

MINISTRY OF DEFENCE

CHAPTER III

Bharat Earth Movers Limited

Performance of Engine Division

Highlights

Despite availability of in-house capacity, Bharat Earth Movers Limited (Company) resorted to manufacture of equipment with engines of other make.

(Para 3.7.1.1)

The Engine Division (Division) could utilise only a maximum of 42 *per cent* of installed capacity for captive requirements indicating that there had been an unrealistic forecast of the demand for engines at the project.

(Para 3.7.1.1)

Though the annual production targets ranged between 15 and 57 *per cent* of the installed capacity, the Division could not achieve the target in 2003-04 and 2005-06 when the shortfall was 23 and 27 *per cent* respectively.

(Para 3.7.1.1)

The Company could not recover even the material cost in 9 out of 20 models of engines produced during 2005-06. The excess cost worked out to Rs.2.09 crore.

(Para 3.7.2.2)

The Division placed purchase orders based on single tender. Such orders accounted for between 30 and 59 *per cent* of the total value of purchase orders placed during the period of review.

(Para 3.7.3.3)

Diversification efforts made to manufacture and sell the Company's engines for use in Diesel Generator sets were not successful resulting in loss of Rs.2.49 crore; besides, the Company was left holding an inventory of finished stock of Rs.3.14 crore.

(Para 3.7.4.1)

Another diversification effort made to use the Company's engines in compressor application was also not successful.

(Para 3.7.4.2)

Gist of Recommendations

- The Division should increase the production of engines by planning use of more and more Company's engines for captive consumption, so as to achieve economies of scale.

- The Division should explore the possibility of supply of the Company's engines to new applications and improve the capacity utilisation of engine plant.
- Development of alternative supply sources should be expedited so as to obtain competitive prices in procuring raw materials and components.
- The Company should evolve clear guidelines for dealing with private customers so as to safeguard the interests of the Company.

3.1. Introduction

In order to meet the requirement of engines for the production of Earth Moving (EM) equipment, the Government had accorded approval in 1988 for the establishment of facilities for the manufacture of engines at the Mysore Complex of Bharat Earth Movers Limited (Company). The project was conceived with technical collaboration of Komatsu Limited, Japan. The first phase of the project was commissioned in April 1991 and second phase (with establishment of Flexible Manufacture System) in March 1998. The gross block (Fixed Assets) of the project as on 31 March 2006 stood at Rs.72.44 crore and the net block at Rs.16.81 crore. The project envisaged manufacture of 2400 engines in the sixth year of commencement of production.

3.2. Organisation

The Engine Division of the Company is headed by a Chief General Manager, who reports to Director (Production). The General Managers and other sub-ordinate officers assist them.

3.3. Main objectives of the Division

According to the Project Report (1983), the Engine Division was set up to satisfy the demand for captive consumption and to overcome customers' dissatisfaction with engines being used in the Company's equipment due to:

- (i) Poor engine quality resulting in high down time of the Company's equipment;
- (ii) Poor performance, reliability and life of engines;
- (iii) Non-availability of engine spare parts in time;
- (iv) Poor after sales service of engines;
- (v) Diversity in product line, such as diesel engine sets, compressors etc.

3.4. Scope of Audit

The Performance audit of Engine Division of the Company covered the period from 2000-01 to 2005-06.

3.5. Audit objective

The Audit objectives were to ascertain the extent to which the envisaged objectives of the Engine Division were achieved.

3.6. Audit methodology and acknowledgement

In preparing this report, Audit followed mixed audit methodology viz. audit requisitions, questionnaire, audit enquiries, discussion with the Division heads and other officers and analysed Board agenda and minutes, project report for setting up of the Division, perspective plan and annual production plans, budgets, manuals, cost audit reports and

customers' information and competitor's information as available with the Company/Division. Entry and exit conference were also held with the Management. Audit acknowledges the cooperation and assistance extended by all the levels of Management at various stages for completion of the Performance audit.

3.7. Audit findings

3.7.1 Capacity utilisation and production performance

The original project report had prescribed the production capacity of the plant as 2400 engines (4 bore sizes) per year with man power of 1500 and with the plant working in three shifts. The manpower strength of the Division as on 31 March 2006 stood at 263 (101 officers, 88 direct employees and 74 indirect employees). The Division could not achieve the envisaged capacity. The average engine production per year during the period 2000-01 to 2005-06 stood at only 356 engines. Reasons for the underutilisation of capacity and related issues are detailed below.

3.7.1.1 Production performance

(a) According to the project report, the Engine Division was expected to manufacture 2400 engines of varying bore size category per year. Actual production against the envisaged capacity was as follows:

(In nos.)

Bore size in mm	Envisaged no. of engines as per project report	Actual no. of engines manufactured per year					
		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
105	475	67	85	55	64	214	279
125	585	14	42	37	96	80	80
140	135	36	37	26	41	50	66
170	1150	98	106	99	130	137	200
170-V	55	-	-	-	-	-	-
Total:	2400	215	270	217	331	481	625

However, since the machining facility for cylinder blocks was not enhanced beyond 1500, the installed capacity has been adopted as 1500 engines per year. Percentage of utilisation against the installed capacity, targets of production and actual production of engines in the Division during 2000-01 to 2005-06 were as follows:

(in Nos.)

Year	Installed capacity	Production on targets	Actual production	Percentage of utilisation		
				Target against installed capacity	Actual production against installed capacity	Actual production against target
2000-01	1500	229	215	15	14	94
2001-02	1500	275	270	18	18	98
2002-03	1500	223	217	15	14	97
2003-04	1500	429	331	29	22	77
2004-05	1500	509	481	34	32	94
2005-06	1500	859	625	57	42	73

As could be seen from the above, from 2003-04 onwards there was some improvement in the number of engines manufactured. In all the years even though the targets fixed were very low compared to the installed capacity, the Division could not achieve the targets.

In terms of installed capacity of the Engine Division, the utilisation ranged from 14 *per cent* in 2000-01 to 42 *per cent* in 2005-06. The Management attributed the underutilisation to low demand of engines for captive requirement as compared to the projections made in the Project Report. While establishing the manufacturing facilities (including 2nd phase), projection of the year-wise captive requirement of engines varied from 1211 in 1993-94 to 2650 in 1997-98. As against this projection, the actual demand was very low. This suggested that the demand projections in the project report had been unduly inflated.

The Management stated (November 2006) that based on the existing facilities, they had themselves re-assessed the capacity of the Division and determined its installed capacity as 1100 equivalent engines of 140 mm bore size. The engines manufactured were presently only for captive consumption in Earth Moving (EM) equipment and hence full production level was not planned till date. Further, it was stated that as certain EM equipment viz. dumpers were originally engineered with Cummins engines, the re-engineering of the same with the Company's engine took some time and production could not be achieved to the level of available capacity. During 2006-07, the Company proposed to manufacture 1000 engines.

The reply is not tenable since the revised capacity of 1100 engines determined in October 2006, was yet to be approved by Board/Administrative Ministry. The project report as approved by the Government was for the capacity to manufacture 2400 engines. The cost audit report as accepted by the Board of Directors also indicated the installed capacity of the Engine Division as 2400 engines.

(b) The Company did not utilise its engines in all its equipment manufacture resulting in under utilisation of the manufacturing capacity of engines. The Company had been purchasing Cummins engines and utilising the same for manufacture of equipment. Details of engines manufactured and utilised in EM equipment were as follows:

Year	Equipment manufactured (KGF and Mysore) (Nos.)	Equipment fitted with Cummins and other engines (Nos.)	Percentage of equipment fitted with Cummins and other engines	Equipment fitted with the Company's engines (Nos.)	Percentage of equipment fitted with the Company's engines
2000-01	652	454	70	198	30
2001-02	838	633	76	205	24
2002-03	1119	955	85	164	15
2003-04	1610	1376	85	234	15
2004-05	851	418	49	433	51
2005-06	995	581	58	414	42

Except in 2004-05 the number of equipment fitted with the Company's engine was less than 50 *per cent* of the total number of equipment manufactured. In spite of the availability of capacity in the Engine Division, the Company did not use its engines in all its equipment manufactured. An audit analysis in this regard revealed that fitting of the Company's engines in the equipment supplied to the major customers viz. Coal India Limited and its subsidiaries ranged between 15 and 45 *per cent* only. Details were as below:

Year	Total no. of equipment ordered during the year by CIL and its subsidiaries	Equipment fitted with the Company's engines (Nos.)	Percentage of equipment fitted with the Company's engines	Equipment fitted with Cummins engines (Nos.)	Percentage of equipment fitted with Cummins engines
2000-01	166	75	45	91	55
2001-02	81	12	15	69	85
2002-03	230	92	40	138	60
2003-04	154	46	30	108	70
2004-05	235	97	41	138	59
2005-06	503	186	37	317	63

The Management stated (November 2006) that the customer had the discretion to specify the engines to be fitted into EM equipment. Further, the engines manufactured by Engines Division were not compatible for use in some models of EM equipment manufactured and that if Engine Division started production of engines of required range, utilisation would improve. However, feedback from Coal India Limited and its subsidiaries revealed that it was the Company which was offering a competitor brand viz. Cummins engines as an alternative in preference to their own product thereby defeating the aim of establishment of Engine Division to cater to the captive consumption for its equipment.

Further, as could be seen from the table below, the expenditure on warranty showed a decreasing trend even though the number of engines sold had gone up, which suggested qualitatively better performance of engines manufactured by the Company and used in their equipment.

The warranty expenditure incurred by the Division was as follows:

Year	Engines sold (units)	Cost of warranty (Rs. in crore)	Cost of production (Rs. in crore)	Percentage of total warranty to cost of production.
2001-02	270	1.49	33.34	4.48
2002-03	217	1.11	31.32	3.55
2003-04	272	0.31	33.01	0.92
2004-05	470	0.31	42.21	0.73
2005-06	622	0.47	48.60	0.98

In addition, the customers' feed back on the engine performance analysis assessed through customer satisfaction survey had rated the Company's engines between seven and nine on a rating scale of one to ten during 2003-04 and 2004-05. From this, it could be concluded that the Company's engines were of a quality acceptable to users. Accordingly, the Management should have modified/upgraded upon their engines to suit the equipment being manufactured and avoided underutilisation of available capacity.

Recommendations

- The Division should increase the production of engines by planning use of more and more Company's engines for captive consumption (instead of using purchased engines) so as to achieve economies of scale.
- The Division should explore supply of the Company's engines to new applications to improve the capacity utilisation of engine plant.
- The Division should follow up with customers for replacement of existing engines with the Company's engines at the time of re-powering of earth moving equipment at site.

3.7.1.2 Machine utilisation

25 high cost machines were being used in the manufacture of engines. Besides assembly and testing facilities, the machine groups/operations involved were (1) Camshaft Line operations (2) Connecting Rod Line operations (3) Flywheel Housing Line operations (4) Cylinder Head Line Operations (5) Cylinder Block Line operations. The machine utilisation for the last five years period was as follows:

Year	Planned hours	Utilised hours	Percentage utilisation	Shortfall	Percentage of shortfall
2001-02	87243	68273	78.26	18970	21.74
2002-03	102060	76885	75.33	25175	24.67
2003-04	94299	77197	81.86	17103	18.14
2004-05	83046	66966	80.64	16080	19.36
2005-06	87011	75408	86.66	11603	13.34

The Division worked on single shift and the planned hours were not in line with the installed capacity. The reasons advanced by the Management for the unutilised planned hours were:

Year	No operator (hours)	Breakdown (hours)	Other reasons (hours)	Total unutilised hours
2001-02	6066	4403	8501	18970
2002-03	6268	7030	11877	25175
2003-04	5036	5072	6695	17103
2004-05	4005	5372	6703	16080
2005-06	3883	5482	2238	11603

The hours lost due to 'breakdown' could have been controlled by taking timely action.

The Management stated (November 2006) that since production had not reached the envisaged capacity, utilisation was low and manpower strength was restricted to current level of production.

Reply is not tenable as the planned machine hours utilisation needed close monitoring to ensure that there was no over absorption of cost due to unutilised planned hours.

3.7.1.3 Labour utilisation

As against 1500 employees proposed at the project report stage, only 263 were on rolls (31 March 2006). The labour and labour overhead was allocated based on the horsepower of engines, as job card system was not in place till October 2004. Effective labour utilisation could not be audited in the absence of job cards for earlier years.

The Management stated (November 2006) that due to low volumes of production, the job cards were not introduced till October 2004. Reply is not acceptable since labour charges would not be allocated properly in the absence of job cards.

3.7.2 Cost method and profitability

3.7.2.1 Batch costing system was in vogue. From the financial year 2001-02 onwards, the cost audit of the Engine Division was being conducted by a Cost Auditor as required under section 233(B) of the Companies Act, 1956. The observations by the Cost Auditor also pointed towards underutilisation of the capacity.

3.7.2.2 The financial results of the Engine Division for the last four years were as below:

(Rs. in crore)

	2002-03	2003-04	2004-05	2005-06
Total income	24.40	31.58	43.58	46.56
Total expenditure	40.37	47.54	52.97	50.97
Profit(+)/loss (-) for the year	(-)15.97	(-)15.96	(-)9.39	(-)4.41

As could be seen from the financial results the Division incurred loss every year. The loss of the Division during the year 2002-03 was Rs.15.97 crore but came down to Rs.4.40 crore in the year 2005-06. The progressive improvement in the financial results could be attributed to increase in the volume of production (217 nos. in 2002-03 to 625 nos. in 2005-06).

The manufacturing cost was higher mainly due to high cost of raw materials and components, underutilisation of installed capacity and low volume of production for captive consumption.

The Management accepted that there was financial loss. The Management, however, claimed that the presence of Engine Division had deterred the competitors from escalating the prices for engines sold by them to the Company in spite of increase in the input cost during this period. This was indicative of a skewed management approach.

The Management further stated (November 2006) that the profitability indicated was based on the transfer price adopted by the Company. The transfer price for the engines produced by the Division was fixed based on prices of comparable models of engines available in the market at that time and pro-rata on Horse Power basis wherever prices were not available and the same was retained since 2000-01. Barring a few equipment like BE 220 where the competition was very severe, majority of the EM equipment were showing positive trend and the Company was able to recover full material cost and labour.

Reply of the Management is not acceptable as transfer price was pegged below material cost in most of the engines produced. As a result the Engine Division could not recover even direct material cost in many models resulting in loss of Rs.2.09 crore. (**Annexure-7**)

3.7.2.3 Even though the Engine Division achieved import substitution by indigenising certain portion of material and components, the material cost could not be brought down significantly as the Division was unable to achieve economies comparable to those of the multinational companies. The Company was not in a position to secure the most economic prices since the quantity of raw material procured was low and production was not commensurate with installed capacity. There was competitive Research and Development (R&D) in EM equipment and the related business being complex needed heavy investments.

The Secretary (DP & S) had informed Audit Board (November 1999) that it had been decided to start a dialogue with leading multinational companies for a strategic alliance in an effort to hive-off engine plant in due course of time. There has been no progress in this direction and the Division continued to incur losses.

The Management stated (November 2006) that even though the representative of the original collaborator of the plant Komatsu inspected the plant there was no positive response.

3.7.3 Cost reduction measures

The Division stated that efforts were being made for reducing the material cost of all the engines either by indigenising imported items or by value engineering. The cost reduction measures taken by the Company like offloading/subcontracting, indigenisation, development of alternate sources, etc. are discussed below.

3.7.3.1 Offloading/subcontracting

The effort of the Company to offload conventional process for cost saving activities related to turning, milling, drilling, boring, tapping, grinding and keyway slotting, etc. The offloading was taken up to reduce the cost of production.

(Rs. in crore)

Year	Total purchases made by Engine Division	Value of offloading orders	Percentage of value of offloading to total purchases
2000-01	20.20	0.74	3.7
2001-02	33.44	1.36	4.1
2002-03	23.95	0.67	2.8
2003-04	27.64	1.34	4.8
2004-05	44.18	1.66	3.8
2005-06	44.66	3.30	7.4

However, it was seen that offloading was less than 10 *per cent* of the total purchases made during the last six years and such outsourcing had also resulted in non-utilisation of available capacity.

The Management stated (November 2006) that as per the original project report the plant was established to manufacture only seven critical components in-house and remaining components were to be procured through offloading. Accordingly the offloading activities were resorted to based on production requirements.

The reply was not tenable since man/machine hours available were not being fully utilised which had a cost implication. In the absence of a clearly articulated policy regarding the work to be offloaded and the targetted cost reduction, such unplanned offloading might result in creating more idle capacity.

3.7.3.2 Indigenisation

The Division had a continuous programme of indigenisation in order to reduce the cost of production/imports. As per the project report prepared at the time of establishment of Engine Division it was stated that 85 *per cent* of the materials/parts would be indigenised from the sixth year of production. The Division claimed to achieve indigenisation levels between 95 and 98 *per cent* as at the end of 2005-06. The year wise achievement of indigenisation and the amount of savings achieved per engine were as below:

(Savings per engine: Rs. in lakh)

Year/ Model	2002-03		2003-04		2004-05		2005-06	
	Per-centage of indige-nisation	Savings per engine	Per-centage of indige-nisation	Savings per engine	Per-centage of indige-nisation	Savings per engine	Per-centage of indige-nisation	Savings per engine
140 series	73.0	--	82.2	2.36	72.3	1.15	96.5	0.04
105 series	74.4	0.46	78.8	1.61	87.2	0.65	98.2	0.20
125 series	72.9	2.06	78.3	--	83.8	0.09	97.8	0.51
170 series	87.1	0.37	92.8	0.20	92.5	0.04	95.4	0.65

The Division had achieved indigenisation ranging from 72.9 *per cent* (2002-03) to 98.2 *per cent* (2005-06).

The Management stated (November 2006) that it had achieved reduction in material cost ranging from 9.38 to 39.40 *per cent*.

The Management would have to further improve upon the reduction in material cost in all the models of engines manufactured, in order to keep pace with the competition.

3.7.3.3 Development of alternate sources

The dependence on single source suppliers for raw materials and components by the Division was high. An audit analysis revealed the following in respect of value of purchases made on single tender basis during the years 2000-01 to 2005-06.

(Rs. in crore)

Year	Total purchases made by Engine Division	Value of purchase made on single tender basis	Percentage of single tender purchases to total purchase
2000-01	20.20	6.20	30.7
2001-02	33.44	10.06	30.1
2002-03	23.95	7.40	31.0
2003-04	27.64	11.95	43.2
2004-05	44.18	18.81	42.6
2005-06	44.66	26.45	59.2

Percentage of purchases made on single tender basis ranged between 30.1 and 59.2 *per cent*. The procurement of materials and components on single tender basis resulted in denial of the benefits of competitive pricing with resultant higher cost.

The Division started developing alternate sources by incurring development cost. The following table gives the details of development charges incurred by the Division during the years 2001-02 to 2005-06.

(Rs. in crore)

Year	No. of development orders placed	Development charges paid
2001-02	16	0.10
2002-03	18	0.11
2003-04	32	0.21
2004-05	48	0.46
2005-06	51	1.75

The Division had made efforts for developing alternate sources in recent years but the benefits of cost effectiveness were yet to be achieved.

The Management stated (November 2006) that because of low volume of components the vendors were reluctant to develop the components according to the Company's standards. Hence the dependence on single source became inevitable. Further it was stated that the benefits of development cost presently being incurred would be reaped in the future by competitive prices from the alternative sources.

The reply of the Management is not acceptable. As envisaged in DPR the target number of engines to be manufactured was 2400 and as the production of engines had shown an increasing trend from 2003-04 onwards the Company should have taken action for development of alternate sources.

Recommendation

- Development of alternative source of supply should be enhanced to get a competitive price in procuring raw materials and components.

3.7.4 Diversification activity

In order to optimise the capacity utilisation and also to normalise the cost of production the Division intended to extend the application of the Company's engines to other products and also to sell them independently as separate aggregate. Accordingly the Division took up the manufacture of engines for diesel generator set applications and K-300 engines for compressor applications to private customers as discussed below.

3.7.4.1 Manufacture of diesel engines for Diesel Generator Sets

As a part of production programme for the year 1998-99, anticipating demand for Gensets, the Company proposed to manufacture 24 Diesel Generator (DG) sets and accordingly procured raw materials required for the purpose. However, the Company could manufacture (1999-2000) only two numbers each of 548 KVA and 358 KVA DG sets at a total cost of Rs.65.57 lakh and Rs.38.82 lakh respectively and finally sell (2000-04) three DG sets (two numbers of 548 KVA and one 358 KVA) for a total value of Rs.46.29 lakh. On account of the Company's inability to market DG sets, the programmed manufacture of 24 DG sets could not be continued and the unsold DG sets (one number) alongwith the raw materials procured for the purpose had to be devalued (2000-03) based on prevailing market prices resulting in a loss of Rs.1.69 crore. Subsequent efforts made by the Company through value engineering and indigenisation did not yield the desired results and thus the Company's plan to enter DG sets market could not materialise (November 2006).

The Company's subsequent effort made in March 2003 to enter into the marketing of DG sets through an agreement with a private firm M/s Jeevan Diesel & Electricals Limited, Bangalore (JDEL) was also not successful and the Company had to incur a loss of Rs.2.49 crore besides huge accumulation of unsold stock valued at Rs.3.14 crore lying with the Division as on 31 March 2006 (after devaluation) on account of non-lifting of diesel engines by JDEL. It was observed in Audit that the Company had taken up (2003-04) the manufacture of 59 diesel engines at a cost of Rs.6.39 crore even before the receipt of any order as required under the terms of the agreement and financial commitment by the firm. Finally, JDEL lifted only three diesel engines (value Rs.1.6 crore) and paid only 20 *per cent* of the sale value. JDEL insisted for conversion of the purchased engines to different ranges and the balance payment of 80 *per cent* had not been received so far (November 2006) pending conversion as required by them.

The Management stated (November 2006) that with a view to finding out suitable distributors who could market engines for DG sets an agreement was entered into with JDEL, for marketing DG engines based on indications given by them, but the same could not materialise as envisaged and JDEL were reluctant to adhere to the agreement. Efforts were being made to persuade JDEL to lift the engines. In case of failure by JDEL to lift,

it was proposed that the engines would be rebuilt for use in other equipment. It was claimed that the development of DG engines may be viewed as a marketing strategy and that the expenditure was product development (R&D) expenditure in anticipation of sales and not wasteful expenditure against the sale contract dishonoured by the party. Further the manufacture of DG engines had been taken up to use the existing capacity and to reduce the financial loss.

However, the fact remains that the manufacture of DG engines on a large scale without any firm commitment from JDEL and continuance of manufacturing without ensuring the delivery/receipt of DG engines by the customer on a regular basis had resulted in an avoidable loss of Rs.2.49 crore besides accumulation of non-moving finished stock valued at Rs.3.14 crore.

3.7.4.2 Manufacture of K-300 engines for use in compressors

The Division took up the manufacture of a prototype diesel engine (K-300) for use in compressor applications at a cost of Rs.13.40 lakh. The engine was sent (May 2004) to Kirloskar Pneumatic Company Limited, Pune (KPCL) for testing on compressor application and the test was successful. In August 2004, the Division took up manufacture of 10 engines for marketing at a cost of Rs.1.1 crore.

The Division delivered one more engine in September 2004 on request by the customer i.e. KPCL without finalizing the commercial terms with the firm. The customer intimated (September 2004) the purchase price of Rs.4.75 lakh at which it was interested in buying the engines along with the terms of delivery as ex-works Pune, with 90 days credit and warranty period of three years or 6500 hours from the date of commissioning. There was no settlement of the commercial terms with the customer. The material cost of the Company's engines itself was Rs.7.34 lakh as against the indicative price of Rs.4.75 lakh. In December 2005, the matter of price was again discussed with the customer and the customer finally agreed to pay Rs.7.5 lakh as a special proto price for the first proto type engine accepted by them.

However, the customer subsequently informed that the market for K-300 compressor had collapsed and there was no demand for this range of compressors. Thus the diversification effort of the Division in marketing engines for compressor application had failed. Manufacturing of products without determining the commercial terms, proper market feed back regarding cost of production and market price led to failure of diversification efforts and blocking of Rs.1.10 crore.

The Management stated (November 2006) that while entering into a new area it may not be always possible to follow a strict pricing policy and market could be penetrated only by taking certain business risks. However, all the K-300 engines had since been converted and used in Earth Moving equipment.

Recommendation

- The Company should evolve clear guidelines for dealing with private customers, particularly in diversification activity, so as to properly regulate such transactions while safeguarding the interest of the Company.

3.7.5 Sale of spares and after sales service

The Company had been earning income from sale of spares. The loss in manufacturing engines at higher cost was expected to be compensated by marketing of spares. The

income earned by the Division through sale of spares during the years 2000-01 to 2005-06 was as follows.

(Rs. in crore)						
Particulars	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Income from spares (Company bought and manufactured)	424.27	412.22	406.65	430.12	533.41	531.51
Income from spares (Engine Division)	6.66	12.65	12.89	9.39	15.67	19.53
Percentage	1.57	3.07	3.17	2.18	2.93	3.67

The Engine Division continued to incur losses in all the years and it could not cover the losses incurred in the sale of engines through the margin in the sale of spares.

The Management stated (November 2006) that the Company was able to generate additional revenue by way of sale of engine spares.

Clearly, the Company has to make special efforts to bring down the cost of manufacture of engines and increase the volume of sale of spares to restrict its losses.

3.8 Conclusion

The installed capacity was created mainly for the captive consumption of engines for in-house production. However, the Company resorted to procuring engines from outside sources and the Division could utilise only upto a maximum of 26 *per cent* of its installed capacity for captive consumption. Economies of scale could not be achieved as the volume of production was low. Efforts to diversify the product-mix did not bear fruit as the Company did not proceed in a regulated manner. The Division had achieved indigenisation of 95.4 *per cent* to 98.2 *per cent* of the parts/materials imported as on 31 March 2006. The Company has to reduce further the material cost of all the models of engines manufactured in order to acquire a price edge over its competitors. Capacity utilisation too needed substantial improvement.

The matter was reported to the Ministry in December 2006; reply was awaited (January 2007).

CHAPTER IV

Hindustan Aeronautics Limited

Outsourcing activities

Highlights

Determination of available in-house capacity, which was vital for deciding quantum of outsourcing, was not realistic and uniform among divisions.

(Para 4.7.1.1)

In-house capacity was not properly utilised before resorting to outsourcing. In spite of increase in the volume of outsourcing there was increase in capital investment in certain divisions and also in manpower.

(Paras 4.7.1 2 and 4.7.2)

The method adopted for working out savings from outsourcing was not uniform.

(Para 4.7.3)

The vendors list was not updated regularly; mandatory documents during registration process were not obtained and orders were placed on unregistered vendors.

(Para 4.7.4.1)

Developed vendors were not nurtured by placing continuous orders. There was dependence on limited sources, orders were placed in excess of the capacity of the vendors. Alternative sources were not developed.

(Para 4.7.4.2)

Repeat orders were being placed on selected vendors in spite of poor performance. The performance of the vendors was not being rated annually as prescribed in the procedure.

(Para 4.7.5)

The policy on outsourcing was not properly defined and the programme objectives were not in line with the policy objectives. A systematic database of the items to be outsourced had not been developed.

(Para 4.7.6.1)

It was noticed that orders were split, repeat orders were placed without entering into any Long Term Agreement (LTA) with vendors and adequate security was not taken for the raw material issued. There were also lacunae in the system of physical verification and reconciliation of material lying with vendors.

(Paras 4.7.6.2 and 4.7.6.3)

Gist of recommendations

- The method of determination of in-house capacity should be recast after taking into account latest technology developments/Computerised Numerically Controlled (CNC) machines.
- Utilisation of in-house capacity should be optimised before resorting to outsourcing and additional investment in manpower and capital should be preceded by exploration of all outsourcing options and the process should be documented.
- The method of working out savings from outsourcing should be formulated/standardised and communicated to the divisions.
- The vendors list should be updated and mandatory documents required for registration of vendors should be obtained. Process of registration of vendors should be streamlined.

- A wider vendor base should be developed to avoid dependence on limited sources. Developed vendors need to be nurtured by placing continuous orders. Import of indigenously established items should be avoided.
- Rating of the vendors should be made based on their performance and incorporated in a databank of vendors to be utilised during subsequent contracts.
- The policy should be revised to specify the target parameters for outsourcing and the period by which the target should be achieved. Guidelines regarding selection of activities to be outsourced should be formulated and communicated to the divisions for uniform implementation.
- The system for placement of purchase orders, issue, receipt and account of material to vendors needs to be streamlined.

The Management generally agreed (November 2006) with the above recommendations.

4.1 Introduction

Outsourcing refers to the delegation of non-core operations of a business to an external entity specialising in the management of that operation. The decision to outsource is often made by a business in the interest of lowering costs and redirecting its resources towards its core competencies. Hindustan Aeronautics Limited (the Company) has been outsourcing components, tools and assemblies since 1980. However, a major thrust to outsourcing was given from 2002-03 by formulating (April 2002/March 2003) the procedures and systems for outsourcing. The Company had outsourced works amounting to Rs.625.61 crore during 2002-03 to 2005-06 which worked out to 3.72 *per cent* of the turnover of Rs.16795 crore.

4.2 Scope of Audit

A Performance audit was taken up to review the outsourcing activities in the Company during the period 2002-03 to 2005-06. Out of 16 production divisions, nine divisions, viz. Aircraft, Helicopter, Engine and Foundry & Forge Divisions at Bangalore, Aircraft Division Nasik, Avionics Division Hyderabad, Koraput Division, Lucknow Division and the Corporate Office, Bangalore were selected based on their volume of outsourcing activities and geographical locations.

4.3 Audit criteria

The following criteria were adopted for assessing the performance of outsourcing activities:

- (i) Policies and guidelines issued by the Company;
- (ii) Annual production plans and achievements there against;
- (iii) Quality inspection procedures and monitoring mechanism;
- (iv) Contracts entered with vendors for outsourcing.

4.4 Audit objectives

- (i) To examine whether the policy and programme objectives were well defined and adequate;
- (ii) To examine the procedure for selection of vendors and vendor rating;

- (iii) To examine whether outsourcing was resorted to after properly utilising in-house capacity;
- (iv) To examine whether the increased activities of the Company were met through outsourcing without increasing the manpower and capital investments;
- (v) To examine whether outsourcing resulted in any cost benefit;
- (vi) To examine whether the outsourcing targets were achieved.

4.5 Outsourcing by the Company

The main objectives of outsourcing by the Company were:

- (i) To meet the increased activities without increasing the man-power;
- (ii) To outsource a large number of medium and low-tech components/activities after ensuring full utilisation of available infrastructure, thus limiting the investment in infrastructure and man power;
- (iii) Cost Reduction.

The outsourcing policy of the Company was:

- (i) to outsource components and major assemblies to industries in private/public sector, having necessary infrastructure and capability and to extend all assistance to such industries to absorb the technologies and quality standards required in the aeronautical industry;
- (ii) to progressively increase the content of outsourcing to 25 *per cent* of the turnover;
- (iii) to supply material to the vendors in view of non-availability of raw-material easily or of specified quality; the vendor would be required to provide an indemnity bond and take insurance for the material.

4.6 Audit methodology and acknowledgement

Data collection and evidence gathering were based on the review of records at the Corporate Office and the divisions selected for Performance audit, using sampling techniques, meetings/discussions with the Management and issue of audit requisitions/audit enquiries. Entry and exit conference were also held with the Management. Audit acknowledges the cooperation and assistance extended by all the levels of management at various stages for completion of the Performance audit.

4.7 Audit findings

4.7.1 Capacity determination and utilisation

4.7.1.1 Capacity assessment/determination

The Company considered the excess workload over the available capacity in terms of the Standard Man Hours (SMH) as the deficit capacity and the same was planned for outsourcing. A Committee was constituted (December 2003) to formulate the basic principles, assumptions and methodology for working out the Man Hour Rate (MHR) for various types of jobs outsourced by all the divisions in the Bangalore Complex. The report of the Committee indicated the rates for milling, drilling, grinding, etc. for both conventional and Computer Numerically Controlled (CNC) machines and recommended

that part-wise SMH should be determined and database created for use as a ready reference. The following deficiencies were noticed in calculating the in-house capacity:

- (i) The part-wise SMH and database had not been determined and maintained so far as recommended by the Committee. Part-wise SMH indicated in the Engineering Data Master (EDM) based on Rationalised Elemental Time Standards (RETS) prepared in 1960s on conventional machines were not revised keeping in view the large number of CNC machines in operation. Due to these deficiencies in the calculation of available in-house capacity, actual output in terms of SMH in the Engine Division exceeded the assessed capacity by 3.68 lakh hours in 2002-03, 2.81 lakh hours in 2003-04 and 0.10 lakh hours during 2004-05. The Engine Division stated that the RETS was developed and released by the Corporate Office many decades ago and the revision of RETS was being referred to Corporate Office.
- (ii) While working out the available capacity, machine capacity was not considered although norms were fixed for high value machines and CNC machines. This indicated that the divisions under assessed their in-house capacity.
- (iii) As per the Corporate Office guidelines for calculating capacity per direct labour per year (DL/PY) from 2000-01 onwards, the available capacity per SMH/DL/PY was considered to be 2250 hours.

The Engine Division had considered the available capacity at 1800 hours per SMH/DL/PY during 2002-03 to 2003-04 against the norms of 2250 hours and the Nasik Division assessed the capacity of five shops by adopting 140 to 150 SMH/DL per month against the Corporate Office norms of 187.5 SMH/DL/PM which resulted in understatement of in-house capacity and consequent higher outsourcing.

Recommendation

- The method of determination of in-house capacity should be recast after taking into account latest technological developments and CNC machines.

The Management noted (November 2006) the need for a common guideline for determining the available capacity and agreed to issue suitable guidelines for determination of in-house capacity to ensure uniformity in practice.

4.7.1.2 Utilisation of in-house capacity

Underutilisation of in-house capacity in terms of SMH and simultaneous outsourcing of works were noticed in the following cases:

- (i) In the Engine Division, against the in-house tooling capacity of 74880, 60480 and 86625 hours, capacity planned for in-house manufacturing was only 63350, 54900 and 85979 hours during the year 2002-03 to 2004-05. In spite of available capacity, outsourcing was resorted to which was avoidable.
- (ii) The Aircraft Division had resorted to outsourcing in respect of tooling during 2002-03 to 2005-06 though in-house capacity of 4.15 lakh hours was available. This resulted in extra expenditure of Rs.16.60 crore considering an average MHR of Rs.400 per hour.
- (iii) The Foundry and Forge Division had planned outsourcing of 50000 hours during 2004-05 for rough machining of castings and forgings in respect of Advanced

Light Helicopter (ALH) and Light Combat Aircraft (LCA) projects though the Division had 53156 unutilised machine hours. Considering the composite rate of Rs.72 per hour, the outsourcing cost of Rs.36 lakh was avoidable.

The Management stated (November 2006) that outsourcing was resorted to despite availability of machine capacity due to non-availability of right operators.

Recommendation

- Measures to ensure optimum utilisation of the in-house capacity should be put in place. Utilisation of in-house capacity should be ensured before resorting to outsourcing.

The Management agreed (November 2006) with the recommendation and stated that the available capacity would be kept in mind.

4.7.2 Manpower and capital investment

The objective of the Company was to meet customer expectations through outsourcing without resorting to increase in manpower thereby limiting the investment in manpower and infrastructure. However, the following deficiencies were noticed in this regard:

- (i) The Aircraft Division recruited 283 labour during 2002-03 to 2005-06 apart from employing contract labour.
- (ii) The strength of direct labour in the Helicopter Division was increased from 705 in 2003-04 to 847 in 2005-06.
- (iii) Manpower of the Engine Division came down from 1710 in 2002-03 to 1543 in 2005-06. There was reduction in manpower of 167 due to natural causes. However, contract labour continued to be employed during 2002-03 to 2005-06.
- (iv) Capital investment on major projects being implemented by the Company namely, LCA, Intermediate Jet Trainer (IJT), etc. were funded by the customers. In spite of this, additions to plant and machinery by 188.72 *per cent* were made from 2003-04 to 2005-06. At the same time outsourcing activities also increased from Rs.63 crore in 2002-03 to Rs.282 crore in 2005-06.

Thus, in spite of increase in the volume of outsourcing there was increase in capital investment and also in manpower.

The Management stated (November 2006) that increase in manpower had no direct bearing on increase in outsourcing and that instructions would be issued to examine and assess whether a job could be outsourced instead of acquiring new facility at the time of projecting the capital facility requirements.

Recommendation

- Additional investment in manpower and capital should be preceded by exploration of outsourcing options and the process should be documented.

4.7.3 Cost benefit analysis

The method for calculation of savings out of outsourcing was not indicated in the procedure for uniform adoption by the divisions. The savings should be the difference between the actual in-house cost and the actual cost of outsourcing. The following deficiencies were noticed during audit in this regard:

- (i) The Engine Division had not worked out the actual conversion cost for sub-contracted items. Instead, savings were worked out by adopting a uniform Man Hour Rate (MHR) of Rs.200. The shop-wise MHR was not worked out for comparing the in-house cost and cost of outsourcing. Hence, working out of saving was not realistic. In addition, sample check of 62 purchase orders revealed that in-house cost estimated was lower than outsourcing cost involving extra expenditure of Rs.35.76 lakh. In respect of 36 items, in-house cost was not estimated at all before finalising the purchase orders.
- (ii) In the Aircraft and Lucknow Divisions the savings due to outsourcing were worked out as the difference between the value of purchase orders placed during the year and the MHR of the division which did not indicate the correct position. Engine Division stated that there was no system prevailing to work out machine-wise/shop-wise MHR and no specific guidelines existed to work out the savings. Hence composite MHR was considered for arriving at the savings. Further, it was stated that implementation of Enterprise Resource Planning (ERP) would improve the system.

The method adopted for working out savings from outsourcing was not uniform. In the absence of a standard method of working out the benefits of outsourcing, it was not possible to categorically conclude that outsourcing activities had resulted in cost reduction.

Recommendation

- The method for working out savings from outsourcing should be clearly formulated and standardised and communicated to the divisions.

The Management noted (November 2006) the need for uniformity in the method of working out the savings and agreed to issue suitable guidelines to adopt a uniform practice for the purpose.

4.7.4 Registration and selection of vendors

4.7.4.1 Registration of vendors

As per the extant procedure, the applications of vendors received by the division for registration were to be evaluated by a committee and the committee was required to visit the vendors' works for assessment of technical and financial capabilities before their selection. The divisions were expected to maintain a directory of approved vendors category-wise and also exchange the same with other divisions. However, the following deficiencies were noticed in this regard:

- (i) The Engine Division had not updated the vendor directory, finalised in the year 2002-03 based on the performance of the vendors. It had been updated upto 2004-05 in the Aircraft and Helicopter Divisions.
- (ii) Sample check of nine major vendors of the Engine Division revealed that documents like income tax returns, income tax and sales tax clearance certificates for three years, financial statements, details of experience, certificate of incorporation, etc. required to be produced by the vendors were not obtained while registering these vendors. It was also noticed that purchase orders were placed on 13 vendors who were not registered at all.

- (iii) The Koraput Division received eight applications in 2002-03 and nine applications in 2003-04 for registration of vendors for tooling. The officials of the Division had not visited the premises of the vendors so far (August 2006) to finalise the registration.

Recommendations

- The vendor list should be updated and mandatory documents required for registration of vendor should be obtained. The process of registration of vendors should be streamlined.

The Management stated (November 2006) that capacity and credentials of the vendors were considered before placing orders though registration was not carried out and agreed to issue instructions for regular updation of the directory of vendors.

4.7.4.2 Selection of vendors

The procedures for subcontracting provided for selection of 5 to 10 vendors for each category of tools/components to ensure availability of good vendor base and as per the policy the capacity and infrastructure of the vendor were to be assessed before placing order. Further, the guidelines (May 1999) on indigenisation of imported material emphasized that having developed indigenous sources, efforts should be made to sustain and ensure growth of these sources. However, the following deficiencies were noticed in the selection of vendors.

- (i) Against 112 vendors available in the Engine Division, a limited group of 27 vendors supplied 1051 items in 2003-04, 343 items in 2004-05 and 998 items in 2005-06.
- (ii) During 2002-06, 3213 purchase orders valued at Rs.43.18 crore were placed by Aircraft Division on 331 vendors.
- (iii) The Helicopter Division placed orders valued at Rs six crore only on one firm during past 10 years (1996 to 2006) in respect of certain long cycle items like input housing and mast beaming under ALH project. However, no effort was made to develop an alternative source.
- (iv) The Foundry and Forge Division was dependent on only one vendor although alternative sources were available for polishing stator blades thereby denying itself the benefit of competitive bidding.
- (v) Sample check of two projects in the Engine Division, revealed that the Division had incurred extra expenditure of Rs.1.04 crore on import of 25 items for which indigenous sources had been developed. The reply that import was resorted to at the instance of customer and that the differential cost between the Company fabricated item and the imported item was reimbursed by the customer was not proper.
- (vi) The Helicopter Division developed (December 2002/January 2004) two indigenous sources for machining and fabrication of pitch horn required for the ALH project. In December 2004, the Division placed order for 40 pitch horns on a foreign firm and the balance requirement of 52 pitch horns was ordered on

indigenous firms. Placement of order on the foreign firm in spite of the availability of indigenous sources resulted in extra expenditure of Rs.17.62 lakh.

- (vii) The capacity available and agreed was not indicated in the vendor directory for reference while placing orders. During the period January 2005 to January 2006, the Helicopter Division placed 150 purchase orders valued at Rs.9.55 crore on four vendors though the actual SMH available with these vendors were valued at Rs.4.78 crore thereby resulting in placement of excess orders valued at Rs.4.77 crore. The vendors had not executed orders valued at Rs 3.97 crore so far.

Recommendations

- A wider vendor base should be developed to avoid dependence on limited sources. Developed vendors need to be nurtured by placing continuous orders. Import of indigenously established items should be avoided.

The Management stated (November 2006) that guidelines would be issued to nurture vendors for items involving high development cost.

4.7.5 Performance of vendors and control over product quality

According to the monitoring procedure the divisions were required to continuously monitor the performance of each party in respect of quality, delivery, price, etc. and corrective action/termination was to be advised wherever required. Persistent failure in timely delivery/quality compliance would entail cancellation of registration. The registered vendors were required to be evaluated by the Performance Evaluation Committee and rated at least once in a year. However, the following deficiencies were noticed in this regard:

Sample check of data of five major vendors in the Engine Division showed shortfall/delay in supply of 104 items against 117 items during the period July 2000 to January 2006. Similarly in the Aircraft Division, there was delay of 90 to 1852 days in supply of 1169 orders during 2003-04 to 2005-06. However, subsequent orders continued to be placed on them despite their poor performance.

In the Engine Division, on a review of the performance of Prathiba Industries, it was noticed that out of 3027 items outsourced by the Division during 2003-04 to 2005-06, purchase orders for as many as 688 items were placed on the vendor. However, only 29 *per cent* were supplied in 2003-04, 41 *per cent* in 2004-05 and 2 *per cent* in 2005-06.

Out of 2479 items outsourced during 2003-04 to 2005-06 by the Engine Division, 633 items were rejected and the percentage of rejection was 26 *per cent*. On an analysis of the supplies made by the vendors, high rejections of almost 100 *per cent* were noticed in 34 cases as the raw material used by the vendor was not as per the required specifications.

The Management stated (November 2006) that vendor rating would be reinforced on an annual basis. In the specific cases noted by audit, the supplied items were rejected as the raw material used by the subcontractor was not as per the specifications. In case of material issued by the Company, a quality control on usage was maintained.

The reply was not acceptable as quality control should be exercised not only on the raw material issued by the Company but also on the raw material used by the vendor to ensure product quality and timely supplies.

Recommendations

- The divisions need to ensure that the raw material used by the vendor meets the required specifications. Corrective action should be taken to reduce the rejections. Performance of the vendors should be rated based on past performance and databank of good vendors should be maintained.

4.7.6 Implementation, monitoring and evaluation

4.7.6.1 Achievement of targets

According to the Chairman's statement in the Annual Report of the Company for the year 2001-02, outsourcing target was based on turnover and as per the outsourcing policy, outsourced turnover of 25 per cent was to be achieved progressively. However, the roadmap for achieving the target was not defined in the policy. In the absence of specific instructions, workload in SMH was considered as the parameter for outsourcing in all the divisions. Further, the policy was silent about the period by which 25 per cent of total turnover was to be progressively achieved.

The percentage of outsourcing to turnover during 2002-03 to 2005-06 was only 2.01, 2.6, 4.01 and 5.28 per cent respectively as indicated below:

Year	Turnover Rs. in crore	Target to be achieved (25 per cent) Rs. in crore	Actual outsourcing/ achievement Rs. in crore	Percentage of achievement to turnover
2002-03	3120.42	780.10	62.87	2.01
2003-04	3799.78	949.94	98.70	2.6
2004-05	4533.79	1133.45	181.90	4.01
2005-06	5341.50	1335.37	282.14	5.28
Total	16795.49		625.61	

Considering the workload in terms of SMH, outsourcing achieved was 16.6, 21.9 and 26 per cent during the years 2002-03 to 2004-05 respectively as under:

(SMH in lakh)

Year	Total workload in SMH	In-house output in SMH	Workload outsourced in SMH	Percentage of outsourcing to total workload
2002-03	277.39	231.48	45.91	16.6
2003-04	316.28	246.98	69.30	21.9
2004-05	350.30	259.05	91.25	26
2005-06	To be furnished		131.80	

The actual outsourcing planned was less than 25 per cent of the workload during 2002-03 to 2004-05 in the Engine and Lucknow Divisions and in 2002-03 to 2003-04 in the Aircraft and Hyderabad Divisions. The Engine Division and the Aircraft Division could not achieve planned outsourcing during 2002-03 to 2004-05 and 2002-03 to 2003-04 respectively. The Helicopter Division exceeded the outsourcing targets in all the years. The following points were noticed:

- Outsourcing was to be resorted to in case of non-core operations like medium and low-tech items/activities. However, items had not been identified and documented as low-tech, medium-tech or high-tech and there was no such database in the Company. Full responsibility for identification and execution had been left to the discretion of the divisions.

- (ii) The value of actual outsourcing achieved was based on the value of purchase orders issued as stated by the Company. But this was not correct as supplies were received in subsequent years also. In the Aircraft Division, the value of outsourced work completed during 2004-05 to 2005-06 was only Rs.22.45 crore against the order value of Rs.28.75 crore during those years.

Thus, there was shortfall in the achievement of outsourcing targets in terms of turnover at all the divisions and in the Company as a whole. The policy was not properly defined and the programme objectives were not in line with the policy objectives. Although the outsourcing policy was framed in 2002-03, a systematic identification of the items to be outsourced had not been made.

Recommendations

- Efforts are to be made for fixing realistic targets as per outsourcing policy. The policy should be refined to specify the period by which the target was to be achieved and guidelines regarding selection of activities to be outsourced should be formulated and communicated to the divisions for uniform implementation.

4.7.6.2 Placement of purchase orders

According to the procedure for placement of purchase orders, a Long Term Agreement (LTA) would be entered into after approval of the initial order and repeat orders would be placed on the basis of the LTA. The following deficiencies were noticed in the placement of orders:

- (i) The Aircraft Division placed 774 repeat orders valued at Rs.6.42 crore for same items on 55 vendors during 2002-03 to 2005-06. However, long term agreements were not entered into to avail of quantity discounts.
- (ii) Data analysis of 1295 purchase orders in the Engine Division for the period 2002-03 to 2005-06 indicated delay in conversion of Material Purchase Request (MPR) to purchase orders from 91 to 360 days in respect of 428 purchase orders. Similarly out of 3123 purchase orders analysed in the Aircraft Division for the period 2002-03 to 2005-06, delay beyond 91 days in conversion of MPRs to purchase orders was noticed in 1228 cases.
- (iii) As per the delegation of powers, General Managers/Executive Directors were authorized to approve placement of orders upto Rs.10 lakh in each case. Splitting up of orders was noticed in the Helicopter Division in 112 cases valued at Rs.10.78 crore. Orders worth Rs.4.79 crore and Rs.2.64 crore were placed on two vendors during 2001-02 to 2005-06, none of these orders being for more than Rs.10 lakh. The orders were split up and placed on the same day or within the same month.
- (iv) Sample check of 20 rate contracts valued at Rs.six crore entered into by the Helicopter Division during 2003-04 revealed that 12 contracts valued at Rs.4.44 crore were being renewed every year since 1998-99 without any kind of review of the terms and conditions of the contracts.

Recommendations

- The system of placement of purchase orders needs to be streamlined to avoid delays in conversion of MPRs to purchase orders, splitting of orders to circumvent delegation of power and periodic review of contracted terms and conditions.

The Management agreed with the recommendations.

4.7.6.3 Issue and accountal of raw material

As per the procedure for sub-contracting, raw material was to be supplied to the vendors against furnishing indemnity bond, bank guarantee and comprehensive insurance policy covering the cost of material. The value of raw material lying with the vendors as at the end of each of the last four years ended on 31 March 2006 was as indicated below:

(Rs. in crore)

Year ended	Value of inventory lying with vendors
31 March 2003	6.65
31 March 2004	9.22
31 March 2005	11.46
31 March 2006	68.16

The following deficiencies in issue, receipt and accountal of raw material were noticed:

Deficiencies in obtaining security

- (i) In many cases, purchase orders issued did not indicate the cost of raw material to be issued to the vendors or the value was indicated as Re.one. It was stated that wherever the raw material purchase details were not available, the raw material value was indicated as Re.one. Due to this, security by way of bank guarantee/indemnity bond against raw material issued was not obtained or was inadequate. On a sample check of 5907 items ordered by the Engine Division during 2000-2001 to 2005-06, it was observed that 2396 items did not indicate raw material cost and indemnity bonds against raw material issued were not obtained from the vendors.
- (ii) Cost of material to be issued to the vendors was not indicated in the purchase orders to facilitate issue of indemnity bond. Bank guarantee obtained was for maximum amount of Rs.40000 though the material lying with certain vendors ranged between Rs.11 lakh to Rs.44 lakh under the Lucknow Division.
- (iii) A review of raw material issued and bank guarantee obtained by the Aircraft Division in respect of nine vendors revealed that during the period 2002-03 to 2005-06, the bank guarantee obtained was not revised leaving raw material valued at Rs.6.97 crore uncovered.
- (iv) Bank guarantee had not been obtained from any vendor in the Foundry and Forge Division. Review of raw material issued to 15 vendors in the Helicopter Division for fabrication of titanium materials revealed that the security obtained by way of indemnity bond and insurance was much below the value of material lying with vendors in seven cases.

- (v) The Engine and the Koraput Division had not ensured obtaining of comprehensive insurance policy by the vendors against the material issued.

Other deficiencies

- (i) Premises of vendors were required to be visited by the Company officials to verify the quality of storage and material lying with vendors. No documentary evidence was available in the Engine Division for such visits; which was confirmed by the Management (June/August 2006).
- (ii) Age-wise/year-wise/vendor-wise data regarding raw material lying with vendors were not maintained for follow-up and monitoring. On verification (sample of five major vendors) of raw material held as on 31 March 2006 in the Engine Division, it was observed that the value of raw material held which amounted to Rs.30.35 lakh was not confirmed or reconciled. Similarly, in the Helicopter Division, the material lying with vendors was not being confirmed by the vendors or reconciled with the books of the Division.
- (iii) On inspection of the material supplied by vendor, the same was accepted, rejected or sent for rework. The cost of rejected material was to be recovered at the prevailing market rate from the customer. However, raw material cost was not recovered till date.
- (iv) Review of 173 purchase orders of the Aircraft Division revealed that raw material was issued after the scheduled date of delivery of the finished material and the delay noticed was upto 1005 days. Sample check of 500 purchase orders under the Helicopter Division revealed delays of four to nine months in issue of material in respect of 497 purchase orders. Delay in issue of material ranging from 3 to 15 months from the date of purchase orders was noticed in the Lucknow Division resulting in delay in completion of supplies by vendors.
- (v) Material lying with vendors was to be insured by the vendors. It was, however, noticed that the total inventory held by the Company including material lying with vendors were being insured by the Company also. This resulted in avoidable payment of insurance premia.

The Management stated (November 2006) that the instructions regarding bank guarantee, indemnity and insurance would be reinforced and the procedure and periodicity of verification of materials at vendors works would be enforced.

Recommendation

- The system of issue, receipt and accountal of raw material to vendors needed streamlining.

4.7.6.4 .Quality inspection procedures

Hindustan Quality Instructions (HQI) were issued (August 2003) to emphasize the responsibility of the supplier/vendor in respect of quality system, design/drawing/document control, raw material procurement, manufacturing process, inspection and quality control, packing, route card, etc. These instructions were applicable for components offloaded for one or more machining operations and complete machining to get finished component. On a review of the inspection procedures and its compliance, it was observed that:

- (i) As per HQI (Clause 6.1 and 9.1) vendors were responsible for proper traceability and storage of material supplied by the Company. However, the system of traceability and storage facility of the vendor were not ensured.
- (ii) HQI prescribes (Clause 7.1) Pilot Batch Inspection Report (PBIR) along with the finished material supplied by the vendor which was not furnished by the vendors.
- (iii) The vendors were also required (Clause 8.1.2.2) to furnish Detail Inspection Report (DIR) for the finished material supplied. However, it was observed that the DIR furnished by very few vendors was also not as per the prescribed format.
- (iv) The HQI also prescribes (Clause 8.1.2.4) format for Certificate of Conformity, which was required to be signed by supplier organisation's authorised quality control representative. The same was not obtained alongwith the material supplied by the vendors.
- (v) The supplier organisation was required (Clause 8.1.5) to carry out internal audits at a pre-defined frequency. The findings of the internal audit were to be shown for reference to the division at the time of audit. This was not complied with by the vendor/division.
- (vi) The quality level of some of the major vendors as assessed by the outsourcing department of the Engine Division was between 35.85 *per cent* and 50 *per cent* during 2004-05 which indicated low quality assurance/achievement.

The Management agreed (November 2006) that the procedure to be followed by the vendors for maintaining the quality of the finished components would be enforced.

4.7.6.5 Reporting and monitoring mechanism

The broad guidelines on outsourcing were issued by the Corporate Office and it was the responsibility of the divisions to decide on outsourcing, implementation, execution and monitoring. The monthly reports on outsourcing from the divisions were to be collected and presented to the Management which were to be reviewed quarterly during the meetings of the Managing Director and the General Managers at the Corporate Office.

It was noticed that outsourcing was not being properly monitored at the Corporate Office. It was also noticed that the Board of Directors of the Company were not apprised about the achievement on outsourcing activity on a regular basis. Further it was noticed that the Hyderabad, Koraput and Lucknow Divisions reported value of bought out items like purchase of silver, special tools, etc. as outsourcing in order to meet the committed target of outsourcing and Lucknow Division included value of orders placed on sister division as outsourcing.

The Management stated (November 2006) that a dedicated outsourcing department at the corporate level was not considered necessary as the same was proposed to be done at divisional level.

However, since instructions were issued by the Corporate Office and targets for outsourcing were fixed at the corporate level and approved by the administrative Ministry, evaluation of achievement of outsourcing targets and implementation of the procedure could only be effectively monitored at corporate level.

4.7.7 Conclusions

The Company had achieved some success in outsourcing in the years 2004-05 and 2005-06, after coming out with detailed procedures and systems for outsourcing in March 2003. The outsourcing policy was, however, not properly defined regarding offloading of non-core operations. The vendors' list was not updated regularly and mandatory documents required during registration process were not obtained. Developed subcontractors were not nurtured by placing continuous orders. Determination of available in-house capacity for deciding the quantum of outsourcing was not realistic nor uniform among the divisions. The method adopted for working out saving from outsourcing was not uniform. Adequate security for the raw material was not received and there was delay in issue/excess issue of raw material. Repeat orders were being placed on selected vendors despite poor performance.

The Company agreed with most of the audit recommendations to streamline and improve outsourcing operations.

The matter was reported to the Ministry in December 2006; reply was awaited (January 2007).