

Chapter-III

Reviews relating to Statutory corporations

3A Maharashtra State Electricity Board

3A.1 High Voltage Direct Current Project of Transmission System

Highlights

High Voltage Direct Current (HVDC) project was planned in 1987 for evacuating power from Eastern to Western region of Maharashtra. The project planned for completion in 1991-92 was actually taken up in August 1993 and completed in November 1999. Delayed implementation of the project resulted in time overrun of 92 months and cost overrun of Rs.1,683.70 crore.

(Paragraphs 3A.1.4 and 3A.1.5)

Terminals costing Rs.1,342.95 crore remained idle for 12 months due to delay in completion of HVDC line as Board failed to supply the material in time to the line contractors. Thus, anticipated benefit of Rs.59.76 crore envisaged on account of reduction in transmission loss of power could not be availed.

(Paragraph 3A.1.6.1.1)

BHEL offered to pass on to the Board the deemed export benefits of excise duty drawback and duty free imports on HVDC equipments. But unwarranted forego of such benefits while making the agreement led to a loss of Rs.1.73 crore to Board.

(Paragraph 3A.1.6.1.2)

Due to delay in availing the discount on the contract price, the Board suffered loss of interest of Rs.0.51 crore on excess payment retained by the contractor till its recovery.

(Paragraph 3A.1.6.1.3)

The Board took more than five months out of six months validity period for finalisation of tenders to purchase conductor and allowed less than a month for clearance by Central Electricity Authority (CEA) and World Bank (WB). The delayed receipt of approval from CEA/WB after the

validity period led to procurement of conductor through another tender at an extra cost of Rs.27.31 crore.

(Paragraph 3A.1.6.2.1.1)

Failure of quality testing system to reject the defective dampers during inspection resulted in avoidable expenditure of Rs.0.50 crore on refitting of all the dampers.

(Paragraph 3A.1.6.2.1.2)

The Board failed to specify in the agreements with line contractors that price escalation would be allowed on contract price by excluding interest free advance. This had resulted in payment of price escalation of Rs.1.63 crore on interest free advance of Rs.11 crore given to three line contractors.

(Paragraph 3A.1.6.2.1.4)

The HVDC system with bipolar mode constructed at a cost of Rs.2,258.82 crore has not been operated at its full capacity after commissioning thereof. Most of the available time, it was operated on monopolar mode. Against the anticipated load of 900 MW at 60 per cent load factor, system was actually utilised for 560 MW (37 per cent) .

(Paragraph 3A.1.7.1)

3A.1.1 Introduction

The construction of transmission lines is taken up for evacuation of power from generating stations to the bulk load centers. In Maharashtra majority of thermal power stations have been set up in the Eastern region of the State. New generating units with a capacity of 1,920 Mega Watt (MW) at Chandrapur (3 x 500 MW) and Khaperkheda (2 x 210 MW) were planned for completion during VIII Five Year Plan (1990-95) by the Board to meet the expected growth in demand for power. Further, an additional power of about 880 MW was likely to be delivered at Chandrapur by National Thermal Power Corporation (NTPC).

The Board considered (May 1987) the existing transmission network of five 400 kilovolts (KV) Alternating Current (AC) transmission lines inadequate and decided to establish 500 KV, 2,000 MW High Voltage Direct Current (HVDC) Line; a new technology to be implemented for the first time by the Board between Chandrapur and Lonikand (near Pune) at an estimated cost of Rs.595 crore. The project was subject to modifications, if any, desired by Central Electricity Authority (CEA) to whom the project report was submitted in January 1987.

The HVDC system, a relatively new technology in India being used for the first time by the Board for transmission was considered better than the conventional 400 KV/AC lines as it was considered difficult to obtain environmental and statutory clearance for the project. However, no cost benefit analysis for augmentation of 400 KV AC system *vis-a-vis* HVDC system was done by the Board for cost comparison. The project report envisaged the readiness of HVDC system by 1991-92 so that power generated by new units planned for completion in 1991-92 could be evacuated. The Board envisaged the following main benefits of HVDC system:

- ◆ Lower transmission losses
- ◆ Improved stability of transmission system
- ◆ Very small^s right of way as compared to AC lines

After submission of Project Report to CEA, fresh studies were jointly carried out by CEA and the Board and it was agreed (September 1987) that power rating of 1,500 MW would be adequate and the link would be terminated at Padghe (near Mumbai) instead of Lonikand, as proposed earlier. Accordingly, revised project report envisaging the completion of project by 1992-93 was submitted (May 1988) to CEA for approval.

3A.1.2 Organisational set up

The Transmission and Distribution Wing of the Board is headed by a Technical Member who is assisted by Technical Director (EHV Projects and Commercial) and Technical Director (Distribution). The day-to-day matters relating to planning and implementation of EHV Projects are looked after by Chief Engineer (Transmission and Planning). The overall control of operation and maintenance of HVDC project is with the Chief Engineer in the Zonal office (Vashi), who is assisted by two Superintending Engineers in circle offices and Executive Engineers in respective divisions.

3A.1.3 Scope of Audit

Brief mention of delayed implementation of HVDC system was made in paragraph 3A.2.6.6 of the Report of Comptroller and Auditor General of India for the year ended 31 March 1999 (Commercial) for Government of Maharashtra. The Committee on Public Undertakings has not yet discussed the matter (June 2002).

The present review is based on the examination of records conducted during December 2001 to March 2002 at the head office of the Board at Mumbai, Chief Engineer HVDC Zone, New Mumbai and HVDC Circles at Chandrapur and Padghe. The resultant audit observations are discussed in succeeding paragraphs.

^s Right of way means land rights for construction of line.

3A.1.4 Project planning

The HVDC project was planned in 1987 for evacuation of power from Eastern to Western region of Maharashtra. CEA/Planning Commission approved (October 1988/June 1992) the project proposal of the Board for construction of ± 500 KV HVDC system with a capacity of 1,500 MW which comprised HVDC transmission line of 739 kms. between Chandrapur and Padghe and two terminal stations at the end points *i.e.* for converting generated AC power into DC power at Chandrapur and for restoring DC power into AC power for distribution at Padghe. The cost of the project approved by Planning Commission was Rs.575.12 crore.

3A.1.5 Cost estimates and actuals

The initial project cost of Rs.575.12 crore, approved by the Planning Commission, was revised (October 1991) to Rs.842.18 crore by the Board on the basis of information provided by the prospective suppliers for HVDC terminals and price levels of 1991-92 for other components. On receipt of approval from the Government of India in March 1992, global tenders were invited (March/April 1992) for construction of HVDC terminals; the tenders for construction of transmission lines were invited in June 1992.

Based on the actual prices of contracts awarded, the Board revised the project cost to Rs.1,887.41 crore (including interest of Rs.449.37 crore during construction period) which was approved by the Planning Commission in June 1995.

Details of componentwise estimated cost revised from time to time by the Board and actual thereof were as under:

Sr. No.	Cost components	Estimated cost as per Project Report (May 1988)	First revision (October 1991)	Second revision (September 1993)	Actual cost incurred (February 2002)
<i>(Rupees in crore)</i>					
1	HVDC Terminals (including communication equipments)	358.56	485.97	1,011.09	1,342.95
2	Transmission Line	122.56	226.27	259.52	464.76 ^{\$}
3	Other items	23.92	30.34	110.43	} 451.11 [#] }
4	Administrative Overheads	70.08	99.60	57.00	
	Total	575.12	842.18	1,438.04	2,258.82

It was observed from the above that the estimated cost of Rs.575.12 crore of the project increased to Rs.842.18 crore (46.4 *per cent*) within a period of three years. However, the estimated cost of Rs.842.18 crore further increased

^{\$} Worked out based on the Board's record.

[#] Balancing figure.

to Rs.1,438.04 crore (70.8 per cent) within a span of two years. Out of total increase of Rs.595.86 crore in the second revision, the increase in terminal cost accounted for Rs.525.12 crore (88 per cent). The Board stated that the increase was mainly due to price and exchange rate variation.

The project was originally envisaged for completion by 1991-92. However, the work of the project was taken up in August 1993 and same was handed over to the Board for commercial operation in November 1999. The actual cost incurred upto February 2002 was Rs.2,258.82 crore. Thus, the cost overrun of Rs.1,683.70 crore (from Rs.575.12 crore to Rs.2,258.82 crore) was due to delay in implementation of the project by 92 months.

3A.1.6 Construction of HVDC system

HVDC system consisted of two main parts viz. construction of terminals and construction of line which are discussed in the following paragraphs.

3A.1.6.1 Terminals

3A.1.6.1.1 Idle Terminals

On the basis of lowest offer received against the global tender, the Board awarded (August 1993) the contract for supply, erection and commissioning of two HVDC terminals with communication systems on turnkey basis to Bharat Heavy Electricals Limited in association with ABB Power Systems, Sweden (BHEL/ABB) at a contract price of Rs.905.97 crore including payments in foreign currencies equivalent to Rs.520.79 crore at the exchange rate prevailing in January 1993. The successful trial run of the bipole system was scheduled for completion in April 1998.

The terminals were ready in May 1998 but could be commissioned only in May 1999 because of delay in completion of the transmission line due to non supply of material by the Board in time. As a result thereof, the system was actually tested for only six months as against the stipulated period of nine months and was handed over in November 1999 to the Board for commercial operation.

Idle terminals deprive the Board from anticipated benefits of Rs.59.76 crore.

As the terminals costing Rs.1,342.95 crore remained idle for 12 months, the anticipated benefits of yearly reduction in transmission loss to the tune of Rs.59.76 crore by use of HVDC system could not be availed of as power generated was transmitted through the existing 400 KV lines during the period.

In its reply Board stated that the lost benefits can be availed of in future because the expiry of HVDC Project will be considered from the date of commissioning. The reply is untenable as during the entire idle period, interest was paid to the lending institutions without any benefits accruing to the Board.

3A.1.6.1.2 Under fixation of deemed export benefits

Unwarranted forego of deemed export benefits resulted in loss of Rs.1.73 crore.

BHEL offered (June 1993) deemed export benefits of Rs.22.10 crore under EXIM policy 1992-97 towards excise duty drawback (Rs.8.36 crore) and duty free imports (Rs.13.74 crore). BHEL did not claim any reduction in export benefits due to discount of 4 *per cent* offered by it on the prices of equipments at the time of offer (January 1993) and further 4 *per cent* during negotiation. However, the Board reduced (July 1993) the amount of benefits to Rs.20.37 crore and incorporated the same in the contract. Thus, due to unwarranted reduction in deemed export benefits offered by BHEL, the Board lost the opportunity to avail benefit of Rs.1.73 crore. In reply, the Board stated (February 2002) that export benefits were reduced as the original offer of BHEL was reduced in January and May 1993. The reply is not tenable as BHEL offered (June 1993) the benefits of Rs.22.10 crore and did not claim any reduction on this item in the negotiated offers.

3A.1.6.1.3 Loss of interest due to delayed recovery of discount

As per agreement, a discount of 0.25 *per cent* on the contract price for construction of terminals was admissible to the Board if the Board did not avail the financial package offered by BHEL. The financial package was under consideration of the Board till the finance was arranged (October 1996) through another source *i.e.* Power Finance Corporation Limited. However, the Board did not take immediate action to recover the amount of discount from the BHEL. The omission was realised by the Board and amendment was issued in February 2001. Meanwhile payments for supplies were released on gross value without availing 0.25 *per cent* discount causing a loss of interest of Rs.0.51 crore to the Board for the period during which BHEL retained excess payment.

The Board stated (September 2002) that BHEL would have claimed interest on the amount of their bills not paid in time; had the Board insisted on interest on the amount of discount not adjusted in time. The reply is not convincing as the payment of bills in time was the responsibility of the Board and cannot be linked with the interest loss due to delayed recovery of discount. According to prudent financial practice, the Board should have made all payments to BHEL in time similarly made timely recovery of discount, thus protecting its own interest and being fair to BHEL.

3A.1.6.2 Transmission line

3A.1.6.2.1 Execution of line works

As per agreement, HVDC transmission line was to be completed for testing by December 1996. However, the line was completed in May 1999 after a delay of 28 months which was attributable to the Board in procurement of conductor and replacement of defective vibration dampers. Cases of delay and other irregularities noticed are discussed below.

3A.1.6.2.1.1 Delay in Procurement of conductor

The global tenders called for procurement of 6,000 km of conductor were opened on 1 November 1994 and validity of tenders was upto April 1995. Three suppliers who were technically and commercially acceptable to the Board had quoted the rate of 4720 US \$ (Rs.1,50,699) per km. of conductor. As the procurement cost was to be financed out of loan of 350 million US \$ sanctioned by the World Bank (WB), the purchase proposal needed approval of the CEA and WB.

Delay in finalisation of tender led to extra expenditure of Rs.27.31 crore.

Keeping these aspects in view, it was essential for the Board to complete the tender scrutiny at the earliest and provide maximum time cushion to CEA/WB. It was, however, noticed that the Board approved the tender on 31 March 1995 by taking five months out of the 6 months validity period of the tender and submitted it to the CEA/WB on 4 April 1995. The WB conveyed its approval on 1 June 1995 by which time validity of tender had expired. The extension in validity period was agreed to only by one supplier out of three suppliers. Accordingly, order was placed (June 1995) for 2,150 km. of conductor at a value of Rs.32.40 crore. Thereafter, the Board re-invited tenders (January 1996) for procurement of remaining quantity (assessed as 3,803 km.) and orders were placed (July 1996) on seven firms at rates ranging from Rs.2.16 lakh to Rs.2.38 lakh per km. by arranging the finance from its internal resources. Thus, the delay in finalisation of tender led to avoidable extra expenditure of Rs.27.31 crore.

The Board stated (July 2002) that inspite of pursuance with the WB there was inordinate delay on the part of WB and the Board could not place orders within time and material could not be purchased out of the WB loan.

The reply is not acceptable as the Board took undue time to finalise the tender, thus leaving insufficient time for the approval of CEA/WB.

3A.1.6.2.1.2 Avoidable expenditure on replacement of vibration dampers

Due to failure of quality testing system, the Board incurred avoidable expenditure of Rs.0.50 crore on replacement of defective dampers.

The Board procured (1995-96) 2,336 vibration dampers from EMI Transmission Private Limited, Thane (EMI). During the course of stringing, breakage and snapping of the earth-wire at the points of vibration dampers were reported in November 1998 and such instances continued to occur at 46 locations. Central Power Research Institute, Bangalore (CPRI) tested the dampers at a fee of Rs.4.23 lakh and reported (May 1999) that the dampers supplied by EMI were defective having sharp edges and uneven surface that led to breakage and consequent snapping of earth-wire. CPRI further suggested (July 1999) for replacement of dampers. EMI replaced the entire quantity of 2,336 dampers (costing Rs.2.59 lakh) free of cost during December 2000 to February 2001. The Board, however, incurred further expenditure of Rs.46.09 lakh on re-fitting of 2,301 dampers including restringing charges and cost of conductor on the line. The claim for recovery of re-fitting charges preferred (July 2001) by the Board was rejected (August 2001) by EMI stating that as per conditions of supply, the supplier was only liable for replacement of defective material and not for the reimbursement of re-fitting charges.

In reply, the Board stated (June 2002) that 100 *per cent* checking was not possible and hence, random sample pieces were visually inspected from the lot. The reply was not acceptable as the entire quantity of dampers supplied by EMI was defective including inspected and cleared dampers. It shows that the quality testing system had completely failed in this case. No responsibility has been fixed for this lapse.

3A.1.6.2.1.3 Non recovery of hill cutting charges from contractor

As per the agreement, the contractor was responsible for maintaining minimum ground clearance from the conductor. The scope of work also included tower spotting, check survey, geo-technical investigation, design and construction of foundation, *etc.* It was observed that the contractor did not ascertain the exact level at the centre portion of the valley before tower spotting and check survey in respect of two towers (No.1,802 and 1,803) in Naneghat area (Package 'C' and 'A', respectively). After construction of these two towers it was noticed (November 1998) during stringing that there was no adequate ground clearance between the conductor and hill (cliff) between these two towers. In fact, the minimum ground clearance could have also been possible by extending the height of these two towers at an extra cost of only Rs.2.63 lakh. But the contractor constructed these two towers without study of ground clearance during initial survey. Subsequently, the dismantling of the towers became difficult and the height could not be increased. Thus, the Board had to resort (February/April 1999) to blasting of cliff through another contractor at a cost of Rs.30.13 lakh. The Board should have either got the work done through the existing contractor or recovered the differential cost of Rs.27.50 lakh from the existing contractor as ensuring minimum ground clearance was the responsibility of the contractor as per terms of the contract.

Although, it was contractor's responsibility, yet the Board incurred expenditure of Rs.30.13 lakh on blasting of cliff.

The Board stated (September 2002) that the cliff was not accessible during the survey and inadequate ground clearance was noticed at the final stage of sagging of wire. The reply is not convincing as the cliff, which was found inaccessible during survey was finally blasted by moving men and material to the site. Since the situation arose due to negligence of the contractor, the differential cost of Rs.27.50 lakh should have been recovered from him.

3A.1.6.2.1.4 Non-adjustment of advance in Price adjustment claims

Agreement for construction of terminals awarded to BHEL/ABB specifically stipulated that the interest free advance was not to be considered for payment of price variation. But this clause was not included while making agreements for construction of line. The contractors were entitled to claim price variation

The Board paid Rs.1.63 crore as escalation charges on interest free advance.

on full value of work done without deduction of the amount of interest free advance from the value of work done. Thus, due to non inclusion of suitable clause in the contract for non-payment of escalation on interest free advance, the Board paid escalation of Rs.1.63 crore on the component of interest free advance of Rs.11.00 crore.

3A.1.6.2.1.5 Blocking of fund and loss of interest

As per terms of agreement for construction of line, the material such as conductor, conductor accessories, earth wire, dampers *etc.* were to be supplied by the Board and the contractor was to submit material utilisation account to the Board. The tower material was, however, to be supplied by the contractor and Board was responsible for payment towards tower material. The work was completed in March 1999.

It was seen from the final bills submitted (July 1999 to February 2000) by three line contractors that Rs.54.75 lakh was due for recovery from two contractors mainly on account of non-return of material supplied by the Board and excess payment made for tower material. Though the amount was recoverable from the contractors, the final bills were not finalised by the Board (July 2002). Thus, the blocking of funds with the contractors resulted in loss of interest of Rs. 19.71 lakh for three years upto 31 March 2002 at the rate of 12 *per cent* per annum.

As per terms of contract, modvat credit on the quantity of steel used for fabrication of towers was to be passed on to the Board by the contractors. It was, however, noticed that no such credit was passed (July 2002) on 25,034 MT of steel valued at Rs.76.28 crore used in the construction of towers.

3A.1.7 Operational performance

3A.1.7.1 Functions of HVDC system

The Board incurred expenditure of Rs.2,258.82 crore (February 2002) on the HVDC system. The system was designed for conversion of AC power into DC power at Chandrapur terminal and re-conversion of power at Padghe terminal. The converted DC power gets transmitted through two poles provided on a single tower between the two terminals. The system can be operated on a single pole (monopolar operation) at a time with a maximum transmission capacity of 750 MW or on both the poles simultaneously (bipolar operation) with a maximum transmission capacity of 1,500 MW.

3A.1.7.1.1 Low operational achievements

Against a maximum occurrence of 10 outages per annum as guaranteed by BHEL/ABB, the numbers of actual outages were 26 and 21 in the first two years of operation from November 1999 to October 2001.

The HVDC system with bipolar mode was mostly operated on monopolar mode.

During November 1999 to March 2002, the period available for operation of the system was 21,168 hours. It was observed that the system was operated in bipolar mode only for 7,154 hours, which represented only 33.8 *per cent* of the total availability of 21,168 hours. Of the remaining 14,014 hours, the system was operated in mono polar mode utilising either pole I or pole II for 11,557 hours (54.6 *per cent*) and 1,548 hours (7.31 *per cent*), respectively.

This clearly shows that the availability of pole I (including mono polar and bipolar operations) was 88.4 *per cent* and availability of pole II (including mono polar and bipolar operations) was 41.1 *per cent*. Thus, for majority of time the system was available in mono polar mode and low availability of pole II was a major factor affecting the utilisation of the system. It was observed that Pole II was under outage even at the time of taking over for commercial operation. Thereafter, Pole II could not be operated continuously due to frequent outages caused by repeated failures of 'light guides' in the valve hall of terminal station at Chandrapur requiring changes in its design. In addition, three converted transformers had also failed during June 2001 to May 2002 and were yet to be repaired by BHEL (June 2002).

Against the anticipated load of 900 MW at 60 *per cent* load factor, system was actually utilised for 560 MW (37 *per cent*).

Moreover out of 7,154 hours, the system was operated in bipolar mode for 1,570 hours at a load level upto 450 MW, for 4,372 hours at 450 to 1,050 MW and for 1,212 hours at 1,050 to 1,500 MW. Thus, as against the anticipated load of 900 MW at 60 *per cent* load factor, HVDC system was actually utilised for an average load of 560 MW at the load factor of only 37 *per cent* during November 1999 to March 2002.

The Board stated (September 2002) that the system as a whole was available for about 96 *per cent* of time during March 1999 to December 2001. The Board worked out 96 *per cent* by adding the availability of the system in bipolar mode (32 *per cent*) and mono polar mode (Pole I–60 *per cent*; Pole II– 4 *per cent*). This calculation was based on an erroneous assumption that the sum of availability of the system in bipolar and individual mono polar modes was equal to the total availability of the whole system. The Board's assumption was erroneous as could be seen from a situation where if both Pole I and Pole II are available for the entire period *i.e.* being available for 100 *per cent* of the time, the entire system availability comes to 200 *per cent*, which was a physical impossibility. In fact the total availability of the HVDC system was 48 *per cent* of time (total 18,160 hours out of 38,016 hours) during November 1999 to December 2001.

3A.1.7.1.2 Inadequate Project appraisal

Position of power availability in Eastern region, the power to be evacuated to Western region, existing AC transmission network *vis-a-vis* HVDC system

during the planned year of completion of HVDC (1992-93) and during 1999-2002 was as under:

Sr. No.	Particulars	1992-93	1999-00	2000-01	2001-02
		(In MW)			
1	Installed capacity of power generation by the Board (Chandrapur, Koradi and Khaperkheda thermal power stations) in Eastern region	2,860	3,860	4,280	4,280
2	Availability of power as per average plant load factor	1,806	2,739	3,126	3,191
3	Purchase of power from NTPC (projected by the Board)	879	879	1,076	1,076
4	Less: Power required for auxiliary consumption/local area requirement (20 per cent of installed capacity)	572	772	856	856
5	Net power to be evacuated (2 + 3 - 4)	2,113	2,846	3,346	3,411
6	Transmission network:				
	(a) Existing				
	- No. of 400 KV/AC lines	5	5	5	5
	- Maximum transmission capacity	3,000	3,000	3,000	3,000
	(b) HVDC system (average load)	Not existed	Operational from November 1999	397	643
7	Actual transmission				
	(a) HVDC system (actual average load)	-	-	397	643
	(b) Existing network (AC)	2,113	2,846	2,949 [#]	2,768 [#]

It was noticed that no cost benefit analysis of existing 400 KV/AC system *vis-a-vis* HVDC system was done by the Board at the time of the preparation of project report in 1987. As seen from the above table that the role played by HVDC system during November 1999 to March 2002 could have also been easily played by a double circuit 400 KV AC line with efficient demand management and load despatch.

The Board, however, preferred the HVDC system and completed the project at a total investment of Rs.2,258.82 crore. In comparison to the actual cost of HVDC system, the cost of double circuit line would have been Rs.890 crore approximately. Thus, the excess investment by the Board in HVDC system was of Rs.1,369 crore.

However, the monetary benefits expected from HVDC system over and above the AC system were not commensurate with the reasonable return expected on excess investment. The value of monetary benefits by way of savings in transmission loss at operation level of 60 per cent with 97 per cent availability worked out to Rs.76 crore (312 MUs x Rs.2.45 selling rate per unit during 1999-2000), as against the reasonable return of Rs.137 crore at an interest rate of 10 per cent per annum on the excess investment. Thus, the need for the project was not properly examined and the entire project is likely to become financially unviable.

[#] Balancing figure

The Board stated (September 2002) that the viability of the scheme cannot be evaluated only from the point of view of saving in losses occurring from HVDC operation and consideration has also to be given to stability, controllability and other advantages. The Board also cited instance of collapse of the towers of three 400 KV AC lines (17 May 2002) between Chandrapur and Parli whereby HVDC system prevented grid failure.

The Board's reply is unacceptable as the HVDC system did not show any significant increase in the average load carried on pole I during the period as compared to the period before 17 May 2002 and pole II was completely out of operation from 14 May 2002 onwards (August 2002). In fact to avoid grid failure, the generation at Chandrapur Thermal Power Station was markedly reduced during this period. As a consequence thereof, districts of Pune, Satara, Sangli, Kolhapur and Solapur suffered acute power shortage and HVDC played negligible role in the system stability and contingency requirement.

Moreover, for any project of such huge financial magnitude as HVDC, the overriding concern should have been the financial viability especially when alternatives were available.

The matter has been reported to Government in July 2002; the reply was awaited (September 2002).

Conclusion

The HVDC system constructed at a cost of Rs.2,258.82 crore has not been run at its full capacity after commissioning. Most of the time, it was operated in monopolar mode with low load factor. Chances of recovery of the cost during the life of the system by way of reduced line losses were also remote. The role played by the HVDC system till date could have been easily played by a 400 KV AC double circuit line, costing less than half the cost of HVDC system.

In future, the Board should undertake proper cost benefit analysis before embarking on such major projects involving huge capital outlay.

3A.2 Power Sector Reforms-Signing of Memorandum of Understanding and Implementation thereof

3A.2.1 Introduction

The issue of power sector reforms by the States was discussed in the conference of Chief Ministers/Power Ministers held in March 2001; wherein a consensus was reached to depoliticise the power sector reforms and to speed up their implementation. As a follow up thereto, a Memorandum of Understanding (MOU) was signed (16 March 2001) between the Government of Maharashtra (GOM) and the Government of India (GOI), as a measure of joint commitment to undertake the reforms in a time bound manner and the support which the GOI would extend to GOM. The MOU was valid for five years and subject to review annually.

3A.2.2 Objectives

The objectives of MOU were to identify the weaknesses of the power sector in Maharashtra and adoption of appropriate remedial measures to :

- reduce the gap between demand and supply through short term and long term measures, expeditious commissioning of projects, demand side management, research and management programme and reduction of technical, commercial and transmission and distribution (T&D) losses.
- strengthen the Electricity Regulatory Commission, rationalisation of tariff structure and measures to ensure commercial viability.

3A.2.3 Commitments by Government of Maharashtra

The commitments made by GOM for speeding up the power sector reforms were as under :

- (i) Enactment of appropriate legislation for expediting reforms.
- (ii) Achieving break even in distribution operation by 31 March 2003 and positive return thereafter. For this purpose energy audit and energy accounting would be undertaken at all levels to promote accountability and reduce T & D losses and bring them to the level of 18 *per cent* by March 2003. To achieve this, steps envisaged were to :
 - install meters on all 11 KV feeders and distribution transformers by 31 December 2001;

- provide meters to all consumers by September 2003;
- form profit centres in generation, transmission and distribution by 30 June 2002;
- develop an effective distribution management information system.

(iii) Introduction of time of day (TOD) metering for all High Tension consumers for demand side management and flattening of demand curve.

(iv) Extending full support to Maharashtra Electricity Regulatory Commission (MERC) in discharging its statutory responsibilities and implement the orders of MERC fully unless stayed or set aside by court orders.

(v) Timely payment of subsidies required in pursuance of GOM's orders on the tariff determined by MERC.

(vi) Action to improve availability of Thermal Power Stations (TPSs) from 80 to 85 per cent by 2005.

(vii) Identify areas with low power factor loads and high agricultural consumption for installation of capacitors in transmission and distribution system.

(viii) Securitise outstanding dues of Central Public Sector Undertakings (CPSUs) as per scheme approved by GOI and ensuring that outstanding of CPSUs do not cross the limit of 2 months billing.

(ix) Maintaining grid discipline, compliance with Indian Electricity Grid Code and carrying out directions of Regional Load Despatch Centre.

3A.2.4 Support from Government of India

The support to be extended by GOI for implementation of power sector reforms in Maharashtra was as under:

(i) Allocating additional power from the unallotted share of Central Pool considering capacity to pay for the power.

(ii) Financial support by GOI for repairs and maintenance and Life Extension Programme for improving plant load factor and availability.

(iii) Arrange funds and other clearances for installation of additional units at TPSs.

(iv) Arranging funds for implementation of transmission links and augmentation of transformation capacity to have security of grid.

(v) Arranging funds for appointment of consultants to undertake energy conservation measures and demand side management to reduce peak demand.

(vi) Development of an effective distribution management information system.

3A.2.5 Implementation of reforms programme

3A.2.5.1 Status of implementation by Government of Maharashtra

Areas in which there had been delay in implementation of the reforms programme by GOM with reference to commitments made in MOU are indicated below :

3A.2.5.1.1 Non-enactment of Reforms Bill

GOM did not enact Maharashtra Electricity Reforms Bill so far (August 2002) with the result that unbundling of the Maharashtra State Electricity Board was not initiated.

3A.2.5.1.2 Non securitisation of dues of a CPSU

In order to securitise outstanding dues of Central Public Sector Undertakings (CPSUs) as per scheme approved by GOI, the Board and National Thermal Power Corporation (NTPC) agreed in July 2001 to settle the outstanding dues of Rs.381.40 crore as of March 2001, through bonds to be issued by GOM to NTPC. However, GOM did not issue any bond so far (August 2002).

3A.2.5.1.3 Increase in transmission and distribution losses

Prime objective of the MOU was that the Board would achieve break even in distribution operations by 31 March 2003 and positive return thereafter and would reduce T & D losses to 18 *per cent*. Though the Board had established Energy Accounting Unit (Unit) in March 2000 for monitoring of T & D losses, the losses increased from 31.9 *per cent* in May 2000 to 38.9 *per cent* in March 2002. The Board stated (January 2002) that the losses had not increased but had been better estimated based on improved level of energy audit.

3A.2.5.2 Status of support from Government of India

The status of support extended by GOI as against its commitments in the MOU was as under:

3A.2.5.2.1 Additional power not demanded

GOI agreed for allocating additional power from unallocated share of Central Pool. However, the Board had not applied for allocation of additional power (September 2002).

3A.2.5.2.2 Non clearance of projects

The commitment of GOI was to arrange funds and other clearances for installation of additional units for capacity addition. The Board submitted proposals for expansion for Parli, Paras and Bhusawal thermal power stations

and Uran Gas Turbine Expansion Project. However, techno-economic clearance from Central Electricity Authority for Parli TPS was received in July 1999 and investment approval of Rs.1,053.90 crore for the same from Planning Commission was received in February 2001. For the remaining three projects, necessary clearance/approvals were awaited (August 2002). The Board stated (July 2002) that project could not be implemented as the issue of absorption of power from Dabhol Power Corporation (DPC) was still undecided (August 2002).

3A.2.5.2.3 Non utilisation of loan

During March 2001 to March 2002, the Board received a loan of Rs.61.42 crore from PFC (Rs.17.19 crore) and from GOI (Rs.44.23 crore) under Accelerated Power Development Programme for augmentation and modifications of coal handling plants and ash disposal systems at thermal power stations (TPS). Out of which the Board could spend Rs.28.57 crore only up to March 2002. It was further noticed that the Board could not utilise the loan of Rs.5.76 crore received on 30 March 2001 due to non-finalisation of work order and paid an interest of Rs.0.62 crore for the year 2001-02. Similarly, loan of Rs.1.41 crore for revamping old units (below 140 MW) at TPSs sanctioned by PFC (January 2002) was not drawn for want of signing of the agreement.

3A.2.5.2.4 Non availing of loan

The Board proposed (May 2002) establishment of computerised MIS at a cost of Rs.57.63 crore by April 2004. Expenditure on MIS would be met by obtaining loan from PFC as per the commitment of GOI. However, the Board had not applied for loan from PFC for this purpose so far (July 2002).

3A.2.5.3 Status of implementation of power reforms by the Board

Action taken by the Board in implementation of terms of MOU was as under:

3A.2.5.3.1 Non assessment of feeder wise losses

The work of installation of meters on all 11 KV feeders was scheduled for completion by 31 December 2001, with a view to identify feeder-wise losses. However, as of March 2002, out of 7,128 feeders, panel meters were installed on 5,463 feeders (76.6 per cent) at an expenditure of Rs.1.09 crore. According to the Board, meters on the remaining 1,665 feeders would be provided by December 2002 (a delay of one year). As of March 2002, feeder-wise losses were ascertained for only 277 feeders (196 express feeders, each supplying energy to only one high tension (HT) consumer and 81 feeders supplying energy to the consumers in industrial area established by Maharashtra Industrial Development Corporation (MIDC)). The feeder-wise losses for balance 5,186 feeders were not identified owing to non-segregation of consumers feeder-wise.

Panel meters were installed on 76.6 per cent 11 KV feeders but feeder-wise losses were not assessed due to non-segregation of consumers feeder-wise.

3A.2.5.3.2 *Non ascertainment of transformer wise losses*

Transformer losses were not ascertained due to non identification of energy consumed transformer-wise.

With a view to ascertain transformer-wise losses, meters on low tension (LT) side of distribution transformers were to be installed by September 2001. However, the Board decided (March 2002) to install meters on all 1.89 lakh distribution transformers in 550 sub divisions by October 2003 (a delay of more than 2 years); out of this 9,172 transformers in selected 50 sub divisions would be provided with meters by December 2002 in order to commence transformer-wise billing. Meters were installed on 3,310 distribution transformers in 30 sub divisions upto March 2002. However, transformer-wise losses were not ascertained due to non-identification of energy consumed and billed transformer-wise.

3A.2.5.3.3 *Delay in installation of meters*

The Board was to provide meters to all consumers by 30 September 2002. Upto March 2002, out of 18,64,408 agricultural and 33,965 Public Water Works (PWW) which were not provided with energy meters, the Board provided meters to only 18,057 agricultural consumers (one *per cent*) and 913 PWW (2.7 *per cent*). Installation of meters for remaining consumers was planned for completion by December 2004 with a delay of more than 2 years.

3A.2.5.3.4 *Consumption pattern of energy*

Time of day meters were provided, however, there was no increase in consumption pattern during off peak hours.

For the purpose of shifting the energy consumption in peak hours to off peak hours, MERC introduced (May 2000) a system of Time of Day (TOD) metering. Tariff orders issued (May 2000) by MERC stipulated the rebate for energy consumption during ‘off peak’ hours and penal charges for consumption during peak hours. As per orders of MERC, TOD meters were to be installed at all HT consumers’ premises by September 2000. As of July 2002, the Board provided TOD meters to 9,731 (93.1 *per cent*) HT consumers at a cost of Rs.11.67 crore. Scrutiny of records regarding billing of HT consumers under TOD metering tariff revealed that there was no increase in consumption pattern during ‘off peak’ hours and no decrease was observed during period of ‘peak’ demand. The Board extended rebate of Rs.327.40 crore for consumption in ‘off peak’ hours and recovered penal charges of Rs.279.47 crore for consumption in ‘peak’ hours during June 2000 to March 2002.

The Board estimated (May 2001) the cost of installation of TOD meters and other meters on feeders, transformers, HT consumers and unmetered consumers at Rs.501.17 crore and attributed (May and September 2002) non-achievement of target for installation of meters to non-availability of funds, meters and inadequate manpower for installation of meters.

3A.2.5.3.5 *Setting up of profit centres*

With reference to setting up of profit centres in generation, transmission and distribution by 30 June 2002, it was observed that out of 550 sub divisions and 8 power stations where computerised billing of the consumers would be done transformer-wise *vis-à-vis* feeder-wise, process of development of

50 sub divisions and 3 power stations as profit centres was still in progress (June 2002). The work was now scheduled to be completed by October 2003 at a cost of Rs.56.90 crore.

The matter was reported to Government/Board in September 2002; their replies were awaited (September 2002).

Conclusion

There had been delay in implementation of power reforms programme by Government of Maharashtra with reference to the commitments made in MOU. The process of speeding up the power sector reforms could not achieve required momentum. Government of Maharashtra need to take effective steps to speed up the implementation of the reforms as per MOU.

3B Maharashtra State Road Transport Corporation

Purchase and Performance of Tyres, Tubes, Flaps including Tyre Retreading Plants

Highlights

Despite poor past performance of tyres supplied by a firm, the Corporation continued to procure the tyres from the same firm at higher rates resulting in avoidable expenditure of Rs.20.34 lakh.

(Paragraph 3B.5.2)

Though tubes were available separately at lower rates, the Corporation purchased tubes with tyres at higher rates from tyre manufacturers, resulting in extra expenditure of Rs.1.20 crore.

(Paragraph 3B.5.3)

Tyre retreading materials were purchased at higher rates from a firm by ignoring the recommendation of Mechanical Engineering and Stores and Purchase Department which resulted in avoidable expenditure of Rs.34.12 lakh on purchase of precured treated rubber.

(Paragraph 3B.6.1)

The Corporation did not raise claims for Rs.2.46 crore and short-raised claims for Rs.10.62 lakh on account of shortfall in guaranteed kilometres of precured treated rubber.

(Paragraphs 3B.6.2.1 and 3B.6.2.2)

The Corporation used inferior quality tyre retreading materials valuing Rs.47.57 crore during 1998-2001 due to abnormal time taken (28 to 363 days) in testing of samples.

(Paragraph 3B.7.1)

Due to shortfall in performance of new/retreaded tyres, there was shortfall of 55,572 lakh revenue kilometres valued at Rs.22.30 crore during 1997-2001.

(Paragraph 3B.10.2)

The Corporation had not fixed any norms for consumption of tyre retreading material. However, as compared to norms of Association of State Road Transport Undertakings for tread rubber and precured treated rubber, the Corporation incurred extra expenditure of

Rs.5.45 crore due to excess consumption of tread rubber/precured treated rubber during 1997-2002.

(Paragraph 3B.11.4)

The Corporation purchased oversized and heavier precured treated rubber which resulted in avoidable expenditure of Rs.0.84 crore.

(Paragraph 3B.11.7)

Non-replacement of uneconomical moulds used in hot process resulted in avoidable loss of Rs.40.53 crore.

(Paragraph 3B.11.8)

Due to fixing of standard manhours required for retreading tyres on the higher side, the Corporation incurred expenditure of Rs.4.26 crore on payment of inadmissible incentives to staff/workers of tyre retreading plants.

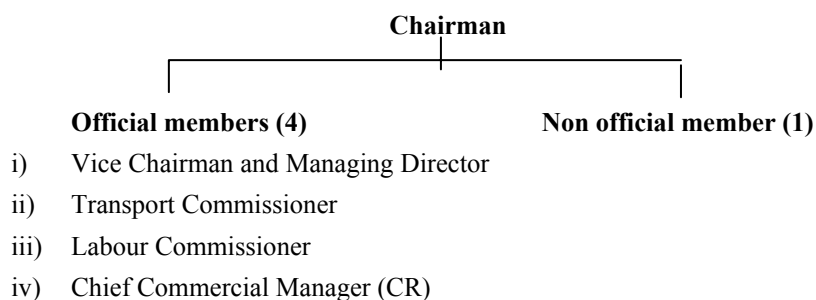
(Paragraph 3B.11.9)

3B.1 Introduction

Maharashtra State Road Transport Corporation (Corporation) was established in 1961 under the State Road Transport Corporations Act, 1950 and operated an average daily fleet of 16,794 vehicles through 243 depots during the year 2001-02.

3B.2 Organisational set up for purchases

The apex body for purchase of tyres, tubes *etc.* was the Tender and Stores Committee (T&SC) headed by the Chairman of the Corporation, who was a Member of the Legislative Assembly. As on March 2002, the T&SC consisted of the following members:



However, it was observed that during September 1997 to June 1999, non official members were appointed on the committee in place of official

members and the committee was dominated by non official members including politicians.

Purchase proposals of all revenue items above Rs.30 lakh and capital items above Rs.20 lakh (Rs.15 lakh and Rs.3 lakh respectively prior to April 2000) were finalised by the T&SC after vetting of the same by Mechanical Engineering (ME), Stores and Purchase (S&P) and Finance departments.

3B.3 Scope of Audit

The working of the Corporation was last reviewed in the Report of the Comptroller and Auditor General of India (Commercial) – Government of Maharashtra for the year ended 31 March 1991. The recommendations (April 1994) of COPU were as under:

- i) The Corporation should not rely on a single source of supply and agreement should be executed initially for one year instead of five years.
- ii) The Corporation should take proper care of its financial interest while entering into agreements.
- iii) Allotment of business at a higher rate should not occur merely because the firm is based in the State.

As a follow-up on the recommendations of COPU, the Corporation was procuring material from more than one source and agreements for purchase were also entered into annually. As regards implementation of recommendations of COPU at (ii) and (iii) above, it was observed that the same have not been implemented in toto as would be evident from the audit findings discussed in succeeding paragraphs.

The present review conducted from December 2001 to April 2002 covers transactions pertaining to the purchase and performance of tyres, tubes, flaps and tyre retreading material and also attempts a performance appraisal of tyre retreading plants (TRPs) during 1997-2002. This review is based on examination of records of Stores and Purchase and Mechanical Engineering departments at central office, four[●] Regional Offices, four[⊙] Divisional Offices as well as inspection of four[⊙] tyre retreading plants.

3B.4 Trend of expenditure on consumption of tyres, tubes, flaps and tyre retreading material

The expenditure on consumption of tyres, tubes, flaps and tyre retreading material decreased from Rs.107.61 crore in 1997-98 to Rs.86.88 crore in

● Amravati, Pune, Nasik and Nagpur.

⊙ Amravati, Pune, Nasik and Nagpur.

⊙ Amravati, Central Works Shop Dapodi, Nasik and Nagpur.

2001-02 due to reduction in tyre prices, improvement in tyre mileage and consequent reduction in consumption rate of tyres. This represented 18.84 per cent of the total expenditure on stores consumed in 1997-98 and 9.40 per cent in 2001-02.

3B.5 Purchase of tyres, tubes and flaps

3B.5.1 Improper allocation of business

Improper allocation of business for purchase of tyres resulted in avoidable expenditure of Rs.29.50 lakh.

The Corporation invited (June 1997) limited tenders for supply of tyres and tubes from 14 suppliers. The allocation of business was made on the basis of past mileage performance, cost per kilometre (CPKM) and the capacity to supply. Purchase orders for 7,000 and 10,000 tyres were placed on Apollo Tyres Limited and Modi Tyres Limited, respectively, in July 1997. Audit noticed that both these firms had given past performance of 48,313 kilometres and 46,811 kilometres and the CPKM was 13.84 and 14.60 paise, respectively. Considering the past performance *vis-a-vis* CPKM, the Corporation should have purchased 15,000 Apollo Tyres and 2,000 Modi Tyres. Due to improper allocation of more business to Modi Tyres, the Corporation incurred extra expenditure of Rs.29.50 lakh.

The Corporation stated (November 2002) that Apollo Tyres did not have the capacity to supply 15,000 tyres. The reply was not tenable as Apollo Tyres had offered 15,000 tyres. The Corporation further stated (August 2002) that as Apollo Tyres could not supply 6,100 tyres out of 22,500 tyres in earlier tender (January to June 1997), the order was placed for 7,000 tyres only. This contention was also not tenable as Apollo Tyres could supply 16,400 tyres as per delivery schedule against the earlier order. Besides, the order for 15,000 tyres could have been placed with Apollo Tyres not only to avoid extra expenditure of Rs.29.50 lakh but also to ensure better performance of tyres.

The Government stated (November 2002) that the urgency for purchase at higher rates had not been explained by the Corporation.

3B.5.2 Undue favour to the supplier

The Corporation invited (February 1999) limited tenders for purchase of nylon and radial tyres with tubes for its requirement for the period from April to September 1999. In response, nine offers were received. Considering the past performance *vis-à-vis* CPKM, ME Department recommended (March 1999) four suppliers* and stated that the quantity offered by these four suppliers was sufficient to meet the requirement. S& P Department also endorsed the said recommendation. However, in spite of the fact that the Secretary of the committee had brought to the notice the poor record of Wearwell Tyres, Tender and Store Committee approved purchase of 2,000 nylon tyres with tubes from them and the remaining from the four firms[@]. T&SC did not assign

* MRF Limited (MRF), Apollo Tyres Limited (Apollo), J.K. Industries Limited (JK) and Vikrant Tyres Limited (Vikrant).

[@] MRF (25,000 tyres and tubes), Apollo (12,000 tyres and tubes), JK (10,000 tyres and tubes) and Vikrant (5,000 tyres and tubes).

Corporation incurred extra expenditure of Rs.20.34 lakh by not purchasing tyres from the lowest tenderer.

any reasons for ignoring the recommendations of the ME and S&P Departments. Thus, the Corporation incurred avoidable extra expenditure of Rs.20.34 lakh in respect of 2,000 tyres which could have been purchased from MRF (first lowest tenderer) which offered a price lower by Rs.194.92 and better mileage by 6,004 kilometres per tyre.

The Corporation stated (August 2002) that the T&SC was competent to allocate business to Wearwell Tyres though same was not recommended by S&P Department. The fact remained that undue favour was shown to Wearwell Tyres at the cost of the Corporation. The Government (November 2002) did not agree with reply furnished by the Corporation and stated that directives have been issued for detailed enquiry in the matter.

3B.5.3 Purchase of tubes at higher rates

Purchase of tubes with tyres at higher rates resulted in avoidable expenditure of Rs. 1.20 crore.

The Corporation purchased tubes along with tyres from tyre suppliers during 1997-2000 although it was not necessary to procure tyres and tubes from the same suppliers. The rates paid per tube together with tyres ranged between Rs.463.58 and Rs.616.00 though rates for tubes alone were lower and ranged between Rs.463.58 and Rs.544.82 per tube. Purchase of tubes along with tyres at higher rates from tyre manufacturers had resulted in avoidable expenditure of Rs.1.20 crore during 1997-2000. The Corporation stated (May/August 2002) that from the year 1999-2000, possibility of purchase of tubes separately was explored and independent rate contracts for tubes were issued. However, the Government disagreed (November 2002) with the action of the Corporation of combined purchase of tubes with tyres.

3B.6 Purchase of tyre retreading material

3B.6.1 Purchase of material at higher rate

The Corporation invited (May 1998) open tenders for purchase of tyre retreading material. In response, 65 offers were received. The tenders were opened in June 1998. Based on the recommendations of ME Department, S&P Department recommended (December 1998) 90 *per cent* business to eight suppliers[#] and 5 *per cent* business each to Leo Rubber, Secunderabad and Highspeed Rubber, Sangli (Maharashtra).

By placing order at higher rate, the Corporation incurred extra expenditure of Rs.34.12 lakh.

The T&SC, however, awarded 10 *per cent* business to Sisodiya Rubber Factory Private Limited, Aurangabad (SRF) which was not recommended by ME/S&P Department. Further, the firm had quoted rates higher than that quoted by High Speed Rubber, Sangli (HSR) by 16.5 to 32.4 *per cent* for various materials. Thus, purchasing 10 *per cent* quantity at higher rate from SRF tantamounted to undue favour which resulted in extra expenditure of Rs.34.12 lakh.

[#] Sallion Rubber, Delhi (5 *per cent*); Trident Rubber, Daman (15 *per cent*); Giant Rubber, Indore (10 *per cent*); Pollygold Rubber, Ahmedabad (5 *per cent*); Omega Tyres, Indore (10 *per cent*); Midas Precured, Kerala (20 *per cent*); ELGI Tyres and Treads, Coimbatore (15 *per cent*); and Tono Rubber Works, Bangalore (10 *per cent*).

The Corporation stated (August 2002) that the T&SC had taken the decision as per the authority vested in it though the firm was not recommended by ME/S&P Departments and the Financial Advisor. It further stated that the business was allotted to SRF to encourage Maharashtra based manufacturers. The reply was not tenable as HSR was also a Maharashtra based firm and had quoted a lower rate and was capable of supplying the quantity as supplied by SRF. The Government stated (November 2002) that the explanation given by the Corporation was incorrect.

3B.6.2 Non availing of offered performance guarantee

Pursuant to a tender opened in November 1999, for purchase of Precured Tread Rubber (PCTR), Eastern Treads Limited, Cochin (ETL) offered a minimum performance guarantee of 35,000 average kilometres. However, the Corporation issued (September 2000) rate contract (RC) to ETL for the period from August 2000 to August 2001 with performance guarantee of 32,000 average kilometres *i.e.* MSRTC was to raise claim for shortfall if the tyre performance was below 32,000 kilometres and not 35,000 kilometres as offered by the firm.

The performance of tyres retreaded using the PCTR supplied by ETL was 27,420 kilometres only. Thus, there was a shortfall of 4,580 kilometres per tyre with respect to the performance guarantee of 32,000 kilometres mentioned in RC. For this shortfall, the amount recovered was Rs.17.91 lakh instead of Rs.27.10 lakh calculated on the basis of performance guarantee of 35,000 kilometres offered by the firm. Since the Corporation accepted the lower kilometres guaranteed in the RC, it had resulted in avoidable loss of Rs.9.19 lakh.

The Corporation stated (May/August 2002) that since the offers were evaluated on the basis of minimum performance of 32,000 kilometres per retreaded tyre, shortfall claims were to be raised *vis-a-vis* a performance guarantee of 32,000 kilometres only. The reply was not acceptable as the performance guarantee offered by ETL was for 35,000 kilometres, which should have been incorporated in the RC for recovery of shortfall. Further, the Corporation in its earlier tender of June 1998 incorporated the condition of 35,000 kilometres, 33,000 kilometres and 33,249 kilometres offered by different firms. The Government endorsed (November 2002) the views of the Corporation.

3B.6.2.1 Short raising of claims for failure of performance guarantee

The Corporation issued (September 1997) RCs to four firms* for purchase of PCTR for the period July 1997 to July 1998. One of the conditions of the RC was that each retreaded tyre was to give an average performance of 32,355 kilometres.

* Toja Tyre and Treads Private Limited, Kalady, Kerala; Milind Tyre and Rubber Company Private Limited, Kolhapur; Sisodiya Rubber Factory Private Limited, Aurangabad and Tono Rubber Works Private Limited, Bangalore.

Short raising of claims for shortfall in performance resulted in loss of Rs.10.62 lakh.

The Corporation purchased 9,39,184 kgs. of PCTR excluding low NSD[@]. By using 9.5 kgs of PCTR per tyre, the Corporation could have retreaded 98,861 tyre with this quantity. Performance of retreaded tyres during September 1997 to January 1999 was below par and did not meet the stipulated mileage condition. However, claims were raised after a lapse of two years, to the extent of shortfall in performance of 66,812 retreaded tyres only, whereas, the claims ought to have been raised for 83,972 (excluding scrap of 15.06 *per cent*) tyres retreaded. Thus, shortfall claims of Rs.0.78 crore only were raised and claims for Rs.10.62 lakh were not raised. Claims raised (February 1999) have not been settled so far (August 2002).

3B.6.2.2 Non raising of claims for failure of performance guarantee

Between February and June 1999, the Corporation issued RCs to 15 suppliers for purchase of PCTR, bonding gum, vulcanising solution, *etc.* for the period of RCs from January 1999 to January 2000. As per conditions of the RC, the tread rubber was to give mileage equal to 70 *per cent* of the average new tyre or the guaranteed kilometres against this tender *i.e.* 32,216 kilometres, whichever was higher. However, two suppliers offered a higher guarantee of 35,000 kilometres and one supplier offered guarantee of 33,000 kilometres.

The Corporation did not lodge claims of Rs.2.46 crore for shortfall in performance.

The performance of 2,42,972 numbers retreaded tyres from 23,08,235 kgs. material received from 14 suppliers ranged between 23,985 and 32,905 average kilometres. Based on the actual performance of the retreaded tyres (January 1999 to September 2000) a shortfall claim of Rs.2.46 crore should have been lodged. But the same had not been lodged so far (August 2002), resulting in a loss of monthly interest of Rs.2.46 lakh.

The Corporation/Government stated (August/November 2002) that raising of claims in respect of 2,36,962 tyres retreaded using 9.8 kgs. per tyre was being considered. The fact remained that the claims were yet to be raised, the number of tyres considered was on the lower side and the base now taken as 9.8 kgs. was not consistent with earlier claims where 9.5 kgs. was taken as the base.

3B.6.2.3 Pending/rejected claims in respect of warranty of new tyres

As per the terms of the purchase orders of new tyres, the tyres supplied were warranted against failure on account of manufacturing defects and after joint inspection the supplier was to ensure replacement against the accepted claims of tyres or recoup the amount already paid on priority. Out of 30 divisions, the data compiled for 22 divisions revealed that during 1996-2002, total claims of 3,498 tyres were taken for joint inspection, of which 3,309 tyres were accepted for warranty claims. Claims of 189 tyres valuing Rs.10.05 lakh were rejected on grounds of no manufacturing defects. Of the 3,309 tyres accepted, replacement claims of 582 tyres valuing Rs.30.97 lakh were outstanding for a period ranging from one to five years. Thus, 582 tyres remained out of operation for a period ranging from one to five years. Out of 2,727 tyres

[@] Non skid depth.

replaced, 791 tyres had remained out of operation for a period of six months to more than 36 months.

The Corporation stated (May 2002) that the firms were being advised for early settlement of warranty claims. It further stated that updated position of warranty claims was being collected from the units. Further progress was awaited (August 2002).

3B.7 Quality control – sample testing

3B.7.1 Use of substandard materials due to abnormal delay in testing of samples

Although, the Corporation had its Research and Development (R&D) wing at Pune, it did not have its own testing laboratory (August 2002). Samples of tubes, flaps and tyre retreading materials were sent by divisions through R&D wing to Indian Rubber Manufacturers Research Association (IRMRA) laboratory at Thane for testing. As per the RCs, the random samples from the consignments were taken and tested. If the test results were unsatisfactory, the suppliers were liable to pay the test charges, consequential expenses and penalty charges considering weighted marks of the parameters in which random samples failed.

(i) During 1997-2002, the Corporation got tested 2,359 samples which took 28 to 363 days. The material was consumed before the test results were made available. Out of the above, testing of 251 samples took more than six months from the date of receipt of sample from division to date of despatch of test report to division and in 201 cases, R&D wing took 15 to 296 days for despatching the test reports to the concerned divisions. The R&D wing also took 263 and 289 days in despatching two test reports to Dapodi, TRP in the same premises.

Delays in testing and reporting procedures led to consumption of substandard material worth Rs.47.57 crore.

(ii) Analysis of 1,511 samples tested during 1998-2001 revealed that only 345 samples (23 per cent) passed the tests i.e. 77 per cent of the material (Rs.47.57 crore) purchased and consumed were of inferior quality. Thus, delays in testing and reporting led to consumption of substandard material worth Rs.47.57 crore which would have also led to lesser efficiency in operation. No responsibility has been fixed so far (August 2002).

While accepting the delays in testing the samples of tyre retreading materials, the Corporation/Government stated (August/November 2002) that the delays were inevitable and the R&D wing had been instructed to avoid delays and forward the reports to TRPs immediately after their receipt from IRMRA.

3B.7.2 Non recovery of testing charges

As per the RCs, suppliers were to pay the testing charges in respect of failed samples. An amount of Rs.10.67 lakh was recoverable from 36 suppliers in respect of samples failed from July 1998 to December 2001.

The Corporation/Government stated (August/November 2002) that efforts were being made to adjust the amount from EMD and security deposit.

3B.8 Inter division transfer of tyres, tubes and flaps

Nylon radial tyres and tubes and flaps costing Rs.30.04 lakh issued were not received by the recipient divisions.

During the cross checking of the entries of issue and receipt of materials, it was noticed that 318 nylon tyres, 87 radial tyres, 604 nylon tubes, 40 radial tubes and 1,175 flaps costing Rs.30.04 lakh issued by 16 divisions to 13 other divisions during 1997-2001 were not received by the recipient divisions and the possibility of their misappropriation, theft *etc.* could not be ruled out. No action for reconciliation of the difference had been taken (May 2002).

The Corporation stated (August 2002) that out of 50 issues, confirmation in respect of 35 cases had been received and follow-up for remaining was going on. This could not be verified by Audit for want of records. The Government endorsed (November 2002) the views of the Corporation.

3B.9 Excess consumption of flaps

Excess consumption of flaps valued at Rs.0.77 crore due to higher consumption ratio.

As per the norms adopted by the Corporation, the consumption ratio of tyres and flaps should be 1:1. However, the actual consumption ratio was found to be ranging from 1: 1.10 to 1: 1.32 which resulted in excess consumption of 89,941 flaps costing Rs.0.77 crore during 1997-2002.

The Corporation stated (August 2002) that the flap protected the tube from injury and the consumption of flaps was more in city services. It further stated that the extra expenditure was very meagre and the present ratio of flaps to new tyres was due for revision shortly. The reply was not tenable as the effective kilometres of city services constituted only 4 to 5 *per cent* of the total effective kilometres operated in the State. The Government endorsed (November 2002) the views of the Corporation.

3B.10 Performance of tyres, tubes, flaps and retreading materials

3B.10.1 Comparison with other State Road Transport Corporation

a) As per the latest available report (1999-2000) of Central Institute of Road Transport (CIRT), the Corporation had 58,186 breakdowns of buses during 1997-2000 due to road wheel failure (failure of tyres, tubes, flaps *etc.*) and the ratio with respect to average fleet of 16,485 buses was 3.53:1 as against 19,771 breakdowns on account of road wheel failure in Andhra Pradesh State Road Transport Corporation (APSRTC) having average fleet of 17,687 buses, *i.e.* 1.12:1.

b) During 1999-2000, the rate of consumption of new tyres per lakh kilometres was higher in the Corporation as compared to APSRTC and Karnataka State Road Transport Corporation (KnSRTC). Similarly, the rate of consumption of retreaded tyres per lakh kilometres was higher in the Corporation as compared to KnSRTC as shown below:

Sl. No.	SRTUs	1999-2000	
		No. of tyres per lakh kms.	
		New	Retreaded
1	CORPORATION	5.22	14.38
2	APSRTC	4.77	14.41
3	KnSRTC	4.85	12.46

c) The cost of tyres, tubes and flaps of the Corporation was more than that of APSRTC by 10.1, 9.7 and 7.7 paise per kilometre respectively resulting in extra expenditure of Rs.46.53 crore during 1997-2002.

3B.10.2 Retreadability factor

The Corporation's retreadability factor for 1999-2000 was 2.38 while it was 2.77 for KnSRTC and 3.06 for APSRTC.

There was usage of more tyres costing Rs.22.30 crore due to shortage in mileage given by the tyres.

A new tyre is expected to give a mileage equivalent to its initial life *plus* three retreads (*i.e.* 1,42,600 kilometres* by Nylon and 1,61,600 kilometres* by Radial tyres). However, it was seen that there was a shortfall of 55,571.65 lakh kilometres (Nylon tyres: 51,150.06 lakh kilometres; Radial tyres: 4,421.59 lakh kilometres) during 1997-2001 which was equivalent to a cost of Rs.22.30 crore.

The Corporation stated (June 2002) that all tyres were not capable of being retreaded three times. The average number of times a tyre was being retreaded was 2.4 and hence the figures of loss in terms of kilometres worked out by Audit were not agreed to. The Corporation further stated (August 2002) that the Corporation did not assume that all the tyres would give total 1,42,600 kilometres in case of nylon tyres and 1,61,600 kilometres in radial tyres. The reply was not tenable as the retreadability and corresponding life of tyres in kilometres were derived from minimum guaranteed kilometres of tyres and retreading materials insisted upon with the suppliers and it was expected that the tyres would give average kilometres of 1,42,600 (nylon) and 1,61,600 (radial).

3B.10.2.1 Premature failure of tyres

During 1997-2001, 2000 new tyres and 72,125 retreaded tyres were scrapped prematurely. As a result, these tyres could not be retreaded and were replaced

* 46,000 + 3 x 32,200

* 65,000 + 3 x 32,200

by new ones. The premature scrapping of these tyres was due to the following controllable reasons:

- ◆ Non maintenance of proper air pressure in tyres,
- ◆ Non removal of the tyre immediately on reaching wear and tear up to 0.5 mm of skid depth,
- ◆ Improper alignment of wheel,
- ◆ Disproportionate load (*i.e.* overload),
- ◆ Negligence of the drivers,
- ◆ Non changing of the one-sided wear tyre in time,
- ◆ Negligence on the part of the wheel fitter about proper checking of the tyres

Thus, there was an urgent need for proper education and effective supervision in respect of tyre usage and maintenance.

While agreeing with Audit, the Corporation/Government stated (August/November 2002) that in order to improve maintenance, it had already been decided to supply modern machinery to the depots.

3B.11 Tyre retreading plants

3B.11.1 Organisational set up of tyre retreading plants

There are nine* tyre retreading plants (TRPs), each headed by Deputy Superintendent who reports to the Regional Engineer, excepting Deputy Superintendent, Dapodi who reports to Deputy General Manager (Works). Their overall control was with General Manager (ME) at the Central Office assisted by Superintendent (Tyres).

3B.11.2 Performance of tyre retreading plants

The annual average material cost of these plants during 1997-2002 was Rs.33.86 crore and the average staff was 616.

Installed capacity and production of tyre retreading plants during 1997-2002 was as under:

Period	Hot process			Precured (cold)			Total (Hot + Precured)	
	Installed capacity	Production	Shortfall	Installed capacity	Production	Shortfall	Installed capacity	Production
1997-2002	5,04,812	4,58,151 (90.8 %)	46,661 (9.2%)	10,06,032	8,39,997 (83.5%)	1,66,035 (16.5%)	15,10,844	12,98,148 (85.9%)

* Nagpur, Amaravati, Jalgaon, Nasik, Latur, Nanded, Dapodi, Kolhapur and Ratnagiri.

Though the overall capacity utilisation of the TRPs was above 80 *per cent*, the capacity utilisation was low at Ratnagiri (72.4 *per cent*) and Amravati (35.9 *per cent*). The shortfall was attributable to machinery break down and manpower shortage. The Corporation stated (August 2002) that the average utilisation of Ratnagiri plant during 1997-2002 was 87.4 *per cent* based on planned production. However, it was 72.4 *per cent* based on installed capacity.

3B.11.3 Non fixing of norms for consumption of material, energy and fuel

It has been more than 25 years since the Corporation started operating the tyre retreading plants but no norms for consumption of raw material, energy, fuel and process loss have been fixed as yet in spite of having vast data at its disposal. The Corporation should fix the norms as the total average expenditure on TRP materials was to the tune of Rs.33.86 crore per annum and in absence of norms, inefficiency, pilferage, *etc.* could not be quantified.

The actual average consumption of energy (electricity) per tyre ranged between 9.86 and 16.56 units. Similarly, in respect of fuel consumption there was wide variation ranging from 4.94 to 12.16 litres. In the absence of norms, the Corporation did not notice the excessive consumption and thus could not take corrective action.

The Corporation stated (August 2002) that norms could not be fixed as each tyre had different wear and tear characteristic, injury numbers and sizes. However, the Corporation would try to fix norms in future after conducting a detailed study at various plants considering the norms fixed by Association of State Road Transport Undertakings (ASRTU), if any. The Government however, expressed (November 2002) its displeasure to the reply as the Corporation failed to fix norms even after completion of 25 years of operations.

3B.11.4 Excess consumption of tread rubber and precured tread rubber

a) Hot process

There was excess consumption of 239.8 MTs tread rubber valued at Rs.1.80 crore.

One of the reasons for excess consumption was more utilisation of higher size material (74x18/32). Despite issue of instructions (November 1998) by the Corporation to all its TRPs regarding control over buffing activity, more use of lower size material (70x18/32) and reduction of material cost, the TRPs had often used higher size material. The percentages of consumption of higher size tread rubber during 1997-2002 ranged between 23.5 and 47.2 in Jalgaon, 88.5 and 93.9 in Nasik, 66.4 and 75.3 in Nanded, 59.2 and 66.8 in Nagpur and 23 and 80.6 in Dapodi (Pune). As a result, there was excess consumption of 239.8 MTs tread rubber valued at Rs.1.80 crore in comparison to the ASRTU norms of 9.6 kgs. per tyre for lower specification.

The Corporation stated (August 2002) that in hot process the crown width of the tyre increases while the tyre is buffed, compelling the plants to use wider rubber of size of 74x18/32. It was also stated that the norm for consumption should have been considered as 10 kgs instead of 9.5 kgs. The reply was not

tenable as the hot process has now become obsolete and this had been discontinued long back in APSRTC. Secondly, the tyres retreaded by the hot process gave very low mileage (between 16,000 and 18,000). The Corporation had also issued instructions (November 1998) to use more and more lower size material to reduce the cost.

b) Precured process

There was excess consumption of 406.2 MTs. of PCTR valued at Rs.3.65 crore in production of 8,01,876 tyres.

The Corporation did not fix norms for material consumption for precured process. However, for recovery of shortfall in performance guarantee, it considered the standard consumption of PCTR at the rate of 9.5 kgs. per tyre. Based on the standard consumption of 9.5 kgs. there was excess consumption of 406.2 MTs. of PCTR in retreading 8,01,876 tyres valued at Rs.3.65 crore.

The Corporation stated (August 2002) that since the size of PCTR to be used at plant was decided considering the crown width, the condition of the tyre casing and actual weights of PCTR supplied by various suppliers, per tyre PCTR came to more than 9.5 kgs and there was no excess consumption. The reply was not acceptable as the average rate of 9.5 kgs. per tyre in lodging shortfall claims was fixed by the Corporation taking into account all the aspects.

3B.11.5 Performance of curing bags and envelopes

The Corporation incurred avoidable expenditure of Rs.28.32 lakh on curing bags and envelopes.

There was no uniformity in consumption of curing bags, half skirt envelopes and full skirt envelopes. The per unit cures actually obtained during 1997-2002 varied between 51 and 73 cures per bag at TRPs Dapodi, Kolhapur, Nagpur, Nasik and Jalgaon as against expected 75 cures per curing bag. In respect of skirt envelope as against expected 85 cures, the actual cures ranged between 37 and 82 per half skirt envelope at TRPs at Nagpur, Nasik and Jalgaon and between 31 and 72 cures per full skirt envelope at TRPs at Kolhapur, Ratnagiri and Amravati. Due to failure in achieving the expected minimum cures by the TRPs at Amravati, Dapodi, Kolhapur, Nagpur, Nasik, Ratnagiri and Jalgaon, the Corporation incurred avoidable expenditure of Rs.28.32 lakh on curing bags (Rs.9.65 lakh) and on envelopes (Rs.18.67 lakh).

The Corporation/Government stated (August/November 2002) that as the source of supply was limited, they were forced to select available sources whose performance was not good and this was the main reason for drop in average number of cures per bag/envelope. The reply was not tenable as the excess consumption of curing bags/envelope was also attributable to the improper handling/usage by the plants as revealed from the study report of ME Department (January 2001). Further, the average cures per bag obtained at various plants ranged between 51 and 160.

3B.11.6 Process failed tyres/process loss

The Corporation did not fix the admissible process loss so far (August 2002). However, it was observed that 22,033 tyres were scrapped during various stages and the percentage of process loss due to scrapping ranged between 1.24 and 2.07 during 1997-2002. Compared to the 0.25 per cent process loss

fixed in KnSRTC, the process loss of the Corporation was much higher. As these tyres were scrapped, expenditure of Rs.12.54 lakh incurred on labour and material while retreading had become infructuous (after deducting 0.25 per cent process loss).

3B.11.7 Avoidable expenditure on usage of precured tread rubber

The Corporation did not fix any norms for process loss but as per study, avoidable wastage worked out to Rs.0.84 crore.

The Corporation did not fix any norms for process loss. However, on completion of an inspection of Dapodi unit (July 2000), the Works Manager opined that 80 per cent of tyres required PCTR of a length not exceeding 3,100 mm. The study report also suggested that if the Corporation procured majority of PCTR of 3,100 mm instead of 3,125 mm, there would be saving in material cost. On the basis of this study, audit worked out avoidable wastage of material worth Rs.0.84 crore. Further, a report on excess consumption of tread rubber (May 2002) received from Nanded division found that the size of casing after buffing came to less than 3,100 mm in 100 per cent cases.

The Corporation stated (January 2002) that minor wastage was unavoidable, as application of short length belt would result in excessive stress at the joint, which was the weakest area of PCTR and might result in tread separation. Therefore, the length of PCTR was always required to be kept slightly more than the actual requirement. The reply was not tenable as only 20 per cent tyres required a length of 3,100 mm and above and this should have been factored in while placing the purchase orders. This situation could have been avoided if norms were fixed based on analysis of data regarding usage of PCTR.

The Corporation/Government further stated (August/November 2002) that the circumference of the buffed tyre worked out to 3,115 mm and, therefore, the standard length of PCTR had been fixed as 3,125 mm. The reply was not tenable as the study report had considered the actual circumference of tyres which was more realistic whereas the Corporation had worked out the same on theoretical basis which was incorrect. In view of this, the avoidable expenditure worked out by audit was not notional.

3B.11.8 Non replacement of hot moulds

Non replacement of uneconomical moulds used in hot process resulted in avoidable loss of Rs.40.53 crore.

In tyre retreading process, the precured process had advantages over hot process in terms of CPKM, process time, susceptibility to punctures, workload for tyre fitters and payments of incentives. The Corporation had 30 full circle moulds processes and the production through these moulds varied between 39 and 29 per cent during 1997-2002. Considering the benefits of precured process and disadvantages of hot process, had the existing 30 full circle moulds of hot process been replaced by two tyre capacity bonders at a capital cost of Rs.39.10 lakh, the loss of Rs.40.53 crore due to less kms given by the retreaded tyres obtained from hot process could have been avoided (calculated on the basis of loss of 54,998 lakh kilometers equivalent to 3,16,220 tyres retreaded). Also, the conversion cost of Rs.39.10 lakh could have been recouped within 8 to 9 months (payback period) by way of saving in labour cost.

The Corporation stated (February 2002) that the conversion process was in progress and within four months, precured process production would be 84 *per cent*. The Corporation did not agree to the low pay back period pointed by audit and stated that mere replacement of bonders was not enough and other machinery *viz.* buffer, builder, spreader *etc.*, were also required with bonders. The reply was not tenable as the machinery already existed in each steam-heated plant. The Corporation/Government stated (August/November 2002) that all retreadable tyre casings were not accepted in precured process and weak tyre casings were selected for retreading through the hot process. This had compelled the Corporation to continue the hot process to some extent. The reply was not tenable as the weak casing could be retreaded by using PCTR of low NSD (Non Skid Depth). Further, APSRTC had discontinued the uneconomic hot process long back.

3B.11.9 Inadmissible payment of incentive to the workers / staff of the TRPs

(i) Hot Process

The Corporation fixed 6.13 hours as the standard time for retreading of a tyre by the hot process. Stage-wise break-up of the time so fixed was as follows:

Sr. No.	Stage	Minutes
1.	Inspection	7
2.	Buffing	10
3.	Rasping	20
4.	Trimming	7
5.	Inspection	7
6.	Solutioning and drying	170
7.	Building	20
8.	Curing	120
9.	Final inspection	7
		368 (6.13 hours)

From October 1999, after negotiations with labour unions, the standard man hours were reduced to 5.22 hours. As can be seen from the stage-wise break-up above, two stages that contribute to almost 75 *per cent* of time *i.e.* solutioning, drying and curing did not require any labour component. Despite this, they were included in average man hours which formed the basis for calculation of incentive payment. It was observed in audit that the average time taken was 3.92 hours per tyre *i.e.* 75 *per cent* of the standard fixed (5.22 hours). At TRP, Kolhapur the average manhours achieved was even lower *i.e.* 2.868 hours per tyre which was 55 *per cent* of standard manhours fixed. Thus, the standard manhours fixed were higher than the average time spent on retreading a tyre. A report by Kirloskar Consultants Limited on the working of Dapodi unit (December 1992) had also recommended that the standard manhours be fixed at 3 hours which was less than 50 *per cent* of that fixed by the Corporation.

(ii) Precured process

The Corporation fixed standard man hours (inclusive of drying and curing) as four hours upto September 1999 and thereafter reduced it to 3.74 hours with effect from October 1999. Thereagainst the actual average time taken for Corporation as a whole was 2.65 hours *i.e.* 71 per cent of the standard man hours fixed (3.74 hours). This indicated that the standard man-hours fixed was on the higher side. The performance of Ratnagiri TRP where the average time taken was 2.27 hours confirmed Audit's observation.

Due to fixation of base man hours higher side, the Corporation incurred expenditure of Rs.4.26 crore on payment of inadmissible incentive.

Due to fixing of base man hours on the higher side, the Corporation incurred expenditure of Rs.4.26 crore on payment of inadmissible incentive to staff workers of TRPs. The Corporation stated (August 2002) that the Kirloskar Consultant report was not accepted by the labour unions and the findings could not be implemented unilaterally. However, the Corporation after negotiations with labour unions had reduced standard man hours from 6.13 hours to 5.22 hours in the case of hot process and from 4 hours to 3.74 hours in the case of precured process. The workers were hesitant to accept further reduction of base man hours. Though the Corporation agreed that there was further scope for reducing base man hours, the fact remained that the base man hours already fixed were on the higher side resulting in inadmissible payment of incentive of Rs.4.26 crore. The Government while accepting the views (November 2002) of audit directed the Corporation to take decision on recommendations of Kirloskar Consultant Limited immediately.

Conclusion

The Mechanical Engineering and Stores and Purchase Departments had a vital role in the finalisation of contracts for procurement of materials. However, Tender and Stores Committee allocated the business by neglecting their advice, without recording any reasons. The quality control system of the Corporation was also not effective and as a result thereof, sub-standard material was utilised in tyre retreading. The consumption of tyres, tubes and flaps was much higher in the Corporation in comparison to other State Road Transport Undertakings. The Corporation had not fixed any norms for material usage, process loss, energy and fuel consumption *etc.*, for Tyre Retreading Plants. Consequently, inefficiencies remained hidden and could not be controlled properly. In the absence of proper control, the possibility of pilferage could also not be ruled out. Large amount of incentives was paid to the Tyre Retreading Plant workers/staff due to fixation of base man hours on the higher side.

Thus, there was a need for transparent functioning of Tender and Stores Committee with proper and valid documented reasons for its decision. Stores and Purchase Committee has to be a technical/ professional body whereas in the Corporation it was dominated by non-professionals including politicians. The quality control system needs to be streamlined in order to improve the speed and efficiency of its functioning. Fixation of norms for performance and consumption of tyre retreading materials, energy, replacement of hot process of retreading by precured process and rationalisation of incentive payments to the workers of tyre retreading plant merit urgent action.