INDIRA SAGAR PROJECT

GENERAL INTRODUC11ON

River Narmada, fifth largest river in India, with a river flow length of 1312 kms originates from Amarkantak in Shahdol district of Madhya Pradesh. Narmada flows westward and after passing through Madhya Pradesh, Gujarat and Maharashtra, it drains into Arabian Sea near Gulf of Combay.

Indira Sagar Project (ISP) situated on River Narmada, 10 Km from village Punasa in Khandwa district of Madhya Pradesh. ISP is a multipurpose Project with an installed capacity of 1000 MW, with annual energy generation of 2698 Million Units in Stage-I, 1850 Million Units in Stage-II and 1515 Million Units in Stage-III and annual irrigation of 2.65 Lac. Ha on a Cultivable Command Area (CCA) of 1.23 Lac. Ha. Total Catchment Area at the Dam site is 61642 Sq.Km. ISP is the mother project for the downstream projects on Narmada Basin with largest reservoir in India, having 12.22 Bm3 storage capacity.

Govt. of Madhya Pradesh and National Hydroelectric Power Corporation (NHPC) Ltd. have signed a Memorandum of Understanding (MoU) in May 2000 to exploit the hydro-electric potential of the Narmada Basin by taking up and completing the ISP and Omkareshwar Project (OSP) as a joint venture projects between GoMP and NHPC. According to the programme of implementation in MoU, joint venture shall endower to complete the ISP within 5 years and the OSP within 7 years.

Govt. of India, Ministry of Power has conveyed the approval in March 2002 (a) for formation of NHDC Ltd. and (b) to the cost estimate for execution of Unit –I (Dam and Appurtenant works) and Unit- III (Power House) of ISP with the target to complete the project by May 2005. The Dam construction work is almost completed. First unit was commissioned by NHDC in Jan.'04 and the eighth unit commissioned by March 2005.

Details of Yearly power generation in MU w.e.f. Jan. 2004 is as follows:-

2003-04	2004-05	2005-06	2006-07
196.54	1331.85	2573.36	2605.58

1.2 MAJOR PROJECT FEATURES (IN BRIEF) :-

1. Concrete Gravity Dam
   - 653 m long with a slightly curved alignment
   - 92 m high from the deepest foundation level.
   - it has centrally located spillway with 20 radial gates of size 20 m x 17 m
   - Sub-Surface Power House on right bank of river Narmada
   - Eight conventional Francis Turbine units of 125 MW each including construction of Water Conductor System consisting of HRC, Penstocks & TRC.
2. 400 KV Switchyard on right bank of river Narmada. Two lines to Indore, 1 line to Nagda and 1 line to Satpura through loop in loopout system.

Salient features are enclosed at Annexure - 1.

For other detailed information and current status of the Project, please visit the NHDC Wave site -www.nhdcindia.com.

<u>Dates of Commissioning of Units:</u>

Unit –I	14.01.04	Unit –V	27.07.04
Unit- II	18.01.04	Unit –VI	07.01.05
Unit- III	06.03.04	Unit –VII	01.11.04
Unit- IV	29.03.04	Unit –VIII	30.03.2005

Annexure-I

SALIENT FEATURES OF INDIRA SAGAR PROJECT

S.No.	Description	Features/Dimensions
A.	**Capacity (MW)**	8x125= 1000
B.	**Head**	
1	Maximum Head (m)	68.59
2	Minimum Head (m)	49.69
3	Design Head (m)	60
C.	**COST ESTIMATE**	**12/88 Price Level (Rs. In Crores)**
1	Unit-I Head works	832.32
2	Unit-II Canals	541.98
3	Unit-III Power	619.37
4	Command Area Development	50.00
5	Catchment Area Treatment	124.00
	Grand Total	**2167.67**
D.	**REVISED COST ESTIMATE**	**9/2000 Price Level (Rs. in Crores)**
1	Unit-I (Dam)	2634.77
2	Unit-II (Power House)	1232.43
	Total	**3867.20**
E.	**APPORTIONMENT COST**	
1	Sardar Sarovar Project (@ 17.63% of Unit I)	(-) 464.51
2.	Irritation Component GoMP (@ 16.75% of Unit I after taking SSP factor)	(-) 363.52
	Total Cost	**3039.17**
3	IDC	488.37
	Net Cost	**3527.54**
F.	**BENEFITS**	
1	Installed Power (MW)	1000
2	Firm Power Generation	
	(a) Initial Phase (MW)	223.50
	(b) Final Phase (MW)	118.30

S.No.	Description		Features/Dimensions
3	Energy Generation (GWH) (Initial Stage) (I/c Secondary Power)		2698
4	Cost of Energy at Bus bar (Paise/KWH) as per CERC on March 2007		192
5	Irrigation Proposed (Lakh Ha.)		1.23 (only left bank)
6	B.C. ratio (for irrigation component)		1.85
7	No. of villages benefited in the command (Nos.)		564
8	Production of food grains (Lakh Tones)		4.00
9	Production of other grains (Lakh Tones)		10.55
10	Municipal and industrial water supply average (M.A.F.) (Million Acre Feet)		0.06
G.	**HYDROLOGY**		
1	Catchment Area (Sq. Km)		61,642
2	Rainfall		
	(a) Maximum (mm)		1879
	(b) Minimum (mm)		603
	(c) Average (mm)		1288
3	Annual yield		
	(a) 75% Dependable Bm^3 (Billion Cumec)		26.465
	M.A.F. (Million Acre Feet)		21.47
	(b) 90% Dependable Bm^3 (Billion Cumec)		18.184
	M.A.F. (Million Acre Feet)		14.74
4	Standard Project Flood Outflow (Cumecs)		65670
5	Probable Maximum Flood Outflow (Cumecs)		83534
H	**RESERVOIR LEVELS**		
1	Top Bund Level (TBL) (in meter)		267.00
2	Max Water Level (MWL) (in meter)		263.35
3	Full Reservoir Level (FRL) (in meter)		262.13
4	Minimum Draw Down Level (MDDL) (in meter)		243.23
5	Crest Level (Spillway) (in meter)		245.13
6	Tail Water Level (in meter)	Corresponding to PMF	220.00
		Minimum	193.54
		Maximum	196.15
6	Water Spread Area at FRL (Sq. Kms)		913.48
I	**STORAGE CAPACITY**		
1	Gross		
	Bm^3 (Billion Cumec)		12.22
	M.A.F. (Million Acre Feet)		9.90
2	Live		
	Bm^3 (Billion Cumec)		9.75
	M.A.F. (Million Acre Feet)		7.90
3	Dead		
	Bm^3 (Billion Cumec)		2.47

S.No.	Description	Features/Dimensions
	M.A.F. (Million Acre Feet)	2.00
J	**CONCRETE GRAVITY DAM**	(IN METER)
1	(i) Total Length (in meter)	653
	(ii) Non- overflow (in meter)	158
	(iii) Overflow portion Ogee shaped spillway (in meter)	495
	(iv) Power Dam (in meter)	-
	(v) Qty. of concrete (CUM)	13,92.000
2	Maximum Height (in meter)	92
K	**RADIAL CREST GATES**	
1	Number	20
2	Length (in meter)	20
3	Height (in meter)	17
L	**POWER HOUSE**	
1	Type of Power House	Surface
2	Installed Capacity (in MW)	1000
3	Type of Turbine	Francis
M	**SWITCYARD**	
1	Type	400 KV, Open
2	Power Evacuation System	4 Outgoing 400 KV feeders
	(i) One feeder to Satpura Thermal Power Station Sarni.	
	(ii) Two feeders to Indore Sub-station.	
	(iii) One feeder to Nagda Sub-station.	
N	**SUBMERGENCE**	
1	Villages affected due to submergence at FRL	249
2	Families affected (As per CCEA Plan)	31678
3	Population affected	129000
O	**LAND**	
1	Cultivated Area (in ha)	44,363
2	Other area (in ha)	5,565
3	Forest Area (in ha)	41,420
	Total	91,348
P	**Diversion of Railway Line (Khirkia-Talvadia Section)**	
1	Length of Submergence	23.17
2	Original Length (in KMs)	51.00
2	Diversion Length (in KMs)	57
3	Cost of Diversion (Rs. Crores) at 9/2000 PL	343.00