CHAPTER II: MINISTRY OF DEFENCE

2.1 Procurement of trainer aircraft

Delay in development and supply of a trainer aircraft even after a lapse of 14 years by Hindustan Aeronautics Limited (HAL) had adversely affected stage II training of the pilots. Besides, the aircraft under development would be heavier compared to Indian Air Force (IAF) parameters which may affect training related performance. Moreover, advances released to HAL to the extent of ₹2953.88 crore against the contract of March 2010 remained unutilized so far.

Flying training of pilots in Indian Air Force (IAF) is carried out in three stages - Basic stage (Stage-I), Intermediate stage (Stage-II) and the Advanced stage (Stage-III). Kiran and Iskara aircraft had been utilised for intermediate stage training since 1970s. The Iskara aircraft has been phased out from service in 2004[1]. IAF felt (March 1998) the need to procure contemporary trainer aircraft to be designed and developed indigenously by HAL to replace ageing Kiran/Iskara aircraft which were considered to be old and beset with problems of spare. Cabinet Committee on Security (CCS) approved (June 1999) the Design and Development (D&D) of Intermediate Jet Trainers (IJT) aircraft by M/s Hindustan Aeronautics Limited (HAL).

Ministry of Defence (Ministry) accorded (July 1999) a sanction for the D&D of two prototypes of the IJT by HAL at a total cost of ₹180 crore which was subsequently revised (April 2005) to ₹467 crore with milestones for the Initial Operational Clearance (IOC) and the Final Operational Clearance (FOC) as 2006-07 and 2007-08 later revised (March 2009) to 2009-10 and 2010-11 respectively. DDPMAS[2] stipulates that Limited Series Production

[1] Iskara aircraft was phased out from service in year 2004 as per the CCS Note for procurement of 12 LSP IJT aircraft approved on 14 March 2006.

[2] DDPMAS - Design, Development and Production of Military Aircraft and Airborne Stores. It is a manual issued by Defence Research and Development Organisation and prescribed procedure for design, development and production of Military Aircraft and Airborne stores.

(LSP) for aircraft may be initiated by the concerned user service *i.e.* IAF based on Initial Operational Clearance (IOC) certification issued by the CEMILAC[3].

However, while the Design and Development (D&D) of IJT was in progress, Ministry submitted (February 2006) a proposal to Cabinet Committee on Security (CCS) for procurement of 12 IJT LSP aircraft from HAL even before IOC of prototype aircraft. CCS approved (March 2006) the proposal and IAF concluded a contract (March 2006) with HAL for the supply of 12 IJT LSP aircraft at a total cost of ₹486 crore with delivery schedule between March 2008 and March 2010 further revised to 2011-12.

As D&D of prototypes aircraft was getting delayed, the Standing Committee on Defence in its seventeenth report expressed (March 2008) its concern over the delay in development of IJT. Ministry in their Action Taken Note stated (March 2008) that the certification of the aircraft would be completed in time to meet the induction of aircraft from 2008 as planned.

A mention about the delay in manufacture and supply of 12 trainer aircraft (LSP) and its impact on stage-II training of pilots as well as blockade of funds to the extent of ₹283.05 crore was made at Paragraph 2.4 of Audit Report of the C&AG of India (CA No. 18 of 2008-09). In their Action Taken Note, Ministry stated (February 2011) that the IJT programme was envisaged as a concurrent development along with the LSP and that the advance payment and stage payments were not only made for engine development and integration but also for development and testing of other major aircraft systems. Ministry further stated that due to delay in delivery of 12 IJT LSP aircraft, the training was not compromised as sufficient Kiran aircraft were available to undertake the task. Audit did not agree with the Ministry's reply as the terms of the sanction were violated as funds were released to HAL without completion of Initial Operational Clearance of two prototype aircraft. Further, audit also noticed from the CCS note that contract for procurement of 12 IJT aircraft had been made by IAF to fill the void created by phasing out of Iskara and impending phasing out of Kiran aircraft.

[3] CEMILAC - Centre for Military Airworthiness and Certification is an agency which clears the ongoing Military aircraft projects, product and components for flight safety.

During subsequent Audit, we observed (January 2013) that Ministry had concluded (March 2010) another contract with HAL for procurement of 73 IJT Series Production (SP) aircraft along with associated equipment at a total cost of ₹6180 crore without completion of even Initial Operational Clearance (IOC) of prototype and LSP aircraft with delivery schedule in batches between 2013 and 2017. Our examination of the contract (March 2010) revealed the following:

1. Conclusion of contract for series production of trainer aircraft even before IOC/FOC of prototypes resulted in advances of ₹2953.88 crore lying unutilised

At the time of submitting the proposal (February 2006) to the Cabinet Committee on Security (CCS) for procurement of 12 IJT LSP aircraft, Ministry had stated that the experience gained from the operational exploitation of the 12 IJT LSP would be conveyed to HAL for incorporation of necessary modifications on the subsequent series production. IAF had also clarified (September 2007) to HAL that order for series production would be placed after the induction of 12 IJT LSP aircraft.

However, we observed (January 2013) that against their own commitment, Air HQ had initiated (November 2008) a proposal for supply of 73 SP IJT aircraft from HAL even before completion of IOC and Final Operational Clearance (FOC) of prototype aircraft and delivery of any of the 12 IJT LSP aircraft to IAF. Air HQ stated (April 2013) that CCS approved procurement of 73 IJT SP aircraft in order to fill the void created by phasing out of Kiran aircraft and to provide lead time to HAL to commence series production. We also observed that while seeking approval of 73 SP IJT aircraft from CCS in February 2010, the Ministry had stated that the delivery of 12 LSP IJT would be completed by 2011-12. It also assured Ministry of Finance that delivery schedule of 73 SP IJT (2013-17) would be met and there would not be any delay in the SP IJT aircraft that would cause avoidable blocking of funds. A contract was concluded (March 2010) with HAL through production for procurement of 73 SP IJT aircraft with delivery schedule of 2013-17 and in terms of the contract an advance payment of ₹926.15 crore was released to HAL on signing of the contract.

We also observed (April 2014) that out of an advance of ₹2989 crore[4] (including DRE[5] and Capital) paid to HAL upto April 2014 for production of 73 SP IJT aircraft, HAL could utilize only ₹35.15 crore and, therefore, funds to the tune of ₹2953.88 crore were lying with HAL as unutilized advance.

In response to the paragraph issued to the Ministry in May 2014, Air HQ on the direction (August 2014) of Ministry of Defence (Finance/Budget) while justifying the conclusion of contract (March 2010), for procurement of 73 SP IJT stated (August 2014) that HAL had failed to meet the agreed timelines for certification and production of the engine. As a result, IAF was faced with a limitation of aircraft which was going to simultaneously affect the training of future combat pilots for its operational preparedness. Air HQ's reply (August 2014) is silent on violation of provisions contained in DDPMAS regarding initiation of LSP of aircraft only after Initial Operational Clearance (IOC) certification issued by the CEMILAC.

Moreover, Audit scrutiny of records further revealed (May 2014) that even after four years of conclusion of contract (March 2010) Standard of Preparation (SOP[6]) of aircraft were not frozen and therefore production of 73 SP IJT aircraft could not materialize without finalizing SOP. In reply to audit observation, IAF informed (July 2014) Audit that HAL had projected December 2014 and June 2015 as IOC and Final Operational Clearance (FOC) respectively for D&D of IJT prototypes. Air HQ further stated that SOP for IJT aircraft would be finalized only after achievement of IOC.

The response of Air HQ confirms the Audit observation that IAF in contravention of prescribed procedure had gone ahead in awarding the

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[4] ₹2989 crore = 15 *per cent* payment ₹926.15 crore was released on signing the contract + 15 *per cent* second stage (₹926.15 crore) released in May 2010 + ₹786.12 crore released for other milestone stipulated in the contract + ₹350.61 crore for DRE and Capital expenditure.

[5] DRE- Deferred Revenue Expenditure (expenditure incurred on tools, jigs and fixtures etc.)

[6] SOPs are standards of preparation of aircraft which defines the Air Staff Qualitative Requirements (ASQRs) of the aircraft. The SOPs are required to be freezed before manufacture of an aircraft.

contract to HAL for procurement of 73 IJT aircraft even without the IOC/FOC of prototype/LSP IJT aircraft.

Moreover, scrutiny of records revealed that 12 LSP IJT had yet (July 2014) not been delivered. Air HQ stated (July 2014) that at present six LSP IJT aircraft had been produced by HAL and delivery of these aircraft were delayed by HAL due to non completion of D&D activities.

Thus, in contravention of provisions contained in DDPMAS, IAF placed order for procurement of 73 SP IJT aircraft without the Initial Operational Clearance (IOC) and Final Operational Clearance (FOC) of Design and Development of the prototype and 12 LSP IJT aircraft. Consequently**,** due to considerable delay in production of contracted IJT aircraft, IAF continued to depend on ageing and depleting Kiran fleet for training purpose. Further, due to improper planning and hasty decision in conclusion of contract (March 2010), funds to the extent of ₹2953.88 crore remained unutilized.

2. Improper implementation of contract provisions

As per the payment terms of contract (March 2010) concluded for procurement of 73 SP aircraft, the second stage payment of 15 *per cent* of contract valuing ₹926.15 crore was payable to HAL based on certification by the seller (HAL) to the effect that the first purchase order (PO) in respect of contract deliverable and services had been placed by the seller on its vendors. The contract provided that for claiming the 2nd stage payment, HAL had to provide copy of any purchase order (PO) irrespective of the value of PO. Scope of the payment had been divided into four categories *viz*. aircraft, reserve engine, setting up of Capital and DRE[7] facilities and Annual Maintenance Contract (AMC).

Audit observed (September 2013) that HAL had claimed immediately after signing of contract (March 2010) for second stage payment of 15 *per cent* of contract value amounting to ₹926.15 crore. The entire claim of ₹926.15 crore was released (May 2010) for payment by IAF to HAL against POs of nominal value of ₹6.04 crore. The claim was inclusive of three POs:- (i) ₹175.30 crore

[7] DRE- Deferred Revenue Expenditure

w.r.t. setting up of Capital and DRE against Purchase Orders (POs) valuing ₹6.01 crore of September 2008 *i.e.* PO placed prior to signing of contract (ii) ₹627.16 crore *w.r.t.* aircraft against PO valuing only ₹1.44 lakh placed (March 2010) for purchase of cold drawn seamless tube for 12 LSP IJT aircraft and (iii) ₹123.69 crore *w.r.t.* reserve engine etc., against PO valuing ₹0.83 lakh placed (December 2010) which was meant for vacuum cleaner. As such, these payments had been claimed either for items purchased before the conclusion of contract or for items not related to SP IJT aircraft production activity.

On this being pointed out (September 2013) by Audit, Air HQ stated (January 2014) that the payment claimed (₹926.15 crore) against all the POs including that for first batch of 12 of 73 SP IJT aircraft by HAL was in line with the provisions of contract.

The reply is not acceptable as HAL had taken advantage of the ambiguous provision (*i.e.* claiming full second stage payment on providing copy of any PO irrespective of the value of PO) of contract. Besides, it was also observed that payment of ₹123.69 crore *w.r.t.* reserve engine etc., against PO valuing ₹0.83 lakh (December 2010) was not in order as the placement of order had occurred after the release of payment. The IAF contention that PO claimed for aircraft pertains to first 12 of 73 SP IJT aircraft is also not acceptable as the contract (March 2010) stipulated delivery of only six aircraft in first batch of supply (2013) and 14 aircraft in second batch of supply (2014) to be made by HAL. Further, the contention of IAF regarding payment made against 12 sets of 73 SP IJT aircraft was also not corroborated by the fact that HAL could utilize only ₹35.15 crore against total advance payment of ₹2989 crore for SP IJT aircraft which was still (July 2014) in planning stage.

Air HQ further reiterated their earlier stand and stated (August 2014) that all the three POs were in order and as per scope of payment. The reply of Air HQ does not address the issue of HAL's claim of ₹926.15 crore which was based on invoices/ POs valuing only ₹6.04 crore.

It was noticed that the contract is broadly based on the provisions contained in Chapter V 'Standard Contract Document' of DPP-2008. We also noticed that

the DPP-2008 had prescribed that payment terms with DPSUs would be as per the MoU in vogue. However, MoD has not concluded any MoU on payment terms with HAL so far (September 2014). It was also noticed that the payment terms in the contract (2010) did not contain the value of POs to be placed by the HAL *w.r.t* the amount of advance to be released under each category by IAF. Moreover, during implementation of the project the paying authority *viz.* CDA(HAL) failed to point out in Capital and DRE category that the purchase order placed was belonging to the period (2008) prior to the signing of the contract (2010). In the another category of reserve engine the paying authority released advance payment for vacuum cleaner which was not related to the specified category as mentioned in the contract.

Thus, IAF had made substantial second stage payments to HAL against nominal value of purchase orders not directly related to production activities of the contracted aircraft.

3. Limitation on operational role

- As per Air Staff Qualitative Requirement (ASQR) for Series Production (SP) aircraft, the All Up Weight (AUW)[8] of the aircraft must not exceed 3500 Kg. However, Audit observed (January 2013) that against this requirement, the contract entered into was for AUW of 4250 kg in normal training configuration which was much higher than the AUW stipulated in the ASQR. Accepting the facts, Air HQ stated (April 2013) that this increase in weight had resulted in shortfall in some performance related ASQR of the order of approximately 15 *per cent*. Air HQ further added that a team had been constituted to carry out the study for weight reduction. However, from the minutes of 15th Steering Committee[9] (August 2013), we noticed that HAL had clearly stated that only a maximum of 100 Kg weight reduction was possible.

[8] AUW= Total weight of aircraft while airborne inclusive weight of pilots and fuel.

[9] A Committee comprised of HAL and IAF representative constituted to watch the progress of production activity of IJT on quarterly basis.

In response to the paragraph issued to the Ministry in May 2014, Air HQ on the direction (August 2014) of Ministry of Defence (Finance/Budget) stated (August 2014) that a reduction in AUW would directly result in improvement in performance. HAL had carried out (August 2013) a study and had identified possibility to reduce 115 kg in the series production version. However, IAF did not agree (August 2014[10]) to the proposed reduction and advised HAL to seek expert consultancy for further weight reduction. Air HQ further stated that IAF may consider giving concessions to HAL on ASQR, depending upon the merit of case at an appropriate time.

The reply of Air HQ indicates that IAF had not taken seriously the adherence to their own approved ASQRs. As a result, IAF failed in providing requisite ASQR configuration of AUW of 3500 Kg for SP IJT aircraft in the contract which would result in procurement of heavier aircraft having AUW of 4250 Kg. This increase in weight of aircraft will result in shortfall in performance as admitted by the Air HQ.

- Likewise, the initial prototype of IJT aircraft had French SNECMA LARZAC 04-20 engine for design and development that was later replaced (April 2005) with higher thrust AL-551 engine (a Joint Venture of HAL and Russian manufacturer NPO Saturn) to meet the training requirements of IAF. We noticed (January 2014) that despite providing ₹159 crore to HAL exclusively for development of high thrust engine, the contracted engine of SP IJT aircraft (AL-551) would presently have Total Technical Life (TTL) of only 300 hrs against TTL of 3600 hrs provided in the ASQR. The contract (March 2010) provided that TTL of 300 hrs would be subsequently extended to TTL of 3600 hrs. However, the timelines for extending the TTL to 3600 hrs had not been stipulated in the contract. We further noticed (January 2014) that Air HQ had projected (September 2008) utilisation rate of 30 hrs/month/per aircraft to impart training to trainee pilots during

[10] Statement has been made on the basis of Air HQ reply forwarded in August 2014.

stage II whereas considering the present TTL given by the vendor for the engines, the aircraft would complete their engine hours within 10 months after induction into IAF service. Therefore, IAF had taken unlimited liability on themselves by accepting the provision of the contract of SP IJT aircraft which did not have any stipulated timelines for further development of aero-engine to TTL of 3600 hrs.

Air HQ in its reply (August 2014) stated that the engine had been recently cleared for 300 hours of life and further tests were in progress by original equipment manufacturer (OEM) on engines which had run more than 300 hours for next phase of extension. It further added that till the award of engine life upto 1200 hours by OEM, existing Kiran aircraft would continue to be used to impart Stage-II training. Therefore, at this stage it is incorrect to state that IAF had created unlimited liability by agreeing for AL-551 engine of IJT.

Reply is not acceptable as non-stipulation of timelines for development of engine to Total Technical Life of 3600 hours in the contract would affect the stage-II training to trainee pilots as admitted by Air HQ. The reply of Air HQ regarding utilisation of Kiran aircraft for imparting stage-II training is also not tenable as the IAF held only 39 aircraft for training purpose against the authorisation of 79 Kiran and out of these only 19 aircraft were in flying condition. Due to this, IAF was finding itself extremely constrained[11] in completing the training of Stage-II pilots in time. Besides, the purpose for awarding the contract for development of IJT with a view to replacing the existing Kiran aircraft was also defeated.

In brief, IAF committed uncertain liability on their part by entering into series production contract of 73 IJT aircraft even before completion of the Initial Operational Clearance (IOC)/ Final Operational Clearance (FOC) of prototype aircraft in violation of stipulated provisions of DDPMAS. As a result, IAF

[11] Revising downwards the training flying hours from 105 to 87 hours and further by reducing the intake strength of trainees pilots.

was unable to provide modern IJT trainer aircraft to meet its stage-II training requirement for trainee pilots even after a lapse of 14 years. Due to acute shortage of the existing Kiran trainer aircraft, the training hours prescribed for stage-II training had to be reduced by IAF. Besides, the aircraft under development would be heavier compared to IAF parameters which will affect training related performance. Further, advances released by IAF to the extent of ₹2953.88 crore remained unutilized with HAL (August 2014).

The matter was referred to Ministry in May 2014; their reply was awaited (September 2014).

2.2 Non-utilisation of Mobile Ground Exploitation Stations for reconnaissance missions

Non procurement of adequate number of Synthetic Aperture Radar and Electro Optic/Infra Red pods coupled with incorrect allocation of four Mobile Ground Exploitation Stations imported at a cost of ₹129.76 crore resulted in their non-utilisation for the intended purpose thereby affecting the Recce mission of IAF.

A Reconnaissance (Recce) system is used to collect intelligence data for operational needs. An aerial Recce system comprises (a) Synthetic Aperture Radar (SAR) pods, (b) Electro Optic/Infra Red (EO/IR) pods and (c) Static/Mobile Ground Exploitation Stations (SGES/MGES). The SAR pod is used to provide images of enemy territory in all weather, day and night conditions while the EO/IR pods have cameras/sensors which are capable of providing images of any area of interest during day and night. The SGES/MGES, the ground portion of SU-30 MKI Recce pod system, are the control centres for the pods which receive real time data from the aircraft during operation.

Ministry of Defence (Ministry) concluded a contract (December 2004) with M/s Elta, Israel (OEM) for procurement of Aerial Recce system to be integrated on SU-30 MKI aircraft at a total cost of MUSD 136.61 (₹640 crore). Most of the supplies were made between December 2007 and March 2009.

Audit had earlier commented in paragraph No. 3.1 of the Report of Comptroller and Auditor General of India, No.16 of 2010-11 about the abnormal delay in integration of Recce pods onboard an aircraft. In their Action Taken Note, Ministry stated (June 2011) that the Recce pod had been successfully integrated and operationalised for its stated role.

Procured Aerial Recce system comprised two SGES and four MGES and three sets of SAR and EO/IR pods whereas for exploitation of one SGES/MGES, one set of pod (SAR and EO/IR) is required to be positioned for operation of the Recce system. Of these, four MGES valuing ₹129.76 crore were planned to be inducted between December 2008 and March 2009 at four Air Force Stations (AFS) located at forward locations. Presently, all the three sets of pods along with one SGES is located at AFS 'A'. The remaining one SGES is kept at AFS 'B'.

During audit of four AFSs (2010-12), it was noticed that these four newly inducted MGES could not be made operational at designated bases since their receipt (2008-09) as three out of four designated bases did not have SU-30 MKI aircraft. The fourth MGES was positioned at designated location operating SU-30 MKI squadron without any SAR and EO/IR pod eventhough for exploitation of MGES/SGES, one set of pod (SAR and EO/IR) is required to be positioned along with the Recce system. As a result, no Recce mission could be undertaken since the receipt of four MGES (2009). Subsequently, Air Headquarters (Air HQ) had decided (October 2011) to relocate these MGES to other three bases operating SU-30 MKI aircraft for their utilisation.

The matter was referred (July 2012) by Audit to Air HQ. In its reply, Directorate of Engineering (DoE), Air HQ stated (September 2012) that SAR and EO/IR pods are the extra attachment to the aircraft which takes imagery during real time missions and the same can be down linked with nearby SGES/MGES for further analysis. Therefore, positioning of MGES may not necessarily be undertaken at SU-30MKI base. The reply of Air HQ is not acceptable as it was against the intended procurement objective of the Aerial Recce system which was to be integrated on SU-30 MKI aircraft. The reply is also contradictory to their decision (October 2011) of relocating all MGES to bases with SU-30MKI squadrons for their utilisation.

Directorate of Operation (Offensive), Air HQ further clarified (January 2013) to Audit that utilisation of MGES at new locations was contingent on availability of additional sets of pods, the proposal for procurement of which was still under process (March 2014[12]).

On further audit query (March 2014) regarding non procurement of required number of pods for utilisation of four MGES and its impact on operational preparedness, Air HQ stated (April 2014) that while initiating (1999) the procurement action for three SAR pods and three EO/IR pods along with six SGES/MGES, it was envisaged that these pods would be sufficient to undertake necessary Recce operations in the desired area of concern. It further informed Audit that it was decided (2009) to procure additional six sets of SAR and EO/IR pods along with two MGES one each for Southern Western Air Command (SWAC) and Eastern Air Command (EAC) as presently available pods for exploitation limit the area of operations and also prevent IAF from achieving its full potential in Recce operation.

Further, in response to the paragraph issued to Ministry in May 2014, Air HQ on the direction (August 2014) of Ministry of Defence (Finance/Budget) furnished their reply directly to Audit wherein they reiterated (August 2014) their earlier stand that proposal for six sets of pods had been initiated (May 2013) based on the Raksha Mantri's Ops directive (2009) to cater for the contingency deployment.

The reply confirms that the requisite numbers of pods were not purchased earlier which has resulted in non utilisation of four MGES valuing ₹129.76 crore for operation of Recce system for the last five years since receipt (2009).

The matter was referred to Ministry (May 2014); their reply was awaited (September 2014).

[12] Position updated on the basis of information forwarded by Air HQ on 11 April 2014.

2.3 Procurement of Air Combat Maneuvering Instrumentation system

IAF had incurred an extra expenditure of ₹10.35 crore on excess flight trials of the Air Combat Maneuvering Instrumentation (ACMI) system. Further, due to non synchronization of procurement and integration of ACMI system with fleet modification plan, the equipment procured at a cost of ₹167 crore could not be exploited fully for training purpose.

Air Combat Maneuvering Instrumentation (ACMI) system comprises Static and Ground Mobile Station, External pods, Network terminals and V/UHF R/T[13] sets. The system provides an electronic replay of the entire combat sorties and thus ensure thorough effective post-flight debriefings. This results in improving the air combat skills of pilots with lesser flying effort thereby directly contributing to operational skills. It also has the facility to monitor the combat parameters, in real time, at a ground station with an option to communicate immediate warning of unsafe/collision regimes, thus contributing to flight safety.

Ministry of Defence (Ministry) concluded (October 2007) a contract with M/s BVR System Ltd. Israel (OEM[14]) for procurement of three ACMI systems inclusive of 46 external pods and associated equipment at a total cost of MUSD 19.46 (₹79.57 crore). These systems were delivered between December 2009 and January 2010 and commissioned between April 2011 and September 2011 at Air Force Station (AFS) 'M', 'N' and 'O'. Indian Air Force (IAF) procured two additional ACMI systems inclusive of 54 pods along with associated equipment at a total cost of MUSD 18 (₹87.56 crore) in December 2010 under option clause of the main contract (October 2007). These were delivered during July-August 2012 and installed (July 2013) at AFS 'P' and 'Q'. The examination of case reveals the following findings:

[13] Very/High Ultra Frequency Receive/Transmit sets.
[14] Original Equipment Manufacturer

1. Extra expenditure on Flight Integration trial

The ACMI pod fitted on the aircraft constantly transmits aircraft flight path information to the ground station. At the ground stations, it reproduces an accurate and a complete picture of the air combat when replayed along with the inputs from many other pods. These 100 pods were to be adapted to the different six platforms (aircraft) through placement of Repair, Manufacture and Supply Orders (RMSO) on Hindustan Aeronautics Limited (HAL). Out of six platforms, integration of system on aircraft 'C' is to be carried out during their upgradation programme (by 2020) by OEM. For remaining five platforms, flight test of these pods was prescribed at the rate of three days per platform (aircraft) (i.e. total 15 days for five platforms). These test flights were referred to as "Transparent Flights" and were planned and debriefed[15] by the seller. Further, these flight tests were to be completed in two phases *i.e.* in first phase, Integration Flight Test (IFT) inclusive of Pod Integration Trials (PIT) was to be carried out in 15 days for all the five variants of aircraft to refine interface control document between pod and the aircraft. In second phase, On Site Acceptance Test (OSAT) was to be carried out to check the performance of the pod and the entire ACMI system for which no time line was prescribed in the contract.

As per the contract (2007), IAF was to carry out Pre Despatch Inspection (PDI) of the equipment at seller's premises, in order to check their compliance with specifications in accordance with its usual standard procedures. IAF carried out (November 2009) Pre Despatch Inspection of the equipment successfully.

However, we observed (October 2013) from the flight integration trial report that when the vendor brought (December 2009) the equipment to India for first phase of flight trials, it could not integrate the pods successfully with various aircraft at IAF bases due to software problems. As a result, IAF had to fly 5 fighter aircraft in seven phases from 15 December 2009 to 5 March 2011 for validation of Pod Integration Trials (PIT). The vendor could not clear PIT within stipulated time *i.e* 15 days @ 3 days per aircraft. Instead, the vendor

[15] The vendor has to conduct pods integration test in IAF aircraft and for which the seller has to plan the details of flight test and explain the progress of such test flights thereafter to IAF representative.

had taken 43 days for PIT *i.e.* 28 days in excess of the prescribed time in which 84 additional sorties were undertaken for the clearance of flight integration trials. Although contract provision stipulates total 15 days for five aircraft for flight tests, no provision for recovery from vendor on account of excess flight trials was provided therein. Consequently, IAF had to bear an extra expenditure of ₹10.35 crore on account of these 84 excess sorties towards PIT.

On the matter regarding excess flight trials (sorties) being pointed out in Audit (October 2013), Air HQ merely stated (November 2013) that the total 138 flights sorties [i.e. for PIT (109 sorties[16])] and OSAT (29 sorties) were undertaken. The reply was silent on the 84 excess sorties undertaken in extra 28 days for pod integration trials and the expenditure incurred thereon.

In response to the paragraph issued to the Ministry in May 2014, Air HQ on the direction (August 2014) of the Ministry of Defence (Finance/Budget) stated (August 2014) that the extra expenditure worked out towards PIT was not completely incurred towards PIT but also includes comprehensive flight evaluation through flight integration trials. It further added that PIT tests were carried out during flight evaluation trials within the prescribed period as per contract.

The reply is not tenable as the objective of flight evaluation trials was to check the performance and operational exploitation of the external pods after their integration and finalization of Standard of Operation (SOP) to exploit the ACMI modified aircraft with the pods in most effective and safe manner. It is also evident from the flight test reports that all flight trials were conducted to integrate the ACMI pod for which the vendor had taken 43 days to clear the flight trials as against the stipulated 15 days for Pod Integration Trials (PIT). As a result, IAF had to incur an extra expenditure of ₹10.35 crore on extra sorties undertaken during the 28 days for PIT of the system. Besides, the flight test efforts for OSAT were carried out in addition to the pod integration test.

[16] Inclusive of 25 sortie undertaken in 15 days prescribed for flight test

2. Delay in fleet modification

For integration of ACMI system, Air Force had planned to modify all six variant of combat aircraft. The modification was to be carried out by M/s Hindustan Aeronautics Limited (HAL) after due certification by OEM. Initially, HAL modified one aircraft of each variant for flight evaluation for integration of ACMI system and thereafter, the series modification of each fleet for integration and carriage of ACMI pod was to be undertaken after the flight trials.

We noticed (April 2014) that out of six variants of aircraft, IAF had placed Repair, Manufacture and Supply Orders (RMSO) on HAL for series modification in respect of only three variants of aircraft between April-November 2011. For the remaining three variants, the RMSO for 15 aircraft 'A' was concluded in April 2014 and balance 30 aircraft 'A' are to be modified after their up-gradation in 2020-21. The Repair Manufacture and Supply Order (RMSO) for aircraft 'B' was yet to be placed (July 2014[17]). In respect of aircraft 'C', no separate RMSO had been placed as all aircraft 'C' would be upgraded by aircraft OEM in which ACMI integration is a part of Final Operational Clearance.

We further observed that the shelf life of ACMI system is 20 years from the date of delivery[18] and till date (July 2014[19]) series modification of only one variant of aircraft 'D' had been fully completed whereas the fleet of aircraft 'E' and 'F' had been partially modified. Considering the up-gradation plan of aircraft 'A' and 'C', which were under their various phases, the complete fleet modification of all the variants of aircraft for integration of ACMI system would not be accomplished till the end of 2020-21. Thus, by the time all the fleet/aircraft would be modified (2020-21), half of the shelf life of these ACMI system since delivery would expire.

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17 Position updated as per reply furnished by Air HQ on 30th July 2014).

18 Systems were delivered in batches. Delivery of system against contract of October 2007 was materialized between December 2009 to June 2010 whereas the delivery against contract (2010) materialized between July-August 2012.

19 Position updated as per reply furnished by Air HQ on 30th July 2014.

Air HQ in its reply to paragraph issued in May 2014 stated (August 2014) that the exploitation of ACMI system did not depend upon the type of aircraft variant as the ACMI system is not aircraft specific. They further stated that it can be fitted on and exploited by any type of aircraft variant after required study/modification in such variant of aircraft. It also intimated that series modification of various platform were under progress.

The reply is not acceptable as IAF procured the ACMI system to be integrated on all the six variants of aircraft with the aim of improving the training skills of the pilot and also to provide electronic replay of the entire combat sortie. Since, two out of six variants of aircraft would be modified during their upgradation by 2020-21 and the RMSO for one variant was yet to be placed (July 2014), IAF failed to synchronize the procurement and integration of ACMI system with fleet modification plan of all the six variants of the combat fleet for achieving optimal operational exploitation of the system during its life time.

Thus, due to non synchronization of fleet modification plan with the procurement and integration of ACMI system with all the variants of platforms, the system procured at the total cost of ₹167 crore could not be exploited fully for training of pilots. Further, by the time all the system would be integrated, half of the shelf life of the pods would expire since delivery.

The matter was referred to Ministry in May 2014; their reply was awaited (September 2014).

2.4 Unfruitful investment in procurement of a Torpedo

Torpedo 'W' contracted for ₹99.60 crore did not meet the envisaged Qualitative Requirements (QRs). Requisite airborne presetters remained under trials leading to inability of Indian Navy (IN) to operationally exploit these torpedoes, resulting in unfruitful investment. Further, delay in conclusion of contract and delivery of Torpedo 'W' led to inability of IN to maintain minimum pool reserve.

Naval Science and Technological Laboratory (NSTL), Visakhapatnam a laboratory under Defence Research & Development Organisation (DRDO), in

February 2005, developed Torpedo 'W' [earlier known as Advanced Experimental Torpedo (AET)]. A mention was made in an earlier Audit Report[20] that the staff project for development of AET undertaken by DRDO failed to fructify despite delay of twelve years and after incurring an expenditure of ₹46.24 crore which compelled Indian Navy (IN) to continue using vintage torpedoes, adversely affecting defence preparedness. Ministry of Defence (Ministry) in their Action Taken Note (April 2006), while agreeing with the facts of the case, stated that in spite of all the hurdles, the required success rate was demonstrated successfully by February 2005 and IN accepted the torpedo designed by NSTL. It was also stated that Government sanction was under progress by IN for placement of order on M/s Bharat Dynamics Limited (M/s BDL).

Thereafter, Ministry concluded a contract (November 2009) with M/s BDL at a total cost of ₹99.60 crore for procurement of 'A' numbers of Torpedo 'W' along with accessories and support test equipment to be delivered by May 2012.

Though the Ministry had accepted the torpedo designed by DRDO, our scrutiny (July 2013) of the records pertaining to the procurement of Torpedo 'W' revealed the following:

I. Delay in conclusion of contract and delivery of Torpedo 'W'

In November 2005, IHQ MOD (Navy) while proposing procurement of 'A' numbers of Torpedo 'W', projected a deficiency of 'B' numbers of torpedoes from the minimum pool reserve. However, the procurement was restricted to only 'A' numbers of torpedoes with the intention of making up the deficiency from Torpedo 'X'[21] in future. Defence Acquisition Council (DAC) accorded (January 2006), Acceptance of Necessity (AON) with the categorisation as 'MAKE[22]' as per the Defence Procurement Procedure (DPP) 2005. However, since M/s BDL had already been termed as production agency in the past and had already manufactured prototype versions post Transfer of Technology

[20] Para 5.2 of C&AG of India's Report No.7 of 2005 (Air Force & Navy).
[21] Torpedo 'X' is an advanced version of Torpedo 'W' and is under development.
[22] Category 'Make' means indigenous production and research & development of the equipment under capital acquisition.

from NSTL, the procurement was re-categorised (August 2007) as 'Buy'[23] (Indian) from M/s BDL, after this provision was introduced in the DPP 2006. Also as the field evaluation trials were satisfactorily conducted using prototype torpedoes, which were manufactured by M/s BDL, the No Cost No Commitment (NC-NC) trials were waived in July 2008. Accordingly, Request for Proposal (RFP) was issued to M/s BDL in August 2008 and finally the contract was concluded in November 2009 with M/s BDL.

As per DPP 2006, a time frame of 23 to 34 months has been envisaged for signing of contract from the date of AON. As the NC-NC trials were waived off in the instant case, the timeframe for conclusion of contract would be 17 to 22 months. However, the contract was concluded in 46 months from the date of AON entailing a delay of 24 months. We noticed (July 2013) that main reasons for the delay were time taken for change in categorisation of acquisition, decision to waive NC-NC trials[24]coupled with delays in price negotiations[25] between the Ministry and M/s BDL. As the torpedoes were being procured to maintain minimum stock level (pool reserve), the delay had an adverse impact on the operational preparedness of IN.

Further, as per the contract, 'A' numbers of Torpedoes 'W' were to be delivered by May 2012. However, we observed (September 2013) that only 'C' numbers of torpedoes *i.e.* about 52 *per cent* of the contracted torpedoes were delivered between July 2012 and May 2013. M/s BDL cited certain production related constraints and delivery extension was sought up to December 2014 for balance items. We further noticed (May 2014) that 'D' out of 'C' torpedoes received, *i.e.* about 38 *per cent*, were found (April 2014) to be unserviceable due to failure in electrical check conducted during Joint Receipt Inspection by representatives of IN and M/s BDL. Since M/s BDL was nominated as the production agency by Department of Defence Production & Supplies (DDP&S) in 1997 for the torpedoes and Transfer of Technology was completed in 2006, delay due to production related constraints lacked justification.

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[23] DPP 2006 introduced the category 'Buy (Indian)' which is outright purchase of equipment from Indian vendor.

[24] 4 months were taken to decide on waiver of NC-NC trials whereas the time prescribed to conduct trials themselves is 6-12 months in the DPP.

[25] Time prescribed to complete the price negotiation process by Contract Negotiation Committee is 3-5 months which was completed in 9 months.

II. Investment remaining unfruitful

Naval Staff Qualitative Requirements (NSQRs) for Torpedo 'W' were initially framed in July 1985 and finalised in 1997 based on the outcome of a staff project. Though, there was considerable dilution in NSQRs of 1997 in critical parameters as compared to NSQRs of 1985, even the diluted NSQRs of 1997 could not be fully met by the torpedoes that were eventually contracted in 2009 from M/s BDL.

While there was a minor dilution in torpedo speed, there were major dilutions in terms of shipborne presetters[26] and FIAM[27]. The NSQRs envisaged a requirement of both shipborne and airborne presetters but the contract was concluded for airborne presetters only as shipborne presetters was still under development at NSTL. Since shipborne presetters was unavailable, the operational exploitation of Torpedo 'W' from the identified class of ships was uncertain. Further, FIAM were required for fixed wing as well as rotary wing aircraft as per NSQRs**,** whereas in the Torpedo 'W' contracted for, provision for FIAM was made for rotary wing aircraft only. This clearly showed the operational utility of these torpedoes would be considerably reduced due to non-inclusion of these requirements in the contract.

Further, IN had nominated (May 2005) Torpedoes 'W' for MATCH[28] **(**helicopters) since the airborne presetters met the Navy's requirement for MATCH only. In order to facilitate the induction of Torpedo 'W' for MATCH, certification for the fitment of airborne presetters on MATCH by Center for Military Airworthiness & Certification (CEMILAC)[29], Bangalore was envisaged (May 2005). The modifications of airborne presetters and Evaluation Trials (ETs) were completed and the airborne presetters was cleared by CEMILAC for exploitation by February 2007.

As per the contract, quantity 'J' of airborne presetters was to be delivered within 18 months from the effective date of contract *i.e.* May 2011. However, against the contracted quantity of 'J', only 'K', *i.e*. 13 *per cent*, were supplied

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[26] Presetters – It is a Fire Control System which feeds firing data in the torpedo about directions, distance and type of search to carry out.

[27] FIAM – They are required for launching of torpedo from rotary wing aircraft (Helicopters)

[28] MATCH: Multi-role Anti Submarine Torpedo Carrying Helicopters.

[29] Centre for Military Airworthiness and Certification (CEMILAC) is an independent agency under DRDO which conducts airworthiness certification of the airborne equipment, stores and vehicles.

by M/s BDL for ground and flight trials (December 2013) and were undergoing flight trials to resolve certain technical issues as noticed during audit scrutiny.

IHQ MOD (Navy) in their reply (December 2013) stated that the Torpedo 'W' met the NSQRs of 1997. They further stated that another contract (June 2010) with M/s XYZ for upgradation of Torpedo 'Z' catered for the requirement of the dual capability shipborne and airborne presetters which could fire Torpedo 'W' also. However, reply is not acceptable as fact remains that there has been dilution in the speed of torpedoes as compared to NSQRs of 1997. Further, non-procurement of shipborne presetters and fixed wing aircraft FIAM, led to deviation from NSQRs. Our analysis of the another contract (Torpedo 'Z') revealed that it catered for the requirement of airborne presetters for helicopter type 'S' only, and did not cater for airborne presetters for MATCH role helicopter *i.e.* the platform for which Torpedo 'W' were procured. Further, integration and trials for the dual capacity presetters were planned post successful Sea Acceptance Trials (SATs) of Torpedo 'W'. However, the SATs of Torpedo 'W' were declared unsuccessful (April and May 2014).

We also observed (June 2014) that though the airborne presetters were already developed and certified for exploitation in as early as 2007, during their ground trials in February-March 2014, it was noticed by IN that certain software modifications were required to be undertaken in presetters due to certain inadequacies in their functioning. As a result, CEMILAC clearance of February 2007 for exploitation of the airborne presetters was withdrawn. M/s BDL were requested by IN to expedite the clearance only after which flight trials could be scheduled. Therefore no airborne presetters was available with IN for operational utilisation of Torpedo 'W' from MATCH.

To sum up, the procurement of quantity 'A' Torpedoes 'W', which commenced in January 2006 essentially to meet the minimum pool reserve requirement of IN by 2012, could not materialise even in 2014 after an investment of ₹82 crore, due to partial supply of the contracted quantities of torpedoes, supplied torpedoes facing technical problems and the airborne presetters remaining under trials. This resulted in the investment remaining unfruitful and also adversely affecting the operational preparedness.

The matter was referred to the Ministry in May 2014; their reply was awaited (September 2014).