

DETAILED PROJECT REPORT FOR CREATION OF 400/220KV SUBSTATIONS IN NCT OF DELHI DURING 12TH PLAN PERIOD (PART-A)

1.0 CONTEXT / BACKGROUND

Delhi is presently meeting a peak demand of about 6000 MW, out of which about 4700 MW power is brought in from outside. According to a CEA study, peak demand by the end of 12th & 13th Plan in Delhi would be about 7400 MW and 10400 MW respectively. Presently, Delhi has a very limited generation capacity and this situation is expected to continue in the near future also. With the increasing power demand, Delhi would be mostly dependent on imported power from outside in future also. Thus, a very strong Inter State Transmission System along with 400/220KV Grid Sub-stations in and around Delhi needs to be established in order to ensure secured transmission network with adequate transformation capacity. Thus, total four numbers of 400/220kV substations located at Rajghat, Dwarka-I (earlier Papankalan-I), Tughlakabad & Karampura alongwith 400kV lines have been planned in NCT of Delhi.

The scheme has been discussed and agreed in the 34th & 35th meeting of Standing Committee on Power System Planning for Northern Region held on 8/8/14 & 3/11/14 respectively. The scheme was also agreed in the 32nd (Special) NRPC Meeting held on 10.09.2014. (Copy of extracts of the minutes of the meetings are attached at **Annexure-8.0.**)

Considering the urgency of implementation of the scheme and based on the details about land & transmission lines, two separate DPRs are being prepared for the complete scheme. Under the present DPR, two substations at Rajghat & Dwarka-I out of the total four 400/220kV substations alongwith 400kV lines are proposed to be implemented along with connectivity to facilitate Delhi to draw power from the grid.

2.0 DESCRIPTION OF TRANSMISSION SYSTEM

To take care of the load of Delhi by 12th Plan end and also to meet load requirement by the early 13th Plan period, under "Creation of 400/220kV substations in NCT of Delhi during 12th Plan period (Part-A)", the following broad scope of works is proposed under present DPR:

- 1) Establishment of 4x500MVA, 400/220 kV GIS at Rajghat alongwith LILO of both circuits of Bawana –Mandola 400kV D/c line at Rajghat
- 2) 1x125 MVAR Bus Reactor at Rajghat
- 3) Establishment of 4x500MVA, 400/220kV GIS at Dwarka-I(earlier named as Papankalan-I) alongwith LILO of one circuit of Bamnauli - Jattikalan 400kV line at Dwarka-I
- 4) 1x125 MVAR Bus Reactor at Dwarka-I

The Empowered committee in it's 33rd meeting, has recommended the complete scheme to MoP for their consideration and approval of the proposal, for implementation by POWERGRID under regulated Tariff mechanism with compressed time schedule which has since been obtained from MoP vide their Office Memorandum dated 10th December 2014 (Copy enclosed at **Annexure-9.0.**)

The schematic of the proposed Transmission system is shown at **Exhibit-1.0**.

3.0 JUSTIFICATION

Delhi is presently meeting a peak demand of about 6000 MW, out of which about 4700 MW power is brought in from outside. According to a CEA study, peak demand by the end of 12th & 13th Plan in Delhi would be about 7400 MW and 10400 MW respectively. Delhi has a very limited generation capacity and as on date there is no plan to add generation capacity within the state in near future. With the rising power demand, Delhi would be increasingly dependent on imported power from outside in future also. Delhi, at present, is having only one 400KV Inter State Grid Sub-Station at Maharani Bagh in addition to four nos. DTL owned 400kV Sub-Stations. A strong Inter State Transmission System alongwith 400/220KV Grid Sub-stations in and around Delhi needs to be established to ensure secured transmission network with adequate transformation capacity.

Studies were carried out and, 400kV & 220kV Sub-Stations have been proposed to be established within the periphery of Delhi to facilitate handling of increasing quantum of power in 12th Plan. Four Inter State 400KV Grid Sub-Stations alongwith associated 400KV transmission network were identified at Rajghat, Karampura, Tughlakabad and Papankalan-I, under ISTS to facilitate import of power from various sources outside Delhi. With the establishment of above four 400 kV substations, there would be strong in-feed substations around Delhi which can take care and reliably meet the existing and future load demand of Delhi network. 1x125 MVAR bus reactors have been agreed at all the new 400 kV substations as DTL shall be using many 220 kV cables.

Further, the establishment of Papankalan substation was earlier envisaged at Papankalan-I existing substation by replacing existing 220/66 kV substation of DTL. While working out the details for this substation, a joint visit with DTL and CEA representative was undertaken at Papankalan-I substation and it was observed that accommodating 400/220 kV S/s in existing Papankalan-I substation will be difficult without disturbing the present set up in the compressed time schedule. Accordingly, after considering other constraints, an alternate site in Sector-5, Dwarka, close to Papankalan-I was identified which would be named as Dwarka-I substation. DTL shall establish 66 kV substation in Dwarka-I with 220/66 kV ICTs in future. Further, sufficient line corridor for LILO of one circuit of Bamnauli – Jhatikara D/c line at Dwarka-I is available and dismantling of existing 220 kV D/c line would not be required. Accordingly, for LILO of one ckt. of Bamnauli – Jhatikara 400 kV D/c line, a new corridor with 400 kV D/c (Quad/HTLS) shall be constructed.

The above works of DTL are of high priority and have to be completed in a period of less than two years' time i.e. before the summer peak of 2017. These schemes form a part of 24x7 power supply in Delhi and as such need to be commissioned in compressed time schedule. Therefore the above works have been assigned by MoP to PGCIL for implementation under regulated Tariff mechanism with compressed time schedule.

4.0 SCOPE OF WORK

Transmission Lines

- i) LILO of both circuits of Bawana –Mandola 400kV D/c line at Rajghat on M/c tower with Twin/HTLS conductor - **26 km**
- ii) LILO of one circuit of Bamnauli - Jattikalan 400kV line at Dwarka-I with Twin/HTLS conductor – **12 km**

Substations

i. Establishment of 4x500MVA, 400/220 kV GIS Substation at Rajghat

400 kV

- a. Line bays : 4 nos. (with provision for future expansion)
- b. 500 MVA, 400/220 kV ICTs : 4 Nos.
- c. 125MVAr Bus Reactor : 1 Nos.
- d. Transformer bay : 4 Nos.
- e. Reactor Bay : 1 Nos.

220 kV

➤ 24 nos 220KV bays

- a. Line bays : 12 Nos.
- b. Transformer bay : 8 Nos. (4 nos. for 400/220kV ICTs & 4 nos. for 220/33kV ICTs)
- c. Bus coupler bays : 2 Nos.
- d. Bus Sectionalizer bays : 2 Nos.

ii. Establishment of 4x500MVA, 400/220 kV GIS Substation at Dwarka-I

400 kV

- a. Line bays : 2 Nos. (with provision for future expansion)
- b. 500 MVA, 400/220 kV ICTs : 4 Nos.
- c. 125MVAr Bus Reactor : 1 Nos.
- d. Transformer bay : 4 Nos.
- e. Reactor Bay : 1 No.

220 kV

➤ 20 nos 220KV bays

- a. Line bays : 12 Nos.
- b. Transformer bay : 4 Nos.
- c. Bus coupler bays : 2 Nos.
- d. Bus Sectionalizer bay : 2 Nos.