Chapter 5 Strengthening of Sub-transmission and Distribution network

5.1 Non achievement of target of PSSs construction

The development of sub-transmission and distribution (ST&D) infrastructure[81] in rural areas aimed to provide uninterrupted 24x7 electric supply by 2019. PSSs are constructed to reduce the length of supply lines (33/11 KV) in order to minimise the number of consumers affected in case of a breakdown.

Against the target of construction of 146 new PSSs in the State, only 65 PSSs could be constructed as of March 2020. The details of PSSs constructed under RGGVY (XII FYP) and DDUGJY in the test-checked districts are given in **Table 5.1**:

Table 5.1: Target of construction of PSSs and achievement there-against

Name of district	No. of PSSs to be constructed	Capacity of PSSs to be installed (MVA)	No. of PSSs constructed	Capacity of PSSs installed (MVA)	No. of PSSs loaded
Dhanbad	06	40	6	40	3
Deoghar	04	20	4	20	0
Pakur	02	20	0	0	0
Palamu	12	105	3	20	0
Giridih	05	50	4	40	0
Dumka	03	25	3	25	3
Ranchi[82]	09	90	9	90	2
Total	**41**	**350**	**29**	**235**	**8**

(Source: Compiled from data furnished by ESCs of JBVNL)

Table 5.1 shows that out of 41 PSSs of 350 MVA targeted for construction in the test-checked districts, only 29 PSSs of 235 MVA could be constructed. Both JBVNL and the contractors were responsible for delay/non-construction of all PSSs. JBVNL delayed providing land to Turn Key Contractors (TKCs), changed the location due to handing over of unsuitable or rocky land earlier and did not ensure availability of approach road to PSSs sites for periods ranging between four to 19 months from the date of issue of Letter of Intent (LoI) in case of 31 out of 41 PSSs. Contractors delayed submission of survey reports, drawings for PSSs and BOQs by five to 11 months in case of 14 PSSs of Giridih and Ranchi. Contractors also delayed procurement of materials and did not mobilise

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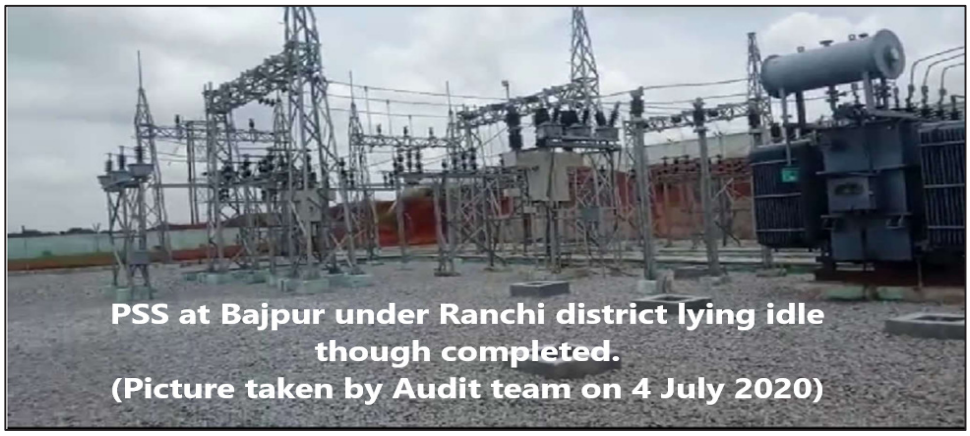
81 Construction of new PSSs, augmentation of existing PSSs, erection of HT lines, installation of new distribution transformers and augmentation of existing distribution transformers.

82 Three PSSs at Jargo, Ormanjhi and Silli out of 12 PSSs under DDUGJY were de-scoped as land were not finalised.

sufficient manpower required for completion of construction of the PSSs within the time schedule.

Thus, GoJ failed to provide suitable land for construction of PSSs resulting in delayed construction of PSSs and de-scoping of three PSSs in Ranchi district.



PSS at Bajpur under Ranchi district lying idle though completed.
(Picture taken by Audit team on 4 July 2020)

Case Study

Construction of one PSS of 2x5 MVA with three feeders (two agriculture and one domestic) at Bajpur village at a cost of ₹ 4.27 crore under Ranchi district was completed (August 2019) after a delay of three months from the scheduled date of completion (May 2019) as land was allotted (January 2018) after a delay of eight months from the date of LoI (May 2017). Even after construction (August 2019), the PSS was lying idle (July 2020) due to non-connectivity from GSSs and non-deployment of operator for the PSS.

Similarly, land for the PSS at Chanho under Ranchi district was allotted after a delay of 10 months in March 2019. The construction of the PSS of 10 MVA with three feeders (two agriculture and one domestic) was completed with a delay of two months in July 2019. Further, the domestic feeder was charged (November 2019) after a delay of four months due to non-deployment of operators and the agriculture feeders were lying idle (July 2020)

Further, out of 29 completed PSSs of 235 MVA, only eight PSSs of 70 MVA could be charged. The remaining 21 PSSs of 165 MVA were not charged (June 2020) even after a lapse of three to 29 months of their construction mainly due to non-construction of GSSs (three cases), non-erection of associated 33 or 11 KV lines (16 cases) and absence of trained manpower (two cases) for operating the PSSs. As a result, the existing PSSs were running at around 80 *per cent* of its rated capacity during peak demand

which was the optimum level of operation considering safety of a transformer.

While accepting (May/October 2021) the audit observation, Management/Department stated that the status has now changed and 33 PSSs have been put on load.

5.2 Augmentation of PSSs

Augmentation of PSSs refers to increase in the existing transformation capacity of PSSs by replacement of old transformers or by installation of additional power transformers.

Against the scope of augmentation of 123 PSSs in the State, 94 PSSs were augmented as of March 2020. In the test-checked districts, 31 PSSs of 189 MVA were augmented against the scope of 34 PSSs of 204 MVA (***Appendix III)***. Augmentation work of PSSs was almost complete except in Pakur and Palamu districts due to poor performance of TKCs.

While accepting (May/October 2021) the audit observation, Management/Department stated that work has been delayed due to termination of TKC of Pakur and shortage of material in Palamu district.

5.3 Construction of 33 KV line

The status of erection of 33 KV HT lines under DDUGJY in the test-checked districts is given in **Table 5.2**.

Table 5.2: Status of erection of 33 KV HT lines under DDUGJY in test-checked districts

Name of district	Scope (Ckm)	Achievement in Ckm (*per cent*)
Dhanbad	62.19	53.57 (86)
Deoghar	103.20	67.72 (66)
Pakur	25.00	15.70 (63)
Palamu	159.96	14.20 (09)
Giridih	104.66	56.00 (54)
Dumka	41.82	36.67 (88)
Ranchi	221.78	221.78 (100)
Total	**718.61**	**465.64 (65)**

(Source: Compiled from data furnished by ESCs of JBVNL)

It can be seen from **Table 5.2** that the physical progress of the work ranged between nine and 88 *per cent* in six out of the seven test-checked districts. This was mainly due to delays in obtaining forest clearances, delays in finalisation of drawings and technical parameters of Power Transformers (PTrs), delays in finalisation of deviation in BoQs, hindrance by locals regarding RoW (Right of Way), insufficient mobilisation of manpower by TKCs and termination of TKC of Pakur and RoW in Palamu district. Non-

erection of 33 KV lines led to non-charging of eight[83] PSSs of 45 MVA in these districts as of February 2020 even though the PSSs were completed between August 2019 and December 2019. Thus GoJ failed to get timely forest clearance and resolve RoW issues resulting in delay in construction of 33 KV lines.

While accepting (May/October 2021) the audit observation, Management/Department stated that work is expected to be completed soon.

5.4 Excess provision of Distribution Transformer (DTrs)

As per guidelines of RGGVY (XII FYP) and DDUGJY, DTrs were to be installed keeping in view the load growth of five years at the rate of 10 *per cent* per year. For calculation of existing load on a DTr, load of 250 watt for BPL households, 500 watt for APL households and 1000 watt for public places were to be considered. For this, a newly installed DTr should not be given the load of more than 50 *per cent* of its capacity so that optimal utilisation maximum up to 80 *per cent* may be ensured as per prescribed norms to cope up with the projected load growth.

- During field visit (July 2020) of Malar and Palma villages of Ranchi district, it was observed that only four KVA for 11 consumers (three APL and eight BPL) and 27 KVA for 58 consumers (35 APL and 23 BPL) were connected with the installed capacity of 50 KVA (2x25 KVA) and 75 KVA (3x25 KVA) DTrs respectively.

Audit observed that 20,051 DTrs were to be installed for the projected 2,81,550 BPL, 3,11,025 APL and 9,272 public places connections. This was revised to 29,079 DTrs[84] for connections to 1,53,181 BPL, 1,50,187 APL and 3,422 public places. Against this, under RGGVY (XII FYP) and DDUGJY, 23,941 25 KVA and 559 63 KVA DTrs having a total load capacity of 6,33,742 KVA were installed in the test-checked districts (***Appendix IV)***.

These DTrs were loaded with 1,80,585 BPL, 1,37,691 APL and 4,965 public places connections under RGGVY (XII FYP), DDUGJY and SAUBHAGYA as of March 2020 which was equivalent to 1,39,893 KVA**.** Considering the load requirement of 50 *per cent* and load growth at the rate of 10 *per cent* per year for five years, the requirement was DTrs with load capacity of 2,79,786 KVA. As such, DTrs with load capacity of 3,53,956 KVA were installed in excess of requirement. Thus, JBVNL incurred avoidable excess expenditure of ₹ 1.51 crore[85] on 14,158 DTrs of 25 KVA due to lack of proper survey and planning.

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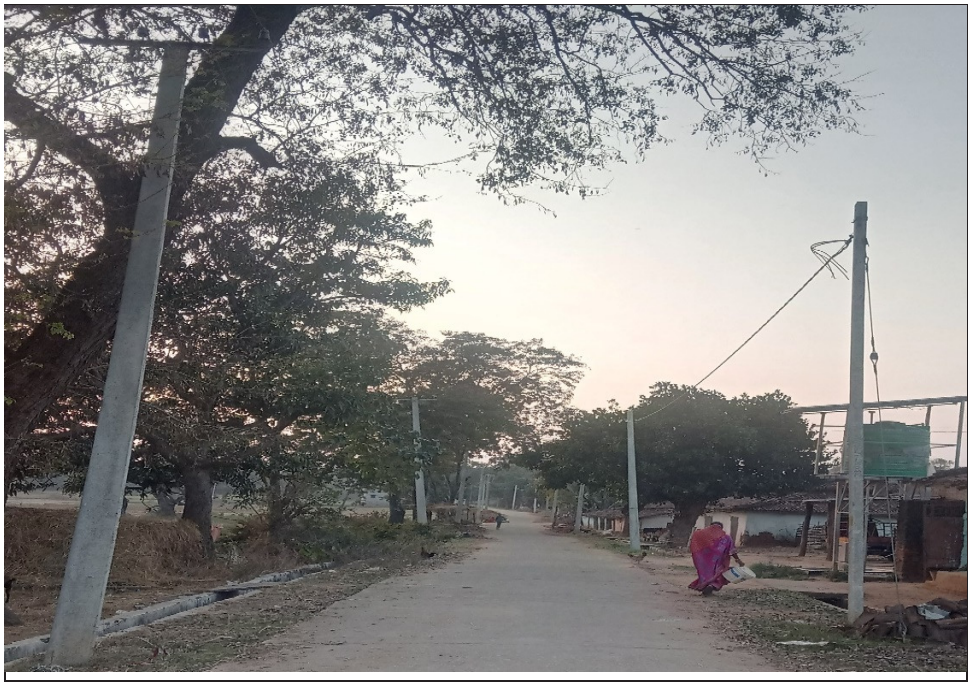
[83] Deoghar-4, Palamu-3 and Ranchi-1
[84] 25 KVA DTrs-28,520 and 63 KVA DTrs-559
[85] Average cost of ₹ 81,332 per DTr.

In reply, Management/Department stated (May/October 2021) that DTrs were installed after considering the site conditions, scattered load and future load so that optimal load should not be more than 80 *per cent* after five years.

The reply is not acceptable as in Malar and Palma villages of Ranchi district, load of only four KVA for 11 consumers (three APL and eight BPL) and 27 KVA for 58 consumers (35 APL and 23 BPL) were connected with the DTrs of 50 KVA (2x25 KVA) and 75 KVA (3x25 KVA) installed at a distance of approx. 80 meter and 100 meter and the projected load after five years would be only 6.44 KVA and 43.48 KVA which could be catered by one and two 25 KVA DTrs respectively.

5.5 Extra expenditure due to excess provision of PCC poles

As per Letter of Award (LoA), 18 HT Portland Cement Concrete (PCC) poles per kilometre (km) for HT (33/11 KV) lines and 25 LT PCC poles per km for LT lines were to be erected.



During field visit in Makka village under Ranchi district, it was observed that the TKC did not utilise the existing poles and erected new ones.

It was observed that against the required 1,24,444 HT poles and 4,48,488 LT poles, JBVNL erected 1,62,067 HT poles and 4,91,229 LT poles in the seven test-checked districts under RGGVY (XII FYP) and DDUGJY. Thus, 39,731 HT and 42,741 LT poles were erected in excess of requirement (***Appendix V***) which led to extra expenditure of ₹ 45.55 crore (calculated at average rate of ₹ 5,333 per pole).

Physical verification of 27 poles in four villages of Ranchi (Makka-7 and Murupiri-11) and Giridih (Jadu Raidih-5 and Baria-4) districts in February 2020 revealed that the distance between two LT poles ranged between 20 and 37 metres against the norms of 40 metres.

In reply, the Management/Department stated (May/October 2021) that excess poles were installed due to it being hilly area, forests, zig-zag streets, RoW etc.

The reply is not acceptable as audit measured the distance between two LT poles in plain and level land and found that it was less than 40 meters.

5.6 Excess installation of Sub Main Distribution Boards (SMDBs)

As per DDUGJY guidelines, connections were to be released through SMDBs installed on LT poles. As per LoI of DDUGJY, eight connections could be released through a single SMDB. Details of SMBDs installed and connections released is shown in **Table 5.3**:

Table 5.3: Details of SMDBs erected and connections released

Name of district	No. of SMDBs installed	No. of connections released	No. of SMDBs required	Excess SMDBs installed
Dhanbad	14,652	20,500	2,563	12,089
Giridih	81,447	80,248	10,031	71,416
Deoghar	20,886	16,538	2,067	18,819
Dumka	82,512	71,105	8,888	73,624
Palamu	15,375	96,690	12,086	3,289
Pakur	6,805	12,424	1,553	5,252
Ranchi	35,657	21,485	2,686	32,971
Total	**2,57,334**	**3,18,990**	**39,874**	**2,17,460**

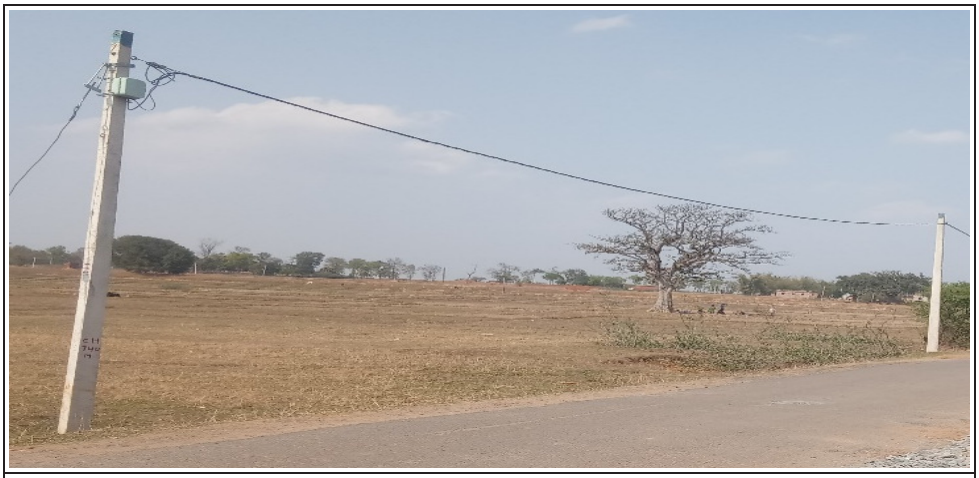
(Source: Compiled from data furnished by ESCs of JBVNL)

Table 5.3 shows that 2,57,334 SMDBs were installed for providing only 3,18,990 connections. Further, in four districts[86], the number of installed SMDBs (2,20,502) were more than the connections (1,89,376) released which indicated that SMDBs were installed even without requirement. In

[86] Deoghar, Dumka, Giridih and Ranchi

Giridih, 81,447 SMDBs were installed on only 59,272 LT poles (***Appendix V***). Thus, SMDBs were installed in excess of requirement in the test-checked districts. The avoidable expenditure on installation of 1,77,586[87] excess SMDBs, as calculated by Audit, was approximately ₹ 33.01 crore considering 50 *per cent* utilisation of SMDB (*i.e.,* four connection per SMDB) at an average cost of ₹ 1,859 per SMDB.

During field visit, SMDBs were found installed even on poles erected in fields wherefrom no connections were released as shown in the photograph given below.



Photograph of SMDB without any connection on a pole at Giridih (photograph taken on 6 March 2020)

In reply, the Management/Department stated (May/October 2021) that excess SMDBs were installed due to scattered load at site, large number of existing consumers and prospective new service connections in near future.

The reply is not acceptable as, during physical verification, SMDBs were also seen installed in areas where no habitation existed. Further, it was seen that only one connection was being provided from a single SMDB.

5.7 PSS and Feeder metering

Metering is of vital importance in order to facilitate sustainable commercial operations of a distribution company. Apart from metering at the consumers end, metering at distribution transformers (DTrs) and feeders facilitate building up a mechanism for proper energy accounting. This also helps in identifying pockets of losses and thus initiating remedial measures to reduce such losses.

Audit noticed that energy meters were not installed at PSSs and feeders constructed/augmented under RGGVY (XII FYP) and DDUGJY. Though energy meters were installed at DTrs, DTr-wise energy accounting was not being done by the Circle/Division offices to check losses of energy, if any,

[87] (2,57,334-39,874x2) x ₹1,859= ₹ 33.01 crore

for reasons not available on record. Thus, one of the main objective of DDUGJY i.e., to reduce the Aggregate Technical and Commercial Loss (AT&C) was defeated despite expenditure of ₹ 30.88 crore on installation of energy meters at DTrs in the seven test-checked districts (calculated at the average rate of ₹ 12,606 per meter).

While accepting (May/October 2021) the audit observation, the Management/Department stated that energy accounting will be done in future.

5.8 Infrastructure created under JSBAY I and II

The work under *Jharkhand Sampurna Bijli Aachhadan Yojana* (JSBAY) Phase I included mainly construction/ augmentation of 44 PSSs and 2,086.38 Ckm transmission lines[88] besides providing connection to uncovered households and agricultural consumers. The works under JSBAY I were taken up between July 2018 and March 2019 for completion between January 2020 and September 2020. Similarly, construction/ augmentation of 85 PSSs and 2,905.26 Ckm transmission lines[89] under JSBAY II were taken up between February 2019 and June 2020 for completion between July 2020 and December 2021.

- In Ranchi district, two PSSs were to be constructed under JSBAY Phase-II for which the district administration allotted land to JBVNL at Nayasarai (May 2019) in Nagri Block and Sukurhutu (July 2019) in Kanke Block after a delay of two to three months after issue of LoI (March 2019). During site visit (August 2019), JBVNL officials and TKC found that the allotted land at both the places were rocky and not suitable for construction of PSSs. Subsequently, the Deputy General Manager (DGM) approached the districts administration for change in the sites which were yet to be handed over to TKC (June 2020). Further, under JSBAY Phase-I, land for Lalli PSSs in Ranchi district was handed over (May 2019) to TKC after a delay 10 months from the date of issue of LoI (July 2018).

Audit observed that physical progress of works ranged between 20 and 60 *per cent* under JSBAY I whereas it was 10 to 45 *per cent* under JSBAY II as of August 2020 (***Appendix VI*).**

Test-check of construction of 39 PSSs[90] in six test-checked districts revealed that there were delays of 20 months (April 2020) from date of LOI in identification of land in case of 15 PSSs[91], delay ranging from two to 12

[88] 33 KV line-1,330.19 CKM and 11 KV-756.19 CKm
[89] 33 KV line-956.17 CKM and 11 KV-1,949.09 CKm
[90] Dhanbad-4, Giridih-17, Ranchi-3, Dumka-8,Palamu-6 and Pakur-1 in Ph-I
[91] Dhanbad-2, Giridih-2,Ranchi-2, Dumka-4 and Palamu-5

months in handing over the land to TKC in 10 PSSs[92], delay in approaching district administration with respect to non-suitability of land by JBVNL in case of 14 PSSs, RoW issues in two PSSs and delay ranging 11 to 15 months in freezing of BOQ in four cases.

There were delays in providing PERT Chart by TKCs ranging from 12 to 30 days (eight[93] PSSs), delay in start of work of repair and maintenance of 13 PSSs, delay of three months in submitting request to Railways for granting way leave permission in three 33 KV lines besides poor quality of material, shortage of manpower, delay in submission of proposal for forest clearance, deficient work and slow pace of work execution by the TKCs.

- Out of 13 PSSs to be constructed in Giridih district under JSBAY Phase-II, works awarded in March 2019 were not started till March 2020 in respect of four PSSs at Bagodar, Pirtand, Jamua and Rajdhanwar. Commencement of work was delayed as demarcation of land for these PSSs was done only in February and March 2020 after a lapse of 11 to 12 months from the date of issue of LoI.

While accepting the audit observation, the Management/Department stated (May/October 2021) that the delays were on the part of the Administration and Forest Department and was beyond the control of JBVNL.

The reply is not acceptable as JBVNL had delayed approaching the District Administration for allotment of suitable land, settling the RoW issues and delay in freezing of BOQ[94]. Further, JBVNL accepted that projects were delayed due to delay in resolving land issues and forest clearance by GoJ.

5.9 Discrepancies observed during Beneficiary Survey and Joint Inspection

With the objective of accessing the effectiveness and efficiency in implementation of the Rural Electrification schemes, Audit carried out joint field verifications along with the officials of JBVNL during September 2019 to March 2020. During field visits, survey of 138 beneficiaries of 26 villages[95] in seven districts[96] were also carried out. It was observed that awareness programme for DDUGJY was not conducted in the villages.

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92 Giridih-7, Dumka-2 and Ranchi-1

93 In JSBAY-I, 27 days in Pkg-2, 15 days in Pkg-3, 12 days in Pkg-5, 22 days in Pkg-6, In JSBAY-II, 15 days in Pkg-1 & 2 each, 30 days in Pkg-4 & 6 each,

94 Dumka, Ranchi and Giridih

95 Dhanbad (Analasia, Kapasara, Kanchanpur,Madhugoda), Pakur (Jitalpur, Mohanpur, Sundarpur, Dhanpahadia) Deoghar (Barakola,Rakti, Guniasole, Mohnadih), Palamu (Khendra Kalan, Purandin, Nawatoli, Khendra Khurd), Giridih(Badwara, Buchha Nawadih, Baria, Jadu Raidih), Dumka (Bedia, Palasi, Sikarpur, Brindabani) and Ranchi (Murupiri, Makka)

96 Dhanbad (September 2019), Pakur (September 2019) Deoghar (December 2019), Palamu (December 2019), Giridih (March 2020), Dumka (March 2020) and Ranchi (February and June 2020)

Danger boards were not found on any pole and sign boards of DDUGJY were not found in any of the villages. Further, meters were found installed inside the premises in case of 33 beneficiaries (24 *per cent*) which were not accessible without getting the premises unlocked or opened for the purpose.

It was further observed that none of the meters were installed on the pillar boxes as envisaged in the scheme guidelines. In case of 21 metered connections (15 *per cent*) out of 138 beneficiaries, 18 meters were not connected with line circuit and three meters were found defective. LED bulbs were also not provided to 81 beneficiaries (59 *per cent*) though it was to be provided by TKC under centrally sponsored schemes. None of the beneficiaries had received bills even after a lapse of 16 to 33 months of electrification. Though meters were installed at DTrs, their readings were not being taken by JBVNL. SMDBs were found installed on poles erected even in uninhabited areas. The beneficiaries further stated that only 10-12 hours of power per day was available in the villages.

- In Madhugora village under Dhanbad district, a consumer having consumer no. BPBD3803 had an existing metered connection (meter no. 22707) which was in working condition. However, he was again provided a new meter by TKC which was lying uninstalled.

The Management/Department accepted (May/October 2021) the audit observations and stated that danger boards have been installed after completion of work and discrepancies in meter connections have been rectified. The Management/Department also stated that LED bulbs had been provided to all beneficiaries and awareness programme was conducted. However, the fact remains that the beneficiaries had stated that LED bulbs had not been provided and no awareness programme had been carried out.

Installation of excess DTrs, PCC poles and SMDBs at a cost of ₹ 80.07 crore needs to be investigated by an independent investigating agency to fix responsibility on the erring officials of JBVNL. The delay in handing over of suitable land for PSSs also needs to be investigated by the Energy Department.

To sum up, *under DDUGJY, 29 Power Sub Stations (PSSs) of 235 Mega Volt Ampere (MVA) were constructed. Of these, only eight PSSs of 70 MVA could be charged while 21 PSSs were idle (June 2020) even after three to 29 months of their construction mainly due to the associated Grid Sub Stations (GSSs) remaining incomplete (three cases), non-erection of required 33 or 11 KV lines (16 cases) besides absence of trained manpower (two cases) to operate these PSSs.*

As against the target of 718.61 Ckm 33 KV line, only 465.64 Ckm were erected in the seven test-checked districts due to delays in obtaining forest clearances, delays in finalisation of drawings and technical parameters of

Power Transformers (PTrs), RoW (Right of Way) and insufficient mobilisation of manpower by TKCs.

JBVNL had not installed energy meters at PSSs and feeders. Meters installed at Distribution Transformers (DTrs) were lying idle without any energy accounting to check losses. Thus, one of the main objectives i.e., reducing AT&C losses was defeated.

Against the target of 129 PSSs of 1,290 MVA, only nine PSSs of 90 MVA were constructed under JSBAY. Test-check of construction of 39 PSSs revealed that there was delay of 20 months (April 2020) from date of LoI in identification and handing over of land by JBVNL besides delay on the part of TKCs to commence and complete the work.