

## CHAPTER IX: DEFENCE PUBLIC SECTOR UNDERTAKINGS

### 9.1 Licence production of Su-30 MKI aircraft

#### 9.1.1 Introduction

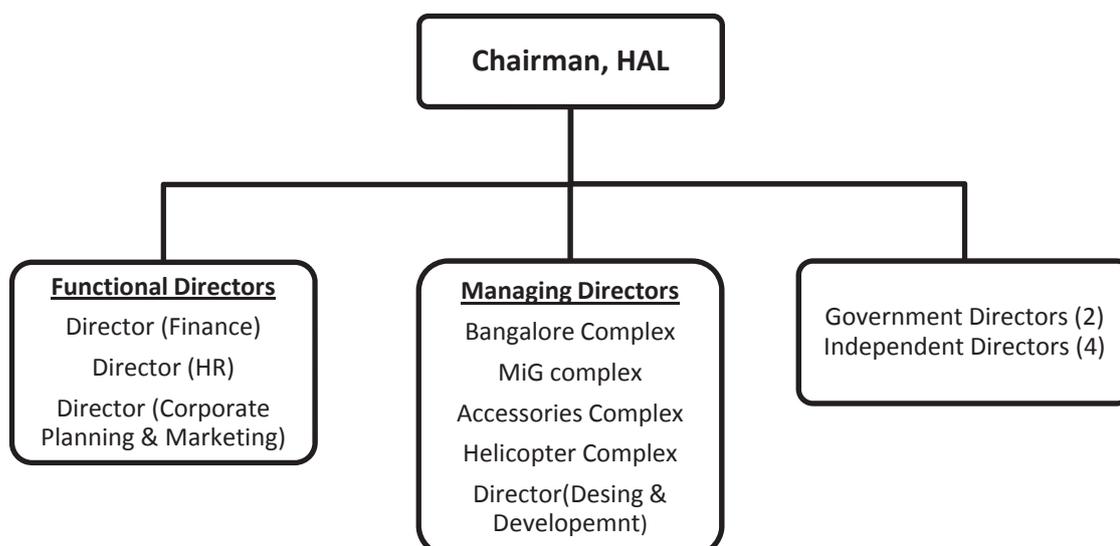
##### 9.1.1.1 Company's profile

Hindustan Aeronautics Limited (HAL), a Navratna company under the Ministry of Defence is engaged in design, development, manufacture, upgrade, repair and overhaul of aircraft, helicopters, aero-engines, avionics and navigation system equipment and marine & industrial gas turbine engines for both military and civil applications.

##### 9.1.1.2 Organisational structure

The management of HAL is vested in the Board of Directors headed by a Chairman assisted by Functional Directors (eight), Government Directors (two) and Independent Directors (four) as detailed in Chart-20 below:

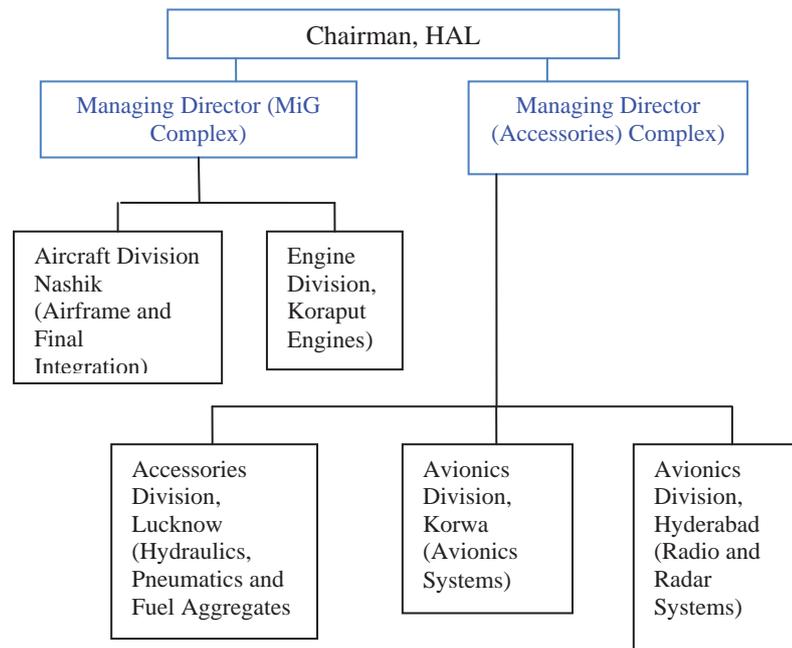
Chart- 20



The Company has 20 production units under five complexes<sup>220</sup>. While the Design Complex is headed by a Director (Design and Development), each of the others is under a Managing Director. The Company also has 10 Research and Design Centres located at various places.

The manufacture of Su30 MKI aircraft is done in five divisions of HAL which is under the control of MiG complex at Nashik and Accessories complex at Lucknow as shown in Chart-21 below:

**Chart-21**



**9.1.1.3 Previous audit coverage**

Report (No.4 of 2006) of the Comptroller and Auditor General of India on Performance Audit relating to Union Government (Defence Services) mentioned about payment of licence fee in advance though manufacture was to take place over 14 years, non-provision for supply of technical documentation in English leading to extra expenditure on translation, non-provision for technology for extension of total technical life and time between overhauls, terms and conditions of warranty clause not being finalised in the contracts with HAL, non-provision of engineering support package, cost effectiveness of indigenous manufacture, cost escalation risks, impact of compressed delivery schedule and the lagging behind in the repair and overhaul facilities. MoD furnished Action Taken Note on the observations in Report No.4 of 2006 in May 2011.

<sup>220</sup> Bangalore Complex, Design Complex and Helicopter Complex all at Bangalore, MiG Complex at Nashik and Accessories Complex at Lucknow

In view of the size/magnitude and strategic importance of the project, slow progress in licence manufacture of aircraft, multiplicity of units involved in the production of the aircraft, and delays in the delivery of aircraft due to various reasons, it was proposed to conduct a study on the progress in the implementation of the project.

#### *9.1.1.4 Audit objectives*

The objectives of the performance audit were to examine compliance to contractual provisions and their execution with particular emphasis on whether-

- transfer of technology and progress of indigenization was timely and adequate,
- level of absorption achieved resulted in –
  - a) achievement of indigenization plans
  - b) timely delivery of quality aircraft;
- setting up and utilization of infrastructure for various activities was ensured as and when required.

#### *9.1.1.5 Audit criteria*

The performance of the project was assessed against following criteria:

- Sanctions for the project
- Inter Governmental Agreement between Governments of India and Russia, General Contract between ROE and HAL;
- Supplementary Agreements between HAL and ROE for licensed production of 140 Su-30 MKI aircraft, engines and airborne equipment;
- Proceedings of Monitoring/Steering /Review Committees of MoD;
- Production Plans of the concerned Divisions;
- MIS, Proceedings of the Board, Management Committee, Audit Committee and Procurement Committee; and
- Feedback from suppliers and customers.

#### *9.1.1.6 Scope and methodology of audit*

Audit commenced after holding an entry conference with the Management on 13 August 2013 where the scope, objectives, criteria and methodology of audit were discussed. This was followed by review of records of five<sup>221</sup> divisions, collection and analysis of data, issue of preliminary observations to elicit

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<sup>221</sup> Aircraft Division, Nashik, Engine Division, Koraput, Accessories Division, Lucknow and Avionics Divisions at Korwa and Hyderabad

responses pertaining to production, quality, supplies and maintenance issues in all the three contracts together with all the supplementary agreements. Discussions were held with the Management at different levels to familiarise with the process, constraints of operations and their root causes. Draft report was issued to Management on 30 October 2013. Replies of the management received (January 2014) have been suitably incorporated in the Report. Audit was concluded with an exit conference with the top management of HAL on 20 February 2014 where major findings of audit and audit recommendations were discussed. The report has been finalised considering additional inputs provided by the Management during the exit conference.

#### **9.1.1.7 Acknowledgement**

Audit acknowledges the co-operation extended by the Management at all levels in production of records and information, clarifications of issues and furnishing of replies.

#### **9.1.1.8 Audit findings**

Audit findings in line with the objectives are detailed in the following chapters as detailed in Table-61 below:

**Table-61**

9.1.3	Transfer of technology
9.1.4	Timely delivery of quality aircraft
9.1.5	Setting up of infrastructure

#### **9.1.2 Background**

##### **9.1.2.1 Sanction for licence production of the aircraft**

As per Note for consideration of the Cabinet Committee for Security (September 2000), level of the combat force of Indian Air Force (IAF) was expected to fall significantly due to likely phasing out of MiG 21 aircraft during the period from 2000 to 2010. To replace them, IAF concluded (November 1996) a contract with the Russian Government for supply of eight Su-30 K<sup>222</sup> air defence aircraft and 32 upgraded Su-30 MK<sup>223</sup> multi-role aircraft. In December 1998, IAF ordered procurement of 10 more Su-30 MK aircraft.

<sup>222</sup> Su-30K-Commercial(export) version of the basic Su-30

<sup>223</sup> Su30MK-Commercial version of Su 30M revealed in 1993. Export versions include navigation and communication equipment from HAL

The original contract (November 1996) for supply of 40 aircraft also envisaged development of Su 30 MKI aircraft by integrating the Russian Su 30MK aircraft with selected latest Western, Russian and indigenous avionics and their licence manufacture through nominated aviation industry for indigenous production under Transfer of Technology (ToT) agreement with Rosobornexport (ROE).

In accordance with the provision for indigenous production under ToT agreement in the original contract, an Inter-Governmental Agreement (IGA) was concluded (October 2000) between the Governments of Russian Federation and Republic of India for transfer of licence and technical documentation to India for production of 140 aircraft, 920 AL-31 FP engines and 140 sets of air-borne equipment to cater for the life time exploitation of the aircraft. Pursuant to IGA and approval (December 2000) of the Cabinet Committee on Security (CCS), a general contract (GC) was concluded (December 2000) by Hindustan Aeronautics Limited (HAL) with ROE, the Russian agency. Ministry of Defence (MoD) conveyed (January 2001) sanction for the manufacture of 140 aircraft in four phases as detailed in Table-62 below:

**Table -62**

<b>Phase-I</b>	Flight Testing Phase (FTS) envisaged delivery after system checks, Ground and Flight Tests and final finishing (Fully Imported).
<b>Phase-II</b>	Final assembly of major assemblies and equipping of aircraft plus above phase activities (Final assembly of major assemblies by HAL)
<b>Phase-III</b>	Raw material participation to commence from this phase. All components and assemblies to be manufactured in the division except the fuselage, which was to be imported, plus above phase activities (Only fuselage was to be imported and rest all manufactured by HAL).
<b>Phase-IV</b>	Manufacture of airframe from raw materials plus above activities (Fully indigenised)

The total cost was ₹ 22122.78 crore and delivery was to be during 2004-05 to 2017-18. For the ease of contracting, the supply was broken up into four Blocks with overlapping time periods. The details are given in Table-62.

The licence technical documentation to be transferred by ROE to HAL within 45 months from December 2000 was to ensure full capability to HAL to produce, test and operate aircraft, engines and airborne equipment with certain exceptions<sup>224</sup>.

<sup>224</sup> Equipment of third country/Indian origin, armaments, general purpose articles, Russian equipment for which contracts were signed or are being signed after November 1996, equipment in the list annexed to the agreement, raw materials, semi finished articles and consumables

### 9.1.2.2 Preparation of DPR

HAL entered (May 2001) into a Supplementary Agreement (SA) with ROE for preparation of Technical Part of Project Report (TPP) detailing requirement of infrastructure and Non-Standard Equipment (NSE) and Toolings and man-hour content. The TPP was received by HAL from the Russian team in October/November 2001.

Division wise Detailed Project Reports (DPR) were prepared based on the inputs furnished by ROE in TPP. The Board of HAL approved (February 2002) the consolidated DPR.

As provided in General Contract, HAL concluded a number of Supplementary Agreements (SA) with ROE from time to time specifying the nature, quantities and time of supplies such as licence documents, aircraft kits etc., required for manufacturing.

### 9.1.2.3 Compression of Delivery Schedule

MoD concluded (December 2003) a contract with HAL for supply of 34 aircraft in Block I comprising 3 aircraft from Phase I, 5 aircraft from Phase II, 18 aircraft from Phase III and 8 aircraft from Phase IV. After an assessment of the combat aircraft force levels, in March 2006, by which time eight aircraft due under Block I contract (three pertaining to Phase I (fully imported) and five pertaining to Phase II (final assembly of major assemblies done by HAL) had been delivered, MoD compressed the delivery schedule to secure completion of deliveries of all the 140 aircraft by 2014-15 instead of 2017-18 as originally agreed to by changing phase-wise composition as per Table-63 below:

**Table-63**

Block No.	Year of delivery	Original					Compressed				
		Phases					Phases				
		I	II	III	IV	Total	I	II	III	IV	Total
I	2004-05	2	0	0	0	2	2	0	0	0	2
	2005-06	1	5	0	0	6	1	5	0	0	6
	2006-07	0	0	8	0	8	4	5	4	0	13
	2007-08	0	0	6	2	8	0	7	6	0	13
	2008-09	0	0	4	6	10					
	<b>Total</b>	<b>3</b>	<b>5</b>	<b>18</b>	<b>8</b>	<b>34</b>	<b>7</b>	<b>17</b>	<b>10</b>	<b>0</b>	<b>34</b>
II	2008-09						0	7	8	0	15
	2009-10	0	0	0	10	10	0	3	8	4	15
	2010-11	0	0	0	12	12	0	0	0	0	0
	2011-12	0	0	0	12	12	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>34</b>	<b>0</b>	<b>10</b>	<b>16</b>	<b>4</b>	<b>30</b>

Block No.	Year of delivery	Original					Compressed				
		Phases					Phases				
		I	II	III	IV	Total	I	II	III	IV	Total
III	2010-11	0	0	0	0	0	0	0	8	8	16
	2011-12	0	0	0	0	0	0	0	4	12	16
	2012-13	0	0	0	12	12	0	0	0	0	0
	2013-14	0	0	0	12	12	0	0	0	0	0
	2014-15	0	0	0	12	12	0	0	0	0	0
	<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>20</b>	<b>32</b>
IV	2012-13	0	0	0	0	0	0	0	4	12	16
	2013-14	0	0	0	0	0	0	0	4	12	16
	2014-15	0	0	0	0	0	0	0	0	12	12
	2015-16	0	0	0	12	12	0	0	0	0	0
	2016-17	0	0	0	12	12	0	0	0	0	0
	2017-18	0	0	0	12	12	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>36</b>	<b>44</b>	
<b>Grand Total</b>	<b>3</b>	<b>5</b>	<b>18</b>	<b>114</b>	<b>140</b>	<b>7</b>	<b>27</b>	<b>46</b>	<b>60</b>	<b>140</b>	

Accordingly, MoD concluded contracts for Block II (30 aircraft), Block III (32 aircraft) and Block IV (44 aircraft) in March 2006, December 2007 and February 2009 respectively besides revised contract for Block I in March 2006. Due to compression of delivery schedule, number of fully imported aircraft (Phases I and II) increased by 26 (from 8 to 34) while the number of fully indigenised aircraft (Phase IV) decreased by 54 (from 114 to 60).

As per the contracts for supply of aircraft, HAL was to receive payments from MoD based on achievement of milestones like signing of contract, starting of manufacturing activity and start of structural assembly. Accordingly, MoD released milestone payments amounting to ₹ 41,928.18 crore to HAL upto 31<sup>st</sup> March 2013 in respect of all the block contracts (for 140 aircraft) as well as contracts for additional 40 and 42 aircrafts.(Refer Table-63)

#### 9.1.2.4 Non-revision of Detailed Project Report

The Manual on Policies and Procedures for Procurement of Works prepared in conformity with General Financial Rules 2005 (GFR) states that if the project cost was likely to vary by more than 10 *per cent* of the sanctioned cost, a revised project report taking into account various possible reasons for variation like change in scope, design of work, material/labour cost, time over run, etc. shall be prepared and sanction of competent authority shall be obtained.

In view of alteration in March 2006 of the phase-wise composition prescribed in January 2001, the import content increased and HAL's participation reduced. The compression of deliveries also decreased the degree of

absorption of technology from time to time and the project cost stood revised from ₹ 22,122.78 crore to ₹ 39,605.95 crore, an increase of 79 per cent in the project cost. Changes in the scope of the project, total project cost, delivery schedule and absorption of technology called for revision of DPR. However, DPR was not revised.

Management stated (January 2014) that DPR was prepared at the inception of the project keeping in view the total investment in the project and to seek sanction of investment in capital and DRE. It added that DPR was not revised since the compressed delivery did not have significant impact.

The reply was not acceptable since the DPR was prepared based on the inputs furnished by ROE in TPP and the changes in the phase-wise delivery due to compressed delivery schedule increased the import component with corresponding decrease in indigenous component and increase in project cost by 79 per cent which necessitated preparation of revised DPR.

#### 9.1.2.5 Contracts for aircraft

While execution of the main contract entered (December 2000) into by HAL with MoD was under way, two more contracts were concluded with it by MoD - one in March 2007 and the other in December 2012 as detailed in Table-64 below:

**Table-64**

Contract Reference	Date of Signing of Contract	No. of aircraft	Original Delivery schedule	Original amount (₹ in crore)	Revised delivery schedule	Revised amount (₹ in crore)
I contract	March 2006 (Revised Block I and Block II) December 2007 (Block III) February 2009 (Block IV)	140	2004-05 to 2017-18	22,122.78	2004-05 to 2014-15	39,605.95
II contract	March 2007	40	2008-09 to 2010-11	9,036.84	2008-09 to 2011-12	9,479.69
III contract	December 2012	42	2012-13 to 2016-17	16,147.28	-	16,147.28
<b>Total</b>		<b>222</b>		<b>47,306.90</b>		<b>65,232.92</b>

While the 140 aircraft were to be supplied in four phases as detailed in para 9.1.2.3, additional 40 and 42 aircraft were to be supplied in three phases (phase I (16 aircraft), phase 1+<sup>225</sup> (20 aircraft) and phase II (4 aircraft)) and four phases (phase I (10 aircraft), phase II (4 aircraft), phase III (4 aircraft) and phase IV (24 aircraft)) respectively.

<sup>225</sup> Aircraft ground tested, flight tested and painted in Russia before delivery to HAL

### 9.1.3 Transfer of technology

**Audit Objective:** Whether contractual provisions were complied and transfer of technology and progress of indigenization was timely

#### 9.1.3.1 Introduction

The Inter Governmental Agreement envisaged transfer of technology to India to ensure full capability to the Indian side to produce, test and operate aircraft, engines and airborne equipment. In order to assess whether the transfer of technology was timely, audit reviewed the arrangements for receipt of technology by HAL which was to utilise it for manufacture, repair and overhaul. The observations are detailed below:

#### 9.1.3.2 Delay in transfer of documents relating to designs

The General Contract<sup>226</sup> envisaged transfer of Licence Technical Documentation (LTD), Design Documentation and Technical Equipment Means (DDTEM), toolings and non standard equipment, test benches, ground handling equipment, etc. within 45 months from December 2000. As required under the General Contract, HAL concluded (May 2001, September 2002 and November 2002) Supplementary Agreements (SAs) with ROE for procurement of the said items. However, ROE did not supply these items as per agreed schedule as tabulated in Table-65 below:

**Table-65**

Sl. No.	Activities/Stages	Original Plan	Actual	Average delays (months)	Reasons for delay
1 (a) (b)	Licence Technical Documentation Receipt of LTD. Receipt of amendment to drawings. Receipt of amendment to technologies.	I Quarter 2002 to III Quarter 2004	II Quarter 2002 to I Quarter 2007	30	Delayed release of drawings and technologies, 26140 amendments to the drawings, and 1174 amendments to technologies by ROE, rejection/ re-work of components/ assemblies already manufactured/ made by ROE.
2	DDTEM (Tool drawings) to be furnished. Offer of contracts/SAs from ROE and corresponding delivery by ROE Amendments to tool drawings and rework.	II Quarter 2002 To I Quarter 2004	II Quarter 2003 To II Quarter 2004	12	Delayed launch of indigenous tool manufacture resulting in hold up/ delays during production, non-availability of production tools to HAL

<sup>226</sup> No.PB/835611233630 dated 28 December 2000

Sl. No.	Activities/Stages	Original Plan	Actual	Average delays (months)	Reasons for delay
3	Russian Tooling/NSE Conclusion of contract/ supplies against signed contract (due to delay in D&D Phase)	2004	2006	24	Delay in supply of assembly jigs; non-coordination of assembly jigs with mock up during commissioning; rework of production tools; rework of tooling due to technological amendments; delay towards stabilizing the production line.

It could be seen from the above that documents which were to be received between I quarter of 2002 to 2004 were actually received between II quarter of 2002 to I quarter of 2007 after a delay ranging from 3 to 36 months. This affected the progress of indigenization and HAL had to resort to outsourcing to meet the delivery schedule.

As per the compressed delivery schedule, 17 aircraft under Phase II and 10 aircraft under Phase III were to be delivered to IAF between 2005-06 and 2007-08. Due to delay in transfer of technology, HAL resorted to offloading its work share in respect of 11 Phase II aircraft and nine Phase III aircraft to ROE by concluding (October 2005, October 2006, September 2007 and October 2008) supplementary agreements for ₹ 115.17 crore. Against ₹115.17 crore, HAL was to receive only ₹ 91.51 crore in respect of 20 aircraft as per the contract. The details of agreement-wise purchase cost and amount receivable from MoD is detailed in Table-66 below:

Table -66

Sl. No.	Phase	Agreement Date	No. of aircraft	Amount receivable from MoD	Procurement Cost	Additional expenditure
				(₹ in crore)		
1)	III	27/10/2005	4	17.89	28.72	10.83
2)	II	23/10/2006	4	5.68	10.91	5.23
3)	II	27/9/2007	4	6.60	9.97	3.37
4)	II	2/10/2008	3	5.34	9.73	4.39
5)	III	2/10/2008	3	32.58	30.65	-1.93
6)	III	7/10/2008	2	23.42	25.19	1.77
		<b>Total</b>	<b>20</b>	<b>91.51</b>	<b>115.17</b>	<b>23.66</b>

As could be seen from Table-66, due to outsourcing the supply of 20 aircraft to ROE, HAL incurred additional expenditure of ₹ 23.66 crore.

Further, against 42 aircraft in Phase III and 36 aircraft in Phase IV that were to be manufactured by 2012-13 (as brought out in Table -63), HAL manufactured 37 aircraft in Phase III and eight aircraft in Phase IV upto 2012-13 which confirms the fact that progress of indigenization did not proceed as envisaged.

Management stated (January 2014) that the excess expenditure was incurred for meeting the commitment of delivery to the customer and the same was met from the contingency provision available for meeting the unforeseen expenditure arising during production/delivery of 140 aircraft programme.

This reply did not address the main audit issue that HAL had to resort to offloading of indigenous work content due to delay in Transfer of documents by ROE as brought out in Table-65 which resulted in additional expenditure of ₹ 23.66 crore to HAL.

#### **9.1.3.3 Delay in transfer of technology for manufacture of engines**

The Detailed Project Report (DPR) envisaged production of engines in five phases at the Engine Division of HAL at Koraput as detailed in Table-67 below:

**Table-67**

Phase I	Receipt of fully tested engines from Russia for re-testing and delivery (Fully imported).
Phase II	Receipt of engine after first test, dismantling, defect analysis, rework, assembly and work under above phase.
Phase III	Disassembly, assembly of assembly units and engines for acceptance test, disassembly, flaw detection and assembly for acceptance test and performing the acceptance test.
Phase IV	Manufacture of parts, assembly and testing of units, sub-units and modules of engine and work under Phase III.
Phase V	Manufacture of blanks (forging and castings) and work under Phase IV (Fully indigenized).

While the aircraft was to be supplied in four phases, the engines were to be supplied/manufactured in five phases. The number of engines in each phase was finalised considering the compressed delivery schedule stipulated by MoD for supply of aircraft as brought out in Table -63.

Koraput Division was to supply engines for the delivery of Su-30 MKI aircraft of Phase II and onwards. HAL was required to manufacture 410<sup>227</sup> engines at the Koraput Division to cater to the requirement of supply of 222 aircraft from all the three contracts. The supplies were required to be made over a period of 13 years from 2004-05 to 2016-17 with production targets ranging from 4 to 74 engines per annum as given in Table -68 below:

<sup>227</sup>266 engines for 140 aircraft contract in line with compressed delivery; 5 and 47 engines for Blocks II and III GHE/GSE after compression, 28 engines for additional 40 aircraft contract, 64 engines for additional 42 aircraft contract

**Table-68**

Year of Manufacture	Phases					No. of Engines
	I	II	III	IV	V	
2004-05	4	0	0	0	0	4
2005-06	2	16	0	0	0	18
2006-07	6	10	4	0	0	20
2007-08	11	14	12	0	0	37
2008-09	8	14	20	2	0	44
2009-10	4	7	14	12	2	39
2010-11	2	40	4	20	8	74
2011-12	6	0	2	10	20	38
2012-13	0	0	0	12	20	32
2013-14	0	0	8	4	28	40
2014-15	0	0	8	0	8	16
2015-16	0	0	24	0	0	24
2016-17	0	0	20	2	2	24
	<b>43</b>	<b>101</b>	<b>116</b>	<b>62</b>	<b>88</b>	<b>410</b>

The General Contract and DPR stipulated that licence technical documentation (LTD), tools and Non Standard Equipments of all the five phases were to be supplied between January 2002 and July 2007 by ROE to HAL.

Audit scrutiny (September-October 2013) revealed that the Koraput Division received all LTD for Phases I to III on schedule during 2004-05 to 2006-07. However, there was delay of 2 to 4 years in receipt of LTD and other items for Phases IV and V as detailed in Table-69 below:

**Table-69**

S. No.	Activity	Schedule as per General Contract	Actual receipt	Delay in months	Remarks
1.	Receipt of LTD for engine manufacture	III Quarter 2004	I Quarter 2007	30	Technology for critical items like vector jet nozzle (VJN) supplied only in March 2007, blade manufacturing technology through CNC route supplied in 2008-09
2.	Receipt of DDTEM for Tools and NSE	I Quarter 2003	I Quarter 2007	48	Pneumo-thermo furnace for VJN part manufacturing received in 2009-10.
3.	Receipt of Tools and NSE	III Quarter 2004	IV Quarter 2006	24	

The delay in receipt of documents led to resultant delay in the production programme for Phase IV and Phase V engines as detailed in Table-70 below:

**Table-70**

Phase	Number of engines	Phase description	Commencement		Remarks
			Scheduled	Actual	
IV	62	Raw material kits (with imported casting and forging)	2008-09	2011-12	Delay of three years (approx.) in building engine and carrying out Long Test that were completed only in March 2011 and non-commissioning of Manned Chamber Welding (MCW) equipment
V	88	Raw material kits (in house casting and forging)	2009-10	Yet to start	Delay of 4 years; Long Test to include VJN and MCW parts planned in 2013-14

The details of number of engines supplied/manufactured in phases IV and V during the period from 2004-05 to 2012-13 is furnished in Table-71 below:

**Table -71**

Year of Manufacture	Phases					No. of Engines
	I	II	III	IV	V	
2004-05	4	0	0	0	0	4
2005-06	2	15	1	0	0	18
2006-07	8	10	2	0	0	20
2007-08	15	10	5	0	0	30
2008-09	0	19	18	0	0	37
2009-10	1	28	19	0	0	48
2010-11	8	19	8	0	0	35
2011-12	0	0	1	5	0	6
2012-13	0	6	0	7	0	13
<b>Total</b>	<b>38</b>	<b>107</b>	<b>54</b>	<b>12</b>	<b>0</b>	<b>211</b>

It could be seen from Table-68 that as against 306 engines to be delivered from 2004-05 to 2012-13, 106 engines were to be in Phases IV and V. However, as could be seen from Table 71, only 12 against 56 engines were manufactured by HAL under Phase IV and no engine against 50 engines were manufactured under Phase V till 2012-13.

Audit scrutiny (September-October 2013) revealed that to meet the IAF's requirement of aircraft for next three years from 2013-14, HAL procured (December 2012) 20 engine kits of Phase II (at ₹ 27.81 crore each) and 30

engine kits of Phase III (at ₹ 21.71 crore each) for use in Phase IV aircraft (fully indigenized). Considering the expenditure incurred by HAL for conversion of the kits into engines, the actual cost per engine was ₹ 31.10 crore. Since the budgetary quote for Phase IV aircraft submitted to MoD included cost of ₹ 24.19 crore per engine, HAL would incur a loss of ₹ 345.50<sup>228</sup> crore for the 50 engines. Six of these engines were used up in delivery of three aircraft under Phase IV in 2012-13.

Management stated (January 2014) that the 50 engine kits were procured to replenish the engines diverted from 140 aircraft programme; though delivery of engine from Phase IV/V was planned under Block III/IV, due to difficulty in production of engines in Phase IV/V, it was decided to deliver the engines from Phase II/III kits; the decision was taken to maximise the aircraft delivery to IAF. They added that the Division had booked a profit of ₹ 23.49 crore against delivery of six engines.

The fact remains that due to delay in receipt of technical documentation, the indigenisation programme did not proceed as envisaged. Consequently, HAL was forced to resort to outsourcing resulting in extra expenditure.

#### *9.1.3.4 Supply of documentation by ROE for creation of Repair and Overhaul facilities by HAL*

The Inter Governmental Agreement (October 2000) and the General Contract (December 2000) stipulated rendering of technical assistance by ROE to HAL for setting up of repair facilities for the aircraft, their engines and airborne equipment without additional licence fee. The technical assistance envisaged transfer of technology for overhauling taking into consideration requirement in equipment and training, not later than 12 months from December 2000.

HAL signed (September 2005) a separate General Contract (0204) with ROE for repair and overhaul of aircraft and its aggregates. The contract enjoined on ROE to prepare and supply technical documents for repair and overhaul and design documentation by November 2010/February 2011. However, supply of documentation was delayed by ROE resulting in consequent delay in setting up of facilities for the same by HAL (Details vide **Annexure - XXVIII**).

It could be seen from the Annexure that

- Repair Technical Documents (RTD) and Design Documentation and Technical Equipment Means were received only in December 2012 as against November 2010;
- Technical equipments and Tooling were received partially and
- Spares for repair and overhaul were yet to be supplied fully.

<sup>228</sup>(( 31.10 (Cost per Engine to HAL) – (24.19 (Budgetary quote to MoD)) \* 50 engines

### 9.1.3.5 Holding up of inventory

As brought out in para 9.1.2.3, the number of aircraft due in Phase IV was reduced to 60 with distribution of four in 2009-10, eight in 2010-11 and 12 each from 2011-12 to 2014-15. Under the revised delivery schedule for Block I contract (December 2003), no aircraft under Phase IV was included. In the Block II contract concluded (March 2006), four aircraft under Phase IV were to be supplied to IAF during 2009-10.

The extant capacity (May 2011) in Nashik Division was for production of only eight aircraft annually. Since the contract with IAF was for supply of 12 aircraft per year from 2011-12 onwards, the production facilities needed to be augmented.

The original delivery schedule and total production cycle time for the aircraft was 48 months comprising lead time of 12 months for obtaining supply of raw materials from ROE and cycle time of 36 months for manufacture and delivery. In January 2008, HAL placed supplementary agreements to make up for the deficiency in supplies to complete manufacture of four aircraft and again in November 2008 for kits for 20 aircraft and in February 2010 for kits for 36 aircraft.

By end of 2012-13, HAL had received aircraft kits for manufacture of 58 aircraft and had accumulated inventory of ₹ 3,318.09<sup>229</sup> crore as of March 2013. Considering the installed capacity of eight aircraft per year and the cycle time of 36 months for manufacture, HAL held inventory of aircraft kits for 26<sup>230</sup> aircraft valued at ₹ 1,725.41 crore (after excluding eight aircraft manufactured during 2010-11 (1 aircraft), 2011-12 (3 aircraft) and 2012-13 (4 aircraft)) in advance of requirement as these aircraft kits will be used for manufacture only after three years.

Management stated (January 2014) that the accumulation was due to shift in the delivery programme of the aircraft, concurrent design and development phase in Russia and delay in absorption of technology. It was further stated that the inventory is funded from the advances from the customer.

The reply was not justified as the Company was aware of the reasons attributed and hence could have avoided placing order in 2010 when the Division was already in possession of unutilised aircraft kits for production of 15 aircraft. Further, as per the contractual terms of payment, HAL had received only ₹ 2,450.47 crore as advance till the start of manufacturing activities. Since this was less than the inventory of ₹ 3,318.09 crore (inclusive

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<sup>229</sup> As per Inventory Valuation

<sup>230</sup> 58 (No. of Kits received) – 8 (already manufactured) - (8 (Capacity)x3 years (Lead Time))

of Work in progress) held, the reply that the inventory was procured from the funds provided by the customer was also not factual.

#### **9.1.3.6 Overhaul of aircraft**

The scope of work of overhaul to be carried out at Nashik Division included repair of airframe, its 228 Russian aggregates (153 repairable and 75 non-repairable) as per Repair and Overhaul documents and final integration of aircraft as also 92 in-house manufactured aggregates. The DPR considered a cycle time of 22 months for completion of overhaul of one aircraft. Nashik Division was allocated (August 2009) ₹ 283.35 crore at 2008 level (₹ 311.44 crore at incurrence level) for civil works, factory, plant & machinery, services office, material handling equipment/assembly aids, runway up-gradation, etc. Though the last batch of Repair Technological Documents and Design Documentation and Technical Equipment Means had been received by December 2012 from ROE, supplies of technical equipment, tooling and spares had been partial.

IAF intimated (August 2007) HAL that ten Su-30 MKI aircraft inducted into service in 2002 would be due for overhaul in 2012. A lifing committee was constituted (May 2011) for carrying out calendar based Time Between Overhaul (TBO) life extension study for examining the feasibility of extending TBO life of the aircraft beyond 10 years. Two aircraft were received at HAL in January 2012 for the purpose. IAF stated (October 2013) that a sizeable number of Su 30 MKI aircraft were approaching their TBO calendar life and needed to be inducted for overhauling but due to delay in setting up of Repairs and Overhaul facilities at HAL, the TBO life of aircraft was being extended from 10 years to 12 years.

Audit noticed that as of March 2014, the two aircraft received for TBO life extension study had been dismantled and study was in progress (August 2014).

Management informed (January 2014) that they expected the facilities to be ready by June 2014.

The fact however remained that funds were sanctioned by MoD in August 2009 and readiness for overhaul was required to be kept by February 2012 but HAL had not achieved this (August 2014). Due to delay in setting up of Repair and Overhaul facilities by HAL, IAF was forced to extend the TBO life of aircraft from 10 years to 12 years which may not be a prudent option.

#### **Conclusion**

HAL did not receive all the components of transfer of technology from ROE as envisaged impacting the timely supply of deliverables to IAF. Similar issue was observed in respect of Transfer of Technology to Ordnance Factories as

brought out in para 8.1.9.2. Consequently, HAL could not achieve the required level of absorption of technology to meet the compressed schedule of deliveries and had to resort to outsourcing to ROE which increased the import component and had an impact on the indigenisation programme.

### Recommendation

- Suitable clauses may be incorporated in the contracts with foreign vendors to safeguard the interests of defence forces in respect of delay in meeting contractual obligations including transfer of technology.
- PERT charts drawn up for each major activity including indigenisation should be adhered to.

#### 9.1.4 Timely delivery of quality aircraft

**Audit Objective:** Level of absorption of technology resulted in timely delivery of quality aircraft

##### 9.1.4.1 Progress in delivery (ferry out)<sup>231</sup> of aircraft

The status of supply of aircraft against the compressed delivery schedule is furnished in Table-72:

**Table-72**

Phase	2004-05		2005-06		2006-07		2007-08		2008-09		2009-10		2010-11		2011-12		2012-13		Cumulative		
	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
I	2	2	1	1	4	-	-	4												7	7
II	-	-	5	2	5	4	7	6	7	1	3	0	-	3						27	16
						2*		2*		4*		3*									11*
III	-	-	-	-	4	0	6	0	8	5	8	4	8	8	4	10	4	6	42	33	
										2*										2*	
					2#		2#				3#									7#	
IV	-	-	-	-	-	-	-	-	-	-	4	-	8	-	12	1	12	4	36	5	
Total	<b>2</b>	<b>2</b>	<b>6</b>	<b>3</b>	<b>13</b>	<b>4</b>	<b>13</b>	<b>10</b>	<b>15</b>	<b>6</b>	<b>15</b>	<b>4</b>	<b>16</b>	<b>11</b>	<b>16</b>	<b>11</b>	<b>16</b>	<b>10</b>	<b>112</b>	<b>61</b>	
						2*		2*		6*		3*								13*	
						2#		2#				3#									7#

S=Scheduled delivery; A=Actual delivery (Ferried out)

\* Aircraft fully assembled in Russia and only flight test conducted at HAL

# Manufacture of wings, empennage, air intake and coupling of fuselages, wings was in Russia and aircraft were supplied by it in coupled condition along with parts required in final assembly with looms, panels and relay boxes

<sup>231</sup> Final acceptance of the aircraft by the Contractee's Inspector after issue of Signaling Out Certificate

As can be seen from the table-72, as against 112 aircraft due during the nine years from 2004-05 to 2012-13, only 81 aircraft had been delivered leaving a shortfall of 31 aircraft (28 per cent). HAL had adhered to the delivery schedule only for two (2004-05 and 2007-08) of the nine years. Shortfall occurred in all the remaining seven years despite resorting to outsourcing of 20 aircraft during the period 2006-07 to 2009-10 from ROE, as commented in para 9.1.3.2.

Management attributed the shortfall in deliveries mainly to delays in receipt of technical documents and rectification of defective toolings received from ROE and consequent delay in absorption of technology.

Management has accepted the delay in absorption of technology as brought out in paras 9.1.3.2 and 9.1.3.3.

#### **9.1.4.2** *Liquidated damages on delayed supplies to IAF*

The contracts with IAF stipulated payment by HAL of liquidated damages at 0.5 per cent of the contract price of the delayed/undelivered stores/services for each and every week of delay or part of a week for which stores have been delayed, subject to the maximum value of the Liquidated Damages being not higher than 5 per cent of the value of delayed stores.

(i) Under the compressed delivery schedule, 36 Phase IV aircraft were to be delivered between 2009-10 and 2012-13 under Blocks II, III and IV (March 2006, December 2007 and February 2009). However, no aircraft was delivered within the stipulated schedule. ROE delayed transfer of technology and as a result HAL was handicapped as it could not progress ahead with indigenization. Consequently, supply of aircraft to IAF was delayed for which MoD recovered ₹96.26 crore upto September 2013 towards liquidated damages.

(ii) Under Block III and Block IV contracts (December 2007 and February 2009), eight types of role equipment<sup>232</sup> required to be supplied by HAL to IAF along with the aircraft during 2010-11 and 2011-12 under Block III and during 2012-13 to 2014-15 under Block IV and were to be procured as ready-made products at additional cost through separate Supplementary Agreements<sup>233</sup>. HAL initiated the agreement process (February 2010) after delay of 25 months. At that time, ROE asked for enhanced rates. HAL ultimately concluded (January 2013) supplementary agreements with ROE for these equipments and due dates of delivery were during 2013 for Block III and during 2013 to 2015 for Block IV. As the delivery dates of the equipments did not match with delivery to IAF, supplies were delayed resulting in levy of liquidated damages of ₹ 4.77 crore against Block III contract.

<sup>232</sup>Role equipment is any equipment, other than installed aircraft components, required to be operated in aircraft during flight.

<sup>233</sup>As per Article 6.2 and paragraph 1.7 of Annexure II to the INTER GOVERNMENTAL AGREEMENT (OCTOBER 2000)

Management stated (January 2014) that the delay in signing of supplementary agreements for role equipment was due to steep price increase by Russian Side and all out efforts were made by Indian Side to maintain prices in line with earlier procurement and agreed escalation, which was achieved with protracted negotiations and the issue would be taken up with Air Headquarters for waiver of liquidated damages.

These replies were not justified since design and development phase of the aircraft was being done by ROE concurrently with process of indigenisation at HAL and hence, HAL should have taken precautionary measures considering the anticipated amendments due to technological changes occurring during development phase. Though HAL was aware of the committed delivery schedules and General Contract (December 2000) also envisaged entering into separate contracts with ROE for supply of Role Equipments, HAL delayed the process for agreement for procurement of Role Equipments which resulted in delay in supply and consequent recovery of liquidated damages by the MoD.

#### *9.1.4.3 Deficiency in accrual of envisaged benefits to IAF*

Each aircraft was to fetch 240 flying hours per annum to IAF. Compression of the delivery schedule resulted in increase in deliveries under Phases I and II from 8 to 34 aircraft. It was envisaged that the compressed delivery programme would enable IAF to induct 4-5 additional aircraft each year from 2006-07 up to 2013-14, i.e., almost five years ahead of the earlier approved delivery programme. This would also have enabled IAF to get additional flying hours ranging from 1200 hours in 2006-07 to 8640 hours during the years 2013-14 to 2016-17 with cumulative additional flying hours of 58,080 during 2006-07 to 2016-17 and result in meeting the operational preparedness of IAF.

While considering the compressed delivery with net additional expenditure of ₹ 2,734.92 crore, MoD had forewarned that the compressed delivery would be justified if HAL delivers the aircraft within the revised schedule of delivery and in case of any slippages, ROE would be benefitted without any benefits to IAF.

The net increase in cost of ₹ 17,483.17 crore (₹ 22,122.78 crore to ₹ 39,605.95 crore) was due to escalation of price, cost of DRE and technical kits. The additional outflow of ₹ 2,734.92 crore (USD 594.54 million) was due to change in phase composition of the technical kits. As brought out in para 9.1.2.3, MoD compressed the delivery schedule to secure completion of deliveries of all the 140 aircraft by 2014-15 instead of 2017-18. This compression was after signing of Inter Governmental Agreement (October 2000) and General Contract (December 2000) and preparation of DPR. As the progress of indigenization was not at the same pace as envisaged in compressed delivery schedule, the import content increased.

Management claimed (January 2014) that it had delivered 88 aircraft against 80 stipulated for delivery in the original schedule and hence had excelled in its achievement.

This had no significance since IAF derived additional flying hours only from actual deliveries after ferry out of aircraft and was not benefited by deemed deliveries<sup>234</sup> claimed by HAL in terms of additional flying hours.

**9.1.4.4 Additional expenditure due to non adherence to original contract terms regarding price**

Though Inter Governmental Agreement (October 2000) envisaged (October 2000) licence production of 920 reserve engines and 140 sets of aggregate (airborne equipment) along with 140 aircraft, the General Contract 3630 (December 2000) covered licence production of only 140 aircraft. Due to non-inclusion of licence production of 920 reserve engines and 140 sets of aggregate (airborne equipment) in the General Contract, HAL entered (October 2012) into a separate General Contract (1050) with ROE for supply of the same. Though the price of technological kits, engine and airborne equipment for the manufacture of 140 aircraft as per various production phases was fixed in the General Contract (December 2000), the same was not considered by HAL while signing the new contract in October 2012.

As against USD 4.78 million and USD 3.73 million being the prices applicable for Phase II and III engine kits under December 2000 contract, the rates agreed in October 2012 contract were USD 5.05 million and USD 3.95 million respectively resulting in additional cost of ₹ 66<sup>235</sup> crore for these engine kits.

Management stated (January 2014) that during discussions for the III contract (December 2012) the Russian side refused (November 2011) to maintain the GC rate for Phase II and III kits stating that delivery schedule was too long to maintain the agreed price at the same level.

This reply is not justified as December 2000 contract did not stipulate any time restriction for additional requirement, HAL had already paid (between September 2002 and November 2004) the licence fee for 920 engines for life time exploitation of the aircraft and delay in achievement of rated capacity of production by Koraput Division was mainly attributable to the delayed supplies of licence technical documentation, tools, NSE, etc as discussed in para 9.1.3.3. Acceptance of a new rate disregarding the price stipulated in December 2000 contract resulted in additional cost of ₹ 66 crore to HAL.

<sup>234</sup> The Management reply of 88 aircraft is based on number of aircraft signalled out and not actually delivered.

<sup>235</sup>  $((5.05-4.78)*20+(3.95-3.73)*30)* 55)/10 = ₹ 66$  crore

#### 9.1.4.5 Supply of accessories

##### 9.1.4.5.1 Under quoting for line items

The firm and fixed price contract for Block III (December 2007) with IAF included USD 2.14 crore (₹85.78 crore) towards cost of 176 items of Ground Handling Equipment/Ground Support Equipment and other associated equipment. HAL had initially submitted quote for these items based on the reference prices given by MoD which were also incorporated in the contract. As these prices were not agreed to by ROE, HAL concluded (February 2012) supplementary agreements for supply of these items at a cost of USD 2.79 crore (₹152.39 crore) resulting in short recovery of ₹ 66.61 crore.

Management stated (January 2014) that as the contract with IAF was on firm and fixed price, there was no opportunity for HAL to revise the contracted price; however, amendments to delivery schedule and waiver of LD were being taken up.

Nevertheless, due to delay in finalization of contract for supply of Ground Handling Equipment/Ground Support Equipment and other associated equipment, IAF could not derive envisaged benefits of increased combat effectiveness. Further, non-inclusion of clause for price escalation with reference to year of incurrence in the agreement with MoD for supply of Block III aircraft (December 2007) resulted in loss of ₹ 66.61 crore to HAL.

##### 9.1.4.5.2 Non-inclusion of cost of accessories

Ground Handling Equipment and Ground Support Equipment (GHE/GSE) including 107 bomb racks was to be supplied for aircraft in accordance with the contracts for Blocks I and II and additional 40. HAL concluded (between March 2005 and November 2007) six supplementary agreements with ROE and got them supplied to IAF by November 2010. However, IAF informed (June 2011) that they could not be utilised due to non-availability of six lines of attachment forming their part and required for suspension on the aircraft.

When the matter was taken up in the meeting of Indo-Russian Sub-group co-operation in the field of production, operation and overhaul of Avionics equipment (IRSA), ROE stated (August 2011) that these accessories were not part of the bomb rack but would be supplied against separate supplementary agreements.

Accordingly, HAL concluded (February 2012) a supplementary agreement for ₹3.17 crore and the supplies were made to IAF. However, HAL's request to IAF for issue of a formal order for the supplies to enable it to make the claim was rejected (September 2012) by Air Headquarters stating that these attachments were supplied free of cost against its direct supply contract.

Management stated (January 2014) that Air Headquarters had informed about the deficiencies in the supply of one bomb rack (MBD3-6U-68) and when the issue was taken up ROE stated that the said items were to be procured separately. It further stated that the expenditure was met through contingency fund and hence there was no loss to HAL.

Failure to specify that the Bomb racks were to be supplied along with accessories while concluding the supplementary agreement with ROE deprived IAF of the envisaged benefits from the aircraft supplied besides additional expenditure of ₹ 3.17 crore to HAL.

**9.1.4.6** *Loss due to adoption of incorrect exchange rate in execution of contract for additional 40 aircraft*

The contract (March 2007) between IAF and HAL envisaged conversion rate of ₹59 per Euro and ₹45 per USD. The prices stipulated in the contract were up to 2007 level with provision for escalation to the year of delivery based on the principles of escalation for Su-30 MKI agreed between IAF and ROE.

Audit scrutiny (September-October 2013) revealed that while working out the impact of price revision for submission to IAF, HAL considered (February 2009) exchange rates as ₹ 45 per USD and ₹ 59 per Euro as in the original contract and sought (February 2009) the approval for contract price of ₹ 9,479.69 crore. However, when the amendment was issued (February 2009), MoD had approved (February 2009) the contract price as proposed by HAL but had adopted FE rates as ₹ 45.50 per USD and ₹ 60 per Euro. Thus, due to adoption of incorrect exchange rate, HAL incurred a loss of ₹101.72 crore.

Concurring with this audit contention, Management stated (January 2014) that amendments towards the change in exchange rate also would be covered in the proposal (covering certain other issues) for final amendment to the contract.

**9.1.4.7** *Injudicious acceptance of delivery schedule*

IAF concluded (December 2012) the contract with HAL which stipulated delivery of 42 aircraft in four phases over the period from 2012-13 to 2016-17. These included 4 of Phase I and 2 of Phase II to be supplied in 2012-13. HAL concluded a General Contract (December 2012) for licence production and a supplementary agreement for six aircraft kits of Phase I and two aircraft kits of Phase II with ROE specifying that the supplies be made within three months. HAL supplied all the six aircraft due in 2012-13 from Phase I.

Audit further noticed that the Russian side had expressed inability to supply 10 kits of Phase IV in 2012 as requested but offered to supply 18 kits in 2013 up to 1st quarter of January 2014 and 6 kits in 2014 up to 1st quarter of 2015. Thus, considering the cycle time of nine months, HAL was not in a position to

supply any Phase II aircraft before end of 2013. As a result, the acceptance (in December 2012) of delivery of Phase II aircraft during the year was injudicious.

#### **9.1.4.8 Recovery of interest on ad hoc advances released by MoD**

As brought out in para 9.1.2.3, MoD entered into a contract with HAL in December 2003 for Block I contract of 34 aircraft. Even before signing of the contract, MoD had released *ad hoc* advances totaling ₹ 3,725.76 crore during 1999-2000 to 2002-03. Subsequent to conclusion (December 2003) of the contract for Block I, stage payments were released from 2003-04 onwards and the *ad hoc* advances paid were adjusted. In July 2004, MoD also stipulated that HAL was to annually (on financial year basis) credit to the respective project the interest on the ad hoc advances outstanding (after adjusting the expenditure) at the actual annual interest rate earned by it on investment of surplus funds for the relevant year.

As per the records of HAL, the interest payable to MoD on the *ad hoc* advances kept unutilised worked out to ₹ 851.78 crore against which an amount of ₹ 1,215.91 crore<sup>236</sup> was actually recovered by MoD from HAL towards interest on the unused funds. Thus, there was excess recovery of ₹ 364.13 crore from HAL dues.

Management stated (January 2014) that based on the Government orders sanctioning the on account advances and approval of the Standing Committee, the interest earned by HAL was passed on to MoD and hence there was no loss to HAL.

HAL's reply that there was no loss is not acceptable as there was excess recovery of ₹ 364.13 crore as per details furnished by Defence Accounts Department and HAL. Further, it also indicates lack of reconciliation of dues and payments in respect of this project by HAL.

#### **9.1.4.9 Delay in ferrying out of aircraft after signalling out**

The I, II and III contracts referred to in Table 63 entered into with IAF stipulated that the IAF's inspector after satisfying himself about completeness of the aircraft and readiness for acceptance shall signal out (Signalling Out Certificate (SOC)) the aircraft. The contracts further stipulate that the buyer shall depute within 15 days of receipt of SOC his representative for acceptance of the aircraft (referred to as ferry out).

Audit scrutiny (September-October 2013) of SOCs issued during the years 2011-12 and 2012-13 revealed that though the production of aircraft were

<sup>236</sup> As per Letter dated 21<sup>st</sup> April 2014 of Defence Accounts Department of Nashik

certified therein as conforming to Standard of Preparation (SOP), a number of concessions from the SOP were mentioned. Audit also noticed that while 121 out of 134 aircraft were deemed to have been delivered up to 2012-13, ferry out happened 1 to 275 days beyond 15 days of issue of SOC in as many as 110 cases. An analysis of the delay in ferry out revealed that it was mainly on account of rectification of snags noticed after signalling out.

Management stated (January 2014) that concessions were granted by the customer and there was no deviation from SOP. They also stated that the aircraft was flight worthy and accordingly the customer had accepted it through SOC. This reply is to be seen in the light of the specific concessions from SOP listed in SOC for which compliance was mentioned in Work Done Reports. Management further stated that the pilot's observation was for software modification to 10i which was an additional requirement against the build of aircraft already accepted by IAF.

The Management's reply is not addressing the main audit issue viz. delay in ferry out of aircraft after signaling out. Further, the Management's reply that software modification to 10i was an additional requirement is factually not correct since all the three contracts referred to in Table-63 stipulate that the aircraft manufactured shall be new and shall incorporate all the latest improvements and modifications thereto. Further, it was decided (February 2010) in the 23rd Indo-Russian Sub-group co-operation in the field of production, operation and overhaul of Avionics equipment (IRSA) meeting that all licence build aircraft from the year 2009-10 were required to be delivered with 10i software.

#### **9.1.4.10** *Fatigue test of airframe not conducted*

Divisional DPR for Nashik aircraft division as well as technological part of the project of ROE proposed *inter alia* repeated static (fatigue) test of the aircraft's airframe. This test was to ascertain the strength of the structure of the aircraft.

It was envisaged that the test could be conducted in National Aeronautical Laboratory or any other agency or in Russia on any one airframe to be manufactured by HAL indigenously in the phase IV of the production programme (original delivery schedule). It was also mentioned that necessary test parameters and failure criteria and load distribution would be provided by ROE if the test was to be carried out in India.

With the compression of the delivery schedule, all the six aircraft of Phase IV identified for the fatigue test fell in Block II contract concluded in March 2006. The test was not conducted on any of the eight aircraft supplied in Phase IV during 2010-11 to 2012-13 aircraft. In the absence of this testing, whether the aircraft supplied could withstand the rigor of designed

performance could not be ascertained.

Scrutiny of records revealed that HAL, in response to Regional Centre for Military Airworthiness (RCMA), had informed (August 2010) that the static test of airframe was planned during Phase IV production but documents required for the same were not yet handed over by ROE and that the aircraft number to be subjected to the test would be decided after their receipt. However, it was observed that HAL placed the supplementary agreement for their supply only in December 2011 at a cost of ₹8.70 crore and the supplies were to be received by September 2013.

Management stated (January 2014) that in the DPR these tests were not planned to be carried out; as such no provision was made for the funds required to carry out these tests and additionally there was no provision for manufacture of additional two airframes for carrying out these tests. It also stated that the data on static and fatigue load details contracted from ROE would be utilised for carrying out life extension and upgrade of aircraft as well as integration of 'X'.

The reply was not acceptable as TPP prepared by ROE as well as Divisional DPR for Nashik aircraft division contained this as one of the testing parameters of the first aircraft of Phase IV and not only on aircraft identified for fitment of 'X'. The reply of HAL does not explain as to why and how this critical test was eliminated from the consolidated DPR. Further, there was an option of conducting the test in Russia in case the setting up of facilities was delayed at HAL and justification for not considering this option has not been stated by the Management. It has also not been explained by HAL as to why funds for the test and manufacture of two additional airframes were not provided for when the Division-wise DPR had provided for this test.

#### *9.1.4.11 Operationally Grounding of aircraft supplied due to Fuel leakage*

HAL delivered 60 of the 64 aircraft due under Blocks I and II up to 2009-10. A review of 42 cases of site repairs undertaken by HAL up to March 2010 relating to 29 aircraft disclosed that fuel leakage was the main snag in 36 cases and complaints relating to leakage from fuel tank were reported by IAF immediately after delivery of the aircraft. The leakages had caused pre-mature withdrawal of the aircraft.

Management stated (January 2014) that ROE had attributed the leakages to operating the aircraft at higher 'g' level, operation of TVC causing torsional force and vibrations on structure, high manoeuvres and hard landings, aircraft parked without fuel for longer time and aircraft parked outside under hot conditions. They added that fuel leakages/seepages could not be fully excluded due to inherent design features of the aircraft and repair had to be

undertaken immediately whenever the leakages were more than permissible limits.

The fact remains that as evident from the reply of ROE that fuel leakages/seepages could not be fully excluded due to inherent design features of the aircraft and hence, called for immediate corrective action from HAL to avoid operational grounding of aircraft.

#### **9.1.4.12 Excess vibration levels leading to scrapping of two engines**

Two engines manufactured by HAL from Phase III kits procured from ROE in 2008 at a cost of ₹ 16.41 crore each were damaged (February 2011) during testing at Koraput Division. Considering that the vibration levels of both the engines exceeded the acceptable norm, HAL and ROE decided (October 2012) that reconditioning was not feasible. As a result, the engines had to be replaced by HAL with new engines procured from ROE.

Audit scrutiny (September-October 2013) revealed that supplementary agreements placed (December 2012) for replacement of engines was at ₹21.71 crore each. Thus, HAL had to absorb ₹ 43.42 crore due to withdrawal of the engines.

Management stated (January 2014) that the engines were being brought to use by replacement/reworking (salvaging) damaged parts as per salvaging programme/procedure obtained from RCMA.

Management reply is not acceptable in view of the fact that salvaging operations have not been completed even after lapse of three years and hence, usability of the engines was doubtful.

### **Conclusion**

Neither HAL ensured timely delivery of the aircraft despite resorting to outsourcing thereby depriving IAF of the full quota of flying hours nor did it ensure total compliance with standards of preparation and foolproof quality.

Compression of delivery schedule warranted preparation of a revised DPR but HAL did not comply with it. There were instances of inadequate planning and contract management which resulted in additional expenditure, loss and untimely procurement of materials.

### **Recommendation**

- Compliance with all mandatory tests and standards of preparation before going in for customer's acceptance tests may be ensured.

- Suitable clauses may be incorporated in the contracts with foreign vendors to safeguard the interests of Indian counterparts in respect of delay in meeting contractual obligations to customer.
- Inventory management needs to be improved.

### 9.1.5 Setting up of infrastructure

**Audit Objective:** Setting up and utilisation of infrastructure for various activities was ensured as and when required.

#### 9.1.5.1 Introduction

The DPR envisaged capital investment of ₹ 762.70 crore (USD 150 million) at 2002 price level towards provisioning of machines, construction of factory buildings and residential accommodation (Details vide **Annexure XXIX**). The capital investment proposed (February 2002) project specific equipment necessary to establish indigenous manufacturing capabilities. The funding was to be done by HAL from internal resources/commercial borrowings which were proposed to be recovered through man-hour rate (MHR). In order to examine the progress in completion of planned infrastructure, Audit examined major facilities. The observations are given below:

#### 9.1.5.2 Delay in construction of Structural Assembly Complex

Construction of a Structural Assembly Complex at Nashik to accommodate additional machinery, equipment, non-standard equipment and tooling was envisaged in the DPR to provide space for assembling and was to be taken up from April 2002 and completed by December 2003. HAL awarded (July 2003) the contract to M/s Engineering Projects India Limited at a cost of ₹23.89 crore. The work which was to be completed by April 2004 was completed in December 2007 (after rectification of defects).

It was noticed by Audit (September–October 2013) that Nashik Division did not initiate timely action for awarding the contract though the DPR had categorically specified the timelines for completion of the civil works by December 2003 so as to ensure readiness for the licence production.

The delay in construction of the complex resulted in non-erection of coupling jigs for production of aircraft in Phase III and led to offloading (October 2005) of coupling activities to ROE at an avoidable expenditure of ₹ 28.73 crore.

Management stated (January 2014) that delay in finalisation of consultancy contractors, delay after award of civil contracts due to various reasons beyond its control, delay in supply of LTD, Tooling and NSE by ROE resulted in outsourcing the labour content of four aircraft due under Phase III to ROE. Management also stated that the extra expenditure incurred in outsourcing to ROE was offset by savings in HAL effort and there was no idle labour.

The reply was not specific to the audit observation with regard to delay in award of civil contract. HAL, having accepted a firm schedule for delivery of aircraft, should have ensured availability of infrastructure for manufacture.

**9.1.5.3 Construction of non-echo chamber**

The DPR envisaged construction of a non-echo chamber at Nashik Division for foolproof checking of the radar complex and snag investigation on ground. The estimated cost was ₹ 3.63 crore and the work was to be completed by December 2003. HAL concluded (December 2003) a supplementary agreement with ROE for transfer of working documentation for establishment of non-echo chamber at the flight hangar and functional test laboratory at a cost of ₹ 54.51 lakh.

The contract for construction of a non-echo chamber was awarded (July 2005) to M/s Vishal Infrastructure Limited (VIL) at a cost of ₹ 5.54 crore with scheduled completion by April 2006. However, the work was completed only in May 2008 after a delay of 25 months. Owing to delay in construction of civil works, was thereafter installed in October 2008. Owing to these delays, ROE recommended partial checks in functional test laboratory and flight hangar and the performance of radar (air to air) being certified by the pilot. The delayed establishment of the non-echo chamber prevented foolproof checking of the radar complex and snag investigation on ground till October 2008.

Management stated (January 2014) that radar complex was received from Hyderabad Division where complete checks/tests were carried out before dispatch to Nashik, similar checks were carried out in the non-echo chamber at Nashik and that these checks/tests were subsequently done on aircraft during flight testing which was final and also that non-establishment of non-echo chamber did not affect the production programme.

The reply was not acceptable as the checks/tests done at Hyderabad were before fitment on the aircraft but the tests were required to be done on aircraft both when on ground and in air. Therefore, the delayed establishment of the non-echo chamber prevented foolproof checking of the radar complex and snag investigation on ground till October 2008.

**9.1.5.4 Delay in commissioning of Computerised Numerically Controlled (CNC) equipment**

Based on technological requirements, workload for peak production, availability of similar machines in-house and feasibility of subcontracting the work, requirement of 205 items of plant and machinery costing ₹ 116.20 crore for Nashik Division were projected in the DPR. These included CNC machines which were required to be ordered by December 2002 and commissioned by June 2004.

Scrutiny revealed that supply of two CNC Axis machines at a cost of ₹ 18.66 crore was ordered in July 2004 and were to be delivered by June 2006. Though the machines were delivered as per schedule, the installation and

commissioning was done only in September 2007 due to non-availability of cranes. The delayed commissioning resulted in slippage of productionising of long cycle spars and main attachment and fittings for vertical fins. Consequently, the Division concluded (October 2007) a supplementary agreement with ROE for supply of two sets of readymade components at ₹3.38 crore to comply with the delivery of aircraft in Phase III during 2007-08. Thus, the delay in commissioning of the machinery led to outsourcing of items required for vertical fins delaying indigenization programme besides additional expenditure of ₹ 3.38 crore.

Management stated (January 2014) that delay in delivery and commissioning of the machines was due to delay in preparation of civil site for machines and technical problems faced by vendor during installation and commissioning besides delay in absorption of technology resulting in additional expenditure of ₹ 3.38 crore which was funded from contingency fund.

Management reply confirmed that the delay in building up infrastructure led to non-achievement of indigenization plan besides additional expenditure.

#### *9.1.5.5 Delay in establishment of welding chamber*

Nashik Division proposed (May 2003) to procure robotized welding chamber for welding of critical components of turbine, compressor and diffuser assembly. A contract for supply, erection and commissioning of TIG welding system in argon chamber was awarded (July 2008) to M/s Hind High Vacuum Company Pvt. Ltd after negotiations at a cost of ₹ 31.09 crore stipulating completion by July 2010. The installation was completed by February 2013 but was commissioned only in October 2013.

Audit noticed (September-October 2013) that due to non-installation and commissioning of the new facility, the Division resorted (November 2007, December 2011 and April 2012) to procurement of 40 sets of readymade Manned Chamber Welding (MCW) assemblies from ROE at a cost of ₹ 18.02 crore.

Management stated (January 2014) that although there was delay in procurement and installation of the equipment, indigenous capability had been established. They also stated that additional cost was incurred to facilitate engine production for supporting aircraft delivery as otherwise other consequential losses would have occurred.

The reply was not acceptable as HAL delayed finalisation of tenders called in December 2006 by 18 months which necessitated outsourcing for ₹ 14.18 crore in December 2011 and April 2012. Besides, delay in setting up of Manned Chamber Welding also affected the indigenization plan.

#### *9.1.5.6 Creation of facilities for repair and overhaul of aircraft*

HAL planned (August 2009) setting up of facilities for overhaul of the aircraft (airframe and its aggregates) at Nashik, Lucknow, Hyderabad and Korwa so as

to be completed by February 2012 since 50 aircraft directly procured by IAF from ROE between (May 1997 and December 2004) as well as aircraft supplied by HAL under I and II contracts (for 140 and additional 40 aircraft) would be due for overhaul from 2011-12 onwards after completion of their Time Between Overhaul of 1500 flying hours or Total Technical Life of 10 years.

Government of India sanctioned (August 2009) ₹ 1,793.17 crore for setting up of these facilities by February 2012. The sanction included ₹ 401.02 crore towards capital expenditure and ₹ 1,392.15 crore towards Deferred Revenue Expenditure.

The delay in establishment of facilities of ROH at HAL and the adverse impact on the fleet serviceability had been commented in the Report (No.4 of 2006) of the C&AG of India on Performance Audit relating to Union Government (Defence Services) presented in May 2006. In the Action Taken Notes, MoD had reported (May 2011) that the delay in setting up of the facilities was primarily due to delay in development of this version of aircraft and lack of its exploitation experience. It had also stated that Engineering Support Facilities had been planned by MoD and were being implemented in a phased manner.

The Division wise project timeframe (**Annexure XXVIII**) and total sanctions and actual expenditure as of September 2013 are given in **Annexure XXX**. Scrutiny of these details show that the repair/ overhaul facilities which were required to be in readiness by February 2012 were incomplete even as of December 2013 resulting in a delay of 22 months.

#### *9.1.5.7 Augmentation of engine production and overhaul capacity*

As brought out in para 9.1.3.3, engines were to be produced in five phases at the Engine Division of HAL at Koraput. The TPP Report envisaged investment of ₹ 406.66 crore at 2000 price level towards 2,043 items of plant and machinery to manufacture 24 engines. However, DPR projected only ₹ 279.51 crore for 1,330 items of plant and machinery to manufacture 24 engines citing fund constraints.

A study instituted (May 2012) by HAL to assess the Division's capacity build up reported (July 2012) that due to non-inclusion of balance items of plant and machinery, the envisaged built up capacity for manufacture of 24 engines was not achieved.

Audit noticed (September-October 2013) that in January 2001 itself, the Government, while according sanction for manufacture of Su-30 MKI aircraft, had mentioned that the capital investment of USD 150 million (₹ 690 crore) towards standard machine tools and civil works required for setting up of new lines or increasing capacity would be funded by HAL from its internal resources/commercial borrowings and no budgetary support would be provided. It had also specified that this would be recoverable by HAL through man-hour rate. Though HAL was aware of its commitment from the beginning, HAL Board accorded sanction only in August 2012 for capital

investment of ₹ 556.71 crore for augmenting manufacturing capacity to 24 engines per annum with timeline for completion up to 2014-15. HAL had initiated (September 2012) procurement action and committed an expenditure of only ₹ 20.99 crore with expected date of completion by March 2016 as of December 2013. It was further noticed that, HAL's decision to restrict the expenditure on augmentation of capacity citing funds constraints was also not justified as it held Reserves and Surplus ranging from ₹ 1,379.11 crore as of March 2001 to ₹ 13,257.69 crore as of March 2013.

Thus, HAL was behind the scheduled completion of 2014-15 for augmentation of Repair and Overhaul facilities.

Management stated (January 2014) that the capacity was assessed by the Study Team based upon various factors including possibilities of subcontracting and that only after gaining experience in the manufacturing of Phase IV engine, the Division realised (July 2012) the need to augment the existing capacity.

The reply was not justifiable because DPR should have been prepared considering all the relevant aspects based on acceptance (March 2006) of the compressed delivery schedule. As brought out in Table-67, HAL was to manufacture more than 12 engines per annum from 2009-10 onwards under phases IV and V. Hence, the present capacity was not adequate for delivering the required number of engines. In view of the same, the Board's decision (August 2012) to augment the capacity was delayed.

### **Conclusion**

HAL was behind schedule in respect of creation of facilities for all the major activities like manufacture of aircraft including avionics systems, engines and accessories as also repair and overhaul. Consequently, it resorted to outsourcing of the related activities to the OEM. These contributed to delay in deliveries and inability to take up overhaul of aircraft inducted after completion of TBO.

The Inter Government Agreement (October 2000) did not provide for protection against delays and resultant escalation in cost attributable to ROE. As a result HAL had to absorb additional financial costs attributable to delays by ROE at various stages as pointed out in paras 9.1.3.2, 9.1.4.2, 9.1.4.4, 9.1.4.5, 9.1.5.2 and 9.1.5.5.

### **Recommendation**

- Synchronisation of availability of infrastructure with production schedule may be ensured.

The matter was reported to the Ministry in April 2014. Their reply was awaited (October 2014).

## BEML LIMITED

### 9.2 Loss due to non utilisation of power for captive consumption

**Non utilization of power generated by wind mill farm for captive consumption and sale of power to Hubli Electricity Supply Company Limited (HESCOM) at a price lower than they paid to Bangalore Electricity Supply Company Limited (BESCOM) and Boruka Power Corporation Limited for purchase of power resulted in loss of ₹ 5.67 crore (April 2014).**

BEML Limited (Company), proposed (January 2006) to the Board of Directors to set up a 5 MW Wind Mill Farm for captive consumption at a project cost of ₹ 25 crore. While according in principle approval (January 2006), the Board desired a project report for consideration and clearance. Accordingly, M/s. Environment & Power Technologies Private Ltd., (EPTPL) were appointed (January 2006) as consultants for the preparation of a detailed project report (DPR).

The DPR (April 2006) of EPTPL considered two financial options viz., (i) generation of wind power for captive consumption against Electricity Supply Company's (ESCOM) rate of ₹ 4.30 per unit and (ii) sale of wind power to ESCOM/Karnataka Power Transmission Corporation Limited (KPTCL) @ ₹ 3.40 per unit. It envisaged savings of about ₹ 3.26 crore per year and ₹ 2.18 crore per year against the two options respectively. DPR was placed before the Board (April 2006) with a proposal to set up 5 MW wind mill farm for captive consumption at a cost of ₹ 30 crore. The Board approved (April 2006) the proposal envisaging a saving of over ₹ 2 crore per annum. Accordingly, the Company placed (June 2007) three purchase orders<sup>237</sup> on M/s. Suzlon Energy Limited for setting up of 5 MW wind farm project at a total cost of ₹ 26.54 crore. Simultaneously, the Company applied (July 2007) to Karnataka Renewable Energy Development Limited (KREDL)<sup>238</sup> for development of wind farm project meant for captive consumption based on a Wheeling and Banking arrangement<sup>239</sup>. Electricity Supply Act, 2003 provided for open access<sup>240</sup> and captive generation of power. Karnataka Electricity Regulation Commission (KERC) (Terms and Conditions for Open Access) Regulations were issued/notified in December 2004.

The Company installed (December 2007) a 5 MW wind mill farm project<sup>241</sup>. Subsequently, deviating from the Board's earlier approval (April 2006) to utilise the power for captive consumption, the Company entered into (February 2008) a Power Purchase Agreement (PPA) with Hubli Electricity Supply Company Ltd., (HESCOM) to sell the generated power for a period of 20

<sup>237</sup>One Purchase Order for supply of Wind Energy Generators, one for Erection, Testing and Commissioning and another for land

<sup>238</sup>Nodal Agency appointed by Govt. of Karnataka for permitting and regulating Renewal Energy Projects.

<sup>239</sup>Wheeling means the operation whereby the distribution system and associated facilities of a transmission licensee or distribution licensee, as the case may be, are used by another person for the conveyance of electricity on payment of charges;

<sup>240</sup>Open access means the non-discriminatory provision for the use of transmission lines or distribution system by any licensee or consumer or a person engaged in generation in accordance with the regulations specified by the Appropriate Commission;

<sup>241</sup>At Kappatguda-2, Mundargi Taluk, Gadag District;

years<sup>242</sup>. The Company had earned ₹ 19.63 crore during the period January 2008 to April 2014 on sale of electricity to HESCOM.

Audit scrutiny revealed that, during the period January 2008 to April 2014 as against the generation of 5.77 crore KWH units of energy and revenue generation of ₹ 19.63 crore, the Company in KGF Complex had incurred an expenditure of ₹ 27.27 crore towards consumption of 5.77 crore KWH units of energy purchased from Bangalore Electricity Supply Company Limited (BESCOM) and Bhoruka Power Corporation Ltd.

Thus, not utilizing the power generated by the windmill resulted in loss of ₹5.67<sup>243</sup> crore for the period from January 2008 to April 2014.

Ministry (March 2014) stated that Karnataka Electricity Regulatory Commission (KERC) had passed orders in the matter of Wheeling and Banking agreement only in July 2008. As there was no provision for captive consumption through wheeling and banking agreement during December 2007, there was no other choice than opting for PPA with HESCOM. Ministry further stated that the matter regarding termination of PPA and captive utilisation of wind energy was being pursued vigorously by the Company.

Reply is not tenable as the order passed by KERC in July 2008 was only to finalise the standard Wheeling and Banking Agreement for all renewable energy projects. The provisions for Wheeling and Banking facility existed even before installation of Wind Mill (December 2007). Despite the fact that the Company applied to KREDL for development of wind farm project meant for captive consumption and wind mill project was intended only for captive consumption even as per the Board approval, Wheeling and Banking agreement was not entered into even after 6 years of installation of wind mill farm. Further, even though PPA<sup>244</sup> provided for termination of contract, the same was not invoked to utilise the power generated for captive consumption.

Thus, non utilization of the power generated for captive consumption and purchase of power at higher rate from BESCOM and Bhoruka Power Corporation Limited resulted in loss of ₹ 5.67 crore till April 2014.

### 9.3 Non-recovery of liquidated damages

**Acceptance of non-enforceable terms of LD coupled with failure to withhold the payments resulted in non-recovery of LD of ₹ 12 crore.**

BEML Limited (the Company) received a Letter of Intent (LOI) (October 2007) from Northern Coalfields Limited<sup>245</sup> (NCL) for supply of BEML-Bucyrus 20 Cu. M. Rope Shovels<sup>246</sup> followed by a purchase order (PO) (November 2007) for supply of two Rope Shovels along with accessories and

<sup>242</sup> At the rate of Rs.3.40 per KW hour for the first 10 years. From 11<sup>th</sup> year onwards, at the rate determined by KERC;

<sup>243</sup> Actual expenditure incurred is ₹27.27 crore and revenue generation is ₹19.63 crore. The loss works out to ₹5.67 after considering wheeling and banking charges of ₹1.97 crore that would have been incurred for captive consumption;

<sup>244</sup> Clause 9.2.1 (b) read with 9.3.1 clarifies the provisions in respect of default and termination.

<sup>245</sup> NCL, Singrauli, Madhya Pradesh - A subsidiary of Coal India Limited, a Government of India undertaking;

<sup>246</sup> Model 295 series Electric Rope Shovel;

consumables within 15 months and 15 days from the date of placement of order at a total value of ₹ 91.99 crore. The purchase order was amended (February 2008) for supply of three Rope shovels at a total value of ₹ 137.99 crore, which stipulated delivery of the third Rope shovel within 18 months and 15 days from the original date of PO (November 2007). Erection and commissioning was to be completed by BEML within 60 days of the receipt of complete equipment at site. As per the terms of the PO, delay in delivery of the equipment attracted liquidated damages (LD) of 0.5 *per cent* per week, of the price of any stores not supplied, subject to a maximum of 10 *per cent* and delay in erection/commissioning of the equipment attracted LD of 0.5 *per cent* per week of the landed price of equipment, subject to a maximum of 5 *per cent*.

On receipt of the order from NCL in November 2007, BEML placed a PO (December 2007) on M/s. Bucyrus International Inc., USA, (BII) for supply of two sets of CKDs<sup>247</sup> of Rope Shovels on back to back basis, which was subsequently amended (February 2008/April 2008) for supply of three sets for a total value of US \$ 16785000 (₹ 70.50 crore). As per the terms of the PO placed on BII, the delivery schedule for Bucyrus supply items and complete groups/components was 24 weeks and 44 weeks for two sets and 30 weeks and 50 weeks for the third set respectively, to be reckoned from the date of the 1<sup>st</sup> purchase order (19 December 2007). Subsequently, PO was amended (November 2008) to exclude electrical items thereby reducing the value of the PO to US \$ 14140315 (₹ 59.39 crore). Another PO was placed (December 2008) on M/s. Bucyrus India Pvt. Ltd., Kolkata (BIPL) for supply of electrical items at a value of ₹ 11.90 crore. BIPL is the Commercial Arm of BII.

As per the terms of the POs placed (February 2008 and December 2008) on BII and BIPL, payment to BII was to be made through Letter of Credit (LC) and payment to BIPL was to be made within 30 days from the date of receipt of goods. Further, for delay in supply of equipment by BII, LD was to be levied at the rate of 0.5 *per cent* per week subject to a maximum of 10 *per cent*, which was payable in the form of OEM parts credit. For delay in erection and commissioning of equipment beyond 60 days from the date of receipt of complete consignment at site, LD was to be levied at the rate of 0.5 *per cent* per week subject to a maximum of 5 *per cent*, which was also payable in the form of OEM parts credit to BEML. The parts credit could be used by BEML either for purchase of spare parts or towards supply of third set of CKD. However, LD was payable by BII only if LD was levied on BEML by NCL for delay in supply and delay in erection and commissioning of the Rope shovels to NCL.

We observed that BII supplied three CKD sets during September 2008 to November 2009 with a delay of about 2 to 43 weeks. Consequently, BEML supplied the equipment to NCL during April to June 2009 with a delay of 3 to 10 weeks and erection and commissioning at NCL was completed between December 2009 and August 2010 with delay of about 7 to 15 months. NCL deducted (April 2009 to September 2010) LD of ₹4.48 crore from BEML

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<sup>247</sup> Complete Knock Down of groups and components;

towards delay in supply of Rope shovels and ₹ 7.56 crore towards delay in erection and commissioning.

As NCL had levied LD on BEML, BEML raised (February 2010/March 2011) a back to back claim on BII for refund of LD of ₹ 12<sup>248</sup> crore. Although BII agreed to settle the claim in respect of only one Rope Shovel, BII did not agree for refund of LD in respect of balance two Rope Shovels (July 2013). The parts credit as per the terms of the contract was also not given/extended to BEML.

We further observed (September 2013) that although 79 (\$ 117.301 lakh) orders were placed by BEML on BII for procurement of spares during 2009-10 to 2011-12, recovery of LD through OEM parts credit in line with the terms of PO was not enforced at all. Further, the alternate option that OEM parts credit which could be used against supply of third set of CKD, was also not enforceable, as payment to BII was through LC and LD was recoverable only on back to back<sup>249</sup> basis. In view of the fact that LC was established by BEML (July 2008 to February 2009) for payment to BII before recovery of LD by NCL (April 2009 to September 2010), LD could not be recovered from BII from the payments due to them.

Management stated (March 2013) that it was important to bag the order to penetrate into the higher end electrical shovels in the mining business. Supply of spare parts is against advance payment through LC/sight draft irrespective of agreed terms for supply of equipment. In the event of invoking LD clause in respect of equipment PO, in the POs issued for spares, BII would not have supplied the spares against customer orders and maintenance and repair contracts. Management further stated that issue of LD was being followed up with BII/CGM<sup>250</sup>.

The reply is not agreeable as the terms and conditions agreed by BEML were not enforceable and did not safeguard the interest of the Company. Further the Company had made payments to BIPL towards electrical items, out of which an amount of ₹ 2.97 crore had also been paid before deduction of LD by NCL from the payments made to BEML. The company also had an opportunity to withhold balance amount of ₹ 9.91 crore. However, BEML did not initiate action to withhold the payment made to BIPL against LD recoverable from BII similarly, as done in the case of POs placed for 10 Cu. M. Rope Shovels. LD claim had not been settled even after a lapse of 3 years (October 2014). Ministry, while endorsing (March 2014) the reply of the Management, stated that instructions have been issued (March 2014) to all DPSUs to review the provisions in such contracts carefully and ensure that sufficient recourse is available for recovery of LD.

Thus, acceptance of non-enforceable terms for recovery of LD coupled with failure to withhold the payments resulted in non-recovery of LD of ₹12 crore.

<sup>248</sup> BEML claimed ₹11.91 crore from BII as applicable, against ₹12.05 crore deducted by NCL. ₹11.91 crore also includes LD of ₹0.23 crore towards supply of electrical items from BIPL;

<sup>249</sup> LD was payable by BII only if LD was levied on BEML by NCL;

<sup>250</sup> BII has been taken over by M/s. Caterpillar Global Mining in July 2011;

#### 9.4 Loss of ₹ 9.81 crore in supply of ACEMU Coaches

**Non-inclusion of Value Added Tax / Central Sales Tax in the offer for supply of Air conditioned Electric Multiple Units resulted in non-recovery of ₹ 5.51 crore and delayed supplies of coaches resulted in payment of Liquidated Damages of ₹ 2.99 crore. Further, the Company had to absorb ₹ 1.31 crore being the Excise Duty paid for deliveries beyond stipulated delivery schedule as the extension of delivery schedule was with denial clause.**

Ministry of Railways (MoR) invited tenders (June 2007) for fabrication and supply of Alternating Current Electric Multiple Units (ACEMU) coaches. As per the tender conditions, presently applicable rate and quantum of Sales Tax (ST) / Value Added Tax (VAT) including the quantum of input tax credit / set off of tax paid on raw material, output tax and net tax of VAT / ST was to be clearly indicated in the offer. M/s BEML Limited (BEML) submitted (September 2007) their offer of ₹ 140.12 crore for supply of 16 rakes<sup>251</sup> and 17 loose coaches. As per the offer, the prices quoted were exclusive of Excise duty (ED). CENVAT credit was not considered since during 2007, ED was not leviable for supply of Coaches to Indian Railways. It was stated in the offer that in case payment of ED was applicable at a later date, the same would be charged extra at actual as applicable at the time of delivery and the prices quoted were exclusive of ST / VAT. ST considered was NIL.

MoR intimated (November 2008) BEML that their offer for supply of ACEMU coaches had been accepted for 8 rakes and 17 loose trailer coaches and sought for unconditional acceptance within seven days from the date of issue of the letter. BEML, in response, conveyed (December 2008) their acceptance subject to amending the clause relating to ST / VAT so as to enable them to claim the reimbursement of actual ST / VAT paid. However, MoR did not consider the request of BEML and placed (March 2009) a regular order for 8 rakes and 17 loose trailer coaches at a total all inclusive cost of ₹ 75.40 crore and the same was accepted (May 2009) unconditionally by BEML. As per the order, deliveries were to commence within 12 weeks after placement of the order and completed within 31<sup>st</sup> March 2010. The order also stipulated levy of liquidated damages (LD) at the rate of one *per cent* of the fabrication cost for each and every month for which delivery was delayed beyond the period specified in the contract. The order also provided Quantity Option clause as per which MoR was entitled, at any time during the currency of the contract, to increase the quantity by not more than 30 *per cent*. In accordance with this clause, MoR increased (May 2011) the quantity by adding three rakes and the total contract price was ₹ 99.67 crore. Delivery of the additional quantity was to commence within three months of issue of the order and completed within three months thereafter. The delivery period of the additional rakes was extended (July 2012) by MoR at the request of BEML upto December 2012 and further upto March 2013 without levy of LD but with denial clause.

Audit observed the following:

<sup>251</sup> One rake includes 3 nos. of Motor Coaches, 4 nos. of Trailer Coach C and 2 nos. of Trailer Coach D

**a) Non-inclusion of Value Added Tax in the quote resulting in non-recovery of Value Added Tax / Central sales Tax paid - ₹ 5.51 crore**

The quotation by BEML stating that ST was NIL was not in order since as per Karnataka Value Added Tax Act, 2003, four *per cent* VAT was payable on the sale of Railway products with effect from 01 April 2005. This was further enhanced to five *per cent* with effect from 01 April 2010. Thus, submission of offer stating that ST considered was NIL was erroneous. BEML paid ₹ 3.79 crore towards VAT / Central Sales Tax (CST) against supply of 8 rakes and 17 loose trailer coaches (₹ 3.34 crore (VAT) and ₹ 0.44 crore (CST)) and further ₹ 1.72 crore against supply of additional three rakes. Owing to non-inclusion of sales tax component in the offer, BEML could not recover the same.

**b) Loss of ₹ 2.99 crore due to delayed supply of coaches**

As per the order, delivery of 8 rakes and 17 loose trailer coaches were to be completed within 31 March 2010. As the coaches were not supplied within the stipulated time, MoR, at the request of BEML, extended the delivery period initially (June 2010) upto December 2010 without levy of LD but with denial clause. The delivery period was further extended (January 2011) upto March 2011, again (April 2011) upto June 2011 and finally (November 2011) upto November 2011 with levy of LD and denial clause. BEML completed the supplies between March 2010 and November 2011 and as the supplies beyond December 2010 were with levy of LD, Railway Board recovered ₹ 2.99 crore due to delayed supplies.

**c) Non-recovery of Excise Duty of ₹ 1.31 crore**

At the time of submission of offer to MoR, ED was not leviable for supply of Coaches to Indian Railways. However, the exemption was withdrawn (March 2011) and a concessional duty of one *per cent* besides education cess (one *per cent*) and higher education cess (two *per cent*) was imposed. This was further enhanced (March 2012) to two *per cent* besides education cess (one *per cent*) and higher education cess (two *per cent*). As the extension in delivery schedule beyond March 2010 were with denial clause viz. any increase in statutory levies were to be borne by the supplier, BEML had to absorb the ED paid amounting to ₹ 0.79 crore being the ED paid on the original order for deliveries effected after March 2011. MoR decided (March 2012) to reimburse Excise Duty at one *per cent* and three *per cent* Education cess for the quantity added under the option clause. As per the order, the deliveries were to be completed before November 2011 but were actually supplied between December 2012 and March 2013. As the ED was enhanced from March 2012 and deliveries beyond stipulated delivery schedule were with denial clause, BEML had to absorb ₹ 0.52 crore being the ED paid on additional quantity.

In response to the Audit observation, Ministry replied (September 2013) that

- BEML was not discharging VAT for Rolling Stock supplied during that period and the order was bagged under stiff competition;

- MoR had not considered the request of BEML for reimbursement of VAT favourably;
- Delay in deliveries were due to delay in free supply of steel raw material and wheel sets;
- BEML earned a contribution of ₹ 36.68 crore on executing the main order (8 rakes and 17 loose trailer coaches); and
- It was a commercial decision to exclude VAT in the price quotation.

The reply is not acceptable since

- BEML was aware that VAT was payable since 2005 and exclusion of VAT was not deliberate but an omission as BEML requested (December 2008) MoR for reimbursement of VAT only after the submission (September 2007) of tender and communication (November 2008) of acceptance by MoR.
- Bagging the order under stiff competition does not allow exclusion of statutory payments while quoting the price, more so when VAT was to be specifically indicated in the quotation.
- Delayed supplies were not due to delay in free supplies since as per the Stores records, BEML had sufficient stock of wheel sets.

Thus, non-inclusion of Value Added Tax while giving the offer and levy of Liquidated Damages due to delay in delivery resulted in loss of ₹ 8.50 crore to BEML. Further, as the extension of delivery schedule was with denial clause, the Company was forced to absorb Excise Duty of ₹ 1.31 crore paid during the extended delivery schedule.

## MIDHANI

### 9.5 Loss due to delay in procurement of material

**Delay in procurement of raw material led to non-recovery of price escalation of ₹ 15.52 crore and consequent delay in supplies resulted in levy of LD of ₹ 1.47 crore**

Mishra Dhatu Nigam Limited (the Company) entered (March 2003/July 2003) into two contracts with M/s. Vikram Sarabhai Space Centre (VSSC), Department of Space, Thiruvananthapuram (customer) for supply of Maraging steel (M250) Forged Rings, Plates, Filler Wires and Rods at a cost of ₹ 40.38 crore and ₹ 63.59 crore. The base price of the contracts were corresponding to October 2001 and February 2002 price levels and governed by price escalation formula. Average cost of power, LPG, labour and weighted average cost of the monthly wholesale price indices prevailing during 18<sup>252</sup> months from the date of contract and actual weighted average cost of raw material (Nickel, Cobalt, Moly and Pure Iron) were reimbursable to the Company. The Company

<sup>252</sup> The period of 18 months was the average cycle time from procurement of raw material to forging stage. Hence price escalation was limited to 18 months in the price escalation formula;

received (March/July 2003) advance of ₹ 47.98 crore<sup>253</sup> against the two contracts towards procurement of raw material.

As per the delivery schedule<sup>254</sup>, deliveries for both the contracts (March/July 2003) were to start within six months and to be completed within 45 months from the date of signing the contract. Accordingly, the supplies were to be completed by December 2006 and April 2007.

Considering 18 months period as allowed in price escalation formula for various elements of cost, procurement of raw material were to be completed by the Company within September 2004 and January 2005. However, procurement of material for two contracts was completed only in January 2008 and October 2008. Consequently, the supplies were completed belatedly in February 2010 and May 2009 with a delay upto 38 months. Liquidated damages (LD) amounting to ₹ 1.47 crore was levied by VSSC.

The Company raised (August 2010/November 2009) claims for ₹ 38.86 crore<sup>255</sup> for two contracts towards price escalation. VSSC did not settle the claim expressing reservations on the amount claimed.

Finally, in a meeting (January 2011) held for negotiating the price escalation claims, it was decided to restrict price escalation claim up to 18 months for all the elements of cost and therefore, the price escalation claim was reduced from ₹ 38.86 crore to ₹ 23.34 crore<sup>256</sup>. The revised claim (January 2011) for ₹ 23.34 crore was realised (March/April 2011) by the Company. Thus, the additional cost, on procurement of raw materials over and above the base price indicated in the contract, incurred by the Company on procurement of material beyond the 18 months period amounting to ₹ 15.52 crore had to be absorbed by the Company.

Management stated (April 2014) that there was no specific clause in the contract stipulating procurement of raw material within 18 months and materials were procured in small quantities over a longer period expecting the downward trend in the international market and also due to inadequate cash flow. Management also claimed that there was no financial loss since reduction in price variation claim was accepted as a good gesture keeping long term relationship in view and investment by customer in critical equipment.

The reply of the Management was not acceptable as

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<sup>253</sup> ₹ 16.19 crore (March 2003) and ₹ 31.79 crore (July 2003);

<sup>254</sup> As per the delivery schedule of the first contract (March 2003), delivery of Rings, Plates and Filler wires was to commence within 28 months and to be completed **within 45 months** and Rods were to be delivered **within 6 months** from the date of signing the contract. The delivery schedule of the second contract (July 2003) stipulated that delivery of Rings was to commence within 36 months and to be completed **within 45 months**, Plates and Filler wires was to commence within 24 months and to be completed within 36 months and Rods were to be delivered **within 6 months** from the date of signing the contract;

<sup>255</sup> Original claim was for ₹ 18.45 crore and ₹ 20.41 crore for two contracts respectively totaling to ₹38.86 crore;

<sup>256</sup> Revised claim was for ₹ 7.15 crore and ₹ 16.19 crore for two contracts respectively totaling to ₹23.34 crore;

- The price escalation clause allowed 18 months period for price escalation in respect of labour, power, LPG and wholesale price index. Though no limitation was prescribed for raw materials (Nickel, Cobalt, Moly and Pure Iron), the fact that the other elements of cost viz. labour, power, LPG and wholesale price index for which the limitation of 18 months was applicable could be incurred only after procurement of raw material indicated that raw material should have been procured within that period. Further, the customer, in fact, enforced the limitation to raw materials whereby the Company had to absorb ₹ 15.52 crore.
- Despite initial payment of 50 *per cent* advance, the Company did not procure the material within 18 months.
- Absorbing the loss as a 'good gesture' was not in order as the customer, in addition to, disallowing the claim also levied liquidated damages on delayed deliveries in line with contractual provisions.

Thus, delay in procurement of raw material led to non-recovery of price escalation of ₹ 15.52 crore and consequent delay in supplies resulted in levy of LD of ₹ 1.47 crore.

The matter was reported to Ministry of Defence (May 2014); their reply was awaited (October 2014).

New Delhi  
Date: 01 December 2014

  
(PARAG PRAKASH)  
Director General of Audit  
Defence Services

Countersigned

New Delhi  
Dated: 01 December 2014

  
(SHASHI KANT SHARMA)  
Comptroller and Auditor General of India