



DHBVN PLANNING MANUAL



Dakshin Haryana Bijli Vitran Nigam

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CHAPTER-I

DHBVN

Present power infrastructure in Haryana comprises:

☛ Transmission System as under:

Status as on 31.03.2006

Voltage level	Length of transmission line in circuit kilometer	No. of substations	Transformation capacity in MVA
220	2453	29*	8000
132	2734	112	5484
66	1954	96	2974
Total	7141	237	16458

❖ There are eight 220 kV BBMB substations also in Haryana territory.

☛ Distribution System is as under:

Status as on

31.3.2006

Sr. No.	Description	Quantity
1.	33 KV Sub-stations	131 Nos.
2.	33 KV Lines	1772.000 Kms.
3.	33 KV Transformation capacity	1332.9 MVA
4.	11 KV Lines	33977.11 Kms.
5.	LT Lines	52668.303 Kms.
6.	Total No. of Distribution Transformers	68903 Nos.
7.	Total capacity of DTs Installed	4797.753 MVA
8.	Total No. of Connections	18,05,292
9.	Total Connected Load	5437.281 MVA

During 2005-06, the maximum demand met by power utilities in the State with the existing transmission network was 3980 MW (restricted). Haryana met peak demand of 4224 MW on 23.7.2006.

The growth of power demand in Haryana on the average has been of the order of 7 to 8%, for the state as a whole, whereas in certain pockets like Gurgaon and other industrial belts, this rate has touched a high level of 20-25%. Looking at the aspirations of the consumers, their paying capability, expectations and electrical equipment available for consumer use, the rate of growth is likely to be higher than the rate which existed a few years back.

Haryana being agriculture based State; the power demand varies with irrigation demand for agriculture which has wide variance in different areas depending on the type of crop and effectiveness of monsoon and other climatic conditions. The demand is prominently high in southern Haryana during winter season due to wheat being cultivated and in Northern Haryana during summer season due to paddy. To meet the demand, power is being arranged/ procured from distant sources directly or through Power Trading Corporation, in addition to own resources of Haryana Power Utilities. The availability from own sources depends on various factors like monsoon conditions for Hydro Projects, Coal availability for Thermal Projects and gas availability for gas based projects. Besides these factors, a margin has to be kept for outages of various machines/ units due to planned maintenance. In addition, 5 to 10% power generated is consumed at the respective plant itself for auxiliary requirements. In view of various conditions explained above, the availability is normally 75 to 80% of installed capacity (4033 MW).

17th Power Survey conducted by CEA has projected the peak demand of 7611 MW during 2011-12 and it would require installed generation capacity of **10129 MW against 4033 MW as on date**. To meet with the general load growth, HVPN has approved a number of transmission works which would be carried out from own funds of HVPN as per details given below:

Voltage Level	New Substation		Augmentation of Substation		Transmission Lines
	No.	MVA	No.	MVA	
(kV)					(Ckt. Km.)
220 kV	5	1000	7	540	868
132 kV	20	673	35	540	477
66 kV	19	598	23	263	533
Total	44		65		1878

Various schemes are under consideration including creation of 400 kV network & evacuation of power from State Owned/ Central Projects and to transmit the same for utilization by distribution companies.

In view of enormous load growth & due to upcoming developers i.e. private colonisers, HSIDC, HUDA & SEZs etc, it has been felt imperative to provide transparent planning manual for reference by distribution companies, developers & other Government agencies so as to facilitate them in providing power infrastructure as per their load demand.

In order to prepare Discoms to meet the challenges thrown up by Electricity Act 2003 effectively, a comprehensive 5 years Infrastructure Plan has been prepared. The 1st phase of this plan comprising of various works to be undertaken amounting to approximately Rs. 876.36 Crores is planned to be implemented with the objective of:

- i. Reduction of T&D Losses;
- ii. Providing Reliable & Quality supply to the consumers;
- iii. Meeting the Load growth;
- iv. Upgrading the existing deteriorated system and
- v. Providing Administrative Support with latest technology;

The works identified to be undertaken by DISCOM for implementation under the Infrastructure Plan on Return On Investments Basis include establishment of 33/11kV S/s, switching S/s, distribution transformers of various capacities viz. 630, 500, 315, 300, 200, 100, 25, 16 kVA, etc. erection of 33kV, 11kV lines, LT single phase 2 wires, single phase 3 wires, three phase 4 wires and so on, augmentation of capacity of existing power Transformers, replacement of deteriorated structures, Circuit Breakers, energisation of the agriculture pumps, extending the electric supply to house holds, industries, Energy Accounting , Design and implementation of HVDS in Rural/Urban Segment, Automated Reading, Billing and receivable management, Demand Supply management based energy improvement at consumer end, Reactive Power management, Distribution Franchisees, Village Distribution Franchisee or Feeder Franchises etc.

DAKSHIN HARYANA BIJLI VITRAN NIGAM LIMITED Investment plan 2007-08

(Rs. in crores)

Sr. No.	Description	2007-08			Physical targets
		Plan	Non-Plan	Total	
1	New 33 KV S/Stn., Aug. of 33 KV S/Stn., New 33 KV Lines and HT Capacitors	7.35	29.40	36.75	Provision of 37 Nos. new 33 KV sub-stations adding 340 MVA capacity, augmentation of 10 Nos. 33 KV S/Stns. adding 44.3 MVA capacity, release of Tubewell connections and installation of LT & HT capacitors has been made. Provision of Rs. 36.75 Crores has been made under this program during the annual plan 2007-08 which shall be met from loan assistance from REC / NCR or through own resources.
2	Bi/ Trifurcation of 11 KV Feeders, Aug. and addition of new 11 KV and LT lines, strengthening of Dist. System under RGGVY, providing AB cables.	28.20	110.80	139.00	i) Bifurcation of lengthy / overload feeders = 100 Nos. ii) Replace of BPL connections = 43750 iii) Installation of Meters Under RGGVY scheme, all the RHH including BPL connections are to be released in addition to the strengthening of distribution system in the districts under the jurisdiction of DHBVN. The tender for Sirsa and Bhiwani District has been opened and is likely to be allotted by 15.3.07 having estimated amount of Rs. 67 Crores.
3	Segregation of Rural domestic load from rural agriculture load	18.20	249.60	267.80	This scheme has been introduced for giving regular power supply to villages for light purpose to domestic consumers. Existing 490 feeders are to be segregated and new 358 feeders are to be erected. The tender enquiry nos.TED 18 to 23 has been floated total amounting to Rs.210 crore which is in the process of allotment. The projected expenditure against this scheme is likely to be completed in FY 2007-08. Tenders opened on 22.02.2007.

4	Providing HVDS/LVDS	50.40	201.60	252.00	Tender enquiry for 86 villages in Sirsa Circle floated to be opened on 28.02.2007 (Rs. 71 Crores). For balance Circles tenders are being floated.
5	Providing Area Load Dispatch Centre	0.45	1.8	2.25	To assist System Operations. The work is being taken up to provide availability of data at central location at Hisar
6	Consumers metering , DT metering, feeders metering, period metering	3.30	13.20	16.50	Installation of 100000 meters
7	Demand side Management Activities	32.00	128.00	160.00	Quantities will depend on actual assessments
8	NABARD	2.00	0.00	2.00	Bifurcation/ Trifurcation of 11 KV feeders and provision of new LT lines is there
	Total	141.90	734.40	876.30	

Total equity from State Govt. - Rs. 141.90 Crores (including loan and grant through State Plan under APDRP, NABARD)

The non-plan expenditure shall be met through loan / Grant from REC/NCR under various schemes.

Chapter-II

Creation/ Augmentation of Grid Substation along with associated transmission lines for general load growth in Haryana.

Planning cell, HVPN monitors the load data being received from both HVPN & Discoms in respect of different transformers and transmission lines all over Haryana to identify the substations needing augmentation. The system components found overloaded have to be augmented and system strengthened to provide quality power/ service to the consumers. The feed back is received from both HVPN field offices and DISCOMs.

1. Major Consideration for development of power infrastructure

In each case various factors are considered while arriving at the decision. Some of the major considerations while deciding/ approving new works are listed hereunder in brief:

- i) To evacuate power from various generating plants and/ or injection points from the grid into Haryana system.
- ii) Disbursal of power evacuated from 400 kV substations of PGCIL into Haryana system.
- iii) Increase in KVA-Km resulting in poor supply voltage at receiving end due to either excessive length of line or increase in load as intimated by DISCOMs.
- iv) Overloading of transmission lines or transformers as observed while reviewing feed back received from field from time to time.
- v) Availability of existing power system to which the new system can be connected and integrated.
- vi) Space availability both regarding switch yard and control room in existing substation before considering augmentation or upgradation of individual substations.
- vii) In case existing substations cannot be upgraded or new lines cannot be taken out from existing substations, locating alternative site for new substation and associated transmission line.
- viii) Availability of right of way for creation of new transmission lines.
- ix) Coordinated efforts are made to match the source of power with load demand and create transmission & distribution system accordingly.

2. **Procedure to be followed by HVPN & Discoms**

On the basis of general load growth of the respective areas, the proposals are to be submitted by HVPN & DISCOMs dully recommended to their management for consideration and approval, for this the following has been scheduled :-

- a) The SE/Operation circle and SE/TS of the circle have joint meetings by 10th of every month and shall submit the report to concerned CE,s of utility.
- b) The CE/OP and CE/TS of HVPN shall conduct joint meeting by 20th of every month and submit the approved proposal to CE/Planning of concerned utility.
- c) The CE,s/Planning of concerned utility shall arrange a Director level meeting of concerned utility by 30th of the month for final approval from respective MD,s.

Chapter III

Abnormal Load Growth: HUDA/ HSIDC & private developers/ Colonizers/ SEZ promoter

The growth of power demand in Haryana on the average has been of the order of 7 to 8%, for the state as a whole, whereas in certain pockets like Gurgaon and other industrial belts, this rate has touched a high level of 20-25% because of the upcoming developers, colonizers, SEZ promoters etc.

In order to cater to the future power demand of Haryana, the transmission system has to be strengthened. Various existing substations have to be augmented and new substations have to be created, which needs huge investment of the order of Rs. 6000 crore by 2011-12 keeping in view peak demand of 7611 MW during 2011-12 as per draft report of the 17th Power Survey conducted by CEA against 4033 MW as on date . It is evident that adequate and reliable power infrastructure development is essential for better power supply and overall socio economic growth in the State. However, it needs to be highlighted that without support from the State Government and the concerned promoting agencies in industrial and real estate sector, the possibility of financing power infrastructure will be remote. This was posed to the State Government on a number of occasions, including in the meeting regarding identification of the exact extent of New Townships of Jahangirpur -Badli in Jhajjar district, Sampla on NH-10 and Samalkha on NH-1 on 12.1.2006. On the basis of our suggestion, a decision in principle was taken that power transmission and distribution infrastructure in their respective areas will be funded by HSIDC, HUDA, HSAMB and the private property developers and SEZ promoters (**Annexure B**). This includes also augmenting the existing infrastructure wherever such augmentation is called for.

Again a Meeting was held with HUDA, HSIDC & Colonizers/ SEZ promoters on dated 24.4.2006 at Shakti Bhawan, Panchkula, wherein view point of HVPN was conveyed and a presentation was made to HUDA/HSIDC/ all SEZ promoters, wherein the decision of the State Government that all promoters like HUDA/ HSIDC & SEZ promoters would bear the cost of land & substation etc was conveyed and promoters were also apprised about the particular capacity of

substation depending upon the load requirement/ Right of way for transmission lines required as under:

Capacity of substation required as per ultimate load requirement

Discoms will release connection as per availability of power with them. However, colonizers are required to construct substation keeping in view of their ultimate load requirement for at least 5 years. Accordingly, undertaking is required to be given by Colonizers for their ultimate load requirement.

The required Voltage level (kV) substation required to be constructed by developers/ colonizers/ SEZ promoters etc at their own cost including cost of feeding arrangement and the ultimate load of substation after the inclusion of one no. mandatory transformer of HVPN for meeting the load of consumers other than that of coloniser is as under:

Sr. No.	Load of developers/ colonizers/ SEZ promoters etc.	Voltage Level (kV)	Ultimate load on substation including one Transformer to be installed by HVPN at colonizers substation
1.	>200 MVA<630 MVA	400	945 MVA
2.	>63 MVA on 66 kV<200 MVA	220	300
3.	>50 MVA on 132 kV<200 MVA	220	300
4	>15 MVA<50 MVA	132	75
5.	>15 MVA<63 MVA	66	94.5
6.	>5 MVA< 15 MVA	one 33 kV substation	16

Note:

1. The load up to 5 MVA would be supplied by Discoms on either two nos. 11 kV feeders with maximum loading of 200 A on each feeder or on 33 kV feeder depending upon size of conductor, distance of line, cost economics and losses.

2. In case of consumer with load requirement less than 8 MVA in the fully developed area , where there is problem of right of way for new 33 kV line, then the concept of underground 33KV system be developed instead of considering the load to be released on two no. 11KV feeders.

Other Technical requirement:

1. Developer would bear the cost of construction of the substation as per their ultimate load requirement and the proportionate cost of feeding arrangement.
2. Each sub-station will have at least two feeding sources and HVPN would install at least one transformer at the above substation at HVPN cost for meeting the load of the consumers other than Developer load.
2. Substation would be constructed as per design approved by CE/ D&P, HVPN, Panchkula or CE/P&D DHBVN Hisar as the case may be.
3. HVPN/DHBVN can undertake the construction of substation on the request of Developer as deposit work.
4. Provision of capacitor bank at substations as per requirement.
5. Staff colonies along with other provisions as per design of D&P cell HVPN at 400 kV/ 220 kV and important 132 kV/ 66 Kv/33kv substations. At other substation, shelter accommodation for operation staff shall have to be made in substation.
7. The sub-station with Auto Reclosure technology at areas where there are space constraints be made.
6. 33 kV, 66 kV, 132 kV & 220 kV cable shall be laid in case of constraints of Row at the cost of Developer.
7. Any change in feeding substation due to creation of consumer substation, the cost would be apportioned to Developer as per their ultimate load requirement.

Right of Way

Voltage (kV)	RoW/ Line (metres)
220	35
132	27.60
66	18
33	12

Construction of 400 kV substation:

Developer who has been granted license by the Haryana Town & country Planning department would be required to construct the 400 kV substation at their cost if their ultimate load requirement exceeds 200 MVA. As per their load requirement, developer would be permitted to install maximum of 2 Nos. 315 MVA 400/ 220 kV transformers for their requirement. One 315 MVA 400/ 220 kV transformer would be installed by HVPN at HVPN cost to meet with the load of the consumers other than that of Developer. Developer would be required to construct two 400 kV substation if their load requirement exceeds 630 MVA. **Developer would also bear the cost of feeding arrangement.** It is important to mention that Discoms will release connection as per availability of power with them. Developer would handover the substation to HVPN free of cost after the commissioning for their operation & maintenance of the substation.

If the ultimate load requirement of the developer is more than 200 MVA & less than 315 MVA, Developer would construct 400 kV substation at his cost. One 315 MVA transformer would be installed by HVPN at HVPN cost. HVPN would assess the load requirement of that area for next 5 year. In case, there is no further load requirement of HVPN in that area and there is another developer demanding power from this substation then the cost of the substation/ feeding arrangement and cost of 3rd transformer would be shared by 2nd developer with original developer.

Construction of 220 kV substation:

Developer would be required to construct the 220 kV substation at their cost if their ultimate load requirement exceeds 63 MVA in 66 kV belt and 50 MVA in 132 kV

belt. As per their load requirement, developer would be permitted to install maximum of 2 Nos. 100 MVA 220/ 66 kV or 220/132 kV transformers for their requirement. One 100 MVA 220/ 66 kV or 220/132 kV transformer would be installed by HVPN at HVPN cost to meet with the load of the consumers other than that of developers. **Developer would also bear the cost of feeding arrangement.** It is important to mention that Discoms will release connection as per availability of power with them. Developer would handover the substation to HVPN free of cost after the commissioning for their operation & maintenance of the substation.

If the ultimate load requirement of the developer is more than 63 MVA in 66 kV belt and 50 MVA in 132 kV belt & less than 100 MVA, Developer would construct 220 kV substation at his cost. One 100 MVA transformer would be installed by HVPN at HVPN cost. HVPN would access the load requirement of that area for next 5 year. In case, there is not further load requirement of HVPN in that area and there is another developer demanding power from this substation then the cost of the substation/ feeding arrangement and installation of 3rd transformers cost would be shared by 2nd developer with original developer.

Construction of 132 or 66 kV substation:

Developer would be required to construct the **132 or 66 kV** substation at their cost if their ultimate load requirement exceeds 15 MVA. As per their load requirement, developer would be permitted to install maximum of 2 Nos. 25/31.5 MVA 66/11 kV or 2 Nos 20/25 132/33 kV or 10/16 MVA 132/11 kV transformers for their requirement. One 25/31.5 MVA 66/11 kV or one 16/20 132/33 kV or one no. 10/16 MVA 132/11 kV transformer would be installed by HVPN at HVPN cost to meet with the load of the consumers other than that of developers. Developer would also bear the cost of feeding arrangement. It is important to mention that Discoms will release connection as per availability of power with them. Developer would handover the substation to HVPN free of cost after the commissioning for their operation & maintenance of the substation.

If the ultimate load requirement of the developer is more than 15 MVA & less than 31.5 MVA in 66 kV belt and 25 MVA in 132 kV belt, Developer would construct 66kV/ 132 kV substation at his cost. One 66 kV/ 132 kV transformer would be installed by HVPN at HVPN cost. HVPN would access the load requirement of that area for next 5 year. In case, there is not further load requirement of HVPN in that area and there is another developer demanding

power from this substation then the cost of the substation/ feeding arrangement and installation of 3rd transformers cost would be shared by 2nd developer with original developer.

Construction of 33KV substation :

Developer would be required to construct the 33kv substation at their cost if their ultimate load requirement exceeds 5 MVA. As per the load requirement, the developer would be permitted to install maximum 1 nos. 8 MVA 33/11 KV transformers for their requirement. The second 8MVA 33/11KV transformer shall be installed by DHBVN to meet the load of the consumers other than that of the developers. Developers would also bear the cost of the feeding arrangement. In case if there is no load requirement in the area of DHBVN and there is some other developer in that area demanding power from this substation than the proportionate cost of feeding arrangement would be born by the new incumbent demanding power from that substation.

CHAPTER-IV

Sharing of cost by HUDA for development of Power Infrastructure in Old Sectors of HUDA

98th meeting of Haryana Development Authority held on 26.2.2007 under the chairmanship of Hon'ble Chief Secretary, Haryana/ Chairman of Authority regarding sharing of cost by HUDA, has taken the following decision as reproduced as under:

- i) The total cost of 220 KV/132 KV substations including land cost and cost of transmission lines up to 66 KV/33 KV substations will be shared between HVPN and HUDA in the ratio of 50:50.**
- ii) Entire construction and land cost of 66 KV/33 KV substations will be borne by HUDA.**

A copy of the letter No. Auth.2007/ 7263-72 dated 26.02.2007 from Secretary HUDA, Panchkula conveying the above decision is placed as **Annexure B**.

CHAPTER-V

Sharing of cost by Colonizers/ Developers/ SEZ promoters

As explained in Chapter III , promoters would bear the cost of land & substation & interconnected transmission lines etc. as per the decision of the State Government. The particular capacity of substation would be required depending upon the load requirement as under:

Capacity of substation

Sr. No.	Load of developers/ colonizers/ SEZ promoters etc. above which voltage is necessary	Voltage Level (kV)
1.	>200 MVA<630 MVA	400
2.	>63 MVA on 66 kV<200 MVA	220
3.	>50 MVA on 132 kV<200 MVA	220
4	>15 MVA<50 MVA	132
5.	>15 MVA<63 MVA	66
6	>5 MVA<15 MVA	33

- In the area, where 33 kV voltage do not exists, the promoter would bear the proportionate cost of the creation of new 66 kV substation.

However, in case the creation of new substation requires the augmentation/ creation of feeding substation, then the colonizer/ developer will also have to bear the proportionate cost of augmentation/ creation of feeding substation.

A number of colonizers/ developers are approaching HVPN/DHBN for release of their load at the belated stage when they have completed their development activities. Appropriate locations for electrical infrastructure like substations along with right of way for interconnecting lines are required to be kept reserved to avoid problems for development of power infrastructure in their respective areas.

In view of the above, Colonizers are requested to approach HVPN / DHBN immediately along with their ultimate load requirement/ electrification plan/ copy of license after grant of license by Town & Country Planning department, Haryana. Appropriate size of land for substation and corridor for incoming & outgoing lines are required to be kept marked/ reserved to avoid problem later on.

Afterwards, concerned distribution company would send the detailed proposal to HVPN immediately.

Where the load of colonizers/ developers (less than 5 MVA) do not require the creation of new grid substation and it can be met from existing substation, proportionate share cost is required to be deposited as per Deputy Secretary/ Technical, HVPN circular vide Memo. No. Ch-59/ DST-38 dated 12.5.2004 (Annexure G)

Where the load of colonizers/ developers requires the augmentation of existing substation, it would be carried out as deposit work of colonizers/ developers. The cost data of equipments for deposit works would be taken by respective HVPN/DHBVN field officers as per the latest rates circulated by CE/ D&P, HVPN, Panchkula or by the CE/P&D DHBVN HISAR.

Note: HUDA is also requested to provide a copy of the license as and when granted to the colonizers/ Developers etc.

Chapter VI

Distribution System Guidelines for HUDA/Colonizers

As per the provisions in the Town and Country Planning Act, the Developers are required to provide complete infrastructure/ services while developing any residential, commercial or industrial sectors/areas. The important constituents of infrastructure are the electrical system. The electrical system constitutes the availability of feeding source i.e. provision of Grid Sub Stations as per load requirement, transmission lines, indoor switch/distribution Sub Stations provided for distribution transformers, LT lines and service lines for feeding to the end consumers. The electrical system is provided as per particular load requirement.

The load requirement for a particular category/group of consumers i.e. different category of residential plots and different category of flats, different category of commercial sites i.e. common Show Rooms, Small Booths, Shopping Malls, Resorts, Multiplexes, having Cinema Houses, Restaurants and other activities including Company Show Rooms, Company offices etc. and all these categories of consumers have different type of electrical load requirement. The load requirement of each category of consumer has been arrived at after considerable load studies.

As the load requirement for plotted areas and residential multi storey flats is different, similarly the load requirement for commercial Booths, Show Rooms sites, Company's Houses, Shopping Malls, Resorts, Restaurants and Multiplexes is also different. Hence the norms have been framed separately for each category.

The guidelines for providing electrical system in the area being developed by the Developers have been laid down to maintain uniformity. Depending upon locations and requirement the over head and underground system have been suggested.

While framing the guidelines, precautions have been taken to meet with the requirement of provisions of grid Code for distribution system.

CHAPTER-VII

Load Estimation for residential sectors.

The basis for electrification of any residential sector having residential plots is the ultimate load requirement of that particular sector for residential houses, other common and commercial utilities for which the following procedure will have to be followed:-

- i) The Developer should possess the proper license from the Town and Country Planning Department.
- ii) The approved land plan should have the complete detail of areas under various categories like size-wise residential plots, detail of plots earmarked for multi storey buildings or group housing Societies, size wise Commercial plots and the total area to be covered for Market, Resorts, Restaurants, Multiplexes, Schools, Colleges or any other Educational Institutions, Hospitals Dispensary, Community Centers, Police Stations, Water Supply Schemes, Sewerage Disposal schemes, Electricity indoor Sub Station, Out Door Sub Stations or any other important utility for which specific land is earmarked.
- iii) On the basis of land area earmarked as per detail in para-ii above, the load calculation shall be made as per guidelines laid down for specific category of load in specific area/size of plot. The guidelines for load calculations for residential plotted areas are attached as Annexure-I. Load calculations for residential multistory buildings are attached as Annexure-II and load calculations for commercial areas are attached as annexure-III.

After arriving at total load requirement of the sector, the following schemes shall be followed for designing the feeding arrangements of the load of the sector.

- a) Up to 4 MVA = Through 11 KV independent feeder from the existing Sub Station of HVPN/DHBN subject to the maximum of 200 Amps load on 11 KV side of each feeder.

- b) Above 4 MVA and upto 5 MVA = Second 11 KV independent feeder form the existing HVPN/DHBN Sub Station.
 - c) More than 5 MVA to 15 MVA = Separate 33/11 KV or 66/11 KV Sub Station shall be created.
 - d) More than 15 MVA up to 50/63 MVA= Separate 132/11 KV or 66/11 KV S/Stn. Will be created.
 - e) Beyond 50/63 MVA on 132/66kv level = 220 KV Sub station shall be created.
1. The above mentioned works shall be carried out at the cost of Developer. For example taking out of 11 KV independent feeder, where, the augmentation of power transformer is required at the feeding Sub Station, the Developer shall be liable to bear the proportionate share cost of augmentation of power transformer. Of course, the works shall be carried out and executed by HVPN/DHBN as the case may be.
 2. The land for creation of indoor switching station cum complaint centre- Atleast 2 numbers SS cum CCs per sector shall be constructed at the cost of the Developer and shall be handed over to DHBN complete in all respect for maintenance and operation.
 3. Grid Sub Station i.e. 33 KV, 66 KV, 132 KV or 220 KV shall be constructed by the Developer at his own cost and shall be handed over to DHBN/HVPN free of cost. The norms of land requirement for various type of Sub Station as per DHBN/HVPN norms is as per Annexure-IV.
 4. For creation of the above Sub Stations the cost of feeding transmission line and its right of way shall be arranged by the Developer through his own sources.
 5. The cost of terminal arrangement of the transmission lines at DHBN/HVPN Sub stations shall be borne by the Developer as per sanctioned estimate/standard design of DHBN/HVPN.
 6. For the creation of Sub station/Transmission works, material shall be used as per specification of DHBN/HVPN. Before, erection of major items inspection of DHBN/HVPN authorities will be got carried out. The inspection charges @ 1.5% of the estimated cost of work shall be paid by the Developer to DHBN/HVPN.

Load Norms For Plots in Sector / Colonies being developed by HUDA / Private Colonies

Sr. No.	Class of City	Size Category of Plot/ Load Norms 14KW							
		2 Kanal	1 Kanal	14 marla	10 marla	8marla	6 marla	4 marla	2 marla
1.	A Class	40 KW	30KW	25KW	20KW	16KW	12KW	10KW	6KW
2.	B Class	30KW	20KW	20KW	15KW	10KW	8KW	6KW	4KW
3.	C Class	25KW	20KW	15KW	12KW	8KW	6KW	6KW	2KW

Note:- The classification of city for the purpose of load projection of Plots & Flats shall be as under:-

- I) A Class:- Fridabad, Gurgaon, Manesar.
- II) B Class:- Sirsa, Fatehbad, Hisar, Bhiwani, Narnaul, Palwal, Dharuhera, Rewari, Hansi.
- III) C Class:- All other cities/Town in DHBVNL, which are not covered in 'A' & 'B' class as above
- IV) D Class:- Stores flats are generally constructed in 'A' class were the load norms shall be as

Load Norms for Flats being constructed by Group Housing Societies:-

Sr. No.	Flats having covered area	Connected load
1.	Upto 900 Sq.ft.	8kw
2.	From 901 to 1600 Sq. ft.	16kw
3.	From 1601 to 2500 Sq. ft.	20kw
4.	Above 2500 Sq. ft.	24kw

Load norms for commercial areas

Norm shall be taken as 23 KVA per 1000 sq. feet of covered area as recommended by the Committee

LIST OF DOCUMENTS REQUIRED FROM COLONIZERS/HUDA/HSIDC ETC

Documents to be submitted by Private Developer to concerned Discoms:

1. Area/ Plot size to be developed.

2. Quantum of load/ Nature of load: Details of domestic/ commercial/ Industrial etc along with basis of calculation.
3. Ultimate load requirement. Details of load required year-wise for atleast next 5 years.
4. Copy of license granted by Haryana Town & Country Planning department.
5. Undertaking by developer for creation of required capacity of substation as per Planning manual at the cost of developer.
6. Mode of advance payment for construction of above substation by HVPN as deposit work of developer.
7. Electrification Plan of the area to be developed by developer highlighting the Land/ Row for feeding lines etc. earmarked on the electrification plan.
8. Requirement of initial load by developer and proposal to meet with the same.
9. Whether any captive generation will be undertaken by developer.
10. Any tie up for Open access power.

Other details:

1. Name of the developer
2. Address
3. Contact Person with designation
4. Phone/ fax
5. Proof of ownership of Area/ Plot to be developed.
6. Details of area along with geographical map marking the proposed project in details.
7. Purpose of development
8. Copy of license granted by Town & Country Planning, Haryana.
9. Quantum of load/ Nature of load: Details of domestic/ commercial/ Industrial etc as per Annexure H.
10. Ultimate load requirement. Details of load required year-wise for atleast next 5 years.
11. Undertaking by developer for creation of required capacity of substation as per Planning manual at the cost of developer.

12. Mode of advance payment for construction of above substation by HVPN as deposit work of developer.
13. Electrification Plan of the area to be developed by developer highlighting the Land/ Row for feeding lines etc. earmarked on the electrification plan.
14. Requirement of initial load by developer and proposal to meet with the same.
15. Whether any captive generation will be undertaken by developer.
16. Any tie up for Open access power, copy of agreement.

Documents to be submitted by HUDA to concerned Discoms:

1. Area/ Sector, City to be developed.
2. Details of area along with geographical map marking the proposed project in details.
3. Quantum of load/ Nature of load: Details of domestic/ commercial/ Industrial etc as per Annexure H.
4. Ultimate load requirement. Details of load required year-wise for at least next 5 years.
5. Undertaking for creation of required capacity of substation as per Planning manual at the cost of developer.
6. Mode of advance payment for construction of above substation by HVPN as deposit work of developer.
7. Electrification Plan of the area to be developed by developer highlighting the Land/ Row for feeding lines etc. earmarked on the electrification plan.

Documents to be submitted by HSIDC to concerned Discoms:

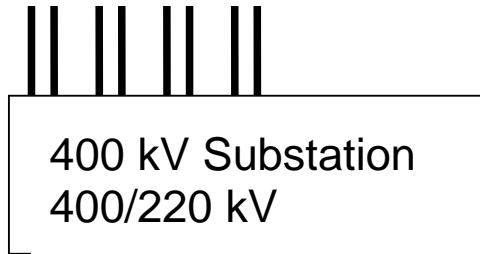
1. Area/ Sector, City to be developed.
2. Details of area along with geographical map marking the proposed project in details.
3. Quantum of load/ Nature of load: Details of domestic/ commercial/ Industrial etc as per Annexure H.

4. Ultimate load requirement. Details of load required year-wise for atleast next 5 years.
5. Undertaking for creation of required capacity of substation as per Planning manual at the cost of developer.
6. Mode of advance payment for construction of above substation by HVPN as deposit work of developer.
7. Electrification Plan of the area to be developed by developer highlighting the Land/ Row for feeding lines etc. earmarked on the electrification plan.

Loads and Sub-stations - General Information						
Particulars	400 kV	220 kV	132 kV	66 kV	33 kV	11 kV Switching Station
Load beyond which Voltage is to be considered (MVA)	300	94.5 in 66 kV belt & 75 MVA in 132 kV belt	15	15	5	-
Maximum Load, which can be handled (MVA)	945	300	75	94.5	15	5
Minimum land required (Acres) for conventional Substations	20	12	12	4	2	0.75
Minimum land required (Acres) for Gas-insulated Substations/Unmanned substation	8	6	3	2	1/4	-
Minimum size required (Mtrs) for Conventional Substations	300x300	240x200	150x200	80x120	80x120	75x50
Minimum size required (Mtrs) for Gas-insulated Substations	300x150	240x100	200x100	100x75	20x60	-

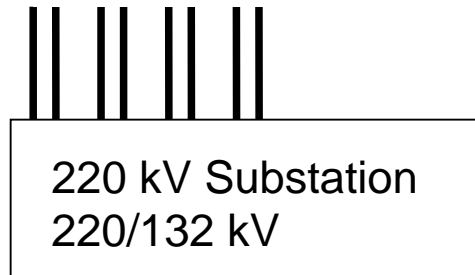
Corridor width for line required (Mtrs.)	60	35	28	18	12	6
Number/ total width of corridors required						
400/220	4 No./ 240 m	6 No./ 210 m	-	-	-	-
220/132	-	4 No./ 140 m	6 No./ 168 m	-	2 No./ 24 m	6 No./ 36 m
220/66	-	4 No./ 140 m	-	6 No./ 108 m	-	6 No./ 36 m
220/33	-	4 No./ 140 m	-	-	10 No./ 120 m	-
132/33/11	-	-	4 No./ 112 m	-	4 No./ 48 m	6 No./ 36 m
66/11	-	-	-	4 No./ 72 m	-	15 No./ 90 m
33/11	-	-	-	-	4 No./ 48 m	5 No./ 30 m

400 kV lines 240 m (4 Nos. bays)



220 kV lines 210 m (6 Nos. bays)

220 kV lines 140 m (4 Nos. bays)

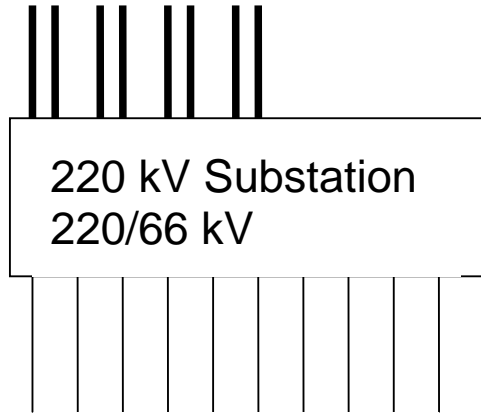


132/33/11 kV lines 168+24+36 m

(6 Nos. 132 kV bays +2 Nos. 33 kV bays + 6 No. 11 kV lines)

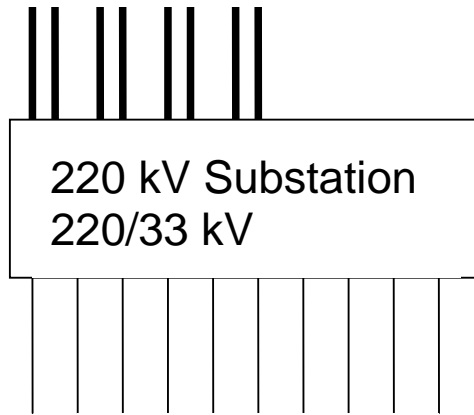
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220 kV lines 140m (4 Nos. lines)

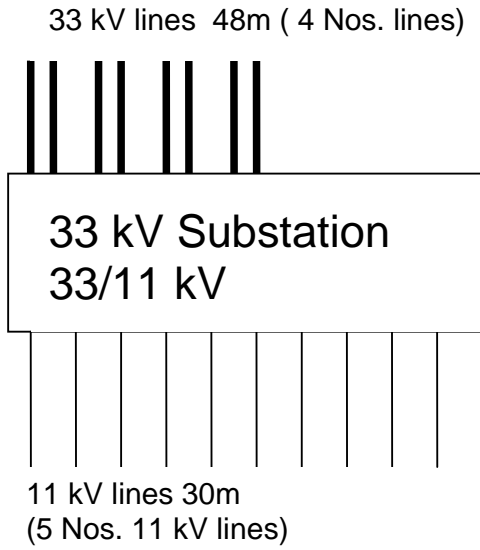
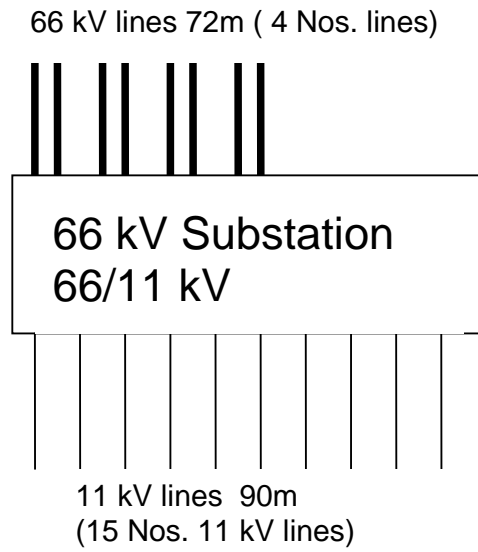
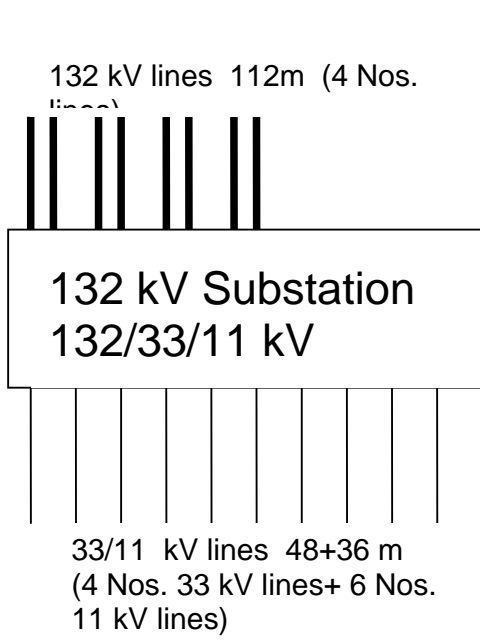


66/11kV lines
108+36m(6 Nos. 66 kV
lines+6 Nos. 11 kV lines

220 kV lines 140m (4 Nos. lines)



33 kV lines 120m (10
No. 33 kV lines



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Chapter VIII

High Voltage Distribution System (HVDS) in residential areas

A. For Plots of size 10 Marla and above Category

- i) Electrification will be done through 11 kV line on 11 Mtr. long PCC poles & the length of the span will not be more than 50 mtrs.80/50 MM2 ACSR conductor will be used for 11kv line.
- ii) 25/63/100 KVA completely self protected (CSP) type transformers shall be installed for 2-4 number houses depending upon the load requirement as per norms. The distribution transformer shall have a provision of DT meter.
- iii) For releasing the connection, A meter Pillarbox/pole mounted meter box shall be installed hear the T/F for housing the consumer busbar, from that busbar the connection will be taken to the consumer meter, which also be installed in the same box. The service line will be provided to consumer. One meter pillar box/pole mounted meter box can house 4,6,8,10 no. meters depending upon the location.
- iv) The LT armoured cable shall be taken out from the meter to the consumer premises (may be underground).
- v) Street light phase shall be provided under the 11 kV line through 30 mm2 insulated ACSR conductor by installing distribution transformer (s) as per load requirements with DT meter in the area which will be dedicated only for street light.

B For Plots of Size less than 10 Marla categories

- i) 11 kV line will be laid on 11 meter PCC poles wherever possible keeping in view the width of the roads. The span length should not be more than 50 mtrs.80/50 mm2 ACSR conductor will be used.
- ii) 25/63/100 KVA completely self-protected (CSP) type transformers shall be installed from where the connections will be made for 4-6 consumers through insulated conductor.
- iii) Wherever it is not possible to install ACSR conductors due to less clearance, then Aerial Bunched Conductors can be used.

- iv) Connection will be released to the individual consumer by installing the meter in meter pillar box/pole mounted meter box near the pole. From the LT side of T/F connection will be taken to a common bus bar which will be installed within meter pillar box/pole mounted meter box. Bus bar will be completed protected.
- v) Wherever it is not possible to install meter pillar box/pole mounted meter box, then the consumer Meter shall be installed outside the gate of the house in proper MCB.
- vi) Street light phase shall be provided under the 11 kV line through 30 mm² insulated ACSR conductor by installing distribution transformer (s) of desired capacity with meter in the area which will be dedicated only for street light

C For Group Housing Societies.

- i) 11 kV line will be laid up to the Boundary wall of the Group Housing Society on 11 meter poles with span length of 50 meters.
- ii) 200kva, 400 KVA , 500 KVA & 1000 KVA Distribution Transformers CSP Type shall be installed according to the requirement of load and shall be installed adjacent to the HT meter room.
- iii) Single point HT/LT NDS connection shall be given for common services like lift, water supply, street light etc. for which the metering equipment shall be installed near the main gate of the outer boundary wall of the society.
- iv) The LT shall be taken directly from the DT through armoured cable up to the Building, If laid underground, it should be through open trench, available for inspection.
- v) The meters will be installed at one place in the stilt at the basement of the building, in the completely protected Meter Pillar Boxes. 10-14 consumers meters shall be installed in single meter pillar box.

D For Housing Board Colonies.

- i) Electrification will be done through 11 kV line on 11 Mtr. long PCC poles & the length of the span will not be more than 50 mtrs.80/50 MM² ACSR conductor will be used for 11kv line.

- ii) 100 KVA completely self-protected (CSP) type transformers shall be installed.
- iii) The LT shall be laid directly from the DT through armoured cable using 9 Meter PCC Poles.
- iv) Connection will be released to the individual consumer by installing the meter in meter pillar box/pole mounted meter box near the pole.
- v) Wherever it is not possible to install meter pillar box/pole mounted meter box, then the consumer Meter shall be installed outside the gate of the house in proper MCB.

Annexure A

Form for submitting case for creation of new substation/ augmentation of existing substation by Discoms to HVPN

S.No.	Description	Information by Discoms	Comments of CE/TS, HVPN	Comments of Planning HVPN
1.	Existing substation requiring Augmentation/ Proposed creation of new substation			
2.	Name of "Op' division/ subdivision			
3.	Name of "Op' Circle			
4.	Location			
5.	Name of Distt. / Tehsil			
6.	Population of town at which the substation being proposed			
7.	Road connection			
8.	Amenities like PWD Rest house, school, Hospital, Health Centre, Dispensary, Post Office, Drinking Water facility etc.			
I	Creation of new substation			
	Voltage rating & capacity of new substation proposed			
	Size of land available			
	Suitability of land for construction of new substation			
	Whether size of land is suitable for creation of the proposed substation as per size defined in Planning manual			
	Whether resolution of Panchayat/ allotment of land by HUDA/ HSIDC obtained. If yes, enclose			

	the same. If no, how much time it will take to obtain the same			
	Distance from adjoining town/ Village			
	Availability of Right of Way for incoming lines from source 1 & 2			
	<p>Details about the present feeding of the area. Name of the existing 33 kV substation from which Area is presently being fed with</p> <p>a) Installed capacity of substation</p> <p>b) Maximum Demand recorded on the substation With date and time</p> <p>c) Feeder wise Maximum Demand of 11 kV feeders emanating from the substation</p>			
A	Data in respect of Feeding Substation (source at 1 & 2)			
	Availability of bay at feeding substation (source at 1 & 2)			
	Availability of space in control room at feeding substation for installation of new panels (source at 1 & 2)			
	Installed capacity at feeding substation (source at 1 & 2)			
	Maximum loading of transformers installed at feeding station (source at 1 & 2)			
	Availability of spare power at			

	feeding substation (source at 1 & 2)			
	Any augmentation of feeding source is required (source at 1 & 2)			
	Additional MVA capacity/ voltage rating required at feeding substation (source at 1 & 2)			
	Size of conductor of feeding line to source 1 & 2			
	Margin available feeding line to source 1 & 2. If not, any augmentation of conductor/ additional circuit required.			
	Any other approved proposal/ proposal under approval from feeding substation (source 1 & 2)			
	Any specific load requirement of the area of feeding substation (source 1 & 2).			
	Year wise load growth of area i.e load expected on the feeding substation by the next five years			
B	Data in respect of proposed substation			
	Whether proposed substation is to be fed by making LILO arrangement from existing line. If yes, data in respect of feeding line like Conductor size, maximum loading of line etc be supplied			
	Margin available at feeding line to			

	feed extra load to proposed substation			
	If new feeding line is to be erected then size of conductor & length of transmission line for proposed substation.			
	Details of upcoming colonizers/ promoters/ SEZ promoters in the area			
	Any specific load requirement of area			
	If any load is to be diverted from existing system to proposed substation. Quantum to be defined in MVA			
	No. of 11 kV/ 33 kV feeders proposed to be fed			

	<p>Name of the existing 33 kV substation from which Area is presently being fed with</p> <p>a) Installed capacity of substation</p> <p>b) Maximum Demand recorded on the substation With date and time</p> <p>c) Feeder wise Maximum Demand of 11 kV feeders emanating from the substation</p> <p>d) Whether 11 kV feeders are running in groups if so how many ? Give details</p> <p>e) Distance from existing substation to proposed substation</p> <p>f) Length, Size and current carrying Capacity in MVA or feeding lines.</p>			
	<p>Name of the existing 66 kV substation near the Proposed Substation with</p> <p>a) Installed capacity of each substation</p> <p>b) Maximum demand recorded on existing substation.</p> <p>c) Feeder wise Maximum Demand of 11 kV feeders emanating from the existing substation.</p> <p>d) Distance from substation to proposed substation.</p>			

	Relief to be afforded/available on the creation of proposed substation and to which substation give details			
	Voltage drop calculation with existing and proposed arrangements.			
	Geographical Map indicating the proposed substation alongwith connectivity with feeding substation			
	Sketch of the existing and proposed 11 kV/ 33 kV system of the area concerned along with marking of the proposed substation.			
	Detailed justification for creation of 66 kV or 132 kV substation clearly indicating the supply condition before and after the creation of new substation.			
	Alternate proposal if any/ Scope of further improvement			
	Recommendations for new substation			
II	Augmentation of existing substation			
A	Data about feeding substation			
	Installed capacity at feeding substation			
	Maximum loading of transformers installed at feeding station			

	Availability of spare power at feeding substation			
	Any augmentation of feeding source is required			
	Additional MVA capacity/ voltage rating required at feeding substation			
	Size of conductor of feeding line			
	Margin available feeding line If not, any augmentation of conductor/ additional circuit required.			
	Availability of bay at feeding substation			
	Availability of space in control room at feeding substation for installation of new panels			
	Any other approved proposal/ proposal under approval from feeding substation			
	Any specific load requirement of the area of feeding substation			
	Year wise load growth of area i.e load expected on the feeding substation by the next five years			
B	Data in respect of substation proposed to be augmented			
	Existing Transformer details			
	Loading of existing transformers			
	Space for transformer in switchyard			
	space of creation of outgoing bays			

	space in control room for installation of new panels			
	Loading of feeding line			
	Margin available at feeding line to feed extra load			
	If new feeding line is to be erected then size of conductor and availability of Row			
	Category wise pending applications with their loads of the substation by the next five years.			
	Year wise load growth of area i.e load expected on the substation by the next five years			
	Details of upcoming colonizers/ promoters/ SEZ promoters in the area			
	PRM at the time of Maximum demand of transformer in MVA			
	Grouping of 11 kV/ 33 kV feeders			
	Alternate proposal if any/ Scope of further improvement			
	Transformer capacity for augmentation			
	Recommendations for augmentation of substation			
	Existing and Anticipated load in MVA on 11 kV/33 kV Feeders in case of 66 kV or 132 kV substation			

	Name of proposed 11 kV feeders to be fed from substation			
	Name & capacity of 33 kV substation to be fed from substation			
	Any approved augmentation/new creation at 33 kV level			
16.	Geographical Map indicating the proposed substation alongwith connectivity with feeding substation			
17.	Sketch of the existing and proposed 11 kV/ 33 kV system of the area concerned along with marking of the proposed substation.			
18	Detailed justification for creation of 66 kV or 132 kV substation clearly indicating the supply condition before and after the creation of new substation.			
19	Recommendations			
Planning cell, HVPN				
System study by HVPN, if required				20 days
Submission of proposal by HVPN after the receipt of all information/ system study				
Tentative completion schedule				
Tentative funds requirement				

Annexure- B

HARYANA URBAN DEVELOPMENT AUTHORITY SECTOR-6, PANCHKULA.

No. Auth.-2007/7263-72

Dated: 26/02/07

To

- 1 Shri Prem Prashant, IAS
Chief Secretary to Govt., Haryana Vice Chairman
- 2 Shri M.L. Tayal, IAS
Principal Secretary to Chief Minister, Haryana,
Chandigarh. Member
- 3 Shri N. Bala Baskar, IAS
Financial Commissioner & Principal Secretary to
Govt. Haryana, Finance Department. Member
- 4 Smt. Shakuntla Jakhu, IAS,
Financial Commissioner & Principal Secretary to
Govt. Haryana, Town & Country Planning
Department. Member
- 5 Shri Ashok Lavasa, IAS,
Financial Commissioner & Principal Secretary to
Govt. Haryana, Power Department. Member
- 6 Shri P.K.Gupta, IAS,
Commissioner & Secretary to Govt. Haryana,
Urban Development Department. Member
- 7 Shri S.S.Dhillon, IAS,
Chief Administrator, Haryana Urban Development
Authority, Member

AND

Director,
Town & Country Planning & Urban Estate
Departments, Haryana, Chandigarh.
- 8 Shri. H.S.Chahal,
Engineer-in-Chief, PWD B&R, Haryana, Chandigarh Member
9. Shri M.P. Bhandari,
Engineer-in-Chief, PWD, Public Health, Haryana,
Panchkula. Member

Subject: Corrigendum to the proceeding of 98th meeting of Authority – decisions regarding construction of grid sub stations in HUDA sectors.

Sir,

In continuation of this office letter No. Auth-2006/1411-22 dated 12.01.2007 vide which the proceedings of the 98th meeting of Haryana Urban Development Authority held on 12.12.2006 under the Chairmanship of Hon'ble Chief Minister, Haryana/Chairman of the Authority were circulated, I have been directed to inform you that the matter relating to the construction of grid sub stations in the matter relating to the construction of grid sub stations in the sectors/Urban Estates, developed by HUDA was also discussed in the above said meeting. Inadvertently the matter could not be included in the proceedings. The following decisions may also be considered a part of the proceedings.

“Financial Commissioner and Principal Secretary to Government Haryana, Power Department appreciated the gesture of HUDA in deciding to contribute towards construction of Grid sub-stations. Thereby resolving the long pending issue. He informed the Hon'ble Chairman about the decision taken in the meeting held under the Chairmanship of Financial Commissioner and Principal Secretary to Government Haryana , Town and Country Planning Department on 11.12.2006 as per the following:

- i) Total cost of 220 KV Sub-Stations including land cost with total cost of transmission lines upto 66 KV sub stations have to be shared by HUDA and HVPN in the ratio of 60:40.
- ii) Entire construction and land cost of 66 KV sub stations will be borne by HUDA.
- iii) 8 acres land may be earmarked for every 220 KV Gas insulation sub stations.
- iv) HVPN will intimate the construction cost of 220 KV and 66 KV sub stations.

The matter was further deli liberated by the Authority and the following decisions were taken:

- i) The total cost of 220 KV /132 KV substations including land cost and cost of transmissions lines upto 66 KV /33 KV substations will be shared between HVPN & HUDA in ratio of 50:50.

- ii) Entire construction and land cost of 66 KV / 33 KV substations will be borne by HUDA.

Yours faithfully,

-sd-

**Secretary,
Haryana Urban Development Authority,
Panckula.**

Endst. No. Auth-2007/

Dated:

A copy of the above along with proceedings of the 98th meeting of the Authority of the Authority is forwarded to the following:-

1. The Additional PSCM-I for information and necessary action.
2. The Senior Secretary to Hon'ble Chief Minister, Haryana/ Chairman of the Authority for information of the Hon'ble Chief Minister, Haryana.

sd-

**Secretary,
Haryana Urban Development Authority,
Panckula.**

HARYANA VIDYUT PARSARAN NIGAM LTD.

From

The Deputy Secretary / Technical,
HVPN, Panchkula.

To

1. All Chief Engineers/Const.O&M in HVPN.
2. All Chief Engineer 'OP' in UHBVN/DHBVN.
3. All Superintending Engineers/Const.O&M, in HVPN.
4. All Superintending Engineers/OP Circle in UHBVN/DHBVN.

Memo. No. Ch-59/ DST-38

Dated 12.5.2004

Subject: Sharing of cost of Grid S/Stn./Transformer by Colonizers/Developers/Societies at the time of sanction of load release.

The officers of Distribution Companies in the field have been seeking certain clarifications with regard to charging of share cost of new grid substations / augmentations from colonizers / developers / others. This has been inviting attention of the Nigam for quite sometime.

The issue regarding sharing of cost of new grid substations / augmentation of existing substations required for meeting the load demand of Urban / Industrial estates developed by HUDA / other Govt. agencies as well as private colonizers / developers was considered by the **Board of Directors, HVPN** in their meeting held on 28.4.2004 and approved as under :-

1. The colonizers / developers of residential /commercial/industrial complexes including HUDA/HSIDC etc. are required to make suitable **provision for the location of new grid substation required to feed the electric load of these complexes and bear the cost of construction of the required grid substation/ interlinking transmission lines for this Substation as well as for future augmentation of the Substation.** The entire plan design and technology would be as approved by HVPN which may also construct the transmission works including the Substation if required or expedient. The Substation

constructed by HUDA/HSIDC/Colonizers would be handed over to HVPN as implied by the Electricity Act of 2003.

2. In case there is already existing Substation which could take up the load demand of such complex **share cost** of such Substation would be paid by the Colonizers / Developers. Licensees of the TCP department located on land other than land developed by HUDA would be charged shared cost of Substation linked to their complex.
3. In cases where the construction is done by the individual owners on the land developed by HUDA, no share cost of Substation would be levied on such persons. However, HUDA would be responsible for construction of the grid Substations line required to feed the load of that area and would bear the entire cost of the Substation.

You are requested to take immediate necessary action in the matter.

Sd/-
Deputy Secretary / Technical
HVPN, Panchkula.