

NAME OF COMPANY : APGENCO

NAME OF POWER STATION : NAGARJUNA SAGAR COMPLEX

SALIENT FEATURES OF HYDROELECTRIC PROJECT

1. NAGARJUNA SAGAR HYDRO ELECTRIC SCHEME

I. GENERAL

1. Location : **Nandikonda Village, Nalgonda District, A.P.**
2. Category : **Hydro Power Project**
3. Capacity : **1 x 110 MW + 7 100.8 MW = 815.6 MW**
4. River : **Krishna**
5. Dam : **Nagarjuna Sagar**
6. No. of Units : **8 Nos.**
7. Design Energy(in Mu) : **992 MU**

II. HYDROLOGY:

1. Reservoir : **Nagarjuna Sagar**
2. Catchment Area : **83087 Sq. Miles**
3. Max. flood discharge : **1060000 Cusecs**
4. Live Storage : **202.47 TMC Ft**
5. Gross Storage : **408.24 TMC Ft.**
6. Dead Storage : **205.77 TMC Ft.**
7. Generation per TMC : **5.5 MU**
8. Design Head (Max/Min) : **93 Mts (305.13 Ft.) / 71.5 Mts (234.6 Ft.)**
9. Max. gross head : **105 Mts. (344.5 Ft.)**
10. Net Head : **93 Mts (305.13 Ft.)**
11. Full Reservoir level (FRL) : **590.00 Ft.**
12. Min. Draw Down Level (MDDL) : **510.00 Ft.**
13. Tail Race water level for
 - a) Max. Discharge : **295 Ft.**
 - b) Min. Discharge : **240 Ft.**
14. Design Disch. through Machine : **146 Cumeecs (5156 Cusecs)**

III. COMMISSIONING DETAILS

- Unit – 1 : 7th March' 1978**
- Unit – 2 : 8th April' 1980**
- Unit – 3 : 11th January' 1981**
- Unit – 4 : 22nd June' 1982**

Unit – 5	: 31st March' 1983
Unit – 6	: 26th October' 1984
Unit – 7	: 31st March' 1985
Unit – 8	: 24th December' 1985

IV. TECHNICAL:

1. Turbine

a) Type	: Vertical, Francis
b) Make	: BHEL (Unit – 1) Mitsubishi, Japan (Unit – 2 to 8)
c) Net Head	: 91.44 Mts (Unit – 1) 105 Mts (Unit – 2 to 8)
d) Rated Output	: 110 MW (Unit – 1) 103 MW (Unit – 2 to 8)
e) Normal Speed	: 187.5 RPM
f) Runway speed	: 375 RPM
g) Disc. Through Machine	: 146 Cumecs

1. Generator

a) Type	: Synchronous
b) Make	: BHEL (Unit – 1) Mitsubishi, Japan (Unit – 2 8)
c) Rated Voltage	: 11 KV (Unit – 1) 13.8 KV (Unit – 2 to 8)
d) Rated Out put	: 110 MW (Unit – 1) 100.8 MW (Unit – 2 to 8)
e) Current	: 6420 A (Unit – 1) 4690 A (Unit – 2 to 8)
f) Speed	: 187.5 RPM (Unit – 1) 157.9 RPM (Unit – 2 to 8)
g) Power Factor	: 0.9 Lag

2. Generator Transformer

a) Make	: M/s. TELK (Stage – I) M/s. BHEL (Stage – II)
b) Capacity	: 42.5 MVA, Single Phase 45 MVA, Single Phase
c) Voltage Ratio	: 11 KV / 220 KV 13.8 KV / 220 KV

4. Transmission Line

	: 220 KV (4 Nos.) 132 KV (2 Nos.)
--	--

2. NAGARJUNA SAGAR LEFT CANAL POWER HOUSE

I. GENERAL

1. Location : **On the Left side of the Nagarjuna Sagar Head Regulator**
2. Category : **Irrigation & Power, Canal Power Project (Pit – Type Power House)**
3. Capacity : **2 x 30 MW = 60 MW**
4. River : **Krishna River (Utilising Irrigation discharges from Nagarjuna Sagar Left Canal).**
5. Dam : **Nagarjuna Sagar**
6. No. of Units : **2 Nos.**
7. Design energy (in Mu) : **127 MU**

II. HYDROLOGY:

1. Reservoir : **Nagarjuna Sagar**
- 2.. Max. discharge : **15000 Cusecs**
3. Design Head : **26 Mts. (85.30 Ft.)**
4. Gross head : **24.07 Mts. (78.97 Ft.)**
5. Net Head : **22.95 Mts. (75.3 Ft.)**
6. Min. Draw Down Level (MDDL) : **530.00 Ft.**
7. Design Disch. through Machine : **5086 Cusecs (144 cumecs)**

IV. COMMISSIONING DETAILS

Unit – 1 : 27th September' 1992

Unit – 2 : 27th September' 1992

V. TECHNICAL:

1. Turbine
 - a) Type : **Vertical Kaplan**
 - b) Make : **M/s. BOVING, U.K**
 - c) Net Head : **26 Mts.**
 - d) Rated Output : **30 MW**
 - e) Normal Speed : **150 RPM**
 - f) Runway speed : **360 RPM**
 - g) Disc. Through Machine :

3. Generator
 - a) Type : **Synchronous**
 - b) Make : **M/s. GEC Large Machines Ltd., U.K**
 - c) Rated Voltage : **11 KV**
 - d) Rated Out put : **30 MW**

- e) Current : 1850 A
 - f) Speed : 150 RPM
 - g) Power Factor : 0.85 Lag
4. Generator Transformer
- a) Make : M/s. BHEL
 - b) Capacity : 40 MVA, 3 - Phase
 - c) Voltage Ratio : 11 / 132 KV
5. Transmission Line : 132 KV (2 Nos.)

3. NAGARJUNA SAGAR RIGHT CANAL POWER HOUSE

I. GENERAL

- 1. Location : **On the Right Bank Irrigation Canal of Nagarjuna Sagar Reservoir**
- 2. Category : **Canal Power House**
- 3. Capacity : **3 x 30 MW = 90 MW**
- 4. River : **Krishna River (Utilising releases from Nagarjuna Sagar Reservoir in to the Right Side Irrigation Canal).**
- 5. Dam : **Nagarjuna Sagar**
- 6. No. of Units : **3 Nos.**
- 7. Design energy (in Mu) : **292.5 MU**

II. HYDROLOGY:

- 1. Reservoir : **Nagarjuna Sagar**
- 2.. Max. discharge : **15000 Cusecs**
- 3. Design Head : **25 Mts (82.03 Ft.)**
- 4. Gross head : **33.95 Mts (111.39 Ft.)**
- 5. Net Head : **25.59 Mts (83.96 Ft.)**
- 6. Min. Draw Down Level (MDDL) : **530.00 Ft.**
- 7. Design Disch. through Machine : **5000 Cusecs (141.27 cumecs)**

III. COMMISSIONING DETAILS

- Unit – 1 : 24th February’ 1983**
- Unit – 2 : 14th September’ 1983**
- Unit – 3 : 10th September’ 1990**

VI. TECHNICAL:

- 1. Turbine

- a) Type : **Vertical Kaplan**
- b) Make : **M/s. BOVING, U.K**
- c) Net Head : **25 Mts.**
- d) Rated Output : **30 MW**
- e) Normal Speed : **150 RPM**
- f) Runway speed : **360 RPM**
- g) Disc. Through Machine :

5. Generator

- a) Type : **Synchronous**
- b) Make : **M/s. GEC Large Machines Ltd., U.K**
- c) Rated Voltage : **11 KV**
- d) Rated Out put : **30 MW / 39.65 MVA**
- e) Current : **2080 A**
- f) Speed : **150 RPM**
- g) Power Factor : **0.85 Lag**

6. Generator Transformer

- a) Make : **M/s. BHEL**
- b) Capacity : **40 MVA, 3 - Phase**
- c) Voltage Ratio : **11 / 132 KV**

- 4. Transmission Line : **132 KV (2 Nos)**