Chapter III

Planning and Implementation of the Scheme

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The Scope of works under IPDS scheme included the following components: (i) strengthening of sub-transmission and distribution network, (ii) metering of feeders /distribution transformers/consumers, etc. (iii) IT enablement of distribution sector, (iv) provisioning of Solar panels on Government buildings with net-metering, etc.

Significant variations from planned works were observed in execution of system strengthening works. ESCOMs did not include certain quantities in the DPRs or included quantities which were not required therein, necessitating change in scope of works during execution. Work orders under system strengthening component were dropped after awarding, citing reasons such as non-receipt of essential permissions, right of way issues and coverage of works under other schemes.

Audit found that the percentage of execution against the sanctioned quantity in system strengthening works ranged from zero per cent to 4,890 per cent (Ring Main Units – RMU). ESCOMs awarded contracts in violation of KTPP Act and Rules, by providing less time for submission of tenders and by awarding works at high tender premiums. There was delay in completion of the work and non-achievement of the objective as envisaged, even after more than three years of issue of Detailed Work Award. Non-completion of DC/DRC work within time resulted in additional expenditure on co-hosting charges and non-utilising of GIS data procured by ESCOMs. Though BESCOM spent ₹ 42.04 crore for implementation of ERP and declared it as completed, the system was yet to be put to use.

Automated Meter Reading was not done in any of the selected eight Divisions of BESCOM, even after installation of static meters and GPRS modems. ESCOMs issued DWAs without proper planning and identification of buildings for installation of Solar power plants resulting in delay in execution and non-fulfilment of objectives. ESCOMs did not prepare comprehensive Quality Assurance plan and could not ensure prescribed quality of materials. Non-conducting of mandatory inspections resulted in poor quality materials being used in Solar project of CESC and consequent low energy generation by the Solar panels. Non-maintenance of Solar panels also resulted in poor performance.

3.1. Introduction

The Scheme guidelines stipulated formulation of the project in two stages:

Under first stage, ESCOMs were to identify critical gaps in sub-transmission and distribution network considering all relevant parameters[30] for efficient management of the distribution system and prepare a Need Assessment Document in format prescribed in the Scheme Guidelines.

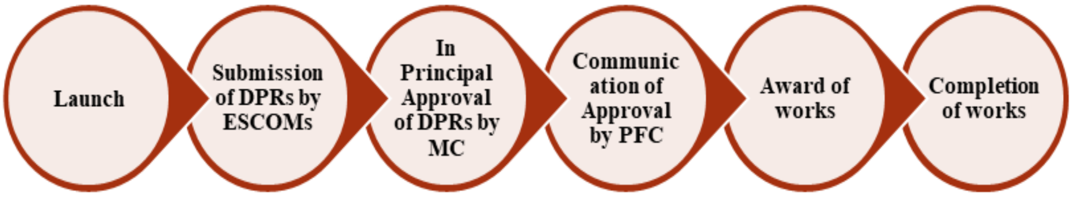
Based on the assessment, scope of work had to be prioritised to ensure (i) 24×7 power supplies for consumers in urban area, (ii) reduction of Aggregate Technical and Commercial (AT&C)[31] losses as per trajectory (ESCOM wise-finalized by the Ministry of Power in consultation with States) and (iii) providing access to all urban households.

Under the second stage, based on the broad scope of work validated by PFC (Nodal agency) in the first stage, ESCOMs were to formulate bankable Detailed Project Reports (DPRs) based on detailed field survey and latest approved schedule of rates for various items of work. These DPRs, duly recommended by the Distribution Reforms Committee (DRC)[32] at the State level, were to be submitted by the utilities to the Nodal agency for appraisal.

As per the Scheme guidelines, works had to be awarded within six months from the communication of approval by Monitoring Committee, *i.e.* by September 2016 and were to be completed within 24 months from award *i.e.* by September 2018 (*i.e.* within a period of 30 months from approval by Monitoring Committee).

The steps in the implementation of IPDS are depicted in the chart below:

Chart No. 3.1 process of implementation of IPDS



ESCOMs in the State took up the following major components under IPDS:

i. System Strengthening;

ii. Metering;

iii. Provisioning of Solar panels on Government buildings including net-metering; and

[30] Such as consumer mix, consumption pattern, voltage regulation, Aggregate Technical and Commercial (AT&C) loss level, High Tension (HT) and Low Tension (LT) ratio, optimum loading of transformers and feeders/lines, reactive power management, power factor improvement, standard of performance *etc*. and on-going works under other schemes.

[31] Sum total of technical and commercial losses and shortage due to non-realization of billed amount.

[32] Headed by Chief Secretary of the State.

iv. IT – Enterprise Resource Planning (ERP) and IT Phase-II (incremental upgradation of RAPDRP system in IPDS towns).

3.2 Mode of Implementation of the Scheme

Based on the broad scope of work validated by Nodal agency (PFC), the ESCOMs were to prepare Detailed Project Reports (DPRs) in accordance with detailed field survey and latest approved schedule of rates for various items of work. These DPRs, duly recommended by the Distribution Reforms Committee (DRC) at the State level, were to be submitted by the ESCOMs to PFC for appraisal. Grant was to be extended on the sanctioned cost or award cost of the project, whichever was lower.

Para 8 of the IPDS guidelines stipulated that the projects could be implemented on turn-key/ partial turnkey/ departmental basis by ESCOMs through *e*-tendering in accordance with the prescribed Procurement Policy, Standard Bidding Document and Technical Specifications circulated separately by the PFC. The projects were to be awarded within six months from the date of communication of approval by the monitoring committee of Government of India (GoI). There was a time limit of 24 months for completion of projects from the date of issue of Letter of Award (LoA) by ESCOMs. The maximum time limit for completion of the project *viz.* award and implementation was not to be beyond thirty months from the date of communication of the approval by the Monitoring committee.

If ESCOMs were not able to complete the projects within stipulated time-periods due to circumstances beyond their control, the Monitoring Committee was authorised to grant time extension based on merit in exceptional cases, on case-to-case basis.

3.3 System Strengthening

3.3.1 Delay in Implementation

In-principle approval to DPRs of all five ESCOMS, valued at ₹ 1138.75 crore for implementation of IPDS in the State was accorded (August 2015) in the fourth monitoring Committee Meeting. Power Finance Corporation (PFC) (Nodal agency) communicated approval for the project proposals of ESCOMS in Karnataka during March 2016. As per the Scheme guidelines, works had to be awarded within six months from the communication of approval by Monitoring Committee, *i.e.* by September 2016 and was to be completed within 24 months from award (*i.e.* within a period of 30 months from approval by Monitoring Committee) *i.e.* by September 2018.

The actual time taken to implement IPDS in the State of Karnataka is detailed in the table below:

Table No. 3.1: Implementation period of IPDS

Sl. No.	Event	Date	Actual time taken	Cumulative time taken
1	Launch of scheme by MoP, GoI	December 2014	-	-
2	Submission of DPRs by ESCOMs	June 2015	6 months	6
3	In Principle Approval of DPRs by Monitoring Committee	August 2015	2 months	8
4	Communication of Approval of project by Nodal agency	March 2016	7 months	15
5	Award of works	13 February 2017 to 04 July 2018	11 months to 27 months from the date of communication of approval by Nodal agency	26 - 42
6	Completion of works	December 2019	18 to 34 months from the date of communication of approval by PFC	60

Source: Compiled by Audit from scheme documents and data furnished by ESCOMs

As seen, PFC took seven months for communicating the Monitoring Committee's approval of DPRs. ESCOMs took another 11 to 27 months to award works as against the stipulated six months. Thereby, the works which should have been completed by September 2018 were completed only in December 2019. The major reason for delay in awarding/ completion of the work was, delay (12 months) in finalization of mode of implementation of the project *ie.*, partial turnkey/total turnkey by PFC.

Further, GoI constituted a Central Procurement Committee (August 2015) to facilitate and handhold states in mobilising major materials with standard technical specifications at competitive prices (Central Procurement Prices-CPP) through a transparent bidding process, for which some States including Karnataka expressed (February 2016) reservation regarding the rates[33] finalised. GoI finally approved (29 June 2016) and intimated that the states were free to procure the materials of their own, if it was felt that their rates were less than CPP rates.

In addition, there were delays in completion of works by the ESCOMs, which were attributable to inadequate field survey and resultant variations in quantities, lack of prior clearances from statutory authorities, non-procurement of land, delays by ESCOMs in issue of work orders, lack of action on defaulting contractors, *etc.* as discussed below**.**

3.3.2 Overall delay in completion of works under the scheme

The Scheme was launched in December 2014 and ESCOMs submitted DPRs in June 2015, which were approved by the Monitoring Committee in August 2015. However, approval was communicated to ESCOMs by PFC only in March

[33] CPP rates.

2016, after seven months. Works were awarded by ESCOMs from February 2017 to July 2018 (delay of 11 to 27 months). The major reason for delay in awarding/ completion of the work was, delay in finalization of mode of implementation of the project (12 months) *ie.,* partial turnkey/total turnkey by PFC.

Thus, there was delay in implementation of works under the Scheme in all ESCOMs, which ranged from two months to 20 months from the original date of scheduled completion as per Scheme guidelines[34]. Audit observed that the ESCOMs were unable to complete the works within the original scheduled date and were allowed extension of date for completion of works, within which works were declared complete as detailed in ***Appendix - 3***.

The observations on implementation of the scheme by ESCOMs are as follows:

3.3.3 Delay in finalisation of tenders and awarding of works

Audit observed that ESCOMS took considerable time to award the approved works (March 2016), resulting in delay in completion. Even though works were to be awarded within six months, in several cases, tenders were issued after six months. The ESCOM wise details of number of tenders issued, DWAs issued, time taken to issue DWAs and delays are tabulated below:

Table No. 3.2: ESCOM wise details of delay in issue of tender and award of works

Sl. No.	ESCOM	Number of tenders called for system strengthening	No. of tenders issued beyond six months	Percentage of tenders issued beyond six months	Delay in issue of tender (in months)	Number of DWAs issued	Number of DWAs delayed (percentage of delay)	Delay in issue of DWA (in months)
1	BESCOM	11	5	45.45	11 to 17	11	11 (100.00)	6 to 21
2	CESC	6	2	33.33	7 to 16	6	6 (100.00)	4 to 13
3	GESCOM	8	6	75.00	8 to 17	8	8 (100.00)	7 to 15
4	HESCOM	14	7	50.00	9 to 22	14	14 (100.00)	5 to 28
5	MESCOM	10	7	70.00	7 to 15	14	10 (100.00)	7 to 20

Source: Compiled by Audit from the data furnished by ESCOMs.

As seen, ESCOMs issued tenders with delays ranging from seven to 22 months and award of works was also delayed by four to 28 months beyond stipulated time from the date of sanction by monitoring committee. The delays in issue of tenders and DWAs are detailed in ***Appendix - 4.***

3.3.4 Delay in issue of work orders and consequent delay in execution

Audit reviewed 49 DWAs issued relating to System Strengthening works in five ESCOMs and observed non-execution of works and delays in completion due to delays in issue of work orders[35] by the divisions. There was a time limit of 24 months for completion of projects from the date of issue of Letter of Award

[34] Mentioned in Para 3.2.

[35] On the basis of DWA, Divisions issue work orders to contractors for individual work components.

(LoA) by ESCOMs. The Corporate office of the ESCOMs called for tenders and issued Detailed Work Awards (DWA) circle-wise. Some of the instances of delay in completion of the works are detailed below:

i. Eight test checked Divisions of BESCOM[36] issued 632 work orders for six DWAs for system strengthening works. Audit observed delays in issue of these work orders and those issued for other components of IPDS as given below:

Table No. 3.3: Details of delay in issue of work orders in BESCOM

Sl. No.	Nature of work	No. of work orders issued	No. of Work orders issued with delay	Issue of work orders after issue of DWA (Period of delay in months)
1	System Strengthening	632	378	13-24
			90	25-36
			11	37-48
2	Installation of AMR meters for consumers	42	27	7-12
3	Procurement and installation of modems	60	60	10-18
4	Metering cubicle	5	5	7-12

Source: Compiled by Audit from the data furnished by BESCOM.

In Rajajinagar and Davanagere divisions of BESCOM, 69 work orders (63 work orders related to System Strengthening and 6 related to installation of modems for 40 HP and above, LT-3 and LT-5 meters) valued ₹ 26.81 crore were issued after the scheduled date of completion *i.e.* 31 March 2019 (***Appendix - 5***). Audit also observed that in many instances (57 out of 69), the dates of issue of work order and work completion were the same. While BESCOM did not record reasons explaining the delays in issue of work orders, in reply BESCOM stated that delay was due to non-allocation of budget, technical glitches in software and need for conducting surveys. The reply was not acceptable, as reasons put forth by BESCOM could not justify the delay of seven to 48 months, as budget was already allocated under the scheme and survey should have been undertaken before taking up of work.

ii. CESC awarded (February – April 2017) four System Strengthening works with delays ranging from 10 to 12 months from the date of approval (by monitoring committee) and works were completed in 35 to 45 months with delays of five to 15 months. In Chamarajanagar-Kodagu Circle of CESC, the DWA was issued with a delay of 9 months and only 75 *per cent* of the awarded works could be executed within the stipulated time. In Hassan Circle, the works awarded during February 2017 were not completed at the time of closure (March 2019) of IPDS scheme. At the time of closure, UG cable work (19.05 *per cent)*, LT, line augmentation/reconductoring (57.78 *per cent)*, capacity enhancement of

[36] Davanagere, Chitradurga, Tumakuru, HSR Layout, Koramangala, Indiranagar, Rajajinagar and Kengeri.

LT substation (70.27 *per cent*), AB cable works (76.83 *per cent)* were completed. Audit observed that no action was initiated against the contractors for non-completion of work within time except one instance of levying ₹ 0.18 lakh as penalty in Hassan Circle for delay in completion of work as per tender conditions.

CESC stated (October 2024) that due to poor progress of the work, notices were also issued to the contractor and due to field constraints/ corridor/ ROW issues/ re-routing/ local issues, the quantity of materials awarded was reduced/ increased. Further, CESC intimated that due to elections to Karnataka Legislative Assembly in March 2018 to May 2018, Parliamentary election from March 2019 to May 2019, natural disaster in Kodagu during 2018, introduction of GST during 2017 *etc.* resulted in delay in completion of work. Audit observed that RoW issues, *etc*, should have been sorted out before award of works and further, CESC did not exercise the option of writing to Election Commission of India for exemption from code of conduct as it had done in 2016 at the time of calling the initial tender. The contractor had not completed the work as on 12 April 2019. CESC did not levy any liquidated damage and the reasons for non-levy were not forthcoming from the records.

iii. HESCOM awarded (March 2017) System Strengthening works in six towns in Chikodi Circle to Manipal Energy & Infrastructure Ltd, Bengaluru in March 2017, at a cost of ₹ 4.74 crore[37] (20.69 *per cent* above the amount put to tender) with scheduled completion by March 2018. The work was completed for ₹ 3.46 crore in September 2019, with a delay of 18 months. HESCOM did not levy any liquidated damage and the reasons for non-levy were not forthcoming from the records.

No specific reply to the observation was furnished by HESCOM.

These delays resulted in delay in completion of work and consequent non-achievement of objectives as envisaged, even after more than three years of issue of Detailed Work Award.

Recommendations:

2. **The Government of Karnataka may ensure that ESCOMs may devise a suitable mechanism to issue tenders in time, and to take up works without delay and to ensure completion of works in time to achieve envisaged objectives.**

[37] ₹ 3.63 crore (Supply) + ₹ 1.11 crore (Erection) = ₹ 4.74 crore.

3.4 Status of System Strengthening works under the Scheme

PFC being the nodal agency, identified 27 components of work to be taken up under system strengthening works, of which DPRs were prepared and approved for 23 components and the ESCOMs in the State executed 19 components. ESCOMs were able to complete envisaged quantum of nine components of works like installation and capacity enhancement of sub stations, transformers, drawing new 33kV feeders, UG cables, 11 KV bay extension and installation of Solar panels on Government buildings, *etc*. Four components pertaining to Repair and maintenance of 33/11 KV Substations, Capacitor Bank, Smart Meter and Prepaid meter were not implemented. The percentage of execution against the sanctioned quantity in the components ranged from zero *per cent* to 4,890 *per cent* (in the case of Ring Main Units -RMU)**.** The details of works sanctioned, executed and shortfall/excess and percentage of execution against sanctioned quantity are detailed below.

Table No. 3.4: Percentage of achievement against sanctioned quantity in system strengthening works consolidated for ESCOMs

Sl. No.	Components	Unit	Sanctioned quantity	Executed quantity	Shortfall (-) / Excess	Percentage of achievement against sanctioned quantity
1	New Sub-station	MVA	85.00	75.00	-10.00	88.24
	Nos of New Sub-station	No.	7	7	-	100.00
2	33/11 KV Additional transformer	MVA	10.00	10.00	-	100.00
	Nos of 33/11 KV Additional transformer	No.	2	2	-	100.00
3	33 KV New Feeders	Km	19.00	21.73	2.73	114.37
4	33 KV Feeder Reconductoring	Km	63.00	43.14	-19.86	68.48
5	11 KV New Feeders	Km	1,166.50	927.81	-238.69	79.54
6	11 KV Feeder Reconductoring	Km	1,207.90	930.60	-277.30	77.04
7	Aerial Bunched Cable	Km	2,319.20	2,067.75	-251.45	89.16
8	UG Cables	Km	950.72	1,300.12	349.40	136.75
9	11 KV Bay Extension	No.	2	6	4	300.00
10	Installation of New DT	MVA	293.04	384.34	91.30	131.16
	Nos of Installation of New DT	No.	3,966	3,899	-67	98.31
11	Capacity Enhancement of DT	MVA	78.22	93.01	14.79	118.91
	Nos Capacity Enhancement of DT	No.	1,240	1,225	-15	98.79
12	New LT Lines	Km	727.96	456.91	-271.05	62.77
13	LT Line Reconductoring	Km	6,744.50	5,625.33	-1,119.17	83.41
14	Boundary Meter	No.	95	72	-23	75.79
15	Feeder Meters/DT Meters	No.	4,318	6810	-3,637	15.77

Sl. No.	Components	Unit	Sanctioned quantity	Executed quantity	Shortfall (-) / Excess	Percentage of achievement against sanctioned quantity
16	Consumer Meter	No.	8,99,681	6,04,183	-2,95,498	67.16
17	Solar Panels	KWp	7,142.00	8,318.00	1,176.00	116.47
18	RMU etc	Lot	10	489	479	4890.00
19	Others	₹ lakh	1,447.47	770.98	-676.49	53.26
20*	*R&M of 33/11 KV S/S*	No.	1	-	-1	0.00
21*	*Capacitor Bank*	MVAr	1.00	-	-1.00	0.00
22*	*Smart Meter*	No.	12,760	-	-12,760	0.00
23*	*Pre Paid Meter*	No.	9,126	-	-9,126	0.00

*** Works not taken up by ESCOMs**

BESCOM replied that during initial survey (January-March 2015), 10 RMUs were proposed in BMAZ Area to replace existing faulty RMU's. But, during the field survey conducted in December 2015 to February 2016 by PMA and Field officials, UG cables were proposed in town limits and 703.48 kms of UG cable work was executed for which 455 Nos of RMUs were installed for converting the existing radial distribution system into Ring main distribution system in order to provide reliable un-interrupted power supply to consumers.

3.4.1 Variation in executed quantities against sanctioned/DPR quantities

The ESCOMs executed 1,923.28 kms of High Tension (HT) feeders[38], 6,082.24 kms of Low Tension (LT) feeders, 1,300.12 kms of Under Ground (UG) cable, 2,067.75 km of LT Arial Bunched (AB) cable, 5,124 Nos. Transformers and installed Solar Panels of 8,318 kWp capacity.

Audit noticed that the quantities executed varied from the sanctioned quantities as per DPR approved by PFC in major items of work. The same is shown in ***Appendix - 6***.

The variation in the actual quantities executed over DPR/ sanctioned quantity ranged from (-) 21.69 *per cent* for HT Feeders, (-) 18.61 *per cent* for LT Feeders, (-) 10.84 *per cent* for AB Cables, 36.75 *per cent* for UG Cable, (-) 1.58 *per cent* for Transformer and (-) 32.84 *per cent* for Consumer metering. BESCOM executed 954.1 kms of UG cable work as against 577.6 kms representing 65.18 *per cent* variation.

Instances of variations in quantities of materials and consequent variations in costs observed in sampled Divisions are detailed below:

- In Operation and Maintenance (O&M) Circle of CESC, Mandya, there were variations in supply of 88 materials and variations in 66 erection works. Further, there was supply of 12 items and erection of 53 items which were not included in the Detailed Work Award (DWA)[39], resulting in an increase of ₹ 3.39 crore over the DWA cost.

[38] 11kV feeder (1858.41 km) +33kV feeders (64.87 km).
[39] As against the DWA cost of ₹ 37.94 crore.

In the case of RCC nine meters poles, as against the DWA quantity of 1,486 poles valuing ₹ 1.19 crore, 3,132 poles valuing ₹ 2.50 crore were used for HT and LT AB cable works in Maddur Town under O&M Circle Mandya. The extent of variation of 110.77 *per cent* over the estimated quantity of RCC 9 meter poles was attributed to more cutouts on LT line and replacement of damaged and deteriorated poles.

- There were instances of execution of work of HT and LT lines which were not included in DWA in Maddur Town of Mandya Circle of CESC, resulting in increased use of ACSR[40] rabbit conductor. However, for Mandya Circle as a whole, there was reduction in utilization of ACSR rabbit conductor by 547.13 kms, resulting in reduction in cost to the extent of ₹ 2.47 crore.

- As per DWA, in Chamarajanagar of Kodagu Circle of CESC, the value of work awarded was ₹ 39.09 crore, whereas the value of works executed was ₹ 29.21 crore resulting in savings of ₹ 9.88 crore (25.28 *per cent*). The main reason attributed to savings was non-requirement of 11 kV reconductoring works owing to changed site conditions. Also, supply (₹ 0.55 crore) and erection works (₹ 0.65 crore) were carried out, which were not envisaged during the issue of DWA.

CESC replied (October 2024) that due to field requirements/corridor/ Right of way (ROW) issues/re-routing/local issues, the quantity of materials awarded reduced/ increased. CESC also stated that the same was reported to SLDC and PFC and all grants were received. The reply clearly indicated that planning was deficient and that CESC did not conduct proper surveys, resulting in incorrect quantities in the estimates.

The ESCOM-wise extent of variations to overall executed quantity against sanctioned quantity are detailed in ***Appendix - 6.***

In the exit conference, MD BESCOM stated there was a considerable gap in time between announcement of the Scheme and its implementation *i.e.* The Scheme OM was issued in 2014, Need Assessment Document was prepared and DPR approved in 2015, tenders were called in 2017 and works were executed in 2019. Since electricity sector was dynamic in nature, the time gap resulted in some emergent work executions that resulted in differential quantities. The statement confirms that ESCOMs have taken two years to tender the works after approval of DPR.

3.4.2 Dropping of planned works

BESCOM and MESCOM dropped works duly approved by PFC (after preparation of DPRs) by citing right of way issues, space constraints, local constraints and non-receipt of permission from local authorities, execution of

[40] Aluminium Conductor Steel Reinforced (ACSR) conductors used for overhead applications.

works outside the Scheme *etc*. Audit observed 14 instances[41] of such dropped works in selected Divisions of BESCOM (₹ 13.90 crore) and MESCOM (₹ 10.69 crore). Further details are given in ***Appendix – 7.*** Two instances are given below:

BESCOM: Twenty six planned works of installation of distribution transformers and drawing UG cables in Davangere division were dropped due to right of way issues, space constraints, non-receipt of permission from local authorities and transformers installed under other works.

MESCOM: Planned work of reconductoring of single circuit 11 kV line using coyote and rabbit conductor (Mangaluru Division 1 and 2) was dropped as it was already executed during 2013-17 outside the scheme.

Since these works were identified and selected on priority basis, dropping these works resulted in non-achievement of envisaged benefits apart from delay in completion. This indicated that surveys conducted by these ESCOMs were inadequate and that the DPRs were prepared without due care. Though there was no financial impact, the works planned could not be executed due to improper survey.

BESCOM and MESCOM replied that the works were dropped owing to the reasons mentioned by audit.

3.5 Award of contracts in violation of KTPP Act and Rules

Audit observed that the ESCOMs did not adhere to the provisions of Karnataka Transparency in Public Procurement (KTPP) Act, 1999 and Rules by providing insufficient time to prospective bidders for submission of bids and accepting tenders at high tender premium as discussed in the following paragraphs.

3.5.1 Insufficient time given for submission of bids

Rule 17 (b) of Karnataka Transparency in Public Procurement (KTPP Rules), 2000 stipulated a minimum time of sixty days from NIT[42] to be given for submission of bids for tenders in excess of rupees two crore in value. Any reduction in the time stipulated had to be authorised by an authority superior to the tender inviting authority for reasons to be recorded in writing.

Test check of tenders invited in HESCOM and GESCOM revealed that 15 to 54 days only were allowed for submission of tenders exceeding rupees two crore in value[43]. Further, the reduction in the time stipulated for submission of tenders was authorised with no recorded reasons.

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[41] Bangalore Metro Rail Corporation Limited did not give permission to lay cable beneath the metro pillars and station in Indiranagar Division of BESCOM. Permission was not given by local authority as the road was asphalted newly in Indiranagar Division of BESCOM. Reconductoring of single circuit 11 kV using coyote and rabbit conductor (Mangaluru Division 1 and 2).

[42] Notice inviting tender.

[43] 7 system strengthening works and 2 metering works in HESCOM; 2 system strengthening works in GESCOM.

HESCOM replied (October 2024) that due to change in mode of execution and revision of Standard Bidding Documents (SBD) by REC/PFC, there was delay in awarding of works which necessitated calling short term tenders (45 days for 1st Call tenders and 15 days for 2nd Call tenders[44]), to complete the scheme within timeline fixed by MoP/PFC. GESCOM also stated similar reasons. The reply confirms the audit findings.

3.5.2 Award of works at high tender premium

The Karnataka Transparency in Public Procurement (KTPP) Act, 1999 and the circular issued (3 December 2002) thereunder allows negotiations solely for the purpose of obtaining lower prices and only in exceptional circumstances, such as lack of competition (less than three bidders), single bid, suspected collusion, or the lowest evaluated responsive bid being substantially above the estimated cost. In such cases, the first choice is rejection of all tenders and re-inviting fresh tenders. The *clause 3.2* of the circular defines a substantially high tender (in case where price adjustment is not provided and updated estimated cost of work of ₹ 50 lakh and above) as one in which the quote is 10 *per cent* above the updated estimate.

Audit observed that the ESCOMS awarded works at costs exceeding the estimated value in the range of 13.93 *per cent* to 34.21 *per cent* for system strengthening works, as detailed in ***Appendix – 8*** and summarised below:

Table No. 3.5: Details of tenders accepted at substantially high rates by ESCOMs in the sampled Divisions

(₹ in crore)

Sl. No.	Particulars	BESCOM	CESC	GESCOM	HESCOM	MESCOM
1	Number of tenders	5	4	5	7	7
2	Total Estimated cost	232.90	110.51	135.20	92.70	129.83
3	Total Quoted price	282.73	143.17	168.96	113.19	160.62
4	Total Awarded Price	282.94	141.30	168.96	113.19	156.14
5	Awarded Price higher than Estimated cost	50.04	30.79	33.76	20.49	26.31
6	Range of percentage of awarded cost over the estimated cost (%)	18.76 to 26.8	19.81 to 34.21	21.61 to 28.49	18.86 to 23.33	13.93 to 24.99

Source: Data furnished by ESCOMs.

The ESCOMS awarded works of a similar nature in different circles at varying tender premiums and were not successful in getting the quoted price reduced. Further, resultant single tenders with high premiums were accepted instead of re-tendering by GESCOM (for all the five tenders), MESCOM (two out of five tenders), HESCOM (four out of Seven tenders) and CESC (two out of four tenders).

[44] Hubballi, Vijayapura and Bagalkote circles.

The ESCOMs responded (October 2024) that tenders were invited according to Standard Bidding Documents (SBD) and were issued after Board approvals. In some cases, works were awarded at high premiums, as low rates could not be secured even after re-calling of tenders. Reply is not acceptable as ESCOMs not only violated KTPP Act (by awarding works at higher tender premium), but also did not adhere to SBD and put in restrictive tender conditions.

Recommendation:

3. **The Government of Karnataka may ensure that ESCOMs may follow time frames as per KTPP Act, 1999 and Rules, 2000 to ensure adequate competition and to allow market discovery for most economical rates.**

3.6 Installation of GIS station

HESCOM planned (March 2018) construction of a 2×8 mVA, 33/11 kV Gas Insulated Substation (GIS) under IPDS along with associated 33 KV lines near Hosur, Hubballi City, Dharwad District, for which DWA was issued in October 2018 with a stipulation for completion of work within a period of 12 months from date of Letter of Intent (September 2018) or from the date of handing over of land, whichever was later. Though the materials were procured and Programme Evaluation and Review Technique (PERT) chart was prepared (September 2018), the work could not be taken up due to resistance from local residents.

In June 2020, the contractor raised the issue of non-allotment of land by HESCOM. Since the contractor had already placed the order for materials, it was decided to relocate the project to HESCOM's leasehold land (2,500 Square meter - 26,910 square feet) at Karnataka Industrial Area Development Board (KIADB), Rayapura Industrial area, Dharwad and the contractor was instructed to commence the work in June 2020. The Rayapura Industrial area site was handed over to the contractor in September 2020 and the substation was commissioned in December 2021 at a cost of ₹ 19.20 crore.

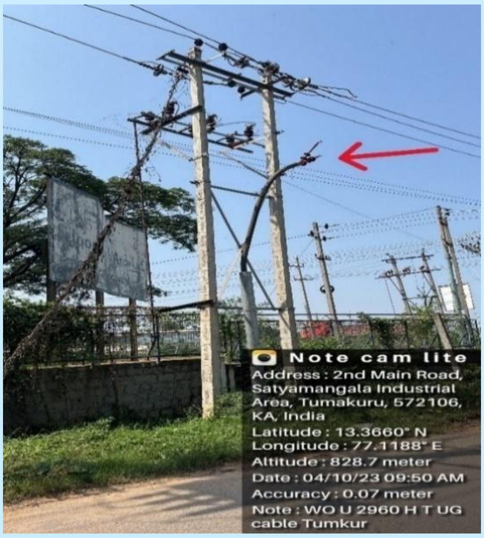
As HESCOM could not award the contract in time for the work to be finished by 15 August 2018, the work was considered closed or cancelled in accordance with PFC's approval for the work. This meant that the planned work with high upfront cost was completed with a delay of two years using own funds and HESCOM lost opportunity to receive grant for the same under IPDS.

HESCOM replied (October 2024) that the residents opposed the setting up of station in its own land and the issue was brought to the notice (February 2019) of local MLA, Mayor and Commissioner. HESCOM also stated that no alternative land could be identified and that the amount which was sanctioned for this work was utilised to carry out other necessary works. Thus, though HESCOM utilised sanctioned amount, the work planned under IPDS could not be taken up as it could not provide land for a DWA issued during October 2018 till June 2020 and was completed by utilising own funds.

3.7 Disconnected UG cables

BESCOM undertook nine works of laying (18.41 km) UG cables (feeders) in Tumkur, during 2018 and 2019, under IPDS. These UG cable feeders were disconnected and power was drawn through overhead feeders rendering the works undertaken under IPDS at a cost of ₹ 6.01 crore infructuous, within a period of four years. As per BESCOMs technical specifications, the life span of UG cables was 40 years.

Joint Physical Verification (February 2024) with Technical Consultant and BESCOM officials also confirmed that these UG cable feeders were disconnected and power was drawn through overhead feeders.



Picture No. 3.1: Disconnected IPDS UG Cables in Tumkur O&M Division, BESCOM.

BESCOM replied (October 2024) that one feeder cable was damaged in October 2023 and power supply was arranged through overhead lines and subsequently power supply was restored through the UG cable.

3.8 Metering

The metering component under IPDS included installation of suitable static meters for feeders, distribution transformers and all categories of consumers with unmetered connections, replacement of faulty meters and electro-mechanical meters, Automatic Meter Reading (AMR) for feeders, distribution transformers and high load consumers, *etc*.

3.8.1 Non-integration of modems for DTC meters with Data Servers

In CESC, short term tender for metering works under IPDS was invited (August 2017) and the work was awarded (October 2017) to the lowest tenderer M/s Santhosh Electricals Mysuru (contractor) at a negotiated price of ₹ 25.48 crore (September 2017). The work involved replacement of Non-DLMS (Device Language Message Specification) meters of DTCs with DLMS meters along with communication infrastructure as per the guidelines of MOP, GoI. The contractor had quoted ₹ 15,000 per modem (GPRS modem with all accessories) for supply and ₹ 3,000 per modem for erection. As per DWA, 438

DTCs were to be installed with GPRS modem. Against this, the contractor supplied and installed 561 modems and SIMs to DTCs under CESC.

Audit observed that, *clause 8 (a) and (b)* of DWA stipulated the contractor to supply three handheld Units (ICS compatible) (HHUs) used for generating energy consumption bills free of cost along with software per O & M division besides providing training for the use of software. The contractor, however, neither provided HHUs along with software to any of the O & M Divisions nor imparted training to use the software as per the tender conditions.

In the absence of the software, none of the 561 modems installed were communicating and they were not integrated with the servers of CESC.

The CESC stated (October 2024) that M-DAS communication (Metering and Data Acquisition Systems) to fetch data from modems was to be taken up in IT Phase-II, which had not been completed and action would be taken to establish communication after Go-live of MDM application. Since the contractor failed to supply HHUs, show cause notice had been issued. Even though work was completed (December 2019) at a cost of ₹ 1.01 crore (561 DTCs × ₹ 18,000), the assets were not put to use (October 2024), resulting in unfruitful expenditure.

3.8.2 Non achievement of objectives

For facilitating Automated meter Reading (AMR) for high load LT consumers, BESCOM issued (February 2018) DWA under IPDS for supply, installation, commissioning, integration and maintenance of 12,373 modems and pushing of data to the existing Metering and Data Acquisition System[45] (M-DAS), to M/s Analogics Tech India Ltd., Hyderabad on total turnkey basis for a period of five years. The agency supplied and installed 12,373 modems (March 2019) and was paid only ₹ 4.75 crore (against ₹ 10.41 crore for completed quantity) as the Company deducted penalty and made part payment for non-supply and delayed timely installation of the modems.

The status of meters installed for high load LT3 and LT5 installations and associated modems at eight selected Divisions of BESCOM were as follows:

Table No. 3.6: Status of AMR meters installed under IPDS in eight selected Divisions

Sl. No.	Division	No. of high load LT 3 and LT 5 installations with load above 40 HP as in June 2023	No. of AMR meters installed under IPDS	No. of modems installed under IPDS	No. of communicating AMR meters as in June 2023	Percentage of modems communicating
1	HSR layout	1,508	274	1,168	1,168	100
2	Koramangala	605	0	193	193	100
3	Indiaranagar	1,189	521	844	301	35.66
4	Chitradurga	184	0	74	0	0
5	Davangere	310	36	67	49	75.13
6	Tumkur	119	119	119	119	100
7	Kengeri	2,014	839	839	214	25.51
8	Rajajinagar	2,080	301	1,055	757	71.75
	Total	**8,009**	**2,090**	**4,359**	**2,801**	**64.25**

Source: Data furnished by BESCOM.

[45] By tying up with local service provider M/s Infosys Technologies and M/s N Soft for GPRS data communication.

As seen, modems were not fixed to all LT 3 and LT5 installations with AMR meters and some of the modems were not communicating. BESCOM has not provided AMR meters and modems to the incremental LT3 and LT5 consumers with load above 40 HP subsequent to implementation of IPDS, which indicated that there was no continuity to the process initiated under IPDS.

BESCOM stated (October 2024) that integration of modems was delayed due to communication issues and incremental work was not considered due to budget constraints and advancement of technology. Further, BESCOM stated that currently, the communication of AMR meters ranged from 79 *per cent* to 92 *per cent*. The reply reiterates that the objective of the scheme was not achieved, considering fitment of AMR meters to only a portion of the eligible consumers and the fact that 100 *per cent* communication has not been achieved in five out of eight divisions where the AMR meters have been installed.

3.9 Solar Component

Under IPDS, all the ESCOMs were supposed to provide Solar panels and install them on roof-tops of Government buildings. Audit observed the following issues in implementation of Solar component under IPDS.

3.9.1 Restrictive tender conditions

CESC called short term tender (February 2018) for supply, installation, testing and commissioning of grid connected additional Solar roof top systems on turnkey basis with five years maintenance with an estimated cost of ₹ 7.78 crore for a capacity of 1,112 kWp. The pre-qualification criteria stipulated experience of successful completion of grid connected Solar power work under IPDS scheme having a cumulative capacity of 1,000 kWp. As only one tender was called previously under IPDS and only one agency had qualified earlier with an executed quantity of 1,715 kWp, the tender condition could be satisfied by only one vendor. Audit observed that this condition prevented the participation of other bidders and favoured one particular bidder.

M/s Naviya Technologies was awarded (May 2018) the work at a negotiated price of ₹ 8.29 crore (6.48 *per cent* above the amount put to tender) with completion date of nine months from DWA (by February 2019). The contractor was also unable to complete the work[46].

CESC stated (October 2024) that it insisted for experience in IPDS so as to get the participation from the experienced system integrators as the time left for implementation in additional SRTPV tender was just 12-13 months. Further, this clause was not restrictive as the experience of IPDS anywhere in India was sought. The reply is not acceptable, as all ESCOMs in the country did not take up Solar component. Further, since IPDS work was going on in all places, the

[46] Against the work order quantity of 1,112 KWp of Solar plants, 1,091 KWp were installed. As against work order value of ₹ 8.29 crore, works amounting to ₹ 7.72 crore only was executed.

number of vendors who would have completed Solar works under IPDS of the specified quantum would have been low.

3.9.2 Preparation of estimates based on pre revised rates

As per tariff order for the financial year 2017-18 approved (May 2016) by Karnataka Electricity Regulatory Commission (KERC), the capital cost for capacity of small Solar plant from 1 to 10 kW was fixed at ₹ 75,000 per kW with O & M charges at one *per cent* of the capital cost with an increase of 5.72 *per cent* annually. Accordingly, the estimate should have been prepared at ₹ 75,000 plus 1 *per cent* O & M charges amounting to ₹ 750 per kW with an annual increase of five *per cent i.e.,* ₹ 37.5 per kW every year totalling to ₹ 75,785.50 per kW. However, CESC prepared estimate at ₹ 90,000 based on pre-revised (October 2013 for the years 2014-18) capital cost, resulting in increase in estimates by ₹ 2.44 crore[47]. The tender was finally awarded (March 2017) at ₹ 88,300 per kWp (₹ 15.14 crore /1,715 kWp). This rate was higher when compared to the rate at which CESC had awarded similar works to the same agency (in September 2016 at ₹ 81,733.47 per kWp). Thus, CESC awarded the Solar works under IPDS at higher rates to the lone bidder, who refused to reduce rates.

CESC replied (October 2024) that work was awarded considering the rate for Solar Roof Top Photovoltaic Cells as per KERC determined capital cost of ₹ 0.90 lakh per kW as per generic tariff order (October 2013). The reply is not acceptable, as approval for placing order based on the high rates was given by Board in September 2016, after the latest KERC approved rates were published in May 2016. CESC should have taken steps to get the rates reduced in accordance with KERC approved rates.

3.9.3 Non-completion of Solar component

The details of DPR cost, DWA capacity of Solar panels issued, number of buildings proposed and completed along with capacity and amount spent by ESCOMs are detailed below:

Table No. 3.7: Details of Solar panels commissioned on Government buildings by ESCOMs

(₹ in crore)

Sl. No.	ESCOM	DWA capacity (kWp)	DWA amount	Buildings proposed	Buildings completed	Actual capacity completed (kWp)	Amount spent	Short fall (kWp)	Delay
1	BESCOM	1,125	7.85	82	51	673.5	3.40	451.5	DWA awarded for 615 kWp was short closed.
2	CESC	1,715	15.14	343	343	1,715	15.14	0	
		1,112	8.29	512	431	1,091	7.77	21	
3	MESCOM	1,671	11.74	68	56	1,351.44	8.35	319.56	10 to 16 months

Source: Compiled by Audit from the data furnished by ESCOMs.

[47] ₹ 15.44 crore – ₹ 13.00 crore (₹ 75,785 × 1,715 kwp).

There were variations in actual capacity completed in comparison with DWA capacity due to issue of DWAs to agencies without detailed survey of Government buildings and not obtaining prior permission from building owners/ heads of departments in advance. Many of the buildings identified and included in DWA were found unsuitable for installation of panels since the roofs were inclined, tiled or east/west[48] facing and some of the building owners did not allow to install Solar panels stating that they were having future plans for expansion of building. This resulted in the need for identification of alternate buildings or cancellation of capacity.

BESCOM and MESCOM could not complete their DWA capacity due to reasons detailed in the following paragraphs:

- BESCOM invited tender (October 2016) in two lots[49] for 'Design, Supply, Installation and Commissioning of Solar Roof Top Photovoltaic grid connected power plants on rooftops of various BESCOM/Government/Local Bodies office buildings (under the jurisdiction of BESCOM), including maintenance for a period of five years, under IPDS. Lot 1 (615 kWp) was awarded (September 2017) to M/s PEnA Power Engineering and Automation Limited, Bengaluru (PPEL) at ₹ 4.08 crore and Lot 2 (510 kWp) was awarded to M/s IC India Pvt Limited (ICIL) at ₹ 3.83 crore.

  Only 163.5 kWp under Lot 1 was completed by March 2019. The reason for non-completion of remaining capacity (451.5 KWp) was BESCOM's inability to take action on the detailed survey findings submitted (October 2017) for approval and to take decision (September 2018) on the unsuitable locations[50] found by PPEL. As IPDS scheme was declared closed (31 March 2019), there was no further progress in installation of Solar panels in the remaining 31 locations of BESCOM.

  Thus, BESCOM lost the opportunity to avail grant of ₹ 2.45 crore[51]

  BESCOM replied (October 2024) that there was change in number of buildings from 40 to 29 and that the proposed capacity was unchanged. However, Audit observed that the proposed capacity was not executed and the reply was silent regarding the issues pointed out by PPEL.

- MESCOM could install Solar panels of 1,351.44 kWp as against the 1,671.00 kWp planned, leaving a gap of 319.56 kWp (19.13 *per cent)*. The scheme guidelines required ESCOMs to prepare bankable DPRs based on detailed field surveys. Audit observed that MESCOM did not conduct detailed survey (regarding feasibility in Government buildings)

[48] With a south-facing roof, Solar panels will produce the maximum amount of energy overall.
[49] **Lot 1:** covered Bengaluru Metropolitan Area Zone (BMAZ) 1, Bengaluru Rural, Ramanagara and Kolar Circles; **Lot 2:** covered BMAZ 2, Tumkur and Davangere Circles.
[50] Hosakote, HSR layout and Jayanagar Divisions due to factors such as leakage, presence of shadows, civil work under progress *etc*.
[51] Being 60 *per cent* of ₹ 4.08 crore (as no payments were made to PPEL).

and did not obtain prior permission from building owners / Heads of Departments for installation of Solar panels.

MESCOM stated that (October 2024) that carrying out site surveys and technical feasibility report work was assigned to the Contractor and the contractor found some buildings unsuitable whereas some building owners refused to provide No Objection Certificate.

This indicates that MESCOM did not conduct field surveys to ensure suitability of location, before including the works under IPDS and awarding the works.

3.9.4 Poor performance of Rooftop Solar power plants

Bid documents/DWA/LoI for installation of Solar rooftop panels on Government buildings issued by ESCOMs included a clause wherein the bidder was to guarantee average minimum generation of 4.5 units/kWp/day in a calendar year in BESCOM and GESCOM; and 5 units per kWp per day for a minimum of 300 days in a calendar year; after considering grid loss and weather conditions in CESC, HESCOM and MESCOM. Audit observations on the performance of Solar panels are detailed below:

- As per specification issued by BESCOM, the Solar Photovoltaic modules were to have an efficiency of *more than or equal to* 15.2 *per cent*, with a degradation allowance of 10 *per cent* for 10 years. Review of performance of installations for 2022-23 revealed that efficiency of 49 out of 51 Solar installations of BESCOM ranged between zero and 14.82 *per cent*[52] and only two installations had efficiency of 14.82 *per cent* or above. Hence, 96 *per cent* of the IPDS Solar installations in BESCOM could not generate energy to the expected levels. A review of generation details revealed that Solar installations at six[53] locations were not generating power due to technical issues/ demolition of building etc.

- The generation of power in 23 installations in selected Divisions of CESC was zero units up to 31st March 2023. This highlights poor monitoring which resulted in loss of generation

  CESC replied (October 2024) that the meter testing wing of the Company periodically inspects the Solar installations for defects, which identifies and communicates the same to the supplier, who is to rectify them. However, Audit found that generation was low indicating that the periodic inspections were not fruitful in ensuring that the installations were functional.

- In MESCOM, in case of 18 installations selected for inspection, generation of power was extremely low (zero to 50 units) for 1 to 26

[52] After degradation allowance for three years.

[53] Anugodu, Sub division, Davanagere, City sub-Division, Tumkuru, CSD Sub-division office KPTCL building Sira, Sub-division office KPTCL premises, Pavagada and S2 Sub Division, Bengaluru.

months from the date of installation [54] to 31st March 2023. The supplier did not rectify the defects immediately and took one to 33 months for rectification of defects, resulting in loss of generation.

MESCOM replied (October 2024) that penalty for not meeting the expected generation would be charged. The proposed action, initiated in response to Audit observations, underscores the scope for enhancing monitoring processes.

- Joint physical verification of 22[55] Solar installations of GESCOM and 32 Solar installations of HESCOM revealed that both the Companies had poorly maintained Solar power installations on Government buildings under IPDS. Audit noticed instances of removal of panels without intimating GESCOM or HESCOM and missing Solar assets, which resulted in low generation levels. The details of discrepancies observed in GESCOM and HESCOM are detailed in ***Appendix - 9.***

  HESCOM replied (October 2024) that strict instructions were given to the EEs of O&M divisions to rectify the non-working SRTPVs.

3.9.5 Non-Compliance to Performance Guarantee Parameters

Technical specifications for Solar Rooftop Photovoltaic power plants (Standard Bid Documents (SBD) (Volume - III)), contained stipulations regarding minimum guaranteed life, guaranteed output, Performance Ratio (PR), penalty clause for non-performance, *etc,*. Audit observed that many of the important technical parameters mentioned in the SBD were not insisted upon by CESC *viz*. obtaining guarantees, inclusion of liquidated damages clause for non-performance, insisting for long term PR values along with the techno commercial bid, inclusion of penalty clauses, *etc,*. The details of non-compliance of SBD parameters are detailed in ***Appendix - 10.***

Recommendations:

4. The Government of Karnataka may ensure that comprehensive feasibility surveys are conducted before project execution and may include conditions of standard bid documents in invitation to bids and ensure adherence to the same while executing works.

[54] Installed during 2018 and 2019.

[55] GESCOM – four Divisions-251 kWp installed capacity, HESCOM – seven Divisions-875 kWp installed capacity.

3.10 IT applications and Enterprise Resource Planning under IPDS

The IT Component under IPDS provided for (i) Establishment of Enterprise Resource Planning[56] (ERP) System and (ii) Incremental upgradation of DC/DRC, additional hardware in towns[57], GIS survey of assets and integration of DC/DRC. The IT components other than ERP were termed as 'IT Phase-II'.

Guidelines for project formulation for IT Applications in non-RAPDRP towns and Enterprise Resource Planning (ERP)[58] stipulated (December 2015) ERP functions of Human Resource Management, Finance and Accounts and Materials (Purchase and Stores).

3.10.1 Non-completion of ERP project in time by BESCOM

BESCOM proposed implementation of ERP system with Human Resource Management, Finance and Accounts Management and Asset Management modules, for which DPR was prepared and submitted (November 2017) to PFC at a total cost of ₹ 75.76 crore[59]. PFC approved (February 2018) project cost[60] at ₹ 51.05 crore, with grant component of ₹ 30.89 crore. The approval letter reiterated that the project had to be implemented in accordance with advisory-cum-guiding principles issued by PFC. The project was to be awarded within six months of sanction letter and to be completed within 31 July 2020. The closing date for drawing of grant was 30 July 2021.

3.10.2 Delay in award of works

Sanction for DPR of ERP (with Human Resource Management, Finance and Accounts Management and Asset Management modules) was received in February 2018 and work was to be awarded within six months (as per guidelines); *i.e.* by August 2018. In March 2018, BESCOM floated a Request For Proposal for supply, installation, commissioning, implementation and support for the Human Resource Management, Finance and Accounts Management and Asset Management modules, which did not elicit any bids. Subsequent RFP was floated in February 2019 by adding four more modules *i.e.,* Project Management, Quality and Safety, Power Purchase, Document Management System (DMS) and Work flow Management System (WMS) in the tender, with the objective of bringing major back office operations of BESCOM under ERP, after a delay of 11 months.

The revised RFP also involved modifying PQR and technical evaluation criteria, including change in technical: financial weightage from 60:40 to 70:30, change in experience requirement from number of users to number of locations

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[56] Enterprise resource planning (ERP) is an integrated software system that helps to run entire business, supporting automation and processes in finance, human resources, manufacturing, supply chain, services, procurement, *etc.*

[57] like switches, router, meters, modems, SBMs, workstation PCs and printers.

[58] under IPDS (item 3(c) and (d)).

[59] ₹ 53.79 crore pertained towards set up cost and ₹ 21.96 crore towards annual maintenance charges, annual technical support and bandwidth cost for five years, to be borne by BESCOM as per the scheme guidelines.

[60] Excluding annual maintenance charges, annual technical support and bandwidth cost for five years.

and change in annual turnover requirement from ₹ 350 crore to 50 *per cent* of amount put to tender, among others

The work was awarded (March 2020) to the lowest bidder M/s. Tech Mahindra Ltd at the negotiated price of ₹ 65.00 crore[61] with pilot-go-live within 12 months (by March 2021) and enterprise-go-live with rollout at identified offices within 20 months (by November 2021).

Thus, it took two years from approval to issue of DWA whereas the guidelines warranted awarding within six months.

BESCOM stated (October 2024) that the delay in issue of tender was due to enforcement of model code of conduct for Lok Sabha elections 2019 and multiple extensions were given (five times) for bid submission dates. After opening the technical bids in June 2019, opening of financial bids, negotiations and getting approval from technical committee and Board of Directors took time. LoI was issued in December 2019 and DWA was issued in March 2020, once the firm had submitted Performance Bank Guarantee. The reply is not acceptable as considerable time was taken to prepare DPR, modify the scope of work and in opening financial bids (opened in August 2019) resulting in delay in award of works. Further, BESCOM could have taken exemption to issue tender from election commission citing limited period for completion of work.

3.10.3 Delay in completion of ERP component

The Monitoring Committee of GoI extended (March 2021) the project completion date to 31 December 2021[62], along with third party evaluation and financial closure of the project to 31 March 2022[63]. Considering this, BESCOM amended the DWA in December 2021. The second amendment to the DWA was issued in December 2022[64], extending the date for rollout of the ERP solution by 31 December 2022 and stabilisation period up to April 2023. It was also decided to levy Liquidated Damages on total contract value as per DWA *clause 11.1(i)*, from the date of default till the actual date of completion of work as per relevant clauses of the DWA.

In the meanwhile, based on certification (February 2022) by third-party inspection agency (M/s. Feedback Infra Private Limited)[65], PFC approved (May 2022) the ERP project as "completed" with a completion cost of ₹ 30.45 crore and released ₹ 18.42 crore as grant.

Audit observed that ERP implementation was neither complete nor ready for roll out as discussed below.

[61] At 27.33 *per cent* above amount put to tender.
[62] Against July 2020 as per Sanction letter.
[63] Against July 2021 as per Sanction letter.
[64] Approved by Board of Directors in September 2022.
[65] Which certified completion on the basis of amended DWA, wherein the work was divided into Phase I and Phase II, for the purpose of showing Phase I as complete.

Table No. 3.8: Details of amendment to DWA

Sl. No.	Work item	Old DWA (March 2020)	1st Amended DWA (December 2021)	Audit remarks
1	Modules	All modules to be completed by 31 March 2021.	Work divided into Phase-I and Phase-II, stating that three modules (Finance and Accounts, HRMS and Materials) were to be completed in Phase-I by 31 December 2021 and the remaining modules were to be completed in Phase-II by 30 June 2022.	None of the modules were rolled out.
2	Pilot go-live	After legacy data migration, user acceptance testing must be completed within 12 months in identified pilot offices.	After legacy data migration, user acceptance testing must be completed within November 2021 in identified pilot offices for Phase-I. After legacy data migration, user acceptance testing must be completed within May 2022 in identified pilot offices for Phase-II.	As the modules were not rolled out, legacy data migration and user acceptance testing were also delayed.
3	Enterprise go-live	After rolling out in identified offices (within 20 months) other than pilot offices, stabilization and final acceptance is to be given by BESCOM.	Phase-I - Training and rolling out in identified offices within December 2021. Phase-II – Training and rolling out in identified offices other than pilot offices within June 2022 and stabilization and final acceptance by BESCOM.	The enterprise go-live also got delayed.

Source: Compiled by Audit from the data furnished by BESCOM

The main implementation period overlapped with the COVID-19 pandemic, which caused protracted delays and non-implementation of ERP. Consequently, the Company was unable to achieve its objective of implementation of an ERP system for its back-office operations for scalable and standardised business processes across the Company, despite spending ₹ 42.04 crore[66].

BESCOM while confirming (October 2024) the facts stated that modules like HRMS, Power Purchase, Finance and Accounts etc. required rigorous validations, before roll out and that the individual modules were being validated with the existing methodology in place and that benefits would be realized once the modules were fully rolled out with complete end-to-end integration. This confirms the Audit contention that the project component was declared complete in December 2021 without fully functional modules, only for obtaining grants.

3.11 IT Phase- II

The ESCOMs in the State were already using the IT system[67] implemented under RAPDRP Scheme since March 2016, which covered 98 towns across ESCOMs. This system was built to have provision in the design of Data Center (DC) / Disaster recovery Center (DRC) for meeting the requirement of entire State. IPDS envisaged extension of the existing IT System to 124 new towns added under the Scheme. Hence, to extend the coverage to additional towns, only incremental expenditure for expansion of the IT System was envisaged.

[66] up to 30 June 2023.

[67] Implemented by M/s Infosys Ltd.

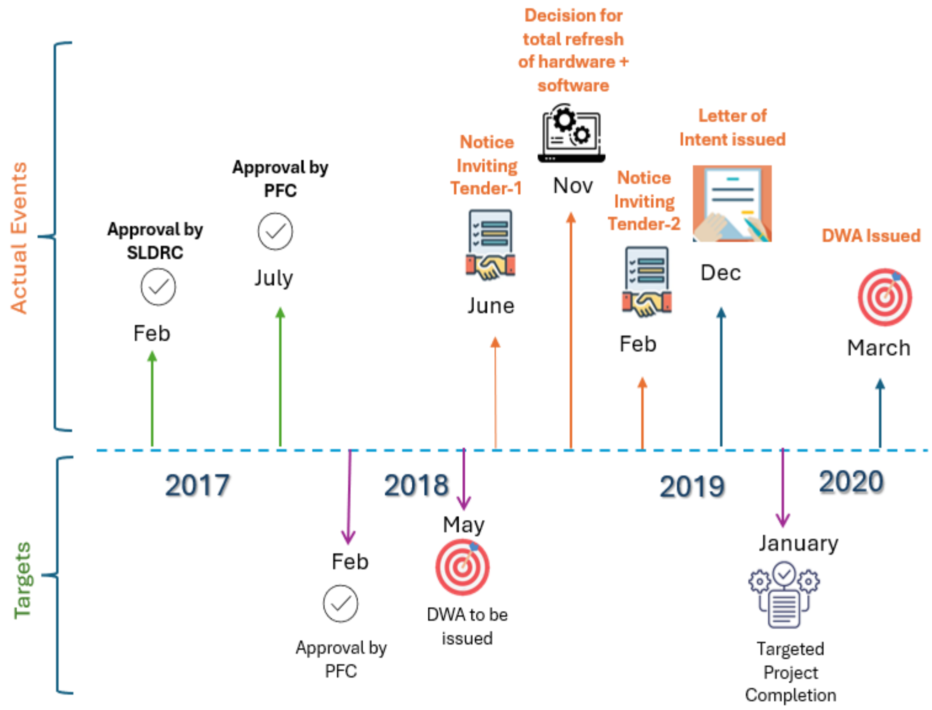
The main components envisaged were incremental cost for DC/DRC for all ESCOMs, hardware costs, implementation costs and GIS survey costs. The IT Phase-II also included IT Infrastructure[68] and GIS Survey in IPDS Towns. The Audit observation on the implementation of IT Phase-II are detailed in the following paragraphs:

3.11.1 Data Centre and Disaster Recovery Centre

State Level Distribution Reforms Committee (SLDRC) approved (February 2017) DPRs amounting to ₹ 103.08 crore for IT enablement under IPDS (IT Phase-II) in the State for submission to PFC. Of this, ₹ 71.79 crore pertained to BESCOM (including ₹ 63.55 crore for incremental cost for Data Centre/Disaster Recovery Centre to be implemented by BESCOM on behalf of all ESCOMS). Against this, PFC approved (July 2017) ₹ 33.93 crore[69] as cost for IT enablement. As per sanction, the work was to be awarded within 3 months from date of approval and was to be completed by January 2020. Though BESCOM decided to invite tenders on behalf of all ESCOMs for implementing IT enablement under IPDS in October 2017, the work was not complete even as at September 2024.

A brief time-line of activities envisaged and executed under the component is depicted in the chart below:

Chart No. 3.2: Timeline showing Actuals against target in implementation of DC/DRC works



Audit made the following observations on review of execution of the Scheme.

[68] Like switches, router, meters, modems, SBMs, Workstation PCs, printers and others.
[69] Grant receivable- ₹ 20.35 crore towards execution (60 *per cent*); ₹ 0.17 crore (0.5 *per cent*) towards PMA cost.

3.11.2 Delay in tendering and awarding of works

BESCOM did not anticipate that the existing hardware of DC/ DRC had to be upgraded, at the time of DPR preparation under IPDS in February 2017. After calling tenders for appointment of IT Implementation Agency (ITIA) in March/June 2018 for the initial plan (which included all the components of IT Phase-II[70] and which could not elicit bids), expert opinion was obtained in October 2018. Considering the appraisal by the existing IT Implementing Agency (ITIA) and technical consultant[71] under RAPDRP[72], BESCOM decided (November 2018) to go for total refresh[73] for DC/DRC. Accordingly, the IT Phase-II cost was re-estimated at ₹ 188.58[74] crore (November 2017), as against the earlier cost of ₹ 103.08 crore. Further, BESCOM also decided to call tenders for the various components[75] separately. Fresh tenders for Appointment of System Integrator (SI) for Implementation of "DC-DRC Hardware and Software refresh under IPDS IT Phase-II implementation across all ESCOMs of Karnataka" was issued in February 2019, with tender value of ₹ 130.00 crore. Subsequently, BESCOM extended the date of submission of bids to July 2019, to incorporate modifications/corrections based on issues pointed out by prospective bidders. This increased the tender submission period from 30 days to 148 days. Letter of Intent was issued in December 2019, followed by DWA in March 2020, after the due date for completion as per PFC approval (January 2020). The total DWA cost was ₹172.00 crore, of which ₹ 89.92 crore pertained to implementation and ₹82.08[76] crore pertained to hosting and maintenance.

BESCOM stated (October 2024) that the delay was due to refusal by RECPDCL to take up PMA work for IT component, which resulted in calling tender for PMA for IT component in September 2017. The Company also stated that bid was dropped in October 2017 due to receipt of single bid, owing to which it was decided to go ahead without PMA. The reply is not acceptable, as there were significant delays subsequent to October 2018, as elucidated in the ***previous paragraph 3.11.1.***

[70] ITIA was required to propose hardware required for existing as well as new load envisaged, propose new license requirements, upgrading of software, supply and installation of hardware for BESCOM DC, setting up of DRC on cloud, supply and installation of field infrastructure, GIS survey of field assets and providing facility management services for five years.

[71] Consultant, M/s International Institute of Information Technology, Bengaluru opined that the existing RAPDRP hardware had reached end of life and support and the infrastructure was full, limiting scope of expansion. The OEMs of software being used recommended the version being at least N-1 to provide appropriate support.

[72] Infosys Technologies Limited.

[73] Total refresh components:

a. **Hardware Refresh**: Complete set of new servers, networking and other hardware to be supplied/installed/commissioned replacing the existing infrastructure.
b. **Software refresh**: Upgradation of the existing software products or replace with any other suitable software.

[74] DC-DRC infra component value was ₹ 98.00 crore, FMS- ₹ 16 crore. Total estimate for DC-DRC - ₹ 114 crore.

[75] Other components included– IPDS towns IT infrastructure (switches, routers, spot billing machines, workstations *etc.*), IPDS towns GIS survey, Fixing meters and modems to IPDS towns *etc*.

[76] Revenue expenditure to be met by ESCOMs - not eligible for grant.

3.11.3 Non-completion of works and non-achievement of objectives

The work was to be implemented within 24 months from issue of DWA (March 2020). An amendment to DWA was issued (June 2021) considering the impact of COVID-19 pandemic, wherein the start date was changed to July 2020, thereby extending the scheduled date of completion for IPDS towns to December 2021 and RAPDRP towns to July 2022.

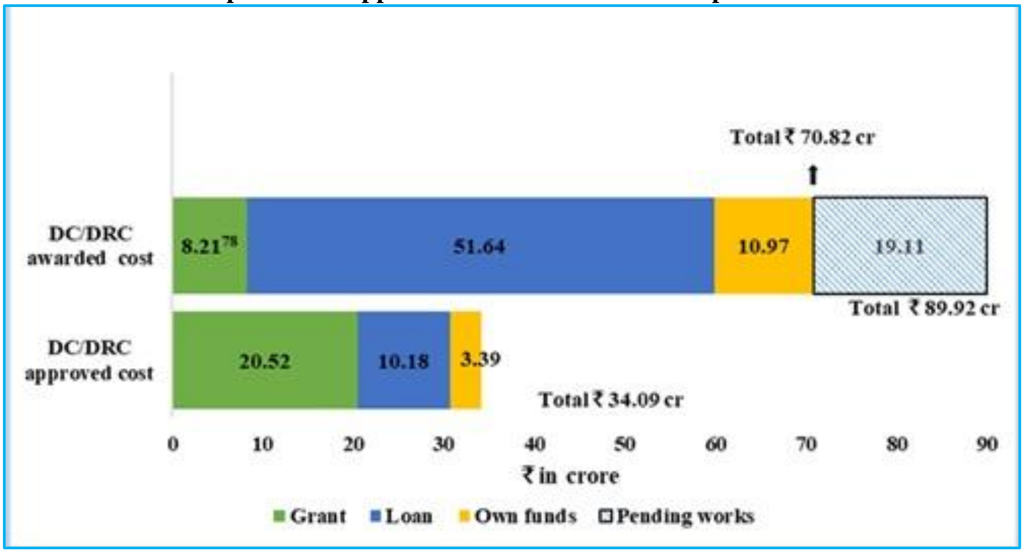
For the purpose of getting grants from PFC, BESCOM declared the work (March 2022) as "complete" in December 2021. However, Audit observed that the work was not yet complete (May 2024). The delay was attributed to lack of support from the proposed Original Equipment Manufacturer[77] for supply of software components. Though BESCOM spent ₹ 70.82 crore (September 2024) on the work it has not derived any benefit from the expenditure and while DWA contained provision for levying liquidated damages for non-completion of work, BESCOM did not levy any penalty on M/s Infinite Computers.

BESCOM replied (October 2024) that a penalty resolution committee was constituted in May 2023 to deliberate and finalise liquidated damages. BESCOM also stated that recovery of liquidated damages would be effected based on the decision of the committee and approval of Board of Directors.

3.11.4 Increase in costs and need for additional loan

BESCOM did not conduct any study to evaluate feasibility of implementation of incremental IT enablement of IPDS towns as envisaged in the guidelines. This resulted in preparation of an initial DPR without DC-DRC refresh. The revised DPR cost which included total refresh of DC-DRC implementation was higher and in order to meet the financial obligation, BESCOM had to take loans, over and above the PFC sanctioned loan component. A comparison of approved cost of implementation of DC/DRC and the awarded cost is shown in chart below.

Chart No. 3.3: Comparison of approved and actual costs of Implementation of DC/DRC



[77] M/s. Fluentgrid; It was later on changed to M/s. Oracle at the request of the contractor.
[78] Grants actually received, excluding that adjusted against RAPDRP.

3.11.5 Additional expenditure on co-hosting charges

The IPDS guidelines enabled subsuming the existing scheme of RAPDRP in IPDS and continuing it as a separate component of IPDS for IT enablement of distribution sector. Under RAPDRP, BESCOM had a co-hosting[79] facility for DC in Bengaluru with M/s Sify Infinite Spaces Ltd (operational from March 2011). The DRC was in Chennai and was co-hosted with M/s Nxtra Data Ltd (operational from October 2011). On implementation of IPDS, the DC had to be housed in BESCOM building in Bengaluru and DRC had to be hosted in cloud (approved by Ministry of Electronics and Information Technology - MEITY). The co-hosting contracts for DC-DRC and Facility Management Service (FMS)[80] under RAPDRP were to be terminated after commissioning of DC-DRC under IPDS.

Due to non-completion of DC work within stipulated time (July 2022), co-hosting facility contract and FMS contract for RAPDRP DC were renewed with the existing contractors, incurring additional expenditure as detailed below:

Table No. 3.9: Extra expenditure incurred on co-hosting of DC/DRC and FMS contracts

Sl. No.	Agency	Type of Contract	Period of contract (contracts awarded for period overlapping with completion date of IPDS and beyond)	Cost (₹ in crore)	Period beyond scheduled IPDS DC-DRC completion (July 2022)	Cost for the period beyond scheduled IPDS DC-DRC completion (₹ in crore)[81]
1	M/s. Infinite Computer Solutions	Facility Management Services	01.05.2022 to 31.10.2022	10.78	01.08.2022 to 31.10.2022	5.39
			01.11.2022 to 31.03.2023	8.98	01.11.2022 to 31.03.2023	8.98
2	M/s. Sify Infinite Spaces Ltd	Data Centre	16.12.2021 to 15.12.2022	3.50	01.08.2022 to 15.12.2022	1.30
			16.12.2022 to 15.06.2023	1.75	16.12.2022 to 15.06.2023	1.75
	Total					**17.42**

Source: Compiled by Audit from data furnished by BESCOM.

Thus, non-completion of the work of DC/DRC work under IPDS resulted in additional expenditure of ₹ 17.42 crore.

Incidentally, the Facility Management Services for the RAPDRP system (existing system) was being done by M/s. Infinite Computer Solutions, who was also awarded the DC-DRC refresh under IPDS. Hence delay in completion of DC-DRC meant continuation of the old system and consequent payment to

[79] Co-hosting: Providing real estate area, continuous power supply, Setting and Maintaining Building Management System and security, whereas the servers are owned by BESCOM.

[80] As per DWA, Facility Management Service provider has to do ensure smooth running of all IT applications besides trouble shooting of IT Hardware equipment like servers, network and software components.

[81] Proportionate cost from 1 August 2022, the date from which the new Data Centre and Disaster Recovery Centre were scheduled to be operational.

M/s Infinite Computer Solutions for FMS of the same, resulting unfair advantage to the agency.

Further, Audit observed that M/s Infinite Computer Solutions had included annual FMS cost as ₹ 3.80 crore per annum for DC-DRC under IPDS. This was much lesser than the FMS cost of the old system[82], which had to be continued beyond July 2022, in the absence of refreshed DC/DRC.

BESCOM stated that the IT Applications were rolled out from HSR data centre on 26 November 2023. The upgraded versions of the main modules were rolled out on 20 March 2024 and the contract with Sify for Co-hosting was terminated in March 2024. Though the co-hosting services were terminated in March 2024, the Company incurred extra expenditure as mentioned above due to non-completion of IT Phase-II works in time.

3.11.6 Non-utilisation of GIS data due to delay in implementation of DC/DRC

One of the components of IT Phase-II was Global Positioning System (GPS) based Geographical Information System (GIS) survey of assets and integration of same with DC/DRC. LoI was issued by BESCOM, on behalf of all ESCOMs during September 2019 for the work of GIS based asset mapping, survey and Digitisation and Integration of Consumer indexing data in 124 IPDS towns to M/s. CyberSwift Infotech Pvt. Ltd., Kolkata at ₹ 5.69 crore. The respective ESCOMs issued separate DWA to the agency during March 2020 and ₹ 3.55 crore was paid to the agency as on May 2023. As the DC/DRC was incomplete, the GIS data generated by M/s. CyberSwift could not be put to use (September 2024).

BESCOM replied (October 2024) that the applications including GIS would be rolled out soon.

3.11.7 Installation of Modems to meters

One of the components of IT Phase-II also included the work of fixing of modems to meters of HT consumers, DTCs[83]and boundary meters. BESCOM invited (June 2018) short term tender on behalf of other four ESCOMS[84] for all IT Phase-II works. As there was no response, revised tender (February 2020) was called for supply, installation, solution engineering, commissioning, and maintenance of modems for HT/Boundary Meters /DTCs/ Feeder installations in IPDS towns (104 towns excluding BESCOM) of the State at ₹ 6.05 crore. The work was awarded (March 2020) to lone bidder M/s. Analogics Tech India Ltd, Hyderabad at ₹ 5.96 crore for total quantity of 6,406[85] modems. The DWA provided that the work was to be completed in nine months and maintenance period of 5 years would be from the date of Go-live declared by BESCOM.

[82] ₹ 19.76 crore for eleven months, as can be seen from Sl.no.1 of table 3.9.
[83] was included and approved by PFC (July 2017).
[84] CESC, GESCOM, HESCOM and MESCOM.
[85] 1,882 for CESC, 1,397 for GESCOM, 1,310 for HESCOM and 1,817 for MESCOM.

As of December 2021 (extended date for completion), M/s. Analogics Tech India Ltd, Hyderabad had supplied only 654[86] modems to ESCOMs.

MESCOM (December 2021) and CESC (January 2022) had requested for short closure of the work under IPDS IT Phase-II, citing the implementation of smart meters under the upcoming Revamped Distribution Sector Scheme (RDSS). Accordingly, the State Level Distribution Reforms Committee (SLDRC) accepted (March 2022) the same. A revised DWA was issued (March 2022) limiting the scope of work to 654 modems already supplied.

Audit observed the following:

- *Clause 6* of DWA stipulated the project implementation period as 9 months from the date of intimation by BESCOM and maintenance period of 5 years from the date of Go Live declared by BESCOM. Though BESCOM awarded DWA in March 2020, intimation to start the work was issued only in January 2021 resulting in delay of nine months to start the work, which indicated lack of proper planning in implementation of work.

- Though the DPR was approved during July 2017, BESCOM took considerable time of 31 months to award the work, as the Company was unable to crystallise the actual requirements before calling the first tender, resulting in modifications in bid documents and retendering, resulting in only partial implementation of the project within the scheduled completion date.

  BESCOM replied (October 2024) that in spite of the delay, the work was under progress and 654 modems were commissioned till December 2021.

Thus, short closure had resulted in foregoing the grant of ₹ 3.21[87] crore and four ESCOMs paid an amount of ₹ 0.16 crore to contractor after deducting penalty on installation of 654 modems, which also became infructuous. Further, while short closing, SLDRC has considered implementation of smart meters under upcoming Revamped Distribution Sector Scheme, where all DTCs, feeders and consumer meters shall be replaced by smart meters, which would make the remote meter reading with modems redundant. However, the State has not yet decided to implement the scheme.

3.12 Deficiencies in Quality Assurance Mechanism

As per the *scheme guidelines*, the ESCOMs were responsible and accountable for assuring quality in IPDS works and had to formulate a comprehensive Quality Assurance (QA) Plan and Inspection Plan and make it an integral part of the contract agreement with turnkey contractors. The ESCOMs had to ensure that the quality of material/equipment supplied at site and field are in accordance with quality assurance and inspection plan. Further, as per the

[86] 229 for CESC, Nil for GESCOM, 114 for HESCOM and 311 for MESCOM.
[87] ₹ 5.96 crore *less* cost of modems supplied ₹ 0.61 crore × 60 *per cent.*

Standard Bidding documents of IPDS[88] and provisions of DWAs, ESCOMs and turnkey contractors had to ensure Quality Assurance checks and 100 *per cent* pre-dispatch inspections of all materials as per approved drawings/ technical specifications/ data sheet/ Guaranteed Technical Parameters/ applicable national and international standards.

Audit observed that ESCOMs did not prepare Comprehensive Quality Assurance plan as required under scheme guidelines. Further, on a review of DWAs issued, Audit observed the following deficiencies in quality assurance mechanism:

- CESC waived (June 2017) pre-despatch inspection for Solar photovoltaic modules valued ₹ 1.29 crore[89] (out of DWA cost of ₹ 15.14 crore) (48.70 *per cent* of value of materials) supplied by M/s Naviya Technologies, Mumbai (supplier).

- HESCOM accepted 3,364 nos of 250 Wp modules (out of 4,044 nos.) supplied by M/s Pratham Integrated Engineering Solution Pvt. Ltd. Bengaluru, as against the 280 Wp stipulated in the DWA. Further, the Company waived inspection of 2,200 of these 250 Wp (February 2018) modules and 1,300 nos of 320 Wp (July 2018) modules supplied by IC India Pvt. Limited, Bengaluru. While accepting the request for waiver, HESCOM stated that, these materials were inspected at site duly collecting all the warranties/guarantees documents.

Accepting Solar modules which were below the specified capacity and waiver of pre-dispatch inspection with a view to complete the work at the earliest, resulted in compromising on material quality.

CESC replied (October 2024) that it had conducted inspection at factory premises of supplier in June 2017 and the results were found to be satisfactory for optimum generation. The reply is not acceptable as CESC had addressed (June 2019) the supplier about the low generation of energy as compared to standard specification of 3-4 units per day/kW. Further, CESC also reported that the online monitoring system was also not functioning.

HESCOM replied that materials were inspected and accepted by HESCOM quality wing as PV modules' specifications/performance were as per IEC[90] standards and that generation of Solar panels depended upon the amount of sunlight received and a lower power module could still perform well if it had a high efficiency and converts sunlight to electricity effectively. It was also stated that, accepting Solar modules below the specified capacity would not result in lower generation and poor generation/ no generation was due to faulty equipment, poor maintenance and other technical reasons which were being addressed regularly.

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[88] *para 2* Quality Assurance and Evaluation Mechanism (Volume-II Section -I).

[89] Calculated at the rate of ₹ 2.15 lakh per set panel cost for 5 kw for 60 sets.

[90] International Electrotechnical Commission- an international standards organization that prepares and publishes international standards for all electrical, electronic and related technologies.