SECTION A
Ministries / Departments

Chapter-II
Department of Telecommunications

2.1 Implementation of USOF project (Phase I) to provide mobile services in areas affected by Left Wing Extremism

The project for providing mobile services in LWE affected areas with funding from USOF was a significant initiative in providing communication services in remote and difficult areas of the country. USOF/ DoT chose a technology for the project which was delivering sub-optimal performance with limited scope for augmentation impacting performance of the network. Further, though the project had been substantially commissioned, there were delays ranging from 3 to 18 months and the project duration was extended from September 2020 to June 2022. Audit also found that monitoring and evaluation of the project was inadequate. On account of the above there is limited assurance that the expected outcomes in terms of providing critical communications facilities in remote and disturbed areas would materialise despite incurring an expenditure of ₹ 3,112.32 crore on the project.

2.1.1 Introduction

Department of Telecommunications (DoT) formulated a project proposal in 2011 for providing mobile services in areas affected by Left Wing Extremism (LWE) at the initiative of Ministry of Home Affairs (MHA). The project was to be funded from the Universal Service Obligation Fund (USOF). Government approval for the project was accorded in June 2013.

DoT and the Administrator, USOF were responsible for selection of technology for the project, obtaining required Government approvals, liaising with MHA and BSNL, approval of cost estimates and tenders, release of subsidy and for overall monitoring of the project.

Bharat Sanchar Nigam Limited (BSNL) was the implementing agency for the project. It was required to identify locations for mobile connectivity after survey and in consultation with MHA, prepare cost estimates, undertake tendering and monitor field work. In addition, BSNL was responsible for maintenance of services through vendors, and as owner of the assets it was required to provide continued services as per TRAI quality standards, following the operation and maintenance (O&M) period of five years.

2.1.2 Project details

Phase I of the project was assigned to BSNL on nomination basis. MHA initially identified 2,199 sites including 363 existing sites of BSNL, in ten States for establishing mobile connectivity. USOF entered into an agreement with BSNL effective from 30 September 2014, for installation/ commissioning of Base Station Controller (BSC)/ Base Transceiver Station (BTS) at the selected sites. The agreement provided for 100 *per cent* CAPEX subsidy for this work and OPEX subsidy for a five-year maintenance period from the date of commissioning. The total cost of the project was ₹ 3,567.58 crore. In respect of 363 existing BSNL sites, OPEX subsidy was to be paid

from USOF to BSNL from the date of agreement. In December 2016, USOF extended the agreement with BSNL upto June 2022, and included another 156 sites as additional work at a cost of ₹ 275.00 crore. Later, after getting complaints of low connectivity, the Telecom Commission in December 2017, recommended augmentation of VSAT backhaul at a cost of ₹ 151.80 crore and enhancement of bandwidth to 2 Mbps at all sites at the rate of ₹ 89.00 crore per year. This took the final cost of the project to ₹ 4,214.28 crore.

State-wise details of the sites identified by MHA and BSNL for providing mobile services in LWE areas are given in **Table 2.1.1**.

Table 2.1.1: State-wise details of LWE sites

	States	New sites proposed	New sites (Add-on order)	BSNL sites already radiating	Total sites
1.	Andhra Pradesh	53	8	1	62
2.	Telangana	171	0	2	173
3.	Bihar	184	66	0	250
4.	Chhattisgarh	146	35	351	532
5.	Jharkhand	782	34	0	816
6.	Maharashtra	57	5	3	65
7.	Madhya Pradesh	16	0	6	22
8.	Odisha	253	8	0	261
9.	Uttar Pradesh (East)	78	0	0	78
10.	West Bengal	96	0	0	96
Total		**1,836**	**156**	**363**	**2,355**

In May 2018, the Central Government also approved Phase II of the Project at a project cost of ₹ 7,330 crore, for setting up around 4,072 sites based on 2G+4G technology.

Funding of Phase I of the project

Funding of the project was through USOF. BSNL was required to claim Capital Expenditure (CAPEX) and Operational Expenditure (OPEX) subsidy from USOF as per the agreement between BSNL and USOF. Details of the project cost as per the agreement, to be released as CAPEX and OPEX subsidy are given in **Table 2.1.2**.

Table 2.1.2: Details of project cost and subsidy released by USOF from October 2014 upto June 2020

(₹ in crore)

Projects	Component wise	Project cost as per agreement	Released fund	Balance fund
1836+156 additional sites	CAPEX - Tendered (Vendor)	1,469.96	1,318.34	64.06 (As per final claims from BSNL)
	CAPEX - Non-Tendered (BSNL)	249.69	249.26	NIL
1836+156 +363 existing sites	OPEX Tendered (Vendor)	1,874.69[5]	1,132.88	As per terms and conditions of the agreement
	OPEX Non-Tendered (BSNL)	619.94[6]	411.84	As above
	Total	**4,214.28**	**3,112.32**	

(Source: Agreement and expenditure details furnished by Administrator USOF)

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[5] OPEX Tendered for five years. OPEX is payable for radiating 1,831 sites + 156 Additional Sites + 356 existing sites = 2,343 Towers

[6] OPEX Non-Tendered includes cost for VSAT bandwidth and carriage charges

CAPEX subsidy of ₹ 1,567.60 crore which was 91 *per cent* of the total CAPEX, and OPEX subsidy of ₹ 1,544.72 crore which was 62 *per cent* of total OPEX subsidy, had been released by USOF as of June 2020. OPEX subsidy was however, payable up to the end of the O&M period i.e. till 2022.

2.1.3   Audit scope and objectives

Audit of Phase I of the project was conducted at USOF Headquarters, Controller of Communication Accounts (CCA) Offices, BSNL Corporate Office and concerned BSNL Circle Offices. The audit covered project activities and transactions from 2011-12 to 2017-18, which was updated in 2020. The audit aimed at assessing whether planning of the project was sound, project execution was as per plan and compliant with the agreement between USOF and BSNL. It also sought to assess the adequacy of financial arrangements for the project and effectiveness of monitoring mechanisms.

2.1.4   Audit Findings

Audit findings relating to project planning, execution, monitoring/ evaluation and financial aspects are discussed in subsequent paragraphs.

2.1.4.1 Project Planning

The selection of technology to be used for the project for providing mobile services in LWE areas had been left to DoT /USOF by MHA. Audit findings from an examination of the selection of technology by DoT/ USOF are brought out in the succeeding paras.

(a)   Imprudent selection of low power BTS using 2G technology

BSNL in its inputs for the project proposal to the Government in March 2012, suggested adoption of normal BTS for the project using 2G Technology with a 2+2+2[7] configuration expandable upto 8+8+8. The suggested solution supported GPRS and EDGE[8] taking into account possible use of EDGE technology by the security agencies. BSNL had specifically mentioned that it was not proposing low power BTS as it would not provide adequate coverage due to the dense vegetation in the LWE areas.

While DoT/ USOF was considering the Draft Feasibility Report (DFR) for the project prepared by BSNL, a Private Telecom Manufacturer (PTM) viz. M/s Vihaan Networks Limited (VNL) presented (September 2012) its 2G based system using solar power for providing voice and broadband services in LWE areas.

DoT thereafter, constituted (October 2012) a Committee[9] to examine the solution proposed by BSNL in its DFR and the alternative solution given by M/s VNL. From the report of the Committee it was noted that the proposal of BSNL was based on

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[7]   2+2+2 is a BTS configuration and consists of elements of antenna, duplexers, data distribution framework rack, transceiver units etc. A 2+2+2 configuration BTS is generally used in rural areas and a 6+6+6 or 8+8+8 configuration BTS in urban areas. A 2+2+2 configuration BTS requires about 1.3 kW of power supply while a higher capacity version (4+4+4 or 6+6+6) requires 2-3 kW.

[8]   General Packet Radio Service (GPRS) and Enhanced Data for Global Evolution (EDGE) or Enhanced GPRS are 2G technologies that were introduced in the GSM networks to enable mobile data services.

[9]   Committee was chaired by Advisor (T) of DoT with Sr. DDG (TEC) and Director (CM) BSNL as Members and DDG (CS) DoT as Member Secretary.

conventional/ normal BTS[10] which would meet the requirement of providing coverage in at least three km radius around the cell tower. On the other hand, the solution of M/s VNL was based on TEC GR No. GR/ WS/ BSS-002/ 01[11] of December 2009 using low power BTS with small capacity and coverage in a limited area in a 2+2+2 configuration. M/s VNL also 'claimed' that it met the coverage requirement of at least three kilometers radius around the tower through its Rural BTS. In addition, for meeting power requirements BSNL had proposed DG sets at all locations and solar panels in 617 locations as it was of the view that in forest areas BTS cannot depend solely on solar power. On the other hand, the solution offered by M/s VNL 'claimed' to consume less power and could thus work with solar power alone without needing grid power or DG sets.

The Committee recommended the solution based on "generic requirements" as contained in the above mentioned TEC GR No.GR/WS/BSS-002/01 of December 2009 for LWE areas, corresponding with the proposal by M/s VNL. The recommended solution predominantly envisaged use of "low power" Cat-I configuration and Cat-II configuration in select areas.

Audit observations on the selection of technology are as follows:

a) While making the choice between BSNL's solution and the solution offered by the private vendor viz M/s VNL which were both based on 2 G technology, certain key aspects were overlooked. BSNL's solution involved use of standard equipment of GSM technology being installed in rural and urban areas, while M/s VNL solution primarily involved use of BTS in Cat-I configuration i.e. small size, low power and with limited coverage. The Committee relied on "claims" made by M/s VNL with regard to coverage requirements, power consumption, compliance with the TEC GR and field testing etc. There was no indication in the report of the Committee if the claims and inputs had been independently verified. No comparison was undertaken on the parameter of scalability of the two alternate solutions, and the suitability of "low power" BTS in LWE areas with dense foliage was not specifically addressed.

b) Both the options considered by USOF in 2012 were based on 2G technology even though BSNL had already launched 3G services in 2009. Besides, by the time USOF signed the agreement with BSNL a further period of over 22 months had elapsed and the use of 3G had become common among Telecom Service Provides (TSPs). DoT/ USOF continued with the same technology for the 156 additional towers approved in December 2016 though complaints relating to coverage and connectivity were being received since June 2015 from some states. The selection of a solution based on 2G technology and failure to review the options at the time of finalising the agreement with BSNL and approval of

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10 Based on GR No GR BSS-01/01 March 2004 "Base Station Subsystem (BSS) of IMPCS".
11 The GR covered Cat-I and Cat-II configurations with Cat-I being small capacity, small footprint for coverage in a small radius of one or a few villages using low power BTS and Cat-II being small capacity, large footprint for large coverage area with higher power requirement.

additional 156 sites was not judicious taking into account limitations of 2G technology especially with regard to provision of data services.

c)   The Committee generally recommended wireless backhaul i.e. through microwave or VSATs but did not give any specific recommendation on bandwidth. As a result, initially provision was made for bandwidth of only 512 kbps which was later increased to 1 Mbps. Subsequently, this bandwidth was found to be inadequate which led to call blocking and congestion. This was also evidence of shortcomings in the planning of the network.

d)   The Committee's recommendation on selection of technology was based on an examination of only two technology options. USOF selected the recommended solution ignoring its observation that other cost-effective technical solutions appropriate for LWE areas would also be available in the market. Further, prescribing a specific technology was also not in line with USOF's extant tendering procedures which envisaged a technology neutral approach so as not to restrict participation.

Audit is of the view that choice of a limited use 2G technology when more advanced and versatile technologies were available, was not efficacious as future upgradation would be at a cost. Further, as funds for the project was not a constraint *ab-initio* adoption of latest available technology would have improved outcomes and made the project future proof. Besides, adopting a solution suggested by a private company which later participated in the bid for the project as a vendor, instead of a neutral and competitive process for selection of technology, deprived USOF of the opportunity of making an optimum technological choice with respect to coverage, scope and scalability of the project while tapping possible cost benefits.

DoT in its reply (May 2019) stated that the project was planned as per requirements of MHA. It stated that the mandate for the project was to provide telecom/ voice services connectivity to the maximum possible population and 2G was able to provide coverage to large areas. It accepted that high speed data was not available under 2G but held that MHA had never projected a requirement for such data services at the planning stage and the focus was on voice services. It denied that the network does not provide data service and also claimed that the equipment used is modular and scalable and the capacity can be enhanced without replacing the existing equipment. Further, VSAT bandwidth had been increased from 512 kbps to 1 Mbps and subsequently to 2 Mbps to resolve call blocking. Thus, it had provided a cost effective, power efficient solution using Renewable Energy Technology (RET) based on the National Telecom Policy (NTP) 2012. It also stated that work for the additional 156 towers had been taken based on the demand of MHA prior to States making complaints about the technology.

The reply that MHA had not projected requirements for high speed data and the focus was on voice services, is not tenable as the choice of technology had been left by MHA to DoT and USOF. That the choice of 2G technology was ill advised is borne out by the complaints relating to coverage and connectivity from some states since June 2015 and as mentioned by DoT itself in its reply (May 2019), in a review meeting (July 2016)

three States had requested for an increase in bandwidth and additional towers. Subsequently in May 2017[12], LWE states highlighted capacity issues with respect to towers installed in Phase I due to use of 2G technology and requested upgradation of the towers and reconsideration of use of 2G technology for the additional 156 towers. DoT/ USOF should have *ab-initio*, taken into account latest available technologies and suggested a solution which was future proof as funds were not a constraint for the project. It could have also reviewed the choice of technology during the currency of the project and adopted more capable technologies. This would also have been consistent with the broader vision of NTP for using broadband services for various Government programs.

In addition, an evaluation[13] report prepared by IIT, Bombay of Phase I of the project (January 2018) inter-alia, highlighted low utilisation of mobile sites due to poor quality of services and lack of data services, and that with the current design at LWE sites capacity addition was not possible and capacity could be enhanced only by replacing the entire existing equipment. This refutes DoT's position that data services were available and that the existing equipment was scalable and that its capacity could be enhanced without the need for replacement.

(b)   Failure of USOF to review and upgrade technology used in the project.

As noted in the previous section, the technological solution for the project based on 2G was selected by DoT/ USOF in December 2012. However, the sites under the project were commissioned over a prolonged period i.e. from July 2015 to November 2018 and the project period including O&M was extended till 2022. As mentioned earlier, in June 2016, approval was also given for establishing an additional 156 towers. However, the same 2G based solution was retained. Thus, though both the project size and period was increased no technology reviews were undertaken despite Telecom technologies evolving rapidly and becoming more efficient with multifarious capabilities. In addition, over this period user requirement had also undergone changes. Audit is of the view that technology reviews for large and critical projects were important and should have been undertaken.

DoT in its reply (May 2019) stated that for high speed data Wi-Fi / LTE can be overlaid at any time utilising the infrastructure created through the project. It intimated that the State Government of Jharkhand had separately funded and got this equipment installed by BSNL at all 816 towers set up under the Project in the state. However, this upgradation was at the initiative of the State Government using its own funds and not part of any centralised USOF funded exercise for upgradation.

Records of USOF show that it had belatedly asked BSNL for a proposal for 4G upgradation for existing sites and that the same is under consideration. However, the exercise was yet to be approved and commenced on ground.

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[12]   In a meeting of CMs of the 10 LWE affected states with MHA
[13]   USOF/ DoT had engaged IIT Bombay in January 2017 to conduct an evaluation of technology deployed in Phase I prior to taking up Phase II of the project. The evaluation Report was submitted in January 2018.

(c) **Vendor guided selection of technology led to de-facto single vendor situation.**

As mentioned in para 2.1.4.1 (a) above, the DoT Committee recommended the solution based on a proposal made by a vendor viz. M/s VNL. BSNL accordingly floated tenders for the project[14] with specifications approved by the DoT Committee which was in turn based on the presentation given by M/s VNL. As a result, only two vendors viz. M/s VNL and M/s HFCL-which had a Transfer of Technology (ToT) agreement with M/s VNL- participated in the tender. As there were only two participants -of which one, viz. M/s HFCL had a ToT agreement with the other bidder i.e. M/s VNL- the tender was tantamount to a single vendor case despite the high value of the project.

It was observed that the DoT Committee on selection of technology, had mentioned in its report that TEC had indicated that "multi-vendor implementations" are available for the recommended technology. Besides, the Committee itself had observed that other "cost effective technical solutions" that "support the generic requirements" could also be available. However, DoT/ USOF neither ascertained the vendor base for the recommended solution prior to tendering, nor did they review the specifications on account of the very limited participation in the tender to expand participation.

Thus, both failure to follow a technology neutral approach and to assess vendor base for the selected technology led to limited participation which did not give any assurance that the price discovered was the most cost effective.

2.1.4.2 Project Execution

(a) **Delays in implementation status of LWE Project- Phase I**

The DoT Committee had recommended (December 2012) the solution based on 2G and renewable energy technologies as this was considered to be cheaper and quickly deployable. However, audit scrutiny disclosed delays at various stages which are discussed below.

The Government approved the proposal for the project in June 2013. As per the approval the installation and roll out of towers/ sites was targeted to be completed in 12 months after signing of agreement with BSNL which would take about three months. Accordingly, the Agreement between USOF and BSNL should have been signed by September 2013 but Audit noticed that the Agreement was signed only in September 2014 i.e. after a delay of a year.

Further, as per the agreement between USOF and BSNL, BSNL was to set up the infrastructure and commission the mobile network covering 1,836 mobile sites within 12 months from the effective date i.e. by 30 September 2015. Audit however, noticed that agreement was amended multiple times between December 2015 to January 2017 to extend the project period. By an amendment in December 2015, the roll out period was extended upto 21 months, which was further extended to 27 months in July 2016. In December 2016, the total agreement period including O&M was fixed at six years

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[14] The estimated project cost in the tender was over ₹ 2,000 crore.

i.e. upto September 2020 which was later extended June 2022. In January 2017, the date for commissioning the additional 156 sites was fixed as 21 July 2017. From the above it can be seen that initial delays in signing the agreement between USOF and BSNL and frequent amendments in the agreement allowing extension of time period for execution of the project added to the delays in completion of the LWE Phase I of the project.

The status of commissioning of the sites is given in **Table 2.1.3**.

Table 2.1.3: Details of commissioning of mobile services in LWE

Total sites	Sites commissioned	Scheduled commissioning date	Date of commissioning	Remarks
1,836	1,831	31 December 2016	Between 16 July 2015 and 28 March 2017	Five sites in Odisha not commissioned due to security reasons
156	156	21 July 2017	Between 24 July 2017 and 01 November 2018	Delay in handing over sites by State Government

Table 2.1.3 shows that commissioning of both the originally planned 1,836 sites and the 156 additional sites, were delayed beyond the scheduled dates. In the case of the 1,836 sites this was despite more than doubling of the period for commissioning. The delays in setting up sites were attributed by the vendors to Naxal problems, delayed deployment of suitable police protection and delays in provision/ acquisition of sites for towers.

Audit however, observed that as per a survey done by BSNL the sites for mobile towers and equipment had been shown as clear. In any case, issues relating to availability of land for mobile sites should have been resolved before issue of work orders to the vendors and not several years after that. The reasons for delays indicate that planning for the project in terms of identification of sites and making arrangements for security was inadequate especially when the adverse nature of the law and order situation in these areas was well known.

The prolonged delay in commissioning of the towers led to non-achievement of the key objective of the project i.e. to quickly provide communication facilities to the security forces in sensitive areas. In addition, the continued use of older 2G technology by USOF also undermined the reliability and utility of the network which was critical to the security forces.

(b)   Agreement for award of work by BSNL prior to agreement between USOF and BSNL

BSNL had been assigned the task of implementation of the project for setting up the infrastructure and commissioning of the mobile network covering 1,836 mobile sites in LWE areas on nomination basis. As mentioned in the preceding section, as per Government approval an agreement between USOF and BSNL for the project was to be signed by September 2013. BSNL instead first issued a tender for the work in August 2013 in which two vendors viz. M/s VNL and M/s HFCL participated. After opening

of the bids a case was sent to USOF for approval. However, it was decided by DoT to retender the project which was done in April 2014. M/s VNL emerged as L-1 and M/s HFCL was L-2. The work was awarded on 05 September 2014 on turnkey basis vide Advance Purchase Orders (APOs), to M/s VNL and M/s HFCL in ratio of 70:30 respectively. Audit noticed that the agreement between USOF and BSNL was executed only on 30 September 2014 i.e. subsequent to the finalisation of the tender by BSNL and issue of APO to the vendors. Thus, BSNL had awarded the work to its vendors prior to the work being formally awarded to it by USOF. The work of add-on 156 LWE sites was also given to the same vendors in the same ratio in 2016.

As BSNL had issued tenders prior to entering into an agreement with USOF, there were discrepancies between the terms and rates in the tender/ APOs issued to the vendors by BSNL and in the agreement between USOF and BSNL. It was noted that for several works the agreement between BSNL and vendors did not specify individual items of work and only provided a lump sum rate, the agreement between USOF and BSNL provided item wise details of the work including estimated costs. It was also noted that the agreement between BSNL and USOF required each item of work to be performed but the same obligation was not specified in the agreement between BSNL and the vendors. These discrepancies were not reviewed and corrected in the Purchase Orders (POs) issued to the vendors. This led to the vendors receiving payments for items of work which were not performed by them.

(c)   Inadequate marketing of Telecom products

In accordance with the BSNL tender, the vendors of the project were responsible for setting up customer service centres for making BSNL mobile prepaid/ postpaid SIM cards, recharge coupons etc. available in the LWE areas. The vendor was required to provide mobile connections and retail services for telecom products at BTS sites in accordance with terms and conditions applicable to Direct Selling Agents (DSA). In terms of BSNL's Sales and Distribution policy, four retailers were to be appointed for each BTS.

Audit however, observed that the vendors did not appoint the required numbers of retailers. It was noted that out of 5,259 retailers required to be appointed as per policy, only 232 retailers were appointed by the vendors in five Circles with circles like Chhattisgarh, Madhya Pradesh, Andhra Pradesh and Telangana having appointed only one dealer each. The situation was somewhat better in Bihar and Jharkhand where 35 and 193 dealers respectively were appointed. The limited availability of BSNL outlets was also pointed out by IIT, Bombay in its evaluation report, in the context of low level of awareness about BSNL schemes. Further, due to absence of outlets, even willing customers found it difficult to obtain BSNL SIM cards. Further, BSNL did not monitor fulfilment of the contractual obligation relating to opening of retail outlets and instruct them to make the required number of retailers available.

DoT in their reply stated (August 2020) that as BSNL had directly appointed the vendors as rural distributors in LWE areas, they were being asked to justify the shortfall.

Audit observed that better marketing and more outlets of BSNL would have resulted in BSNL products being more accessible to customers for whom the project had been implemented. This would also have increased utilisation of the towers in the LWE areas.

2.1.4.3 Monitoring/ Evaluation of the project

(a)   Evaluation of performance of LWE sites

In terms of the Agreement for the project, the Administrator, USOF had the right to inspect the equipment installed at the sites and conduct service performance tests. It could carry out the performance tests either directly or through a designated monitoring agency, and evaluate "Quality of Service parameters" at any time during the tenure of the Agreement.

Audit noted that in November 2015, MHA conveyed complaints received from the Chhattisgarh and Madhya Pradesh Police to USOF that the towers installed by BSNL in the LWE areas were largely non-functional. As a result, security forces deployed in the area were deprived of mobile connectivity. USOF passed on these complaints to BSNL but did not carry out any performance tests directly or through Designated Monitoring Agency (DMA). USOF designated CCAs who belong to the Finance wing of DoT, as DMAs for the project only in December 2016 with the responsibility only for "Inspection of sites for verification of claims submitted by BSNL and for ensuring proper utilization of funds". However, even these instructions for carrying out limited/ non-technical checks, were issued to DMAs only in February 2017 i.e. 20 months after the commissioning of first LWE site in July 2015. By that time 1,668 sites i.e. 90 *per cent* of the LWE sites planned had already been commissioned.

Ministry accepted (May 2019) the audit observation, but intimated that after installation of BTS sites, "coverage" testing would be done by the respective TERM cells of DoT. It also added that instructions had been issued to BSNL in April 2018, for undertaking measures for improving services in LWE areas and contended that the performance of LWE sites was gradually improving.

Audit is of the view that instead of routinely assigning inspection work to CCAs who were not equipped in technical matters, USOF should have constituted a Project Monitoring Unit (PMU) to comprehensively monitor and assess performance of the whole project as this was a major project of National importance. This would have provided the required oversight over BSNL which would have assisted timely project implementation and helped address technical issues impacting on coverage and quality of services.

(b)   Quality of Service- Non-Compliance of terms and conditions of Agreement

As per the Project Agreement, BSNL was required to ensure provision of reliable services to the customers as per the Quality of Service (QoS) prescribed by the TRAI from time to time. In this regard, audit noted that USOF had received complaints from MHA and the State Governments regarding poor voice quality, one-way communication, low signal strength, limited range, dropping of calls, call congestion,

repeated un-serviceability of the towers and poor infrastructure, with respect to the sites commissioned by BSNL under the project for LWE areas. In addition, USOF's own analysis of performance of LWE towers for the quarter April-September 2017, disclosed low uptime of the towers. It was found that only in 19.56 *per cent* of the LWE sites i.e. 358 out of 1,831 sites, uptime was above the 98 *per cent* benchmark. In 1,398 sites uptime was in the range of 60-98 *per cent* and in 75 sites it was from 60 *per cent and less*. As uptime in the case of 80.44 *per cent* of towers at LWE sites was below the 98 *per cent* benchmark, BSNL was liable to be penalised through subsidy cuts.

DoT contended (May 2019) that the BTS downtime for network equipment under the project, was less than two *per cent* (per site limit) as per data obtained from Network Operating Centre (NOC) since October 2017 and also claimed increased utilisation of the sites in some states. However, DoT did not provide any authenticated supporting document for this. On the contrary, there was evidence of feedback from clients/customers about poor quality/ inadequate services by BSNL, and findings relating to low utilisation, and technology and capacity constraints of its own study done by IIT Bombay. The IIT study had also pointed out that utilisation was high only in states/ areas where other TSPs were not available. In addition, data provided in the reply itself showed that the downtime was more than two *per cent* in over 53 *per cent* sites thereby contradicting the claim of downtime being less than two *per cent* since October 2017. Further, the status of performance during January 2019 to November 2020 shows that downtime was less than two *per cent* only in 21 *per cent* sites.

Thus, as a result of the high downtime and BSNL's poor performance in maintaining medium of transmission and quality of mobile service, the very purpose of the project viz. "to provide mobile connectivity especially to the security forces in LWE area" was not met.

2.1.4.4 Financial Issues

(a)   Irregular payments of CAPEX and OPEX subsidy.

i)   Irregular payments for electricity connections.

In the agreement between USOF and BSNL, it was envisaged that an electricity connection will be provided in 1,028 out of the 1,836 new sites as an alternate power source. However, prior to including this work in the agreement, USOF did not advise BSNL to carry out any survey for ascertaining feasibility of provision of electricity connections in remote villages in the LWE areas.

As per the agreement, for providing electricity connections USOF was to provide CAPEX subsidy at the rate of ₹ 5 lakh per site for 1,028 sites, totalling ₹ 51.40 crore. In addition, provision was also made for OPEX subsidy of ₹ 132.77 crore towards payment of electricity charges for five years which was also to be paid to BSNL.

Audit examination of this item of work revealed the following:

a.   USOF released (October 2014) ₹ 51.40 crore as CAPEX subsidy in advance for 1,028 mobile tower sites whereas electricity connections were provided only at 152 sites. Electricity connections could not be provided at the balance 876 sites.

As such, BSNL was not eligible for subsidy payment amounting to ₹ 43.80 crore which needs to be recovered from the ongoing subsidy payments.

b. The above mentioned 876 sites were working without an electricity connection (August 2020). However, for these sites, OPEX subsidy of ₹ 63.35crore[15] for payment of electricity charges for five years, was released to BSNL which had in turn passed these on to the vendors of the project.

c. Further, though electricity connections were to be provided only for 1,028 sites, USOF had also paid and continues to pay subsidy for electricity in respect of 803 sites (1,831-1,028 sites planned) where electricity connections were not planned. As a result, an amount of ₹ 58.07crore[16] has been disbursed to BSNL as subsidy for which it was not eligible. As these payments were then passed on to the vendors by BSNL, this amounted to undue benefit to them for services not rendered.

Thus, USOF needs to recover CAPEX and OPEX subsidy payments amounting to ₹ 165.22 crore made to BSNL for sites where electricity connections were not provided from the on-going subsidy payments.

USOF while accepting the audit observation replied (September 2020) that excess CAPEX subsidy of ₹ 43.80 crore for electric connection would be recovered from the VSAT claims of BSNL. As regards, excess OPEX subsidy released, it was replied that the approved cost was based on the open tender called by BSNL and the deliverables was to be as per the tender. In this tender there was no separate subsidy for electric connection and there was only a single O&M cost which is being paid to vendor. Separate items such as electricity charges specified in the agreement between USOF and BSNL have not been specified in the approved tender for the vendors.

The reply relating to OPEX is not tenable as the agreement between USOF and BSNL provided for electricity connections in all the LWE sites, and the cost of electricity supply at all the sites was part of the OPEX subsidy amounting to ₹ 132.77 crore payable to BSNL. Further, as per clause 6.3 of the Agreement between USOF and BSNL, BSNL was required to ensure deliverables as stipulated by USOF/ DoT in the Agreement. Hence, award of O&M by BSNL to the vendor based on a lump sum cost without specifying electricity supply as a deliverable was a violation of the agreement between USOF and BSNL. Further, it is pointed out that the vendors were also meeting expenditure on the electricity charges from the same quantum of O&M subsidy in the case of 152 LWE sites where electricity connections were provided. Hence, as no electricity connections were actually provided in the remaining 1,679 sites, the payment of composite subsidy including the element of electricity charges is not in order and hence, needs to be recovered from the BSNL/ Vendors.

ii)   Irregular payment of Security costs

USOF provided for deployment of security guards at all LWE sites and covered the cost of deploying two security guards per site in the OPEX subsidy payable to BSNL for all

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[15]   876 sites x ₹ 7,23,148 per site for five years
[16]   803 sites x ₹ 7,23,148 per site for five years

the new sites in the Agreement with BSNL. This subsidy was passed on by BSNL to its vendors as part of payment for OPEX under the O&M contract.

In the course of audit, compliance with the provision for deploying two security guards was verified. It was found that in BSNL Circles covering six[17] States, security was not provided by the vendor at the sites. BSNL Circle Offices replied that there was no provision for security in their tender and sites were being monitored by the vendors through electronic devices. Further, at secured sites in CRPF camps/ Police Stations security guards from outside agencies were not permitted. The report of the IIT Bombay also corroborated non-provision of security guards by vendors.

It was noted that USOF had made provision for cost of security guards at the 1,836 new sites under OPEX subsidy based on Government approval. As per clause 6.3 of the Agreement between USOF and BSNL, BSNL was required to ensure deliverables as stipulated by USOF/ DoT in the Agreement. In the Agreement the total amount provided for providing security during the five-year period O&M period was ₹ 165.24 crore[18]. While the Agreement between USOF and BSNL specified provision of security guards as a deliverable and provided its estimated cost BSNL awarded the O&M contract to the vendors on lump sum basis without specifying OPEX components and the amount earmarked towards cost of security. It also did not prescribe any checks on deployment of security guards by the vendors or any penalty for non-compliance. As security guards were actually not provided by the vendors, subsidy paid to BSNL amounting to ₹ 165.24 crore on this account amounted to excess payment. As BSNL had passed on the lump sum OPEX subsidy consisting of cost of security guards to the vendors even though guards were not deployed by them, the vendors had also received undue payments on this account.

It was also noted that provision for security at various sites had been included without any planning or assessment of need for security either by USOF or by BSNL. USOF also released advance subsidy to BSNL for a period of five years including cost of security without verifying deployment of security guards at LWE sites. USOF had also not considered the feasibility of reimbursing the cost of security guards on actual basis.

USOF/ DoT stated (May 2019) that while BSNL had estimated ₹ 42,000 per month per site for three guards, it had approved estimate of ₹ 15,000 per month per site for security services. It later (September 2020) accepted that in its Agreement with BSNL the approved estimated cost included the cost of security guards but stated that BSNL had adopted a different methodology for ensuring security through vendors as the amount provided for the purpose was covering deployment of guards only for eight hours each day. The reply corroborates the observation that provision for security was made without proper assessment of requirement at the sites and that costs shown in the agreement were wrongly calculated. This reply is also not tenable as BSNL had approved the tendered OPEX which was 22 *per cent* higher than the estimates *inter-alia*, on the grounds that the cost estimates had provided the cost of two guards

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17 Chhattisgarh, Madhya Pradesh, Telangana, Andhra Pradesh, Bihar and Maharashtra
18 Two security guards for eight hours per a day costing ₹ 15,000/- per month

assuming prevailing minimum wage for watch and ward the same had since increased. Thus, while evaluating the bids BSNL was clear that OPEX estimates covered payment of two security guards for a period of five years. It should have thus, ensured that services at this level was provided by the vendors failing which payments should have been suitably adjusted.

As a result, security guards were actually not provided as per the Agreement though USOF had unduly released subsidy to BSNL. BSNL in turn passed this on to the vendors without ensuring the envisaged deliverables under the agreement was provided as its contract with the vendors did not specifically provide for deployment of security at the LWE sites.

In the context of the above instances, it is noted that a flawed system of contracting appears to have been followed in the project. DoT/ USOF being project owners should have first entered into an agreement with the implementing agency i.e. BSNL which should after tendering, entered into back to back agreements with the selected vendors for execution and maintenance based on the main agreement. As a result, in this case the agreements between BSNL and the vendors show deviations from the agreement between USOF and BSNL with respect to scope of services resulting in irregular excess payments to vendors. The implication of the deviations can be that while USOF will recover excess payments from BSNL for services not given, BSNL may have to absorb these costs as vendors may not agree to any recoveries. It was also noted that though the work was awarded to the vendors on a turnkey basis, no bill of quantities appear to have been provided for so as to ensure that all items included in project estimates were actually provided/ supplied by the vendors.

(b) Liquidated Damages recovered by BSNL from Contractors/ vendors not credited to USOF

As per the agreement between USOF, BSNL was required to ensure recovery of Liquidated Damages (LD) from the vendors in accordance with the contract agreement and pass on the same to USOF. LD amounting to ₹ 29.09 crore in respect of 1,836 sites and ₹ 0.67 crore for additional 156 sites had been deducted by the CGMs, BSNL of the respective circles but was retained by BSNL. Audit noted that subsequently after a plea from the vendors, LD was reduced to ₹ 12.39 crore for 1,831 sites and to ₹ 19.11 lakhs for the additional 156 sites by the BSNL Corporate Office. However, retention of LD by BSNL was not compliant with provisions of the Agreement between USOF and BSNL. DoT had accepted the audit observation (May 2019) and stated that the issue had been taken up with BSNL.

BSNL (August 2020), was yet to pass on the recovered LD to USOF nor has the latter adjusted the same.

(c) Non-adjustment of CENVAT Credit by BSNL

As per the agreement, CENVAT credit realized by BSNL was required to be adjusted against payments to be made by USOF as project cost. Audit observed that during the period 2015-16 to 2019-20, BSNL realized CENVAT credit relating to LWE project to the tune of ₹ 212.26 crore. Out of this amount USOF had adjusted and availed credit of

only ₹ 118.45 crore upto March 2020. The balance credit amounting to ₹ 93.81 crore is yet to be passed on by BSNL to USOF or adjusted against payments made by USOF.

Ministry confirmed the above fact and replied (September 2020) that remaining CENVAT credit would also be recovered as per clause 6.8 of the LWE agreement.

2.1.5 Conclusion

The USO Fund is an important mechanism established by the Government of India for providing communication services in remote and difficult areas of the country. The project for providing mobile services in LWE affected areas with funding from USOF was thus a significant initiative in this direction. Audit of the project, showed that USOF/ DoT had chosen a technology for the project which was delivering sub-optimal performance, and had limited scope for being augmented which had impacted performance of the network. In addition, though the project had been substantially commissioned, there were delays ranging from 3 to 18 months. The project duration including O&M has since been extended upto 2022. Audit found that monitoring and evaluation of the project was also inadequate. On account of the above there is limited assurance that the expected outcomes in terms of providing critical communications facilities in remote and disturbed areas would materialise despite expenditure of ₹ 3,112.32 crore on the project. A different approach involving use of latest available technology along with review and upgradation of technology would have ensured value for money and better communication facilities in LWE areas.

2.1.6 Audit Summation

The project for providing mobile services in LWE affected areas with funding from USOF of ₹ 3,112.32, was a significant initiative for providing communication services in remote and difficult areas of the country. Key findings from audit of the project were:

- The choice of technology for the project led to delivery of sub-optimal performance, and limited scope for capability augmentation.
- Project was substantially commissioned but with delays ranging from 3 to 18 months.
- Inadequate monitoring and evaluation of the project.
- High down time of mobile sites and low quality of mobile services.
- Irregular payment of CAPEX and OPEX subsidy.

Thus, there was limited assurance that the expected outcome of providing critical communications facilities in target areas would materialize.

2.1.7 Recommendations

- The choice of technology for a project should be based on Expression of Interest route so that selection of optimal technological options available in the market could be made rationally.

- While choosing the technological option future expansion/ upgradation should be factored in vis-à-vis the cost of such upgradations.
- The system of monitoring the execution of the project should be robust to meet the milestones and the target dates so that the project is operational by the due date.
- Constant technical monitoring of the BTS operations should be done and feedback given to the O&M vendor on real time basis to minimize the downtime.
- The OPEX agreement/ Purchase order between BSNL and vendor should be in line with the OPEX clauses between USOF and the BSNL.

2.2 Non-establishment of Laboratories by Telecommunication Engineering Centre

Telecommunication Engineering Centre (TEC) was designated by DoT as the authority for administering mandatory testing and certification of telecom equipment in India. DoT approved the establishment of five Next Generation Network Labs (NGN) and three other labs viz. SAR, Security and Green Passport Lab in TEC. In the case of NGN labs, while one Lab was dropped (Transmission Lab), only one (Transport Lab) of the remaining four had been established which is also only partially functional due to disputes with vendor. The remaining three labs (Access Lab, CPE and TL Lab and Control Layer Lab) are yet to be established. In the case of the other three Labs, only the Specific Absorption Rate (SAR) lab which has implications for health, had been established but has remained non-functional due to legal disputes. The other two labs viz. the Security Lab and the Green Passport Lab were yet to be established though five to six years have passed since these were approved, despite their significance for National Security and environment respectively. The basic objective of standardising testing and certifications processes and procedures in the context of NGN, was not met. In addition, in the absence of the NGN Labs, TEC continued to rely on and accept certificates issued by notified International Laboratory Accreditation Corporation.

2.2.1 Introduction

The Indian Telegraph Rules, 1951[19], provide that every telecom equipment must undergo prior mandatory testing and certification. The National Telecom Policy (NTP), 2012 also envisaged testing and certification of all telecom products with respect to defined parameters[20] with the objective of ensuring safe-to-connect and seamless functioning of existing and future networks. It also aimed at creation of a suitable testing infrastructure for carrying out conformance testing, certification, and for supporting development of new products and services.

Telecommunication Engineering Centre (TEC) as the technical wing of the Department of Telecommunications (DoT) is responsible for formulating common standards for

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[19] PART XI, Testing & Certification of Telegraph, (Rule 528 to 537)
[20] Conformance, performance, interoperability, Electromagnetic Field (EMF)/ Electromagnetic Interference (EMI), Electromagnetic Compatibility (EMC), health, safety and security

telecom network equipment, services and interoperability, evaluation of equipment and services (against standards and specifications) and according approvals for equipment, technology and services. After the notification of the Indian Telegraph (Amendment) Rules 2017 stipulating mandatory testing and certification of telecom equipment (MTCTE), Telecommunication Engineering Centre (TEC) has been designated as the authority for administering MTCTE in India.

The Standing Finance Committee (SFC) of DoT, approved (November 2009) a project for establishing five Next Generation Network (NGN) labs[21] in TEC, in view of the rapid movement of telecom technologies towards IP technology. Further, as TEC labs were envisaged to act as "Designated Authority" these NGN labs were to be used for setting up test processes and procedures for standardizing mandatory tests, while the tests themselves would be carried out by other labs designated as Conformance Assessment Bodies (CABs).

In addition to the NGN labs, TEC also took up establishment of three other important Labs viz. Security Lab; Green Passport Lab and the Specification Absorption Rate (SAR) Lab, aimed at addressing security, environmental and health issues associated with use of telecom equipment and services.

Details of the labs covering their scope, cost and their present status is given in the **Table 2.2.1**.

Table 2.2.1: Status of Labs under Next Generation Network (NGN) Labs

Labs and its scope	Sanctioned cost/ date	Present status (As on September 2020)	
Next Generation Network Labs			
i) **Access Lab:** A dedicated Lab to test, certify and support Long Term Evolution (LTE) handsets/devices.	₹ 35.99 crore / August 2015	✗	Revised Project Estimate (PE) is under process.
ii) **Customer Premises Equipment and Terminal Lab (CPE&TL):** A lab to provide test beds to test and certify Customer Premises Equipment (CPEs) viz. telephone equipment including multiline and cordless handsets, calling line identification presentation (CLIP), modems, telephone attachments, Point of Sale (POS) terminals, and CPEs with Bluetooth and Wi-Fi capabilities.	₹6.01 crore/ January 2015 Revised to ₹ 10.94 crore/ March 2017	✗	High-Power Committee is considering procurement part of the test equipment through GeM and set up part lab at TEC, New Delhi, to be followed by procurement of the remaining test equipment through open tender.
iii) **Transport Lab:** Lab for testing all protocols and interface of telecom equipment, involved in Metro Ethernet Forum, SIP Forum, Wi-Max Forum, TMN Forum, IEEE, ITU-T, ETSI, NGN related work for IPTV, VOIP, location based services and presence services, messaging services etc.	₹ 6.77 crore and ₹ 2.50 crore towards AMC/ November 2010	P	Transport Lab is partially operational and expenditure of ₹ 2.08 crore (60 *per cent* of the purchase order value of ₹ 3.47 crore) was incurred in March 2012.
iv) **Control Layer Lab:** Lab for testing and certification for all NGN, Signaling gateways, Session Border Controller, Access and Trunking Media Gateways, Media server etc.	₹ 20.65 crore/ May 2017	✗	The installation of the equipment was completed on 31 Oct 2019. However, Acceptance Testing is in progress and lab was to be commissioned shortly (30 Nov 2020).
v) **Transmission lab:** Lab to provide testing and certification in areas of SDH / DWDM/ TDM		✗	TEC decided not to establish Transmission/

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[21]   (i) Access Lab, (ii) Customer Premises Equipment including Terminal Lab (CPE & TL), (iii) Transport Lab, (iv) Control layer Lab and (v) Transmission/ Application lab.

transport, Carrier Ethernet based on optical Ethernet technologies, IPv4 / IPv6 / MPLS / VPLS / etc.			Application labs due to rapid changes in technologies and eco-system.
Other Labs			
vi) Security Lab: Lab for testing of telecom elements as per relevant contemporary Indian or International Security Standards.	₹ 9.81 crore/ October 2014	✗	TEC has not been able to finalize the tender due to change in approach to tender.
vii) Green Passport Lab: Lab for certifying telecom products, equipment, and services on the basis of Energy Consumption Rating.	₹ 1.48 crore/ June 2016	✗	TEC has not been able to finalize the tender due to non-responsive of bids.
viii) Specification Absorption Rate (SAR) Lab: This lab is envisaged to provide testing for mobile handsets in order to check electromagnetic radiation.	₹ 3.25 crore/ June 2009	✗	Dispute with vendor has not been resolved through arbitration and TEC continues to accept the manufacturers' declaration of SAR value.
Legend: ✗= Not implemented; **P**: Partially implemented			

In relation to the Labs, the Standing Committee on Information Technology, in its 35th Report (2016-17) took a serious view of the under-utilisation of earmarked funds by the Department, and noted that delays in the implementation of schemes under TEC "were beyond comprehension" as these related to safety and security of the nation. Subsequently the Standing Committee in its 40th Report (2017-18), desired that the Department take urgent remedial measures for effective implementation of all the schemes thereby ensuring optimal utilisation of funds under TEC.

2.2.2   Audit Findings

Audit took up an examination of the implementation of the project for setting up Next Generation Network (NGN) Labs, and the three other labs in view of the importance of creation of a testing infrastructure in TEC, and the observations of the Standing Committee on Information Technology on the progress of TEC schemes. Audit findings on the setting up of labs by TEC, are given in the succeeding paragraphs.

2.2.2.1 Next Generation Network (NGN) labs at TEC Delhi

Next-generation Network (NGN) refers to important developments in telecommunication core and access networks to be deployed over the next decade. ITU defines NGN as a packet-based network in which service-related functions are independent from underlying transport-related technologies. NGN enables unfettered access for users to networks and to competing service providers and services of their choice.

Telecom Operators round-the-world are implementing NGN and are making huge investments in roll-out of these IP-based networks. Different operators in India have already taken initiatives to deploy NGN in the country. Under these circumstances, it became essential to establish test beds to test and certify conformance and end-to-end inter-operability to ensure smooth roll-out of NGN in the country.

The NGN lab project approved by SFC in 2009, was to be taken up under the 11th Five Year Plan (2007-2012) with an allocation of ₹ 50.00 crore. The SFC approval had envisaged that establishment of Transport Lab would be taken up first. All labs were however, projected to be set up within the 11th Plan period i.e. by March 2012. Out of the five NGN labs only the Transport lab had been set up (December 2012) but was not fully functional. Subsequently, a Review Committee was constituted (September 2016)

to *inter-alia* undertake an assessment of the relevance of the project due to rapid changes in technologies and "ecosystems" since 2009. The Committee recommended that one of the labs viz. the Transmission lab may not be required as most elements were being covered under the other labs. It was decided to continue with the Transport Lab as it was already set up and the CPE Lab as it was sanctioned and in the executions stage. The Access lab and Control Labs were recommended to be retained with some changes in scope. In the meanwhile, the estimated cost of the NGN project increased from ₹ 49.10 crore (November 2009) to ₹ 67.07 crore (April 2017), despite the dropping of one of the labs and change in scope of the others. Status in respect of the four remaining NGN labs is given in the succeeding paragraphs.

i) Establishment and functioning of NGN Transport lab in TEC

> The NGN Transport Lab was to be set up for testing all protocols and interface of telecom equipment relating to Internet Protocol Television (IPTV), Voice over internet protocol (VOIP), location-based services and presence services, messaging services etc. SFC envisaged this lab to be the core around which other NGN Labs were to be built.

Audit scrutiny of the establishment of NGN Transport lab revealed delays in award of work, delays in commissioning, pending/ incomplete validation checks, non-operation of the Lab and unresolved dispute with supplier as detailed below.

a. *Delay in award of work*.

TEC took several advance actions pending sanction of the project estimate and tender for setting up of the lab was floated in May 2010. However, as only one bidder[22] participated (July 2010) the Tender Evaluation Committee recommended (October 2010) to cancel the tender and go for retendering. A new tender could however, be floated only in March 2011 as the first tender did not have the approval of the Competent Authority and post facto approvals had to be obtained.

In the subsequent tender two bidders[23] participated. However, only the bid submitted by M/s Sterlite Technology Limited (STL) was found to be substantially techno-commercially responsive for opening of the financial bid. The financial bid was opened on 08 August 2011 i.e. after more than three months of opening of technical bid. The financial bid of M/s STL was accepted in September 2011 for ₹ 3.47 crore towards supply, installation and commissioning of NGN Transport lab and ₹ 93.81 lakhs towards AMC for five years after warranty period of two years. PO for supply, installation and commissioning of NGN Transport Lab for ₹ 3.47 crore was issued to M/s STL in November 2011.

Thus, due to delays in retendering and in opening of financial bid after retendering, over 17 months were taken in the award of work for the lab from the floating of the first tender.

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[22] M/s Spirent Communication Pvt. Ltd
[23] M/s Sterlite Technologies Limited (STL) and M/s Telecommunications Consultants India Limited (TCIL)

b.   *Delay in commissioning of the Lab.*

The work of establishment of the Lab was on turnkey basis with supply of components to be made within eight weeks of PO date. Overall/ full commissioning comprising delivery of equipment and software, commissioning and validation was to be done within 12 weeks from PO date i.e. by end February 2012. Audit noted that supply and installation of equipment, hardware and software, and conformity checks of supplied equipment of the lab was done during January to March 2012. The validation of equipment and software however, remained incomplete. Accordingly, only 60 *per cent* payment[24] had been made to M/s STL. Despite incomplete validation/ commissioning, the Lab was inaugurated and made partly operational in December 2012 with available features.

c.   *Pending/ incomplete validation checks.*

M/s STL carried out validation of equipment in phases but some validation checks remained pending. Though the M/s STL claimed (February 2015) that 97 *per cent* checks had been completed by November 2014, a committee constituted (August 2015) to analyse the validation status of the Transport lab concluded (September 2015) that pending validation points was 39 *per cent*.

d.   *Non-operation of the Lab*

The Committee that was examining validation issues also reported that the lab was not operational since July 2015 due to faulty controller/ interface cards. It also held that due to pending validation issues it would not be possible to test if any "Device Under Test" (DUT) is offered for testing. Due to the stalemate on account of incomplete validation checks neither the warranty of the project could be started nor could 40 per cent of the balance payment be released to the supplier. As a result, neither has the issue with regard to faulty cards been satisfactorily addressed nor is proper support forthcoming from the supplier. TEC has however, pointed out that 20 devices had been tested during the period from September 2014 to September 2020 on the features validated. The reply of TEC is not tenable as majority[25] of the tests were done during 2014 and thereafter annually only one or two tests were done. Further, TEC was able to conduct few tests after July 2015 by taking support of OEM for replacing faulty cards as a stop gap arrangement only. The fact however remains that the lab was not operational since July 2015.

e.   *Unresolved dispute with supplier.*

On account of the issue of pending validation checks, TEC did not release balance payments as per PO to M/s STL which requested (July 2015) appointment of an Arbitrator for resolving the matter. A sole arbitrator was appointed after more than a

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[24]   60 *per cent* of PO value works out to be ₹ 2,08,34,605 that was reduced by LD @ one *per cent* amounting to ₹ 69,448/- and net payment of ₹ 2,07,65,157 was made.

[25]   In 2014, ten devices were tested and all on requests received from RTEC, Bangalore in 2012.

year in October 2016. The interim order (June 2017) for partial payment[26] of pending amount was not accepted by either parties and hence reviews were filed. Additional awards given by a new arbitrator (September 2018) was not accepted by TEC and an appeal has been filed in Courts on which a final judgement is still due.

As TEC has not been able to resolve the prolonged dispute with the supplier the Lab is yet to be commissioned more than eight years after the contracted date. It is thus only partially functional due to pending validation checks and lack of vendor and OEM support. As in the telecom field, technology evolves rapidly, delays in making the lab fully functional could make the equipment obsolete and render the whole expenditure on the lab infructuous.

ii) Control lab in TEC

A 'Control Lab' shall facilitate testing of Control layer functions of NGN architecture, Soft Switch as well as IP Multimedia Subsystem (IMS) based architecture, thus benefiting the Electronics, Telecom and IT industry in implementing NGN based IP technology in Telecom network. Further, Control Lab shall also take care of Performance, Conformance and interoperability testing for device under test (DUT)[27].

Control lab was one of the five NGN labs approved for establishment in 2009. The Lab was envisaged to test all control layer functions, service layer functions and other specified functions. At the stage of review in 2016, the scope was revised in view of advancement of technologies to add testing for SIP especially for wi-fi calling. Audit findings relating to establishment of this lab are given below.

a. *Prolonged delays in finalising PE.*

Though a decision was taken to establish the lab in 2009 and technical proposals were invited in January 2014, TEC could submit a Project Estimate (PE) for the Control Lab to Finance wing of DoT only a year later in January 2015 only. Thereafter, after prolonged deliberations and correspondence between TEC and Finance wing of DoT the PE was finally approved in May 2017 for an estimated cost of ₹ 20.65 Crore.

b. *Tendering and award of work.*

Subsequent to approval of the PE, a tender was floated by TEC in January 2018. A Pre-Bid Conference was conducted by the Committee constituted for the purpose on 29 January 2018. As the corrigendum/ amendments in tender documents recommended by the Committee were approved by the Secretary (Telecom) only on 19 April 2018, the last date of bid-submission was extended by a month. The Techno commercial bids of three bidders[28] were opened on 11 May 2018 and evaluation was finalized on 02 January 2019. M/s Savitri Telecom Services and M/s Intec Infonet Pvt. Ltd were considered for financial evaluation. The financial bids of the two bidders were opened

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[26] (a) partial payment to the extent of 40 *per cent* of 30 *per cent* (i.e. net 12 *per cent* instead of 30 *per cent*) and (b) 10 *per cent* may be released to M/s STL within four weeks of the receipt of the order.

[27] Combination of software and/ or hardware items which implement the functionality of standards and interact with other DUTs via one or more reference points.

[28] (1) M/s SPI Engineers Pvt. Ltd. (2) M/s Savitri Telecom Services and (3) M/s Intec Infonet Pvt. Ltd.

on 18 February 2019 and evaluated by the Tender Evaluation Committee. The work was awarded to M/s. Savitri Telecom Services at L1 price on 29 April 2019, and an Advance PO was issued on 26 June 2019 for a total cost of ₹ 16.99 crore (including cost + AMC + Professional Services). Thus, from the time of floating the tender it took over 16 months to formally award the work.

c. Delayed commissioning of the lab

The vendor supplied and installed the equipment for the Lab by 31 October 2019. Acceptance Testing (AT) of the same which was to be completed by 16 December 2019, was in progress (September 2020). TEC stated that the lab was likely to be commissioned by 30 November 2020.

Thus, due to delays at various stages and especially at the planning stage, establishment of the Lab was held up and testing of the control layers could not be carried out by TEC during this time. Further, mandatory testing under MTCTE for the equipment/ devices proposed to be tested through Control Lab has also not started.

iii) Customer Premises Equipment & Terminal Lab (CPE&TL)

In telecommunications, a Customer-Premises Equipment (CPE) is any terminal and associated equipment located at a subscriber's premises and connected with a carrier's telecommunication circuit or the communications service provider.

CPE generally refers to devices such as telephones, routers, network switches, residential gateways (RG), fixed mobile convergence products, home networking adapters and Internet access gateways that enable consumers to access service providers' communication services and distribute them in a residence or enterprise with a local area network (LAN).

In TEC, a CPE & TL division was established with the objective of setting up a dedicated CPE & TL lab. This lab would have testing infrastructure for conformance and interoperability testing of NGN CPEs and Terminals and other interfaces. Audit findings relating to establishment of this lab are given below.

a. Delays in approving PE and tendering.

The Project Estimate (PE) including AMC for the lab was sanctioned in January 2015 for ₹ 6.01 crore i.e. after more than four years of the SFC approval. A draft tender document for procurement and installation of lab equipment was submitted to DoT in September 2015. After addressing queries and questions, the draft tender was uploaded on the website in April 2016.

b. Failure of tendering

Following the uploading of the tender a Pre-Bid Conference (PBC) with four prospective bidders was held on 25 April 2016. It emerged from the PBC that the vendors did not have complete solution for setting up of CPE & TL and raised concerns on account of the work involving integration of multi-vendor equipment. However, TEC proposed to go ahead with the current specification of having a complete

integrated lab (CPE & TL) in one go instead of grouping of equipment of similar types as a package and then taking up integration of these packages in second phase. It however, stated that if the results from the present attempt were not encouraging it could consider the other option. This proposal was approved in July 2016 and the amended tender was uploaded on 19 August 2016. However, no bidder participated in the tender which was opened on 16 September 2016 despite extensions, and this tender was cancelled.

To address the lack of response a vendors' forum (October 2016) was organised to obtain feedback and inputs from vendors/ OEMs. The issue was also discussed with other divisions of TEC. Based on the inputs, changes were suggested which included merging of requirement of Test Instruments and Equipment for CPE lab at New Delhi and three RTECs[29]; removing requirement of supply of Unified Management Program (UMP) and complete integration and grouping requirements appropriately in groups having similar instruments/ equipment, which are generally manufactured/traded by same parties. The tender document was revised accordingly and floated on 31 March 2017 after approval of the competent authority. A PBC on this tender was held on 10 April 2017 and the recommendations for amendments in the tender document was submitted by the PBC Committee to DoT on 27 April 2017 for approval. The tender opened on 12 July 2017 was also cancelled in October 2017 on the recommendation of the Tender Evaluation Committee as all the bidders were non-compliant with tender conditions. It was also recommended that a comprehensive review be carried out to analyse reasons for failure of the tender.

c. *Subsequent developments.*

TEC intimated (September 2020) that as Telecom technology had advanced, the requirement for CPEs testing and test instruments had changed partially. Besides, the estimated cost of a few critical test instruments had also reportedly escalated. A High-Power Committee had since recommended procurement of a few test equipment through GeMs for partly setting up a lab, while the balance equipment would be procured through open tender. No time frame was however, given for completing this task.

TEC stated (September 2020) that there was no delay on its part in identifying and carrying out modifications in its requirements, and contended that establishment of a test lab required a high level of technical competence combined with a high degree of exposure in the field.

The reply is not tenable as though the project was approved way back in 2009, TEC despite being the technical wing of DoT has not yet been able to identify the specific requirements for lab and finalise tender documents.

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[29] Regional Telecommunication Engineering Centers

As a result, the objective of facilitating testing of NGN CPEs and Terminals has not been achieved and the work of testing and certification of the CPEs and Terminals were being done in designated labs only.

iv)   Access Lab

> An Access Lab would provide Testing Infrastructure for Protocol & Radio conformance testing of user equipment like mobile handset, dongles, tablets, PDAs, Wireless Access Nodes like BSC, BTS, WiFi devices, SIM / USIM / eSIM testing, Location Services (LBS) testing, Audio Quality including VoLTE voice testing.

After approval of the project for establishing NGN labs in 2009, a separate division i.e. Access Lab Division[30] was created (2013) in TEC for a focused approach on setting up of a dedicated Access lab with capabilities to test, certify and support Long Term Evolution (LTE)[31] handsets / devices[32] etc. Audit findings relating to establishment of this lab are as below.

a.   Delays in finalising technical scope and project estimate.

Though the SFC had approved the project in 2009, substantive steps for establishing the Lab were taken only after creation of the Access Lab Division in 2013. Technical proposals and budgetary quotes from interested vendors were invited by TEC in March 2014. Based on technical and budgetary quotes submitted by four vendors[33], requirements for the lab (November 2014) were drawn up by a committee of TEC[34] and a Project Estimate (PE) for ₹ 35.99[35] crore was prepared and submitted by TEC to DoT in May 2015. DoT approved the PE in August 2015. However, progress with respect to finalising the technical scope of the work and the NIT was not noticed till 16 months later.

b.   Frequent revisions in scope and approach

As mentioned earlier, TEC had constituted a Committee (September 2016) to review the whole project on NGN labs which recommended (November 2016) some changes in the scope of the Access lab. As a result, another committee was constituted in June 2017 which after prolonged deliberations, interactions with OEMs and lab visits, finalized the technical specification and draft tender document and submitted the same for approval (February 2019). At this stage the approach itself was directed to be changed, and on the grounds that the scope of the project was big, phased implementation was ordered to be undertaken.

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[30] First LTE Lab was created which was renamed later as Access lab division.
[31] Long-Term Evolution (LTE) is a standard for wireless broadband communication for mobile devices and data terminals which increases capacity and speed through network improvements
[32] Covering testing of mobile handset, dongles, tablets; wireless access nodes; IOT/ M2M devices like smart meters, wi-fi devices, SIM/ USIM/ eSIM testing, Location Services (LBS) testing, Audio Quality including VoLTE voice testing.
[33] M/s Agilent Technology, M/S Anite Telecom, M/S Rhode and Schwrtza and M/S Anritsu
[34] This committee comprised DDG (LTE), DDG TWA, Director (LTE) and Director TWA
[35] ₹ 35.99 crore included provision of capital expenditure of ₹ 24.21 crore and five-year AMC cost estimated as ₹ 11.78 crore.

c.   Delayed approval of revised PE and tender documents

The case was resubmitted (March 2019) with phased implementation. However, the competent authority at this stage directed that fresh budgetary quotes be obtained. These were obtained and submitted by September 2019. However, as these were higher than previous estimates, an exercise to revise the PEs was taken up. A revised PE was submitted (June 2020) covering additions in scope on account of new technological trends. In July 2020, an Access Lab Committee was formed to deliberate on the revision in PE due to change in Project scope and for finalizing the revised PE. The revised PE was still (September 2020) to be approved.

Hence, due to frequent changes in the scope of the work and the implementation approach, TEC was unable (September 2020) to freeze the PE and tender documents for the Lab even though the lab was approved in 2009 and PE was sanctioned in August 2015. As a result, the objective of testing certifying and supporting LTE handsets/ devices could not be achieved.

TEC stated (September 2020) that as the lab had not been established, testing and certification of LTE handsets/ devices is not being undertaken by it and Certificates issued by notified ILAC (International Laboratory Accreditation Corporation) are being accepted.

2.2.2.2 Specific Absorption Rate (SAR) Lab

Specific Absorption Rate (SAR) is a measure to know the levels of exposure to electromagnetic fields from mobile handsets. It is the rate at which human body absorbs electromagnetic power radiated from Mobile Terminals and Wireless Devices.

DoT decided (September 2008) to adopt the International Commission on Non-Ionization Radiation Protection (ICNIRP) guidelines for limiting Electromagnetic Field (EMF) exposure as protection against known adverse health effects. It was decided that Mobile handsets being manufactured in the country as well as being imported, should comply with laid down SAR[36] values. Manufacturers of mobile handset were required to self-certify compliance with these standards. Later in June 2009, in-principle approval for setting up of SAR lab at TEC at an estimated cost of ₹ 3.25 crore was accorded by the Competent Authority to reduce reliance on self-certification and introduce an audit of self-certification of mobile handsets by a government agency. Audit findings relating to establishment of this lab are given below.

a.   Financial approval, tendering and award of work

Administrative approval and expenditure sanction were accorded in August 2010 for "Supply, Installation, Testing and Commissioning of SAR lab of mobile handsets at TEC, New Delhi" for ₹ 3.30 crore, and for AMC for three years for ₹ 1.18 crore. A

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[36]   SAR is defined as a measure of the rate at which Radio Frequency (RF) energy is absorbed by the body tissues when exposed to Radio-frequency electromagnetic field. Govt limited SAR value to 2W/kg localized for head and trunk in frequency range of 10MHz to 10GHz.

tender was floated in March 2011 and two bids were received. However, due to shortcomings in the documents submitted by the bidders the tender was cancelled (June 2011) and the work was retendered (July 2011). Four bids[37] were received which were opened on 02 September 2011. Only one bidder namely M/s BNN, was found to be technically compliant and its financial bid was accepted in August 2012. A purchase order (PO) was placed (September 2012) on the firm for Supply, Installation, Testing and Commissioning of SAR lab for ₹ 2.62 crore inclusive of VAT @ two *per cent* and AMC charges of ₹ 42.90 lakh for three years. As per delivery schedule, full commissioning of SAR lab was to be done within 16 weeks from the date of PO i.e. by 16 January 2013.

b.   *Execution of work and commissioning*

A committee of TEC officers was constituted (November 2012) for testing/ acceptance/ validation of SAR lab system. This Committee carried out testing from 17 December 2012 to 15 January 2013 and recommended provisional commissioning of the Lab from 16 January 2013. The Committee reported that there were no "major deficiencies" but pointed out under "minor deficiencies" that SAR tests for 2450 MHz relating to Wi-Fi and Bluetooth features of mobile phones, had not been offered by the supplier. The lab was however, inaugurated on 21 January 2013 and a press release was made stating that a lab for measurement of SAR for the mobile handsets had been commissioned.

c.   *Payment dispute with supplier*

As per terms of the PO, payment of 80 *per cent* of the PO value[38] was made (January 2013) to the vendor. M/s BNN Communication Engineers requested (February 2013) for issue of commissioning certificate for the Lab. Later on, 17 July 2013, based on tender conditions after operating the Lab for six months, it requested TEC to take over the Lab and give them a certificate of satisfactory service. At this stage TEC informed the vendor (22 July 2013) about the deficiencies noticed during commissioning of SAR lab and highlighted that all the deficiencies had been telephonically informed to it several times but were not resolved. This was contested by the vendor which took the position that the tests not done were not part of the agreed test plan, which renewed its demand for the balance payment. In addition, as TEC did not issue 'Form C' to the vendor, M/s BNN claimed additional VAT of ₹ 16.42 lakh[39]. 80 *per cent* of additional VAT was paid by TEC to the vendor in September 2016. Had TEC provided the required form to the vendor this payment could have been avoided.

M/s BNN requested (March 2015) TEC to resolve the issues through arbitration. The Arbitrator concluded (October 2017) that after making the lab operational and opening it for all business withholding payments would not be justified and the lab should be

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[37] M/s Kusum Electrical, M/s TCIL, M/s Lambda, and M/s BNN Communication Engineers.

[38] 80 *per cent* of PO value being ₹ 1,75,07,004 reduced by LD of ₹ 98,844 i.e. net payment was made for ₹ 1,74,08,160.

[39] Total VAT paid by vendor was ₹ 20,37,714. This was reduced by VAT already included in PO amounting to ₹ 3,95,376. Thus, additional VAT claimed was ₹ 16,42,338. TEC paid 80 *per cent* of this additional VAT claim amounting to ₹ 13,13,870 in September 2016.

deemed to be considered as commissioned on 15 July 2013. It also ordered that the equipment be treated under warranty starting from the date of commissioning i.e. 15 July 2013. It was further ordered to release balance 20 *per cent* of the payment of PO value and VAT claim with interest within four weeks of the arbitration order.

It thus appears that the position of the TEC in the matter have come into question due to alleged ambiguity in the test plan and absence of formal and written communication to the vendor of deficiencies noticed during testing. These have contributed to a dispute with the vendor as a result the deficiencies have remained and the functioning of the Lab is affected.

d.   *Present status*

TEC stated (September 2020) that the arbitration award has been challenged (February 2018) in the competent Court, but no final judgment has been passed. It was further stated that the lab was meant only for auditing purposes and that as of now self-certificates submitted by the vendors declaring SAR value was admissible.

Thus, as the dispute with the vendor remains unresolved TEC continues to accept the manufacturers' declarations of SAR value without any audit, thereby defeating the purpose of setting up of the Lab.

2.2.2.3 Security lab

Telecommunication networks are playing a critical role in the economic growth of a country. It has led to government regulations in the telecom industry, which include requirements for ensuring the security of the telecom equipment and networks. The wide range of end-user devices that can now connect to the telecom networks has added to the complexity of the networks, thereby increasing the risks and vulnerabilities as well. Hence, the consequences of not implementing adequate security measures to deal with the security threats and challenges to the telecom network could be heavy.

DoT granted administrative approval for setting up a Security Testing Lab in February 2013 based on proposals submitted by TEC in December 2012. This was an important decision in the context of amendments made by DoT (May 2011) to licence agreements with Telecom Service Providers (TSPs) which inter-alia, provided that licensees should induct only those elements which had been got tested as per relevant contemporary Indian or International Security Standards. While upto 31 March 2013 testing was permitted from any international agency/ labs; from 01 April 2013, the certification was to be obtained only from authorised and certified agencies/ labs in India. In addition, with the integration of national and global telecom networks "in an end-to end-IP scenario" and extensive use of foreign made telecom equipment had given rise to issues relating to national security which made it imperative to set up an indigenous Security Test lab. Audit findings relating to establishment of this lab are detailed below.

a.   *Delays in planning of project.*

Prior to the administrative approval for the Lab, a committee had been constituted by TEC in April 2012, to deliberate on the scope and technical requirements for a Security

Test Lab. This Committee submitted (December 2013) an interim report on technical requirements of security lab for formulation of PE. It was noted that though the Committee was set up in April 2012, it met for the first time only on 25 November 2013 and again on 16 December 2013 when it finalised its interim report. Based on budgetary quotes received from nine vendors and after prolonged rounds of queries/ clarifications and explanations, the PE for ₹ 9.81 crore for the Security Test Lab was sanctioned in October 2014.

b.   *Delays and failure of tendering of works*.

The NIT of security lab was issued for the first time on 09 November 2015 i.e. more than a year after sanction of the PE. In the tender a system integrator-based approach was adopted. However, as no bidder participated the tender could not be processed further. Subsequently, an open forum was conducted to obtain feedback from vendors. OEMs expressed difficulty in either providing a complete solution or finding a suitable system integrator, and suggested that OEMs/ partners should be allowed to participate independently item wise.

Based on the feedback, the tender was reviewed and NIT was issued again on 10 October 2016 for 11 items without any system integrator. Four bidders participated in the tender whose techno commercial bids were opened in October 2016 and all the bids were admitted for evaluation by the Tender Evaluation Committee. However, due to deficiencies in the bid documents the tender was also cancelled (May 2017).

Thereafter, a committee of TEC officers was constituted (May 2017) to review the NIT/ tender documents of the lab, which while recommending staying with the approach for item wise bidding, suggested some modifications in the tender document. After modifications, the NIT was floated once again on 12 September 2018. Only two bidders participated responded to the NIT (i.e. M/s. Mahindra Defence Systems Ltd and M/s. LDRA). The bids were opened on 06 December 2018, but the tender was once again cancelled on 15 February 2019, as both the bidders did not submit documents required to assess eligibility.

c.   *Present status*

TEC stated (September 2020) that a High-Level committee was constituted to review the tender document to ensure wider participation by the prospective bidders. An open forum with all prospective bidders of Security test lab was conducted on 09 August 2019 to obtain inputs from prospective bidders. All the committee members were present during this interaction. Based on inputs received from the stakeholders and keeping in view of latest threat scenarios, the tender document was fine-tuned by the committee. As the existing PE of Security test lab of ₹ 9.81 crore sanctioned in October 2014 had become dated and as prospective bidders had given inputs for revision of items in the estimates, a case for review of PE was sent to DoT for approval and the approval process is under progress. Once the PE is revised, the revised tender was to be submitted to DoT for approval. No time lines were provided by which the above activities would be completed to enable fresh tendering.

TEC stated (September 2020) that at present licensed service providers are submitting international accredited test reports for Security Certification, though licensing requirements mandate security certification from authorized and certified labs in India from 01 April 2018. However, security being crucial in nature, it is necessary to set up security testing infrastructure in the country. Further, TEC also accepted that in terms of Government notification dated 05 September 2017, related to Mandatory Testing and Certification of Telecom Equipment, each telecom equipment must undergo mandatory testing and certification prior to sale or import for use in India and stated that security requirements are being finalised and security testing will be performed in TEC accordingly.

The above shows that despite being a technical organization, TEC has been unable to address and resolve the challenges of procurement and contracting approach for a technical project. It was also noted that there were delays at each stage of tender. Further, after the cancellation of the last tender in February 2019 inordinate time has been taken to finalise a revised Tender and a Project Estimate as a result of which the project is at a standstill with no clear time frame for completion. This exhibits a lack of urgency and proper coordination between TEC and DoT in establishing the Security Test lab which is related to National security.

Thus, despite mandating licensing and statutory requirements for indigenous security testing and certification, DoT and TEC have failed to create the required infrastructure for the same.

2.2.2.4 Green Passport Lab

In telecom networks, "Green" refer to minimizing consumption of energy through use of energy efficient telecom technologies and renewable energy resources. Carbon footprint can be reduced by introducing energy efficient telecom products by telecom manufactures and suppliers in the market. Many countries have initiated steps to reduce energy consumption and emissions in line with the Kyoto Protocol of 1997, which was signed by over 160 countries, including India. In present scenario, it is very much essential to have energy saving Telecom equipment and networks which reduce power consumption which is largest operating expenses for telecom network operators and reduce Greenhouse gas effects contributions from energy consumption by telecom networks.

In this context, DoT accepted TRAI recommendations (12 April 2011) on "Approach towards Green Telecommunications" and decided to adopt measures to green the telecommunications sector. It accordingly set broad directions and goals for achieving desired reduction in carbon emission, and issued directions to all service providers in January 2012.

As part of the above directions, TEC was named as the nodal centre that will certify telecom products, equipment, and services on the basis of Energy Consumption Rating (ECR) either by independent certifying agencies under its guidance or through their Quality Assurance teams. TEC was also required to prepare and bring out the ECR

Document delineating the specifics of the test procedures and the measurement methodology utilised. TEC was also to regularly standardize and prescribe specifications for Telecom Equipment with respect to power consumption levels.

In view of the above, a new division i.e., **"Green Passport (GP) division"** was created in TEC, and action for setting up of an integrated Green Passport lab for certification of all telecom products, equipment and services was initiated by TEC in April-May 2014. Audit findings relating to establishment of this lab are given below.

a.   *Delayed administrative approval and failure of tendering for the lab.*

Examination of records show that though the Annual Action Plans had various actions with respect to establishment of the lab since 2014-15, administrative approval and expenditure sanction for Lab was only granted in June 2016 for ₹ 1.48 crore. The tender for the Lab was floated only in February 2017 and was cancelled in April 2017 as no bidder participated. Later, a committee was constituted to revise the tender documents, and after 14 months the tender was re-floated in June 2018. Though two bidders participated they were found non-responsive and the tender was again cancelled in September 2018. A third tender floated in April 2019 which had two participants, was also cancelled in July 2019 as bids were incomplete.

b.   *Subsequent developments.*

TEC intimated (September 2020) that following the cancellation of the third tender, a committee was constituted to go into details and propose changes which gave its report in September 2019. A high-level committee was also constituted to review the tender template itself for making fundamental changes. However, in the meantime it was seen that the main equipment viz. the power quality analyser was available on GeMs and hence it was decided to procure through this route. TEC also intimated that the technical bids had since been approved and approval of financial bids were in process and that the lab would be established shortly.

The above shows that there has been prolonged delay in planning and execution of the Lab. This delay reflects TEC's failure to identify an effective procurement strategy for a technical project despite several attempts. Though it has now reported that procurement is being undertaken through GEMs, no plan of action for installation, validation, integration and commissioning of the equipment has been indicated.

As a result of the delay in establishing the Green Passport Lab by TEC, DoT's aim of achieving desired reduction in carbon emission and greening the telecom sector was likely to be undermined.

2.2.3   Conclusion

DoT had approved the establishment of five NGN Labs and three other labs viz. SAR, Security and Green Passport Lab in TEC as TEC was the testing and certification body of the Government for telecom products, equipment and services. This role has acquired greater significance after TEC's designation as the authority for administering mandatory testing and certification of telecom equipment (MTCTE) from 2017.

However, the analysis in the foregoing sections have revealed several shortcomings in TEC's performance with regard to establishment of the Labs. In the case of NGN labs, while one Lab was dropped (Transmission Lab), only one (Transport Lab) of the remaining four had been established which is also only partially functional due to disputes with vendor. The remaining three labs (Access Lab, CPE and TL Lab and Control Layer Lab) have been affected by inordinate delays at all stages of which one is reportedly nearing completion (Control Layer Lab), two are still in the tendering stage despite a decade having gone by since their original approval. As a result, the basic objective of standardising testing and certifications processes and procedures in the context of NGNs, was not met. In addition, in the absence of the NGN Labs, TEC continued to rely on and accept certificates issued by notified International Laboratory Accreditation Corporation. In the case of the other three Labs, only the SAR lab which has implications for health, had been established but has remained non-functional due to legal disputes. The other two labs viz. the Security Lab and the Green Passport Lab were yet to be established though five to six years have passed since these were approved, despite their significance for National Security and environment respectively. The delay in setting up the Security Lab especially has implications for compliance with the *statutory requirements for indigenous security testing and certification.*

In all the cases it was noted that though TEC was the technical wing of DoT, it had struggled to define technical specifications and identify technical solutions for the labs. It has also been unable to work out an effective procurement and contracting strategy appropriate for technical projects though dedicated verticals were created in TEC. This has led to delays in establishing of the Labs and to disputes which have affected functioning of the two labs already established.

Due to delays and non-establishment of required labs, TEC could not ensure creation of a suitable testing infrastructure in a time bound manner, to support its mandate as a testing and certification agency of DoT especially in a sector where technology evolves rapidly.

2.2.4   Audit Summation

TEC was the testing and certification body of the Government for telecom products, equipment and services. Key audit findings from the audit of establishment of five NGN Labs and three other labs viz. SAR, Security and Green Passport Lab in TEC were as follows:

- Of the five NGN labs only one lab was partially functional, three were affected by inordinate delays at all stages and one lab was dropped. As a result, the basic objective of standardising testing and certifications processes and procedures in the context of NGNs, was not met and TEC continued to rely on and accept certificates issued by notified International Laboratory Accreditation Corporation.

- In the case of the other three Labs, only the SAR lab was established but has remained non-functional due to legal disputes. The other two labs viz. the Security Lab and the Green Passport Lab are delayed despite their significance for National Security and environment respectively.
- TEC was the technical wing of DoT, yet it had struggled to define technical specifications, identify technical solutions for the labs and develop effective procurement and contracting strategies for the technical projects.

Due to delays and non-establishment of required labs, TEC could not ensure creation of a suitable testing infrastructure in a time bound manner, to support its mandate as a testing and certification agency of DoT.

2.2.5 Recommendations

- A high level Technical Committee from DoT should review the status of all the nine laboratories and draw up a blue print for completion and commissioning of the labs as early as possible.
- The services of Technical experts from reputed organisations should be availed in the evaluation of technical proposals from the vendors and during the preparation of Project Estimates for establishing the labs.

2.3 Irregular payment of ad-hoc bonus by C-DOT to its employees

Irregular payment of ad-hoc bonus of ₹ 56.60 lakh by C-DOT to its employees for the years 2015-16 to 2018-19 without extension of the order by the Ministry of Finance for payment of ad-hoc bonus to Autonomous Bodies, needs to be recovered from the concerned employees.

Every year the Ministry of Finance (MoF), Government of India issues orders for payment of ad-hoc bonus to the eligible Central Government employees. Further, separate orders were being issued upto 2014-15, extending payment of ad-hoc bonus to employees of Autonomous Bodies (ABs) subject to conditions[40]. No orders were issued after 2014-15 extending payment of ad-hoc bonus to employees of ABs.

Centre for Development of Telematics (C-DOT) is an Autonomous Society under the Ministry of Communications, Government of India. Audit scrutiny of the records of C-DOT, Delhi and Bengaluru campus revealed that ad-hoc bonus of ₹ 56.60 lakh was disbursed to all the Group "B" and "C" employees for the years 2015-16 to 2018-19, even though no orders had been issued by MoF for payment of ad-hoc bonus to employees of ABs for these four years.

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[40] ABs partly or fully funded by the Central Government which have a pay structure and emoluments identical to that of the Central Government and do not have any bonus, ex-gratia or incentive scheme in operation.

C-DOT (September 2020) justified these payments based on decision taken in its Governing Council's 26th meeting held on 30 March 1999, to treat eligible employees of C-DOT at par with those of various divisions of DoT, for payment of bonus. It also stated that it received circulars for release of ad-hoc bonus for the years 2015-16 to 2018-19 and had then released ad-hoc bonus with the approval of its Governing Council. Further, the matter of the payment for these years was proposed to be taken up in the ensuing meeting of the Governing Council for a decision. It has also put on hold payments for the financial year 2019-20 due to audit observations. The Ministry has endorsed the reply of C-DOT.

The stand of C-DOT/ Ministry is not acceptable as ad-hoc bonus was payable to employees of ABs like C-DOT, only based on specific orders of MoF extending payments to employees of ABs. As no orders were issued for extending payment of ad-hoc bonus to ABs from 2015-16 onwards, payment by C-DOT was irregular. MoF has since confirmed (August 2020) that no order has been issued extending the payment of ad-hoc bonus to employees of ABs from 2015-16 onwards, and that such orders were not required as no decision had been taken to extend ad-hoc bonus to employees of ABs. Further, representations for payment of ad-hoc bonus received from employee federations, ICAR and Ministry of Health & Family Welfare by MoF, have not been agreed to by them. It has also added that payment of ad-hoc bonus by ABs for 2015-16 onwards may be treated as unauthorized and appropriate action may be taken by the concerned administrative Ministries/ Departments.

Thus, payment of ad-hoc bonus of ₹ 56.60 lakh by C-DoT to its employees for the years 2015-16 to 2018-19 without extension of the order by the Ministry of Finance for payment of ad-hoc bonus to ABs was irregular and needs to be recovered or regularized.