4	72.3	79.0	86.5	70.4	78.1	87.1	68.2	76.6	86.9
FIRM ENERGY (MIL KWH/Y) :	739.	633.	692.	758.	617.	684.	763.	597.	671.	752.
SECONDARY ENERGY (") :	111.	113.	118.	125.	116.	122.	132.	123.	130.	143.
ANNUAL AVERAGE E-GY (") :	850.	746.	810.	883.	733.	806.	895.	720.	802.	904.

D A M

DAM HEIGHT (M) :	264.0	245.9	253.2	264.0	241.1	249.7	264.0	236.3	246.3	264.0
EMBANKMENT VOL. (MIL M3) :	57.804	47.067	51.381	57.804	44.215	49.293	57.804	41.690	47.260	57.804

EVALUATION INDICES

CH/V :	6679.	7524.	7080.	6545.	7779.	7207.	6481.	7963.	7300.	6381.
C/V :	27.	32.	29.	26.	34.	30.	26.	35.	31.	25.
P/(20VT+VD) :	7.9	8.1	8.2	8.1	8.3	8.4	8.1	8.5	8.5	8.1
E(FIRM)/(20VT+VD) :	11.5	11.8	11.9	11.8	12.1	12.2	11.8	12.4	12.5	11.8
E(F+SEC*0.3)/(20VT+VD) :	12.0	12.4	12.5	12.3	12.6	12.9	12.5	13.1	13.2	12.5

PROJECT NAME : CHICO-1R  
 PROJECT ID : 2- 8- 3- 4-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	623.1	623.3	623.6	623.9	624.2
NORMAL OPERATING LEVEL (M)	621.7	622.1	622.7	623.2	623.6
MINIMUM OPERATING LEVEL (M)	620.3	620.9	621.7	622.6	623.0
DIVERSION WEIR HEIGHT INC. 3M F-B:	9.1	9.3	9.6	9.9	10.2
WATER DEPTH AT TRASHRACK (M)	6.1	6.3	6.6	6.9	7.2
CHANNEL WIDTH AT TRASHRACK (M)	9.1	11.5	14.9	18.3	20.2
PONDAGE STORAGE VOLUME (1000 M3)	341.5	372.7	414.3	457.2	510.2

ITEMS	CASE				
	1	2	3	4	5
WATERWAY					
NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	2.6	3.1	3.8	4.4	4.7
HEADRACE TUNNEL LENGTH (M)	2950.0	2950.0	2950.0	2950.0	2950.0
INSIDE DIAMETER OF PENSTOCK (M)	2.0	2.5	3.0	3.5	3.8
PENSTOCK LENGTH (HORIZONTAL) (M)	135.0	135.0	135.0	135.0	135.0
EXCAVATION VOLUME (1000 M3)	16.1	23.2	33.9	46.4	53.7

ITEMS	CASE				
	1	2	3	4	5
POWER					
FIRM DISCHARGE (M3/S)	6.2	6.2	6.2	6.2	6.2
DEPENDABLE DISCHARGE (M3/S)	10.3	10.3	10.3	10.3	10.3
PLANT PEAK DISCHARGE (M3/S)	10.2	16.7	27.6	41.9	50.9
TAIL WATER LEVEL (M)	555.0	555.0	555.0	555.0	555.0
NET HEAD (M)	61.8	62.4	63.0	63.0	63.4
INSTALLED CAPACITY (MW)	5.2	8.5	14.2	21.7	26.6
DEPENDABLE PEAK POWER (MW)	5.2	5.3	5.3	5.4	5.4
FIRM POWER (MW)	3.1	3.2	3.2	3.2	3.2
GUARANTEED POWER OUTPUT (MW)	2.7	2.8	2.8	2.9	2.9
FIRM ENERGY/YEAR (10**6 KWH)	27.4	27.6	27.9	28.1	28.3
SECONDARY ENERGY/YEAR (10**6 KWH)	15.3	36.2	65.6	95.6	111.9
ANNUAL ENERGY (MIL KWH/YR)	42.7	63.8	93.4	123.8	140.2

PARAMETERS	CASE				
	1	2	3	4	5
P (INSTALLED) / (20VT) (W/M3)	16.1	18.3	20.9	23.4	24.8
P (DEPENDABLE) / (20VT) (W/M3)	16.2	11.3	7.8	5.8	5.0
E (FIRM) / (20VT) (KWH/M3)	85.1	59.5	41.1	30.3	25.4
E (F+0.3*SECONDARY) / (20VT) (%)	99.4	82.9	70.0	61.3	57.6

PROJECT NAME : SADANGA  
 PROJECT ID : 2- 8- 3- 5-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : CHICO

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.80	0.70	0.70	0.70	0.65	0.65	0.65	0.60	0.60	0.60
FULL SUPPLY LEVEL (M) :	890.0	867.7	875.3	890.0	863.0	871.8	890.0	857.9	868.3	890.0
MIN. OPERATING LEVEL(M) :	792.6	736.5	775.0	811.6	736.4	779.3	820.2	738.3	782.7	827.1
POWER										
FIRM DISCHARGE (M3/S) :	40.2	39.7	39.6	39.5	39.1	39.0	38.9	38.3	38.2	38.1
PLANT PEAK DIS. (M3/S) :	160.8	158.6	158.3	157.8	156.3	155.9	155.5	153.4	152.9	152.4
AVERAGE NET HEAD (M) :	177.1	144.7	161.7	183.3	141.6	160.8	186.1	138.2	159.6	188.4
INSTALLED CAPACITY (MW) :	234.6	189.0	210.7	238.2	182.2	206.5	238.2	174.5	200.9	236.3
GUARANTEED POWER (MW) :	141.5	72.9	117.7	162.2	71.8	121.2	170.2	70.3	122.9	175.0
AVERAGE FIRM POWER (MW) :	58.6	47.2	52.7	59.5	45.6	51.6	59.6	43.6	50.2	59.1
FIRM ENERGY (MIL KWH/Y) :	514.	414.	461.	522.	399.	452.	522.	382.	440.	517.
SECONDARY ENERGY (") :	74.	72.	76.	83.	76.	81.	90.	81.	87.	98.
ANNUAL AVERAGE E-GY (") :	588.	486.	537.	605.	475.	533.	611.	463.	527.	616.
D A M										
DAM HEIGHT (M) :	220.0	197.7	205.3	220.0	193.0	201.8	220.0	187.9	198.3	220.0
EMBANKMENT VOL. (MIL M3) :	23.099	17.029	18.966	23.099	15.940	18.066	23.099	14.774	17.163	23.099
EVALUATION INDICES										
CH/V :	11507.	13793.	12836.	11284.	14159.	13044.	11111.	14572.	13215.	10888.
C/V :	55.	73.	66.	54.	77.	68.	53.	82.	70.	52.
P/(20VT+VD) :	8.5	8.8	9.0	8.6	8.9	9.2	8.6	9.1	9.3	8.6
E(FIRM)/(20VT+VD) :	18.6	19.2	19.7	18.8	19.5	20.1	18.9	19.9	20.3	18.8
E(F+SEC*0.3)/(20VT+VD) :	19.4	20.2	20.6	19.5	20.7	21.1	19.9	21.1	21.6	19.8

PROJECT NAME : CHICO-2R  
 PROJECT ID : 2- 3- 3- 6-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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 CASE  
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ITEMS	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	779.6	779.8	780.0	780.2	780.4
NORMAL OPERATING LEVEL (M)	778.1	778.4	778.9	779.4	779.6
MINIMUM OPERATING LEVEL (M)	776.5	777.1	777.8	778.5	778.9
DIVERSION WEIR HEIGHT INC. 3M F-B	9.0	9.2	9.4	9.6	9.8
WATER DEPTH AT TRASHRACK (M)	6.0	6.2	6.4	6.6	6.8
CHANNEL WIDTH AT TRASHRACK (M)	7.7	9.9	12.7	15.6	17.2
PONDAGE STORAGE VOLUME (1000 M3)	213.2	234.2	255.4	277.5	289.5

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 WATERWAY  
 -----

NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	2.3	2.8	3.3	3.9	4.2
HEADRACE TUNNEL LENGTH (M)	5950.0	5950.0	5950.0	5950.0	5950.0
INSIDE DIAMETER OF PENSTOCK (M)	1.7	2.1	2.6	3.1	3.3
PENSTOCK LENGTH (HORIZONTAL) (M)	275.0	275.0	275.0	275.0	275.0
EXCAVATION VOLUME (1000 M3)	24.5	36.9	53.9	73.7	85.4

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 POWER  
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FIRM DISCHARGE (M3/S)	4.5	4.5	4.5	4.5	4.5
DEPENDABLE DISCHARGE (M3/S)	7.5	7.5	7.5	7.5	7.5
PLANT PEAK DISCHARGE (M3/S)	7.5	12.2	20.2	30.6	37.2
TAIL WATER LEVEL (M)	660.0	660.0	660.0	660.0	660.0
NET HEAD (M)	106.1	107.6	108.2	108.8	109.1
INSTALLED CAPACITY (MW)	6.5	10.3	18.0	27.4	33.4
DEPENDABLE PEAK POWER (MW)	6.6	6.7	6.7	6.7	6.8
FIRM POWER (MW)	3.9	4.0	4.0	4.0	4.1
GUARANTEED POWER OUTPUT (MW)	3.5	3.6	3.6	3.6	3.6
FIRM ENERGY/YEAR (10**6 KWH)	34.6	35.1	35.3	35.5	35.6
SECONDARY ENERGY/YEAR (10**6 KWH)	19.2	45.7	82.6	120.2	140.0
ANNUAL ENERGY (ML KWH/YR)	53.7	80.8	117.8	155.6	175.6

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 PARAMETERS  
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P (INSTALLED) / (20VT) (W/M3)	13.3	14.6	16.7	18.6	19.5
P (DEPENDABLE) / (20VT) (W/M3)	13.4	9.0	6.2	4.6	4.0
E (FIRM) / (20VT) (KWH/M3)	70.6	47.5	32.7	24.0	20.3
E (F+0.3*SECONDARY) / (20VT) (%)	82.4	66.1	55.7	48.5	45.4

PROJECT NAME : CHICO-3R  
 PROJECT ID : 2-3-3-7-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.966	0.900	0.900	0.700	0.649
FULL SUPPLY LEVEL (M)	866.6	857.0	867.6	868.3	868.6
NORMAL OPERATING LEVEL (M)	866.4	866.8	867.4	868.0	868.4
MINIMUM OPERATING LEVEL (M)	866.1	866.6	867.2	867.8	868.1
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.1	6.5	7.1	7.8	8.1
WATER DEPTH AT TRASHRACK (M)	3.1	3.5	4.1	4.8	5.1
CHANNEL WIDTH AT TRASHRACK (M)	6.5	8.2	10.7	13.2	14.6
PONDAGE STORAGE VOLUME (1000 M3)	619.1	709.1	828.9	952.8	1020.4
WATERWAY					
NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	2.0	2.4	2.9	3.4	3.7
HEADRACE TUNNEL LENGTH (M)	3850.0	3850.0	3850.0	3850.0	3850.0
INSIDE DIAMETER OF PENSTOCK (M)	1.5	1.9	2.3	2.7	2.9
PENSTOCK LENGTH (HORIZONTAL) (M)	175.0	175.0	175.0	175.0	175.0
EXCAVATION VOLUME (1000 M3)	12.3	18.5	27.1	37.0	42.9
POWER					
FIRM DISCHARGE (M3/S)	3.2	3.2	3.2	3.2	3.2
DEPENDABLE DISCHARGE (M3/S)	5.4	5.4	5.4	5.4	5.4
PLANT PEAK DISCHARGE (M3/S)	5.3	8.7	14.4	21.3	26.5
TAIL WATER LEVEL (M)	780.0	780.0	780.0	780.0	780.0
NET HEAD (M)	78.6	79.8	80.4	81.1	81.5
INSTALLED CAPACITY (MW)	3.4	5.7	9.5	14.5	17.8
DEPENDABLE PEAK POWER (MW)	3.5	3.5	3.6	3.6	3.6
FIRM POWER (MW)	2.1	2.1	2.1	2.2	2.2
GUARANTEED POWER OUTPUT (MW)	1.9	1.9	1.9	1.9	1.9
FIRM ENERGY/YEAR (10**6 KWH)	18.3	18.5	18.7	18.8	18.9
SECONDARY ENERGY/YEAR (10**6 KWH)	10.0	23.9	43.4	63.5	74.2
ANNUAL ENERGY (MIL KWH/YR)	28.2	42.4	62.1	82.3	93.1
PARAMETERS					
P(INSTALLED)/(20VT) (W/M3)	14.0	15.4	17.6	19.6	20.7
P(DEPENDABLE)/(20VT) (W/M3)	14.1	9.5	6.6	4.8	4.2
E(FIRM)/(20VT) (KWH/M3)	74.2	50.0	34.5	25.4	22.1
E(F*0.3*SECONDARY)/(20VT) (%)	86.4	60.4	58.5	51.2	45.0





PROJECT NAME : CHICO-4R  
 PROJECT ID : 2-8-3-9-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	993.0	993.3	993.8	994.2	994.4
NORMAL OPERATING LEVEL (M)	992.6	992.9	993.3	993.7	994.0
MINIMUM OPERATING LEVEL (M)	992.1	992.4	992.9	993.3	993.5
DIVERSION WEIR HEIGHT INC. 3M F-B	6.0	6.3	6.8	7.2	7.4
WATER DEPTH AT TRASHRACK (M)	3.0	3.3	3.8	4.2	4.4
CHANNEL WIDTH AT TRASHRACK (M)	4.5	5.8	7.4	9.2	10.1
PONDAGE STORAGE VOLUME (1000 M3)	151.3	166.9	187.7	209.2	220.9

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	2.2	2.6	2.8
HEADRACE TUNNEL LENGTH (M)	6620.0	6620.0	6620.0	6620.0	6620.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.4	1.7	2.0	2.1
PENSTOCK LENGTH (HORIZONTAL) (M)	220.0	220.0	220.0	220.0	220.0
EXCAVATION VOLUME (1000 M3)	17.2	17.5	25.5	36.4	42.2

POWER

FIRM DISCHARGE (M3/S)	1.6	1.6	1.6	1.6	1.6
DEPENDABLE DISCHARGE (M3/S)	2.6	2.6	2.6	2.6	2.6
PLANT PEAK DISCHARGE (M3/S)	2.6	4.2	6.9	10.5	12.7
TAIL WATER LEVEL (M)	870.0	870.0	870.0	870.0	870.0
NET HEAD (M)	116.6	110.1	110.6	112.2	112.5
INSTALLED CAPACITY (MW)	2.5	3.8	6.3	9.7	11.8
DEPENDABLE PEAK POWER (MW)	2.5	2.3	2.4	2.4	2.4
FIRM POWER (MW)	1.5	1.4	1.4	1.4	1.4
GUARANTEED POWER OUTPUT (MW)	1.3	1.3	1.3	1.3	1.3
FIRM ENERGY/YEAR (10**6 KWH)	13.0	12.3	12.4	12.6	12.6
SECONDARY ENERGY/YEAR (10**6 KWH)	7.1	15.9	28.8	42.4	49.4
ANNUAL ENERGY (MIL KWH/YR)	20.2	28.2	41.1	54.9	62.0

PARAMETERS

P (INSTALLED)/(20VT) (W/M3)	7.2	10.8	12.3	13.3	14.0
P (DEPENDABLE)/(20VT) (W/M3)	7.2	6.7	4.6	3.3	2.8
E (FIRM)/(20VT) (KWH/M3)	37.9	35.3	24.2	17.2	14.9
E (F+0.3*SECONDARY)/(20VT) (")	44.1	48.9	41.2	34.7	32.5

PROJECT NAME : MATALAG  
 PROJECT ID : 2- 8- 4-10-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : MATALAG

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.80	0.70	0.70	0.67	0.67	0.67	0.67	0.67	0.65	0.65
FULL SUPPLY LEVEL (M) :	81.0	78.4	81.0	77.7	78.6	79.5	80.3	81.0	76.9	81.0
MIN. OPERATING LEVEL (M) :	51.9	51.8	57.2	51.8	53.5	55.2	56.9	58.6	51.7	60.0
POWER										
FIRM DISCHARGE (M3/S) :	22.0	21.7	21.5	21.6	21.5	21.5	21.4	21.4	21.4	21.2
PLANT PEAK DIS. (M3/S) :	66.0	65.0	64.6	64.7	64.6	64.4	64.3	64.2	64.1	63.5
AVERAGE NET HEAD (M) :	42.1	40.3	43.8	39.8	41.0	42.1	43.2	44.2	39.3	44.7
INSTALLED CAPACITY (MW) :	22.9	21.5	23.3	21.2	21.8	22.3	22.9	23.4	20.7	23.4
GUARANTEED POWER (MW) :	11.7	11.5	14.1	11.4	12.3	13.1	13.9	14.7	11.3	15.3
AVERAGE FIRM POWER (MW) :	7.6	7.2	7.8	7.1	7.3	7.4	7.6	7.8	6.9	7.8
FIRM ENERGY (MIL. KWH/Y) :	67.	63.	68.	62.	64.	65.	67.	68.	61.	68.
SECONDARY ENERGY (") :	11.	11.	12.	11.	12.	12.	12.	12.	12.	13.
ANNUAL AVERAGE E-QY (") :	78.	74.	80.	73.	75.	77.	79.	81.	72.	81.

D A M

DAM HEIGHT (M) :	59.3	56.7	59.3	56.0	56.9	57.8	58.6	59.3	55.2	59.3
EMBANKMENT VOL. (MIL M3) :	1.637	1.473	1.637	1.426	1.483	1.540	1.592	1.637	1.378	1.637

EVALUATION INDICES

CH/V :	21938.	22799.	21462.	23088.	22569.	22086.	21670.	21326.	23297.	21089.
C/V :	424.	464.	415.	477.	458.	440.	425.	413.	488.	408.
P/(20VT+VD) :	7.5	7.5	7.6	7.4	7.5	7.6	7.6	7.7	7.4	7.7
E(FIRM)/(20VT+VD) :	21.8	21.6	22.2	21.7	21.9	22.0	22.2	22.4	21.6	22.3
E(F+SEC*0.3)/(20VT+VD) :	22.9	22.9	23.4	22.9	23.1	23.3	23.4	23.6	22.9	23.6

PROJECT NAME : NABUANGAN  
 PROJECT ID : 2- 8- 4-11-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
<b>HEAD PONDAGE</b>					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	353.1	353.3	353.5	353.8	354.0
NORMAL OPERATING LEVEL (M)	352.4	352.6	352.9	353.1	353.3
MINIMUM OPERATING LEVEL (M)	351.7	351.9	352.2	352.4	352.6
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.1	6.3	6.5	6.8	7.0
WATER DEPTH AT TRASHRACK (M)	3.1	3.3	3.5	3.8	4.0
CHANNEL WIDTH AT TRASHRACK (M)	2.8	3.6	4.6	5.7	6.3
PONDAGE STORAGE VOLUME (1000 M3)	38.6	41.1	44.3	47.6	49.5
<b>WATERWAY</b>					
NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	1.9
HEADRACE TUNNEL LENGTH (M)	5850.0	5850.0	5850.0	5850.0	5850.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.4	1.5
PENSTOCK LENGTH (HORIZONTAL) (M)	415.0	415.0	415.0	415.0	415.0
EXCAVATION VOLUME (1000 M3)	15.5	15.5	15.5	15.6	17.9
<b>POWER</b>					
FIRM DISCHARGE (M3/S)	0.6	0.6	0.6	0.6	0.6
DEPENDABLE DISCHARGE (M3/S)	1.0	1.0	1.0	1.0	1.0
PLANT PEAK DISCHARGE (M3/S)	1.0	1.6	2.7	4.1	4.9
TAIL WATER LEVEL (M)	245.0	245.0	245.0	245.0	245.0
NET HEAD (M)	105.6	104.6	101.4	95.7	95.7
INSTALLED CAPACITY (MW)	0.9	1.4	2.2	3.2	3.9
DEPENDABLE PEAK POWER (MW)	0.9	0.9	0.8	0.8	0.8
FIRM POWER (MW)	0.5	0.5	0.5	0.5	0.5
GUARANTEED POWER OUTPUT (MW)	0.5	0.5	0.4	0.4	0.4
FIRM ENERGY/YEAR (10**6 KWH)	4.6	4.5	4.4	4.1	4.1
SECONDARY ENERGY/YEAR (10**6 KWH)	2.5	5.9	10.3	14.0	16.3
ANNUAL ENERGY (MIL KWH/YR)	7.1	10.4	14.6	18.2	20.5
<b>PARAMETERS</b>					
P (INSTALLED)/(20VT) (W/M3)	2.8	4.5	7.2	10.3	10.9
P (DEPENDABLE)/(20VT) (W/M3)	2.8	2.8	2.7	2.5	2.2
E (FIRM)/(20VT) (KWH/M3)	14.8	14.6	14.2	13.3	11.6
E (F*0.3*SECONDARY)/(20VT) (")	17.2	20.3	24.1	26.9	25.3

PROJECT NAME : PINUKPUK  
 PROJECT ID : 2- 8- 5-12-0-1  
 TYPE : RESERVOIR

BASIN NAME : CACAYAN  
 RIVER NAME : SALTAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.86	0.73	0.73	0.73	0.63	0.63	0.63	0.53	0.53	0.53
FULL SUPPLY LEVEL (M) :	158.0	153.0	155.4	158.0	148.8	153.0	158.0	144.1	150.7	158.0
MIN. OPERATING LEVEL (M) :	111.8	111.7	116.8	121.8	111.5	120.0	128.4	111.4	122.7	134.1
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	20.4	20.0	20.0	19.9	19.5	19.4	19.3	18.7	18.6	18.5
PLANT PEAK DIS. (M <sup>3</sup> /S) :	40.9	40.0	39.9	39.9	38.9	38.8	38.7	37.4	37.3	37.1
AVERAGE NET HEAD (M) :	53.0	49.5	52.9	56.3	46.8	52.3	58.4	43.7	51.7	60.2
INSTALLED CAPACITY (MW) :	17.8	16.3	17.4	18.5	15.0	16.7	18.6	13.5	15.9	18.4
GUARANTEED POWER (MW) :	7.1	6.9	8.5	10.1	6.7	8.2	11.7	6.4	9.7	12.9
AVERAGE FIRM POWER (MW) :	8.9	8.2	8.7	9.2	7.5	8.4	9.3	6.7	7.9	9.2
FIRM ENERGY (MIL KWH/Y) :	78.	72.	76.	81.	66.	73.	81.	59.	69.	80.
SECONDARY ENERGY (%) :	9.	9.	9.	10.	10.	10.	11.	10.	12.	13.
ANNUAL AVERAGE E-GY (%) :	87.	81.	86.	91.	75.	84.	93.	69.	81.	94.

D A M

DAM HEIGHT (M) :	77.0	72.0	74.4	77.0	67.8	72.0	77.0	63.1	69.7	77.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	17.243	15.001	16.039	17.243	13.335	14.997	17.243	11.564	14.090	17.243

EVALUATION INDICES

CH/V :	2557.	2666.	2581.	2491.	2726.	2584.	2414.	2786.	2545.	2312.
C/V :	37.	42.	39.	36.	46.	41.	35.	51.	42.	34.
P/(20VT+VD) :	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
E(FIRM)/(20VT+VD) :	3.9	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.0
E(F+SEC*0.3)/(20VT+VD) :	4.0	4.2	4.2	4.2	4.3	4.3	4.3	4.3	4.3	4.2

PROJECT NAME : ADAGA  
 PROJECT ID : 2- 8- 5-13-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : SALTAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.68	0.58	0.58	0.58	0.53	0.53	0.53	0.48	0.48	0.48
FULL SUPPLY LEVEL (M) :	411.0	385.9	397.2	411.0	381.2	394.5	411.0	376.2	391.7	411.0
MIN. OPERATING LEVEL (M) :	346.5	309.2	334.0	358.8	309.1	336.7	364.4	308.9	339.4	369.3
POWER										
FIRM DISCHARGE (M3/S) :	10.5	10.1	10.1	10.1	9.9	9.9	9.9	9.6	9.6	9.6
PLANT PEAK DIS. (M3/S) :	63.0	60.9	60.7	60.6	59.7	59.5	59.3	57.9	57.7	57.5
AVERAGE NET HEAD (M) :	138.3	109.6	125.1	142.3	106.4	124.2	144.1	103.0	123.2	145.8
INSTALLED CAPACITY (MW) :	71.8	54.9	62.5	71.0	52.3	60.8	70.4	49.1	58.5	69.0
GUARANTEED POWER (MW) :	47.1	27.9	39.5	51.0	27.3	40.0	52.6	26.4	40.0	53.4
AVERAGE FIRM POWER (MW) :	12.0	9.2	10.4	11.8	8.7	10.1	11.7	8.2	9.8	11.5
FIRM ENERGY (MIL KWH/Y) :	105.	80.	91.	104.	76.	89.	103.	72.	85.	101.
SECONDARY ENERGY (%) :	20.	19.	21.	23.	20.	23.	25.	22.	25.	28.
ANNUAL AVERAGE E-GY (%) :	124.	100.	113.	127.	97.	111.	128.	94.	110.	129.

D A M	1	2	3	4	5	6	7	8	9	10
DAM HEIGHT (M) :	170.0	144.9	156.2	170.0	140.2	153.5	170.0	135.2	150.7	170.0
EMBANKMENT VOL. (MIL M3) :	7.947	5.282	6.378	7.947	4.843	6.094	7.947	4.434	5.631	7.947

EVALUATION INDICES	1	2	3	4	5	6	7	8	9	10
CH/V :	6663.	8185.	7313.	6998.	8451.	7362.	6264.	8610.	7318.	6067.
C/V :	42.	61.	50.	40.	65.	51.	39.	69.	52.	38.
P/(20VT+VD) :	7.1	7.4	7.4	7.1	7.5	7.4	7.0	7.5	7.4	6.9
E(FIRM)/(20VT+VD) :	10.4	10.9	10.8	10.3	11.0	10.9	10.2	11.0	10.8	10.1
E(F+SEC*0.3)/(20VT+VD) :	11.0	11.7	11.5	11.0	11.9	11.7	11.0	12.0	11.7	10.9

PROJECT NAME : SALTAN-4  
 PROJECT ID : 2- 8- 5-14-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : SALTAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.55	0.43	0.43	0.43	0.33	0.33	0.33	0.23	0.23	0.23
FULL SUPPLY LEVEL (M) :	716.0	675.3	669.1	716.0	663.6	682.2	716.0	648.6	673.8	716.0
MIN. OPERATING LEVEL(M) :	656.8	583.2	632.9	682.5	583.2	637.3	591.3	583.2	641.6	700.0
POWER										
FIRM DISCHARGE (M3/S) :	5.8	5.2	5.2	5.2	4.9	4.8	4.8	4.2	4.1	4.1
PLANT PEAK DIS. (M3/S) :	11.6	10.4	10.4	10.3	9.7	9.7	9.6	8.3	8.2	8.1
AVERAGE NET HEAD (M) :	180.1	129.7	154.9	188.8	122.2	152.0	191.7	112.6	148.2	194.7
INSTALLED CAPACITY (MW) :	17.1	11.1	13.2	16.0	9.6	12.1	15.1	7.7	10.1	13.0
GUARANTEED POWER (MW) :	12.7	5.6	9.6	13.4	5.2	9.3	13.2	4.5	8.2	11.7
AVERAGE FIRM POWER (MW) :	8.6	5.6	6.6	8.0	4.9	6.1	7.6	3.9	5.0	6.5
FIRM ENERGY (MIL KWH/Y) :	75.	49.	58.	70.	43.	53.	66.	34.	44.	57.
SECONDARY ENERGY (%) :	9.	10.	11.	13.	11.	13.	16.	14.	16.	21.
ANNUAL AVERAGE E-GY (%) :	84.	59.	69.	83.	54.	66.	82.	47.	60.	78.

D A M

DAM HEIGHT (M) :	212.0	171.3	185.1	212.0	159.6	178.2	212.0	144.6	169.6	212.0
EMBANKMENT VOL. (MIL M3) :	26.212	14.402	17.886	26.212	11.814	16.028	26.212	8.979	14.047	26.212

EVALUATION INDICES

CH/V :	1389.	1833.	1590.	1239.	1936.	1590.	1153.	1961.	1471.	980.
C/V :	7.	11.	9.	6.	13.	10.	6.	15.	9.	5.
P/(20VT+VD) :	0.6	0.7	0.7	0.6	0.7	0.7	0.5	0.7	0.6	0.5
E(FIRM)/(20VT+VD) :	2.7	3.1	3.0	2.5	3.2	3.0	2.4	3.2	2.8	2.1
E(F+SEC*0.3)/(20VT+VD) :	2.8	3.2	3.1	2.7	3.5	3.2	2.6	3.6	3.1	2.3

PROJECT NAME : SALTAN  
 PROJECT ID : 2-8-5-15-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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ITEMS	CASE				
	1	2	3	4	5
<b>HEAD PONDAGE</b>					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	678.6	678.5	679.1	679.4	679.5
NORMAL OPERATING LEVEL (M)	677.7	677.9	678.3	678.6	678.8
MINIMUM OPERATING LEVEL (M)	675.9	677.1	677.4	677.7	677.9
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.6	5.0	7.1	7.4	7.6
WATER DEPTH AT TRASHRACK (M)	3.6	3.8	4.1	4.4	4.6
CHANNEL WIDTH AT TRASHRACK (M)	3.4	4.4	5.6	6.9	7.6
PONDAGE STORAGE VOLUME (1000 M3)	53.5	57.0	61.7	66.6	69.3
<b>WATERWAY</b>					
NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	2.1	2.2
HEADRACE TUNNEL LENGTH (M)	8590.0	8590.0	8590.0	8590.0	8590.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.5	1.6
PENSTOCK LENGTH (HORIZONTAL) (M)	890.0	890.0	890.0	890.0	890.0
EXCAVATION VOLUME (1000 M3)	23.2	23.2	23.2	30.9	35.8
<b>POWER</b>					
FIRM DISCHARGE (M3/S)	0.9	0.9	0.9	0.9	0.9
DEPENDABLE DISCHARGE (M3/S)	1.5	1.5	1.5	1.5	1.5
PLANT PEAK DISCHARGE (M3/S)	1.5	2.4	4.0	6.0	7.3
TAIL WATER LEVEL (M)	454.4	454.4	454.4	454.4	454.4
NET HEAD (M)	218.4	214.2	202.0	201.3	201.7
INSTALLED CAPACITY (MW)	2.6	4.2	6.6	10.0	12.1
DEPENDABLE PEAK POWER (MW)	2.7	2.6	2.5	2.5	2.5
FIRM POWER (MW)	1.6	1.6	1.5	1.5	1.5
GUARANTEED POWER OUTPUT (MW)	1.4	1.4	1.3	1.3	1.3
FIRM ENERGY/YEAR (10**6 KWH)	14.0	13.7	12.9	12.9	12.9
SECONDARY ENERGY/YEAR (10**6 KWH)	7.7	17.7	30.1	43.6	50.8
ANNUAL ENERGY (MIL KWH/YR)	21.7	31.5	43.1	56.5	63.7
<b>PARAMETERS</b>					
P (INSTALLED)/(20VT) (W/M3)	5.7	9.1	14.2	16.1	17.0
P (DEPENDABLE)/(20VT) (W/M3)	5.7	5.6	5.3	4.0	3.4
E (FIRM)/(20VT) (KWH/M3)	30.2	29.6	27.9	20.9	18.1
E (F+0.3*SECONDARY)/(20VT) (%)	35.2	41.1	47.5	42.1	39.4

PROJECT NAME : SALTAN-5  
 PROJECT ID : 2- 8- 5-15-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : SALTAN

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.53	0.38	0.38	0.38	0.33	0.33	0.33	0.28	0.28	0.28
FULL SUPPLY LEVEL (M) :	876.0	848.6	850.9	876.0	843.4	858.1	876.0	837.9	855.1	876.0
MIN. OPERATING LEVEL(M) :	827.0	793.5	819.0	844.4	793.5	821.6	849.7	793.5	824.0	854.4
POWER										
FIRM DISCHARGE (M3/S) :	3.8	3.5	3.5	3.5	3.4	3.3	3.3	3.1	3.1	3.1
PLANT PEAK DIS. (M3/S) :	7.7	7.0	6.9	6.9	6.7	6.7	6.7	6.2	6.2	6.2
AVERAGE NET HEAD (M) :	119.9	91.2	107.5	125.7	87.8	106.6	127.4	84.3	105.4	129.0
INSTALLED CAPACITY (MW) :	7.6	5.2	6.1	7.2	4.9	5.9	7.0	4.3	5.4	6.6
GUARANTEED POWER (MW) :	5.2	3.0	4.3	5.7	2.9	4.3	5.7	2.7	4.1	5.5
AVERAGE FIRM POWER (MW) :	3.8	2.6	3.1	3.6	2.4	2.9	3.5	2.2	2.7	3.3
FIRM ENERGY (MIL KWH/Y) :	33.	23.	27.	31.	21.	26.	31.	19.	24.	29.
SECONDARY ENERGY (") :	5.	5.	6.	7.	6.	6.	7.	6.	7.	9.
ANNUAL AVERAGE E-GY (") :	38.	28.	33.	38.	27.	32.	38.	25.	31.	37.

D A M

DAM HEIGHT (M) :	147.0	119.6	131.9	147.0	114.4	129.1	147.0	108.9	126.1	147.0
EMBANKMENT VOL.(MIL M3) :	7.806	4.402	5.772	7.806	3.872	5.423	7.806	3.409	5.074	7.806

EVALUATION INDICES

CH/V :	2106.	2732.	2305.	1904.	2857.	2313.	1834.	2859.	2235.	1698.
C/V :	15.	25.	19.	14.	27.	19.	13.	29.	19.	12.
P/(20VT+VD) :	0.8	0.9	0.9	0.8	1.0	0.9	0.8	1.0	0.9	0.7
E(FIRM)/(20VT+VD) :	3.7	4.1	3.9	3.5	4.2	3.9	3.4	4.2	3.8	3.2
E(F+SEC#0.3)/(20VT+VD) :	3.9	4.4	4.2	3.7	4.6	4.2	3.7	4.6	4.1	3.5



PROJECT NAME : BABACA-R  
 PROJECT ID : 2-8-5-17-0-1  
 TYPE : RESERVOIR

BASIN NAME : CAGAYAN  
 RIVER NAME : BABACA

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 \* SUMMARY TABLE OF OUTPUTS \*  
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RESERVOIR	CASE									
	1	2	3	4	5	6	7	8	9	10
RESERVOIR DEVELOP. COEF :	0.70	0.58	0.58	0.58	0.53	0.53	0.53	0.48	0.48	0.48
FULL SUPPLY LEVEL (M) :	219.0	204.2	211.0	219.0	201.6	209.6	219.0	198.9	207.9	219.0
MIN. OPERATING LEVEL (M) :	181.2	161.6	175.6	189.7	161.6	177.1	192.7	161.6	178.6	195.7
POWER										
FIRM DISCHARGE (M <sup>3</sup> /S) :	6.4	6.2	6.1	6.1	6.0	6.0	6.0	5.9	5.8	5.8
PLANT PEAK DIS. (M <sup>3</sup> /S) :	12.8	12.3	12.3	12.2	12.1	12.0	11.9	11.7	11.6	11.6
AVERAGE NET HEAD (M) :	76.9	60.8	70.0	79.8	59.2	68.6	80.9	57.5	69.0	81.9
INSTALLED CAPACITY (MW) :	8.1	6.2	7.1	8.0	5.9	6.9	7.9	5.5	6.6	7.8
GUARANTEED POWER (MW) :	5.2	3.1	4.5	5.8	3.1	4.5	5.9	3.0	4.5	6.0
AVERAGE FIRM POWER (MW) :	4.0	3.1	3.5	4.0	2.9	3.4	4.0	2.8	3.3	3.9
FIRM ENERGY (MIL KWH/Y) :	35.	27.	31.	35.	26.	30.	35.	24.	29.	34.
SECONDARY ENERGY (%) :	4.	4.	5.	5.	4.	5.	6.	5.	5.	6.
ANNUAL AVERAGE E-GY (%) :	40.	31.	36.	40.	30.	35.	40.	29.	34.	40.

D A M

DAM HEIGHT (M) :	98.0	83.2	90.0	98.0	80.6	88.8	98.0	77.9	86.9	98.0
EMBANKMENT VOL. (MIL M <sup>3</sup> ) :	3.539	2.411	2.905	3.539	2.256	2.801	3.539	2.093	2.682	3.539

EVALUATION INDICES

CH/V :	5094.	5046.	5444.	4870.	6125.	5437.	4768.	6173.	5394.	4518.
C/V :	57.	81.	87.	54.	84.	58.	53.	88.	68.	52.
P/(20VT+VD) :	1.9	2.0	2.0	1.9	2.0	2.0	1.9	2.0	2.0	1.9
E(FIRM)/(20VT+VD) :	8.5	8.8	8.7	8.4	8.9	8.7	8.3	8.9	8.7	8.2
E(F+SEC*0.3)/(20VT+VD) :	8.8	9.2	9.1	8.8	9.3	9.2	8.7	9.4	9.2	8.6

PROJECT NAME : BABACA  
 PROJECT ID : 2- 8- 5-18-0-2  
 TYPE : RUN-OF-RIVER

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 \* SUMMARY TABLE OF OUTPUTS \*  
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CASE

ITEMS	1	2	3	4	5
HEAD PONDAGE					
OUTPUT FACTOR	0.966	0.900	0.800	0.700	0.649
FULL SUPPLY LEVEL (M)	400.0	400.1	400.4	400.6	400.8
NORMAL OPERATING LEVEL (M)	399.3	399.5	399.8	400.0	400.1
MINIMUM OPERATING LEVEL (M)	398.7	398.9	399.1	399.4	399.5
DIVERSION WEIR HEIGHT INC. 3M F-B:	6.0	6.1	6.4	6.6	6.8
WATER DEPTH AT TRASHRACK (M)	3.0	3.1	3.4	3.6	3.8
CHANNEL WIDTH AT TRASHRACK (M)	2.7	3.5	4.4	5.5	6.0
PONDAGE STORAGE VOLUME (1000 M3)	36.9	39.3	42.4	45.6	47.3

WATERWAY

NUMBER OF WATERWAY	1	1	1	1	1
INSIDE DIAMETER OF HEADRACE (M)	1.8	1.8	1.8	1.8	1.9
HEADRACE TUNNEL LENGTH (M)	4150.0	4150.0	4150.0	4150.0	4150.0
INSIDE DIAMETER OF PENSTOCK (M)	1.3	1.3	1.3	1.3	1.4
PENSTOCK LENGTH (HORIZONTAL) (M)	620.0	620.0	620.0	620.0	620.0
EXCAVATION VOLUME (1000 M3)	11.5	11.5	11.5	11.5	12.5

POWER

FIRM DISCHARGE (M3/S)	0.6	0.6	0.6	0.6	0.6
DEPENDABLE DISCHARGE (M3/S)	0.9	0.9	0.9	0.9	0.9
PLANT PEAK DISCHARGE (M3/S)	0.9	1.5	2.5	3.8	4.6
TAIL WATER LEVEL (M)	220.0	220.0	220.0	220.0	220.0
NET HEAD (M)	176.9	176.1	173.6	168.2	166.8
INSTALLED CAPACITY (MW)	1.3	2.2	3.5	5.2	6.3
DEPENDABLE PEAK POWER (MW)	1.3	1.3	1.3	1.3	1.3
FIRM POWER (MW)	0.8	0.8	0.8	0.8	0.8
GUARANTEED POWER OUTPUT (MW)	0.7	0.7	0.7	0.7	0.7
FIRM ENERGY/YEAR (10**6 KWH)	7.1	7.0	6.9	6.7	6.7
SECONDARY ENERGY/YEAR (10**6 KWH)	3.9	9.1	16.1	22.7	26.2
ANNUAL ENERGY (MIL KWH/YR)	11.0	16.1	23.1	29.4	32.9

PARAMETERS

P(INSTALLED)/(20VT) (W/M3)	5.8	9.4	15.4	22.6	25.1
P(DEPENDABLE)/(20VT) (W/M3)	5.9	5.8	5.8	5.6	5.1
E(FIRM)/(20VT) (KWH/M3)	30.8	30.7	30.2	29.3	26.8
E(F+0.3*SECONDARY)/(20VT) (")	35.9	42.5	51.3	58.9	58.3