CHAPTER-VII: ORDNANCE FACTORY ORGANISATION

7.1 Performance of Ordnance Factory Organisation

7.1.1 Introduction

7.1.1.1 Ordnance Factories are the oldest and largest organization in India's defence industry with a history that dates back to 1787. There are 41 Factories (including two Factories at Nalanda and Korwa under project stage) divided under five clusters or operating groups (**Table 17**) produce a range of arms, ammunition, weapons, armoured and infantry combat vehicles, and clothing items including parachutes for the defence services. They function under the Ordnance Factory Board (Board) which is under the administrative control of the Department of Defence Production of the Ministry of Defence of Government of India.

Table : 17

Operating group	Number of factories
Ammunition & Explosives	11
Weapons, vehicles and equipment	11
Materials & Components	8
Armoured vehicles	6
Ordnance equipment group	5
Total	41

Source:Annual Accounts of Ordnance Factories–2014-15

7.1.1.2 Status of Two Ordnance Factories under Project Stage

Ordnance Factory Project Nalanda was sanctioned (November 2001) by Government of India, Ministry of Defence as a new propellant factory for manufacture of 2 lakh Bi-Modular charge system *per annum* for 155mm ammunition at an initial cost of ₹ 941.13 crore, revised (February 2009) to ₹2160.51 crore. The project was due to be completed by November 2005, revised to March 2019. Expenditure incurred on plant and machinery, civil works and pre-operative expenditure up to 31 March 2015 amounted to ₹320 crore, ₹507 crore and ₹ 127 crore respectively. A total of ₹954 crore was spent for the project till 31 March 2015.

Ordnance Factory Project Korwa was sanctioned (October 2007) by the Government of India, Ministry of Defence for manufacture of 45,000 carbines *per annum* at an estimated investment of ₹ 408 crore. The time schedule for implementation of the project was initially fixed at October 2010, revised to March 2017. As of 31 March 2015, the Board expended ₹ 142 crore, ₹ 116 crore and ₹ 41 crore towards civil works, Plant and machinery and pre-operative expenditure respectively. A total of ₹299 crore was spent for the project till 31 March 2015.

Even after expenditure of ₹ 1253 crore, none of the project had accrued any benefits to the Board.

7.1.1.3 The objectives of the Board are:

- To supply quality arms, ammunition, tanks and equipment to armed forces;
- To modernise production facilities to improve quality;
- To absorb latest technology through Transfer of Technology and in-house Research & Development; and
- To meet customer satisfaction and expand consumer base.

7.1.1.4 Our analysis of the performance of the Board during 2014-15 places it, where relevant, against the above objectives.

7.1.2 Performance of Ordnance Factory Board

The data on key areas of management in the Board for the five years 2010-15 are summarized in **Table 18**[16]. **Annexure-IX** gives the details segregated across operating groups.

Table: 18

(₹in crore)

				Years			
		2010-11	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**Variation between 2014-15 and 2013-14 (%)**
I	**Financial Performance**						
	Revenue expenditure						
1	Budget Estimate (BE)	11,875	11,640	13,013	13,856	14,317	3
2	Final Grant	11,195	12,332	11,821	12,954	13,617	5
3	Actual Revenue expenditure (% utilization to Final grant)	10,903 (97)	12,141 (98)	11,936 (101)	12,834 (99)	12,832 (94)	(-)0.02
4	Excess (+)/Savings (-) (3)-(2)	(-) 292	(-) 191	(+) 115	(-) 120	(-) 785	554
5	Revenue receipts [17]	11491	12876	12553	12001	12001	0
6	Cost of issues to indentors	14253	16147	16181	15783	16380	4
7	Value of issues to indentors	15425	17273	17119	16122	16664	3
8	Profit (7) -(6)	1172	1126	938	339	284	16
	Capital expenditure						
9	Budget Estimate	769	400	400	436	1207	177
10	Final Grant	456	293	357	466	765	64
11	Capital expenditure (Actual)	454	279	349	465	746	60
12	Excess (+)/Savings (-) (11)-(10)	(-)2	(-) 14	(-) 8	(-) 1	(-) 19	1800

[16] Figures in the Table have been readjusted wherever found necessary.

[17]. Recoveries for supplies to Army, Airforce, Navy and other defence departments are shown as "deduct" under Minor Head 901 to 904 under Major Head 2079 up to 2013-14 in the Appropriation Account of the Defence Services.. With effect from 2014-15, the same is reflected separately in Annexure-'A' to the Appropriation Accounts of the Defence Services. Recoveries for supplies to other indentors are credited to the Major Head 0079.

				Years			
		2010-11	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**Variation between 2014-15 and 2013-14 (%)**
II	**Cost of Production: Components**						
13	Cost of stores	8710	10070	9746	9303	9269	(-)0.37
14	Cost of labour	1319	1490	1617	1705	1959	15
15	Other costs *i.e.* Direct Expenses	136	159	216	239	274	15
16	Overheads	3847	4214	4393	4389	4973	13
17	**Total Cost of Production**	14012	15933	15972	15636	16475	5
18	Overheads as % of COP (16/17*100)	27	26	28	28	30	7
19	Labour costs as % of COP (14/17*100)	09	09	10	11	12	9
III	**Inventory**						
20	Stores-in-hand	5177	5336	5604	5588	5906	6
21	Work-in-progress (WIP)	2296	2551	2999	3538	3817	8
22	Stores-in-transit	669	538	682	854	887	4
23	Finished goods/components	1214	1212	1206	1305	1698	30
24	**Total inventory**	9356	9637	10491	11285	12308	9
25	Inventory as % of COP	67	60	66	72	75	4
26	WIP as % of COP	16	16	19	22	23	5
IV	**Labour & Machines**						
27	Numbers of direct industrial employees (DIEs)	48200	46568	47166	46206	44464	(-) 4
28	Ratio of DIEs : Supervisory officers	1.5:1	1.41:1	1.46 : 1	1.5 : 1	1.5 : 1	0
29	Production per employee (₹ in thousands)	1437	1674	1682	1680	1821	8
30	Labour hour utilization (%)	125	127	129	127	127	0
31	Machine hours available (in lakh hours)	1830	1577	1603	1203	1001	(-) 17
32	Machine hour utilization (%)	72	78	76	73	75	3
V	**Issues: Indentor-wise**						
33	Army	9225	10027	9609	8609	9098	6
34	Air Force and Navy	463	433	433	539	562	4
35	Other Defence Departments	111	192	138	147	164	12
36	Central Paramilitary Police Organizations (Ministry of Home Affairs)	635	826	831	782	650	(-)17
37	Civil trade including Exports	781	913	963	1046	889	(-)15
38	IFD supplies[18]	4210	4883	5145	4999	5301	6
39	**Total issues**	15425	17274	17119	16122	16664	3
VI	**Research & Development**						
40	Expenditure on R&D	40	36	48	43	56	30
41	R&D expenditure as % of total revenue expenditure	0.29	0.30	0.40	0.34	0.44	29
Source : Budget & Expenditure Statement of OFB and Annual Accounts of Ordnance Factories							

Our analysis of trends from the data in Table 2 is discussed in the succeeding paragraphs.

[18] IFD : Inter Factory Demand, whereby sister factories feed the need for stores of other factories.

Budgeting

7.1.2.1 Revenue expenditure & receipt

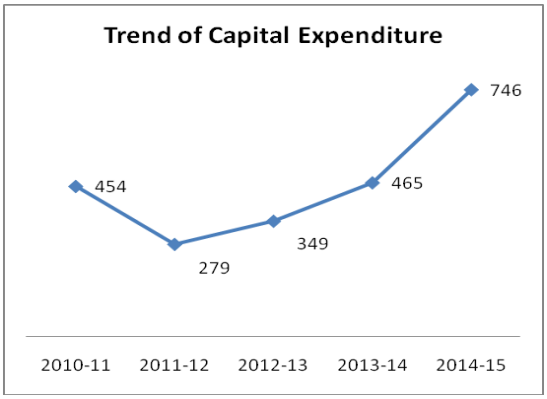
The Ordnance Factory Board (Board) receives budgetary grant under Grant No 25 to meet its running expenses *i.e.*, the revenue expenditure. The total grant was ₹13,617 crore in 2014-15. The Major head: 2079 is operated for booking its expenses and its recoveries against issues to the Defence establishment are shown by way of deduction under Minor Head 901 to 904 under Major head 2079**.** Another Major head 0079 records the receipts against sale of products to non-defence establishments, in the open market or exports, which is a credit to the Consolidated Fund of India.

The expenditure on Stores: ₹5687 crore which represented 44 *per cent* of the total expenditure was 14 *per cent* less than the budgeted figure of ₹6609 crore, and signified the most significant cut in expenditure made by the Board in 2014-15.

7.1.2.2 Capital expenditure

The Board also receives budgetary support for capital expenditure (Major Head 4076), also called the New Capital (NC) grant. This grant meets the expenditure on new projects including procurement of plant and machinery, for which ₹746 crore was spent in 2014-15. In addition, a separate fund called the Renewal and Replacement Fund (RR Fund) funds replacement of old machinery. Currently at ₹76 crore, the Fund has been created through yearly transfers from revenue grant[19].

Chart-6

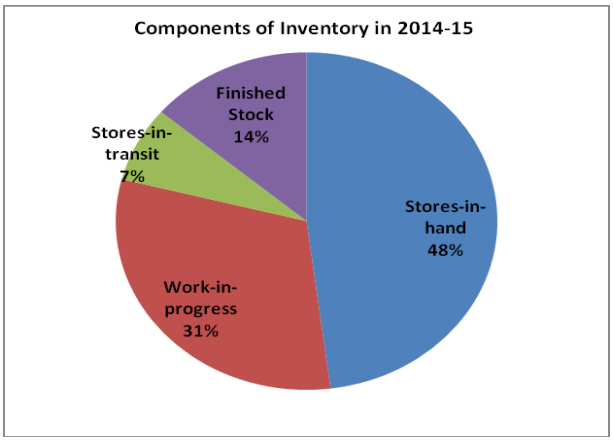


Capital expenditure under NC grant represented only three to five *per cent* of the total expenditure of the Ordnance Factory Board over the years. There had, however, been a 114 *per cent* increase in capital expenditure in 2014-15 over the figures of 2012-13 **(Chart 6).** The Ammunition & Explosive (A&E) group benefitted most from the capital procurements, accounting for 37 *per cent* of the capital expenditure.

[19] The amount transferred from Revenue grants (Major Head 2027) annually for the RR fund is equal to the annual depreciation of plant & machinery and expenditure for annual replacement.

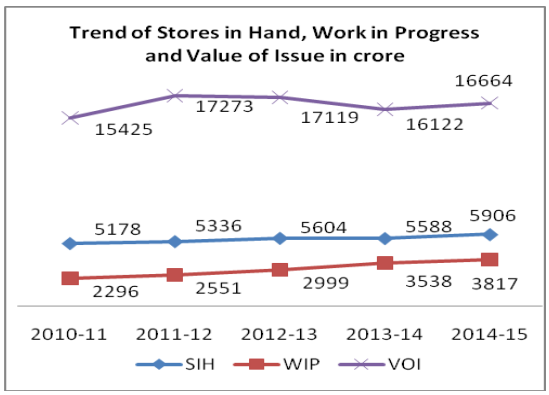
7.1.2.3 Inventory holding

Chart : 7



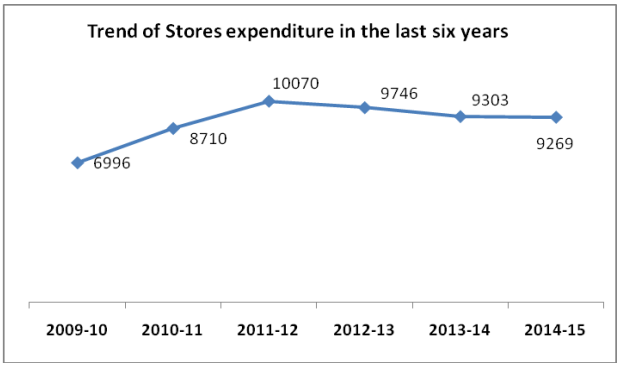
The inventory holding in the Factories increased by 32 *per cent* from ₹ 9356 crore in 2010-11 to ₹12308 crore in 2014-15. However, there was a marginal increase of nine *per cent* over the holding in 2013-14. The level of holding is high representing 75 *per cent* of Cost of Production in 2014-15. Almost half of the inventory is the Stores-in-Hand (**Chart 7).** The Stores-in-Hand *i.e.*, stores procured for manufacture but not used within the year by the Factories of the Board, has shown an increasing trend in the last five years 2010-15. The Work-in-progress (items in semi-finished state of manufacture) also increased during the period (**Chart 8**).

Chart : 8



The high level of holding of inventory is a combination of several factors. In March 2010, the Board authorized the Factories for procurement to meet upto next three years' requirement along with staggered delivery[20]. This led to a significant increase in stores procurement since 2010 (**Chart 9**).

Chart : 9

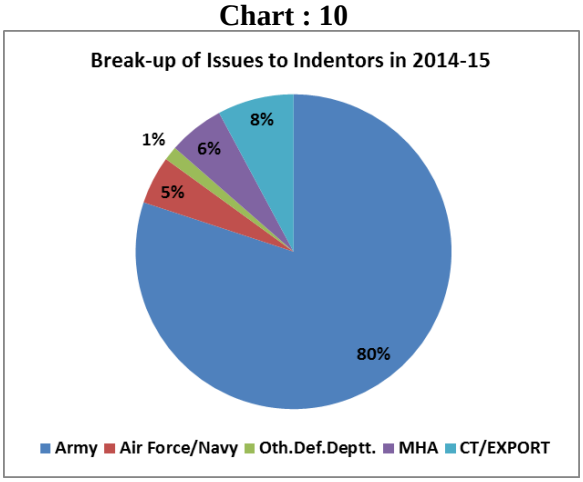


[20] The decision was for "procurement of input materials including IFD items against indent upto next three years' requirement (2 years+ 50% option clause) with Price Variation Clause(for trade procurement) and staggered delivery to conform to budget allotments and shelf life of Stores"

7.1.2.4 Value of issues: Turn-over

Value of Issues was increased by 8 *per cent* from ₹ 15,425 crore in 2010-11 to ₹16,664 crore in 2014-15. However, the increase was marginal in 2014-15 over 2013-14.

Chart : 10



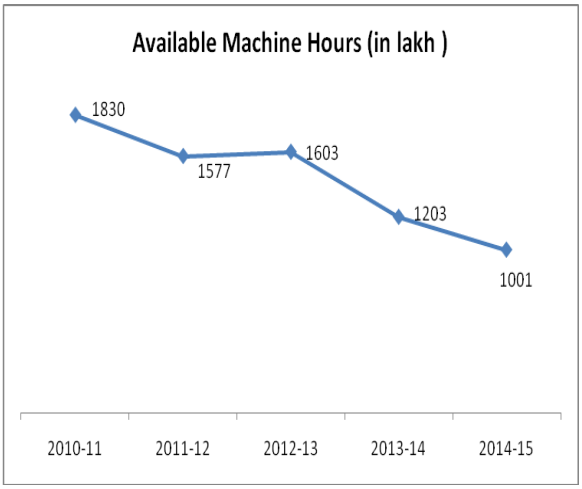
The Army is the major indentor for the products of the Ordnance Factories, accounting for nearly 80 *per cent* of the total issues during the year 2014-15 (**Chart 10**) with Civil Trade and Export being second at eight *per cent*.

Despite assurances by the Board on the discontinuance of issue of advance vouchers[21], we found that the practice still persisted. For instance, Gun and Shell Factory Cossipore, issued advance Issue vouchers worth ₹10 crore in March 2015 in issue of 84mm Rocket Launcher Mark-II (94 numbers) to Army though it was actually issued to the Army during April – June 2015.

7.1.2.5 Utilisation of Machines

While the labour hour utilization was reported to be 127 per cent in 2014-15, machine hour utilization was 75 per cent only. The machine hours available reduced during 2010-15, showing a steady decline over five years (**Chart 11**). The decline could be attributable to the increased down-time of machines or because procurement of new machines did not keep pace with the condemnation of old & unserviceable machines. In this context, the status of un-installed plant & machinery becomes important, i.e., machines purchased but not commissioned to begin manufacture. A total of 364 machines valued at ₹1038 crore were lying un-installed in Factories with the Armoured Vehicle Group accounting for 44 *per cent* of the total un-installed machinery.

Chart: 11

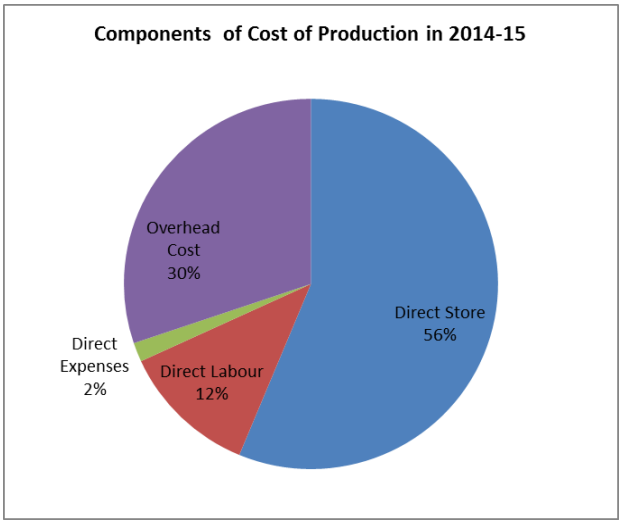


[21] Issue of advance vouchers means raising demand for payment from the indentors without physical issue of stores.

7.1.2.6 Cost of production & Recovery of costs

Stores account for 56 *per cent* of the cost of production in the Ordnance Factory Board. Overheads at 30 *per cent* of the cost of production are particularly high in the Ordnance Factory Board as depicted in **Chart-12.** The cost of production during 2014-15 at ₹16475 crore was a marginal increase over the figures of 2013-14. The composition of costs varies across operating groups (**Annexure-IX**) with the Armoured Vehicle Group and the Ammunition and Explosive (A&E) Group being most material intensive. The Ordnance Equipment Group which manufactures clothing and general purpose items was the most labour intensive among the Factories.

Chart : 12



The Cost of Overheads accounted for 30 *per cent* of the cost of production. The high overheads are a consequence of high committed cost on a workforce that is not directly deployed for production. Material and Components Group with some of the oldest factories of the Board reported the highest levels of overheads: fixed overheads and variable overheads being 25 *per cent* and 11 *per cent* respectively, a total of 36 *per cent* being the overheads as percentage of the cost of production.

Ordnance Factories rely mainly on sister factories for input stores, such stores being called Inter-Factory Demand: (IFD). The inefficiencies of IFD production as reflected in losses in their issue, are offset by surplus generated by the assembling factories. Together, IFD issues reported a loss of ₹83 crore in 2014-15, 11 per cent over the loss in 2013-14.

7.1.3 Our Audit Process

Our Audit process starts with the risk assessment of the organization as a whole and of each unit, based on expenditure incurred, criticality and complexity of activities, level of delegated financial powers and assessment of overall internal controls and concerns of stakeholders. Previous Audit findings are also considered in this exercise. Based on the risk assessment, the frequency and extent of audit are decided. An annual audit plan is formulated to conduct audit on the basis of such risk assessment.

After completion of audit of each unit, Local Test Audit Reports (LTARs) containing audit findings are issued to the Head of the Unit. The units are

requested to furnish replies to the audit findings within a month of receipt of the LTARs. Whenever the replies are received, audit findings are either settled or further action for compliance is advised. Important audit observations arising out of these LTARs are processed for inclusion in the audit reports which are submitted to the President of India under Article 151 of the Constitution of India. During 2014-15, audit of 94 units was carried out by employing 3910 party days. Our audit plan ensured that most significant units, which are vulnerable to risks, were covered within the available manpower resources.

We issued 513 LTAR Paragraphs during 2014-15. In addition, 1628 LTAR Paragraphs were outstanding as of 1 April 2014. A total of 822 Paragraphs were settled during 2014-15. As of 31 March 2015, 1319 LTAR Paragraphs are outstanding as detailed below:

Age	**No. of Paragraphs Outstanding**
More than Six months and upto 1 Year	458
More than 1 Year and upto 2 Years	252
More than 2 Years and upto 5 Years	549
More than 5 Years	60
Total	**1319**

The Ministry/Board may take appropriate action for expeditious settlement of old outstanding Paragraphs.

Planning

7.2 Extra expenditure due to delay in placement of order

Delay in finalization of the import order due to slippages at various levels of the factory and the Board resulted in extra expenditure of ₹4.58 crore in Gun Carriage Factory for procurement of 25 fully formed guns at a higher rate.

Procurement Manual 2010 of the Ordnance Factory Board (Board) stipulates[22] a time frame of 19 weeks from the date of working out the requirement to the date of placement of order for procurement cases. The Manual further provides[23] that every individual in the chain of the procurement process is accountable for taking action in a specified time period so that the requirement of Defence Departments is met on time.

Gun Carriage Factory, Jabalpur (GCF) manufactures Article 2A46M (fully formed gun) to be mounted in T-90 tanks at Heavy Vehicles Factory Avadi (HVF). The Board directed (November 2011) GCF to initiate import action for 25 guns from M/s. Rosoboronexport, Russia (RoE), the Original Equipment Manufacturer of the T-90 tanks.

GCF in turn floated (January 2012) a tender enquiry (TE) on RoE for procurement of 25 fully formed guns. In response to TE, RoE submitted (June 2012) a draft supplementary agreement to supply 25 fully formed guns at a total cost of USD 41.86 lakh. In the meantime, GCF received a directive (May 2012) from the Board emphasizing the need for positioning materials of T-90 guns for 2013-14 onwards in view of an indent to be received shortly from the Director General of Mechanised Forces for supply of 236 T-90 Tanks. Despite this, GCF dropped (August 2012) procurement action for 25 guns. However, after a lapse of four months, GCF again approached (January 2013) RoE to revive its offer considering the requirement of the guns for the year 2013-14.

However, RoE submitted (March 2013) an offer to supply 25 fully formed guns at a total cost of USD 47.31 lakh which was 13 *per cent* higher than their earlier offer (June 2012). The offer was valid up to May 2013. GCF did not take immediate action for procurement and after a lapse of two months GCF requested (June 2013) RoE to extend the validity period of their offer. RoE extended (June 2013) the validity of their offer up to 20 July 2013 subject to the condition that no further extension would be allowed and requested GCF to intimate their decision to them by 5 July 2013.

[22] Annexure 1 appended with paragraphs 5.5.2 of the Procurement Manual
[23] Paragraph 2.6.1 of the Procurement Manual

We observed that GCF referred (June 2013) the case to the Board for their sanction[24]. However, after a lapse of two months and expiry of RoE's offer, the Board returned (August 2013) the case to GCF stating that the financial power of the factory for procurement of stores from RoE was enhanced up to ₹50 crore as per the decision taken during the Board meeting held in July 2013. GCF thereafter took up the matter with RoE (October 2013) for extension of validity of offer up to January 2014. But RoE refused (December 2013) to entertain GCF's request and submitted (December 2013) a fresh offer to supply 25 guns at a total cost of USD 49.72 lakh. In March 2014, RoE on negotiation reduced their offer from USD 49.72 lakh to USD 49.07 lakh. The Tender Purchase Committee Level-I in its meeting (March 2014) decided to place order on RoE for supply of 25 fully formed guns at a total cost of USD 49.07 lakh.

Ultimately, after a lapse of more than two years from the date of initiation of procurement action against the stipulated period of 19 weeks, GCF entered (March 2014) into a supplementary agreement with RoE for procurement of 25 fully formed guns and released an advance payment of USD 7.36 lakh in favour of the RoE in January 2015 (nine months from the date of entering into SA). RoE delivered (August 2015) 25 fully formed guns and received (August 2015) the balance amount (85 *per cent*).

Due to delay in finalization of the import order due to slippages at various levels of the factory and the Board, GCF incurred an extra expenditure of ₹4.58 crore on procurement of 25 fully formed guns at a higher rate.

In reply, the Board stated (March 2016) that (i) since the GCF had met the HVF's requirement of guns up to 2012-13, they prudently dropped (August 2012) the procurement action for 25 guns particularly when no fresh indent from the Army (ultimately received only in December 2013) for the T-90 tanks and Inter Factory Demand (IFD) (received in September 2012) from HVF for the guns was received by the GCF; (ii) with the receipt of fresh IFD from HVF in September 2012 for additional quantity of guns, GCF approached (January 2013) RoE to revive its offer considering the requirement of guns for the year 2013-14, which was not accepted by RoE leading to submission of fresh commercial offer by RoE in March 2013; and (iii) after receipt of fresh commercial offer from RoE, GCF processed the case quickly for TPC/Board's approval as per the then financial power.

The reply is not acceptable since as against the HVF's IFD of November 2004 on GCF for manufacture and supply of 300 guns by December 2009, GCF had actually supplied only 211 guns up to March 2012 (150 imported guns and 61 ex-GCF guns) leaving a deficiency of 89 guns. Against the average production of 31 guns during 2010-11 and 2011-12 at GCF, import of 58 guns was

[24] Financial value of the transaction was not within the General Manager's financial power of ₹ 20 crore.

required to meet the balance requirement and the management should have finalized the import action at the RoE's commercial offer of June 2012. Hence, action of the Factory in dropping import action in August 2012 itself was injudicious.

Thus, delay in finalization of the import order due to slippages at various levels of the factory and the Board resulted in extra expenditure of ₹4.58 crore to Gun Carriage Factory for procurement of 25 fully formed guns at a higher rate.

The matter was referred to the Ministry of Defence (December 2015); their reply was awaited (March 2016).

7.3 Loss of savings due to failure to procure and install equipments

Failure of OFBL to timely procure and integrate (i) Computed Radiography System and (ii) LINAC machines led to consumption of costly X-ray films and chemical towards X-raying of filled shells, resulting in loss of opportunity to effect savings to the tune of ₹4.62 crore.

Ordnance Factory Badmal (OFBL), inter-*alia*, manufactures and supplies Round 125mm High Explosive Ammunition (ammunition) used in guns fitted on T-72 tanks. One of the quality tests, conducted in the Factory, is X-ray filming of filled ammunition with the help of a Linear Accelerator (LINAC) Machine[25].

Accidents of T-72 tank guns led the Ministry of Defence (Ministry) to constitute a Standing Committee[26] (March 2010) which recommended (January 2011) that the system be automated[27] and made online within six months. Accordingly, Ministry instructed (June 2011) Ordnance Factory Board (Board) for expeditious installation of the automated system. Accordingly, as per the recommendation of the Standing Committee and Ministry's instruction, the Factory had to install the automated system by December 2011. The system involved procurement and integration of a digital imaging system (as against the conventional method of using X-ray films and chemicals) with the existing LINAC machine at Unit -5 and Unit 10 section at OFBL.

[25] The LINAC is essentially a X-ray camera that through X-ray filming in four orientations, detects defects like Porosity, crack, piping and cavity. One LINAC machine each is installed at Unit-5 and Unit-10 of the Factory.
[26] Headed by Brigadier Neeraj Pathak.
[27] The automation of the machines would provide online digital images, *inter alia* bring down costs of costly X-ray films, bring in ease of analysis and facilitate longer duration of storage.

We observed that though existing LINAC machines were declared (October 2011) obsolescent[28] by OFBL, they initiated (November 2011) procurement action for replacement of LINAC machine at Unit -5 only. No action was taken by the OFBL to replace the obsolescent machine at Unit-10 as the same was in functional condition. The procurement action of LINAC machine for Unit 5 section also did not fructify (March 2016) owing to (a) failure of OFBL to finalise the technical bids submitted by two firms against Global Tender Enquiry (May 2012) within the extended validity period of July 2013 resulting in the OFBL deciding (November 2013) to go for retender and (b) submission of fresh demand (June 2015) for replacement of LINAC machine by OFBL to the Ordnance Factory Board for approval after a lapse of 19 months which ultimately resulted in issue (September 2015) of Global Tender Enquiry by the Factory after obtaining approval (June 2015) from Board. OFBL was under the process of finalizing the offers received against its GTE (September 2015) as of March 2016.

We also observed that even though the Factory was required to procure and install the digital imaging system for integration with the two LINAC machines by December 2011 of latest technology, OFBL initiated the proposal for procurement of Computed Radiography System (digital imaging system) only in August 2015, which was approved by the Board in December 2015 at an estimated cost of ₹0.75 crore. OFBL, after receiving the approval from the Board in December 2015, issued a draft advertisement (February 2016) to the Director of Advertisement and Visual Publicity, New Delhi for publishing the Tender with due date of opening on 23 March 2016.

While justifying (August 2015) the procurement of Computed Radiography System, OFBL worked out the savings of ₹1.10 crore per annum by working out the total expenditure using Films and chemicals under the conventional system at ₹4.02 crore per annum and the total expenditure using Computed Radiography System at ₹2.92 crore per annum (cost of Computed Radiography system and cost of IP plates and cassette per annum) for the first year and potential savings of ₹1.84 crore from the second year onwards (excluding the cost of Computed Radiography System subsumed during the first year itself).

Thus, failure of OFBL to timely procure and install Computed Radiography System coupled with their decision to use the obsolescent LINAC machine at Unit 10 instead of replacing with new machine led to consumption of costly X-ray films and chemical towards X-raying of filled shells of 125mm ammunition since 2012-13 and thereby lost an opportunity to effect savings of ₹4.62 crore.

On being pointed out in Audit (January 2016), Board stated (March 2016) that delay in finalizing the technical bids against OFBL's GTE (May 2012) was attributed to non-availability of sufficient information/expertise to process such proposal that led to seeking lot of clarifications relating to technical

[28] Equipment is technically obsolete (not capable to carry out its required role) and prototype of an advanced version of the equipment has come up in the market but the equipment is required to be retained in the service for tactical requirements/training etc.

specifications. With regard to 19 months time period taken by the OFBL for submitting fresh demand for the LINAC machine, Board stated (March 2016) that when the case went under retender, OFBL undertook feasibility study and found that in none of the establishments, High caliber High Explosive shells were X-rayed with LINAC machine with digital radiography and hence, the specification was framed based on the response received from reputed manufacturers against Request for Information and in consultation with the High Energy Material Research Laboratory, Pune. Board also confirmed that four offers received by OFBL against retender (September 2015) were being processed (March 2016).

The reply is not acceptable because even though the technical bids received from the firms against GTE (May 2012) were opened in September 2012, OFBL took nearly three months to seek clarifications from the Firms in December 2012 and despite receiving clarifications immediately in December 2012 itself, the Factory did not finalise the case even as of July 2013 which led to the Firms not extending the validity period of their offer up to October 2013 as sought for by the Factory. Further, Board's justification for time period of 19 months for submitting fresh demand on the Board against retendering action only indicate that OFBL did not apply their mind properly while acting upon the Ministry's instruction (June 2011), as the reasons brought out by the Board for 19 months time period for retendering action was known to the Factory as early as in November 2011 when they initiated procurement action for LINAC machine at Unit-5. Even after retendering (September 2015) with due date of opening tender extended up to December 2015, the procurement action was yet to be finalized (March 2016). As a result, OFBL continued use of obsolescent machine at Unit-10 by consuming costly X-ray films and chemicals and lost a potential saving of ₹4.62 crore owing to non-position of LINAC machine with computed radiography system timely.

The matter was referred to the Ministry of Defence (January 2016); their reply was awaited (March 2016).

Procurement of Machinery

7.4 Failure to operationalise a machine

Acceptance of a Machine valuing ₹6.32 crore by Vehicle Factory, Jabalpur without proving the Machine for performance and subsequent neglect in preventive maintenance resulted in its breakdown since June 2012.

Vehicle Factory Jabalpur (VFJ) placed (February 2008) a supply order (S.O) on an Ahmedabad - based firm: M/s. Sahajanand Laser Technology Limited,

(Firm) for a CNC Laser Cutting Machine (Machine)[29] at a total cost of ₹6.61 crore[30]. The machine was scheduled for delivery by 15 September 2008. The Supply Order stipulated that:

- Before the Machine is dispatched by the Firm to VFJ, a Pre-Dispatch Inspection (PDI) would be conducted in which the Machine would be tried out for cutting performance with all MS sheets of requisite thickness[31] at firm's premises in the presence of VFJ's inspectors before dispatch of machine;

- The Firm was required to undertake the commissioning of the Machine within 90 days from the date of receipt of Machine at Site. The Machine would be run for four weeks on production to prove the consistency in accuracy and cycle time before final acceptance of Machine by VFJ ;

- The Machine should prove the cutting of all the materials of various thickness[32] and achieve desired performance level in all the parameters. Minimum 25 components were required to be proved for each category of material;

- 80 *per cent* value of material plus 100 *per cent* taxes/duties would be paid after acceptance in Pre-dispatch inspection at Firm's works and on receipt of the machine at VFJ and balance 20 *per cent* value of the material after commissioning and on furnishing of Performance Bank Guarantee (20 *per cent* of the contract value) valid beyond 60 days after expiry of warranty period. A Commissioning Report and the Final Acceptance Report would be issued by VFJ which will form the basis of payment of 2nd instalment to the Firm

We observed that during PDI (10 December 2008) at the Firm's premises, the inspection team of VFJ noticed deficiencies[33] in dimensional accuracy, consistency and quality in the Machine. Further, cutting speed of the Machine in respect of Mild Steel of 12mm, 16mm and 25mm thickness was not carried out as required under the Supply Order and Technical Specification of the Machine.

Despite the deficiencies and incomplete performance testing, the inspection team cleared the machine for dispatch subject to the Firm attending to the deficiencies and issued (10 December 2008) the Inspection Report.

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[29] Required for production of sheet metal and pipe components made of mild steel, stainless steel, armour steel *etc* and Aluminium alloy

[30] reduced to ₹6.32 crore due to reduction in Excise Duty

[31] 1mm, 2mm, 3mm,4mm,5mm,6mm,8mm,10mm,12mm,15mm,20mm and 25mm thickness as Para 12 of the Supply Order read with Para 5 of Technical Specification of the Machine

[32] Mild steel 1mm to 25mm, Stainless steel 1mm to 20mm, Aluminium Alloy 12mm, Armour Steel 16mm and Jackal steel 10mm as per Para 24 of the Supply Order

[33] Deep marks of serration shape were observed in 25mm pieces.

The Machine was received at the Factory on 28 December 2008 and taken on charge on 17 January 2009. Accordingly, VFJ released (January 2009) ₹5.09 crore to the Firm. The Firm undertook erection and commissioning work of the machine at VFJ since 20 January 2009.

We noticed that the Firm failed to achieve the cutting parameters of the Machine during commissioning trials. In the meetings (September 2009) with the Firm, VFJ directed the Firm to rectify the deficiencies. However, a 'Commissioning Report[34] was issued (27 November 2009) declaring the Machine as commissioned on 9 October 2009, without indicating the deficiencies to achieve the cutting parameters. A Final Acceptance Report[35] was not issued. On the same date (27 November 2009), VFJ reported to the Firm various operational problems[36] during the commissioning, apprehending possibilities of breakdown of Machine or reduction in performance level with non-availability of Machine for production. This raises doubts on the integrity of the process by which the Machine was declared commissioned (9 October 2009) and the payment of the balance amount of ₹1.23 crore was released by the Local Accounts Office (LAO) based on the Commissioning Report. The LAO also deviated from procedures by releasing the payment without the Final Acceptance Report of the Machine.

We noticed that the VFJ did not maintain the production log book since commissioning of the Machine for more than two years (up to December 2011). However, in the meeting with the Firm, the VFJ recorded (August 2011) that the Machine was operated only for 7578 hours up to 3 August 2011. In the absence of production log book, the cutting details of different materials could not be verified in Audit.

We observed that since commissioning, the Machine developed problems[37] and went into repeated breakdowns from time to time for 169 days during March 2011 to December 2011. The Firm ascribed (July 2011) the break down to absence of periodic preventive maintenance by VFJ. VFJ did not[38] enter into an Annual Maintenance Contract after the lapse of warranty period (November 2010) although the Firm proposed it in July 2010. In response to the Audit query (November 2015), VFJ told us that no preventive maintenance record was traceable.

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[34]Signed by the representatives of the Mechanical maintenance, Electrical Maintenance and Production Departments.

[35] Required by the Appendix –W of the Manual for procurement of plant and machinery in Ordnance Factories.

[36] loading/unloading device, surface finish achieved during cutting, frequent breaking of focusing lens, problems in the table movement etc.,

[37] Problems being leakage of coolant from shutter assembly and malfunctioning of chiller units as well as breakage of Z-axis of ball screw mechanism.

[38]Firm's proposal for Annual Maintenance Contract for the machine was approved by General Manager in September 2010 with the remarks that the Firm may be requested to bring down the AMC rates which was considered very high. However, no action was taken thereon by the Factory.

VFJ spent ₹15.25 lakh[39] on unfruitful repairs but eventually the Machine went under break down since 13 June 2012. It remained non-operational as of November 2015.

In response to the Audit query (April 2013), VFJ stated (April 2014) that the Firm had been approached for restoration of the Machine but it was insisting on clearing pending payments[40]. The Firm had also not made any commitment schedule of spares which could aid VFJ to put the Machine to use. As a result of the stalemate, no remedial action could be taken.

The reply was silent as to why the Machine was cleared for dispatch despite deficiencies in PDI; a Commissioning Report issued despite deficiencies in commissioning trials; and payments released without the Final Acceptance Report. The reply also accepts the inaction that led to the Machine being non-operational since June 2012.

Thus, acceptance of a Machine valuing ₹6.32 crore by VFJ without proving the Machine for performance and subsequent neglect in preventive maintenance resulted in its breakdown since June 2012.

We recommend that the matter be investigated to fix responsibility.

The matter was referred to the Ministry of Defence/Ordnance Factory Board (January 2016); their replies were awaited (March 2016).

Manufacture

7.5 Injudicious manufacture of cartridge cases

Manufacture of excess quantity of 20,997 numbers of cartridge cases with CED coating by Metal and Steel Factory Ishapore, prior to successful clearance of pilot lot in trials and in deviation from the decision of the Alteration Committee, resulted in avoidable rejection loss of ₹1.32 crore.

Ordnance Factory Khamaria (OFK) and Metal and Steel Factory Ishapore (MSF) undertook indigenous manufacture of 23mm Schilka ammunition Steel Cartridge Cases having carbon content 0.09-0.13 per cent with zinc coating

[39]Against a total bill of the contractor of ₹45.27 lakh (including service charges of ₹3.14 lakh), payment of ₹15.25 lakh was released. Balance amount of ₹30.02 lakh being the liability of the VFJ.

[40] Pending payments relating to a service charge which was due to be paid to the Firm for sending Service Engineers to the Factory.

since 1997[41] and January 2002 respectively, based on Transfer of Technology received from M/s Kintex Bulgaria in 1984.

Army units reported from time to time 139 accidents with use of ammunition which on analysis revealed that 107 accidents pertained to imported ammunition and 32 accidents related to Ordnance Factory manufactured ammunition. The accidents were basically due to cartridge case rupture/burst/crack/rim shear and primer blown off.

The Alteration Committee (Committee) comprising representatives of OFB and Inspectorates of the Director General of Quality Assurance, New Delhi analysed the reasons for various problems faced during the use of ammunition by the Army units from time to time, as well as those encountered during manufacturing at Ordnance Factories and subsequent proof of ammunition.

In order to overcome the problems, the Committee recommended (November 2004) MSF to enhance the carbon content of the steel cartridge case from 0.09-0.13 *per cent* to 0.16-0.22 *per cent*, duly coated with Cathodic Electro Deposition (CED)[42].

We observed that even though the CED coating was found compatible with propellant of the ammunition and satisfactory by the Controllerate of Quality Assurance (Ammunition) in February 2005, one lot of cartridge case coated with CED failed in corrosion resistant behavior. The committee, therefore, recommended MSF (December 2006) to further manufacture 1,000 cartridge cases with improved CED coating and subject them the same to (i) corrosion resistant behavior test (10 samples) at Controllerate of Quality Assurance (Metals) Ishapore (ii) Compatibility test (5 numbers) at Controllerate of Quality Assurance (Military Explosive) and (iii) dynamic test (86 numbers). Bulk Production Clearance (BPC) for the CED coating was scheduled to be accorded after successful clearance of the samples in three tests.

As the performance of steel cartridge case with enhanced carbon content coated with Zinc was found satisfactory during firing, the Committee in July 2007 authorised MSF to manufacture two lots comprising 5,000 numbers of cartridge cases each with new chemistry carbon content and zinc coating and subject them to proof before according bulk production clearance for steel cartridge case with enhanced content.

We observed that 10,000 number of cartridge cases manufactured by MSF with enhanced carbon content and duly coated with Zinc was successfully fired at OFK in October 2007 and November 2007. Accordingly, the Committee accorded (November 2007) BPC to MSF for manufacture of

[41]Though the ToT was received in 1984, indigenous manufacture at OFK was undertaken only in 1997 since the CKD/SKD received from M/s Kintex were assembled during 1987-91 and there was no demand for the ammunition from the Army during 1992 to 1996.
[42]Electroplating of copper in the cartridge cases.

cartridge cases with enhanced carbon content with zinc coating since (i) results of 100 grams of CED coating material sent to CQA (ME) for compatibility test was not received and (ii) 250 numbers of cartridge cases with CED coating failed in corrosion resistance test at CQA (Metals) Ishapore in August 2007 and November 2007 rendering CED coating unacceptable unless otherwise perfected. Further, during the meeting held in May 2008, the Committee recorded that (i) exercise of CED coating for its efficacy as alternate to Zinc passivation was going on; (ii) 10 numbers of samples were under test for corrosion resistance; and (iii) further 490 numbers of CED coated components were available at MSF.

The matter regarding improvements of steel cartridge cases and its surface coating was discussed in the office of the Joint Secretary/Defence Production New Delhi in August 2010 wherein it was decided that Ordnance Factory Board would supply improved 10,000 rounds of ammunition duly for firing to gain users' confidence. Further, as a sequel to the discussion taken in August 2010, the Committee met in September 2010 at MSF wherein the introduction of CED coating in place of zinc coating was recommended subject to successful trials of 20 samples of cartridge cases duly coated with CED in salt spray test. Thus, effectively the Committee recommended MSF to manufacture only pilot lot of 1,000 cartridge cases under new chemistry duly coated with CED for subjecting them in various tests before according BPC for steel cartridge cases with CED coating.

In view of failure of the pilot lot of cartridge case duly coated with CED in corrosion resistance test and occurrence of longitudinal and circumferential ruptures cracks during proof held subsequently, further coating of CED on the surface of Steel Cartridge cases was closed at MSF once and for all since December 2012.

We observed that even though the committee recommended MSF to manufacture 1,000 numbers of new chemistry cartridge case coated with CED as pilot lot[43] for trials, the factory actually manufactured 21,997 numbers of new chemistry cartridge cases against five warrants (November 2006- 2011) at a cost of ₹1.38 crore[44] and got it coated with CED at a total cost of ₹1.05 lakh against three supply orders placed between February 2007 and September 2010. However, cost cards were not made available to Audit, though called for (July 2015- January 2016). Thus, MSF sustained a loss of ₹1.32 crore towards avoidable coating of 20,997 numbers of new chemistry cartridge cases with CED.

[43] For any development item, production is carried out on the pilot lot and based on successful performance of the pilot lot in trials/proof, bulk manufacture of the item are normally undertaken at Ordnance Factories. This is to safeguard Ordnance Factories from sustaining huge losses in case the items manufactured in bulk fails in proof/trials.
[44] Unit cost of cartridge has been furnished by the Factory management.

In reply, Ministry stated (September 2015) that CED coated new chemistry cartridge cases were manufactured by MSF as per the decision taken in various forum and the matter was referred to the Project Monitoring Team who was looking into the failures of cartridge cases for suggesting further course of action.

Ministry's contention is not acceptable since MSF's decision for bulk manufacture of 20,997 new chemistry cartridge cases coated with CED even before successful clearance of pilot lot in trials, was in violation of Committee's recommendation and was imprudent resulting in avoidable rejection loss of ₹1.32 crore.

Thus, manufacture of excess quantity of 20,997 numbers of new chemistry cartridge cases with CED coating by MSF in deviation of the decision of the Alteration Committee as well as prior to successful clearance of pilot lot in trials resulted in avoidable loss of ₹1.32 crore towards rejection.

Miscellaneous

7.6 Blocking up of inventory due to non-replacement of rejected fuses

Failure of Ordnance Factory Chanda to invoke and follow-up on the remedial provisions of the contract on supply of fuses resulted in holding of rejected fuses worth ₹6.05 crore.

Ordnance Factory Chanda (OFCh) entered (February 2012) into an agreement with M/s. Kintex Shareholding Company, Bulgaria (Firm) for delivery of 50,000 fuses at a cost of ₹9.08 crore[45]. The B-429E fuse filled with explosives (fuse) would be received, inspected by OFCh and sent directly to the Army on behalf of Ordnance Factory Badmal (OFBL)[46]. The scheduled date of delivery was October 2012[47] with full payment[48] to be released by the OFCh on receipt of consignment.

The agreement provided the following conditions to ensure compliance to quality of the items being imported:

- Pre-dispatch inspection (PDI) of the fuses at the Firm's premises in the presence of OFCh representative. In case, OFCh did not attend the PDI,

[45] Equivalent to Euro 14 lakh
[46] OFBL is the filling factory for 125mm High Explosive ammunition for which the B-429 fuse is used.
[47] The scheduled date was August 2012 which was subsequently extended (September 2012) to October 2012
[48] 100 per cent of the contract value by an irrevocable letter of credit opened through State Bank of India Nagpur

the conformity and acceptance report would be signed by the Firm's Quality Assurance representative which would be binding on both the parties. In that event, consignment would be delivered by the Firm under their warranty/guarantee Certificate;

- Joint Receipt Inspection (JRI) of delivered goods in the presence of Firm's representative for which a minimum 15 days' prior notice was to be given by OFCH to the Firm. In case, the Firm's representative did not attend the consignee inspection, the consignee end Inspection proceedings and Acceptance Certificate would be signed by the OFCh's representative only and the same would be binding on the Firm;

- In case of deficiencies in quality or defects, a quality claim would be raised by OFCh which shall be settled by the Firm within 45 days from the date of receipt of the claim ;

- The Firm would provide a *Performance Guarantee Bond* of Euro 1.4 lakh which would be encashed by OFCh if the conditions of the contract were not fulfilled by the Firm;

- Should there be a dispute on discharge of contractual obligations, OFCh would notify the dispute to the Firm and within 60 days of such notice, the case would be referred for Arbitration.

OFCh received (December 2012) 50,000 fuses in three lots[49] along with warranty/guarantee Certificate from the Firm against payment of ₹10.08 crore[50] without PDI.

OFCh did not invite the Firm for JRI. While one lot (Lot No 4) comprising 10,000 fuses were rejected[51] in quality inspection (February 2013 and May 2013), another lot (Lot 2) of 20,000 fuse was accepted (May 2013).

OFCh preferred (May 2013) a Quality claim on the Firm for free replacement of the defective fuses: Lot No: 4. The Firm did not agree on the ground that the test conditions for dynamic testing were not complied with. The Firm, however, proposed (June 2013) to send their team to OFCh. It was proposed that the team would discuss the conditions under which dynamic tests were conducted in India as well as to attend the test of the balance 20,000 fuses (Lot No 3), which was yet to be tested at that time.

The Firm complained (July 2014) to the Board / OFCh that despite multiple mutual attempts to resolve the situation, they were not provided

[49] Lot No 02-12-33 for 20000 fuses, Lot No 03-12-33 for 20000 fuses and Lot No 04-12-33 for 10000 fuses

[50] ₹10.04 crore being the cost of fuses and ₹0.04 crore towards banking charges.

[51] Post impact delay beyond the acceptable range of 15m to 60m at two occasions of dynamic shooting at Central Proof Establishment, Itarsi

with[52] a viable option to accomplish it. The Firm suggested (July 2014) having a meeting in India to resolve the issues and if required to conduct repeated proof of Lot No 4 and new proof of Lot No 3. The Board directed (August 2014) OFCh to settle the issue with the Firm. The Firm did not send their representative.

OFCh again carried (March 2015) out the dynamic check proof of Lot No 3 and Lot No 4 without the presence of Firm's representatives. Lot No 4 was once again rejected; Lot No 3 was also rejected and a quality claim was raised. The rejection of both the lots were intimated (April 2015) to the Firm. The Firm did not agree with the sentencing[53] (May 2015) and once again proposed a meeting in India to resolve this issue. OFCh in reply requested (November 2015) the Firm to send their personnel in India for discussion.

The quality claim in respect of Lot No 4 and Lot No 3 remained unsettled since May 2013 and April 2015 respectively (against the stipulated period of 45 days). But no action was taken by OFCh/OFB to issue a Notice to the Firm for referring the matter to an Arbitration Tribunal in accordance with the Arbitration clause in the contract. OFCh also did not (March 2016) initiate action to encash the performance guarantee bond of Euro 1.40 lakh (equivalent to ₹ 1 crore) submitted by the Firm though it was valid up to 31 March 2016.

Board stated (March 2016) that the matter was under consideration of OFCh to settle the issue amicably. They further added that OFCh could not invoke the remedial provisions of the contract because the final decision of acceptance/rejection of the quantity in question had not been arrived at till date.

The contention of the Board is not acceptable because even after a lapse of more than three years from the date of preferring the quality claim, the matter remained unresolved.

Thus, failure of OFCh to invoke and follow-up on the remedial provisions of the contract on supply of fuses resulted in holding of rejected fuses worth ₹6.05 crore[54].

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[52] Cancellation of a meeting in September 2013; proper conditions were not provided for normal conduct of delay function proof in February 2014 and Firm's request to organize a joint meeting in India are not still satisfied by OFCh/OFB.

[53] The grounds for such disagreement being that the documents provided by OFCh did not contain sufficient data about the rounds used in the lot tests on 18th March 2015 and it was presumed that, as in the tests carried out in February 2014 a projectile containing incendiary composition had also been used in March 2015 and hence attributed failure of fuse to initiation of the incendiary composition but not the fuse.

[54] Cost of 50000 Filled fuses = ₹10.08 crore. Proportionate Cost of 30000 Fuses = ₹10.08 crore x 30000/50000 = ₹6.05 crore.

The case was referred to the Ministry of Defence (January 2016); their reply was awaited (March 2016).

7.7 Recovery at the instance of Audit

Avoidable payment of bank charges (₹18.90 lakh) for establishment of Letter of credit by Ordnance Factory Medak was recovered by the unit after pointed out in Audit.

Ordnance Factory Medak (OFMK) recovered avoidable payment of ₹18.90 lakh towards bank charges after Audit pointed out the irregularity. The detail is given below:

Ordnance Factory Board (Board) entered (March 2011) into a Memorandum of Understanding with M/s. Mishra Dhatu Nigam Ltd. (MIDHANI) for creation of balancing facilities for manufacture of wide armour plates, required by OFMK at MIDHANI at an investment of ₹507 crore, out of which the share of Board was ₹307 crore. A Tripartite Agreement (Agreement) was concluded between the Board (on behalf of OFMK), MIDHANI and State Bank of India, Hyderabad for opening an Escrow Account to carry out the banking transactions. As per clause 3(ii) of the Tripartite Agreement, all bank charges towards establishment of Letter of Credit (LC), amendment to LC etc. would be borne by the MIDHANI.

OFMK, however, authorized (October 2012) the State Bank of India, Hyderabad to debit banking charges of ₹18.90 lakh (July 2012) from the Escrow account of the Board for establishment of LC against MIDHANI's purchase Order (May 2011) for import of an equipment, though bank charges were to be borne by MIDHANI as per the Agreement.

On this being pointed out in Audit (March 2014), OFMK referred the matter and obtained (November 2015) a refund of ₹18.90 lakh from MIDHANI. In reply, the Board confirmed (March 2016) that the recovery of ₹18.90 lakh been effected at the instance of Audit.

The matter was referred to the Ministry of Defence in January 2016; their reply was awaited (March 2016).