

CHAPTER-VI : DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION

6.1 Development of an Integrated Aerostat Surveillance System

Import of a balloon costing ₹ 6.20 crore by a DRDO's lab under a project for development of aerostat surveillance system lacks rationale. Further, the project itself did not achieve its objective despite an expenditure of ₹49.50 crore.

Aerostat is a balloon based platform which is based on lighter than air principle and carries payloads for surveillance and communication purposes.

The Aerial Delivery Research and Development Establishment (ADRDE), Agra, had completed (2013) development of medium size aerostat of capacity 2000 cum under a research and development (R&D) project named 'Akashdeep' by using polyurethane (PU) coated nylon fabric with payload capacity of 300 kg, endurance²¹ of five days and balloon life²² of 18 months.

Based on Army's expressed interest in medium size aerostat with upgraded technologies, Ministry of Defence, Department of Defence Research & Development, New Delhi sanctioned a technology demonstration (TD) project (project Nakshatra) to ADRDE in July 2011 to develop aerostat platform with net payload capacity of 300 kg and an endurance of seven to 14 days with balloon life of four to five years at a total cost of ₹48.80 crores, by December 2014. The project included a sub-system for aerostat platform namely COMINT²³ payload to be developed by Defence Electronic Research Laboratory (DLRL) at a cost of ₹22.50 crore. It was decided to use laminated fabric to overcome the endurance and shelf life constraints in PU coated fabric. It was provided for in the project proposal that in case of unavailability of laminated fabric, attempt will be made to import the fabric.

The project cost was revised to ₹58.80 crore in October 2013 to cater for the import of laminated fabric. Probable date of completion (PDC) of the project as December 2014, was also extended up to June 2016.

²¹Endurance - Gas leakage rate of laminated fabric was less than that of PU coated fabric, which results in increased endurance from 5-7 days to 12-14 days.

²²Shelf life- laminated fabric has less degradation effect when exposed to actual environment condition, which increases the balloon life from 18 months (PU coated) to 4-5 years.

²³ - COMINT (Communication Intelligence)- to intercept and measure direction of arrival of fixed frequency and frequency hopping signals even in dense signal environment so as to meet the internal security requirement.

Audit noticed (January 2017) that ADRDE spent ₹6.20 crore on import of balloon made of laminated fabric. However, this balloon was not utilised in the project as the project was carried out using PU coated fabric balloon. This project has been closed by ADRDE on 30-06-2016 after incurring an expenditure of ₹ 49.50 crore²⁴ without acceptance of the user. Thus, the balloon imported from a foreign firm at ₹6.20 crore had not been utilised for the intended purpose.

The ADRDE stated (January 2017) that the integrated aerostat (PU coated fabric balloon) surveillance system was successfully demonstrated during user associated technical trials (UATT) (May/June 2016) and the project was closed. ADRDE also stated that the other balloon (*i.e.* balloon made of laminated fabric) was kept as spare and would have been utilised in case of any damage that might have occurred in unforeseen circumstances.

However, the Army replied (February 2017) to an Audit query by stating that the UATT for the system could only be carried out for three days and as such the effectiveness of the COMINT system could not be ascertained. It further mentioned that ADRDE has been requested to deploy the aerostat with the COMINT payload for three months for UATT as it is a pre-requisite to ascertain efficacy before taking over the system for extended trials.

Thus, the very purpose of import of a balloon made of laminated fabric was to attain the project's objective of a medium size aerostat without the constraints of endurance and shelf life experienced in PU coated fabric. However, non-utilisation of the imported balloon by the lab for purposes of the project militates against the project's objective as consequently neither the aerostat was deployed nor COMINT payload tested for the duration desired by the user. The claim of the ADRDE about usage of the imported balloon as a spare to cater for the unforeseen circumstances is only an afterthought. Further ADRDE's claim for successful completion of the project is incomprehensible as the intended objective has not been achieved even after an expenditure of ₹49.50 crore, wherein the integrated aerostat is still based on a PU coated fabric. Thus, ₹6.20 crore incurred on import of balloon with laminated fabric, have been rendered idle.

²⁴ As of March 2016, project expenditure comprised of ₹ 30.06 crore on aerostat platform and ₹20.09 crore on COMINT payload with demands in pipeline worth ₹ 1.75 crore

6.2 Irregular sanction and expenditure of ₹5.20 crore on construction of vehicle testing ground after completion of the project

Director General, Research & Development accorded sanction for construction of Vehicle Testing Ground at Vehicle Research & Development Establishment, Ahmednagar (VRDE) at a cost of ₹5.20 crore in April 2009 based on VRDE's proposal of March 2005 to meet the specific requirement of testing the Unmanned Ground Vehicle (UGV) being developed on 2.5 Ton 'B' vehicle. However, by then UGV Project was closed. The expenditure is rendered infructuous because the Testing Ground cannot be gainfully utilized as Army's requirement is of a 50 Kg UGV for which existing VRDE Test Tracks would suffice.

The Defence Works Procedure-2007 envisage that all defence works and services are completed with the minimum delay in a cost-effective manner and that no new works are sanctioned without careful attention to the assets and facilities already available.

Audit noticed (April 2015) that a Vehicle Testing Ground was constructed in April 2014 at Vehicle Research & Development Establishment, Ahmednagar (VRDE) at a sanctioned cost of ₹5.20 crore to meet the test requirements of Unmanned Ground Vehicle (UGV) project²⁵, which was closed in February 2008. The Administrative Approval for the work was accorded by DG (R&D), in April 2009 based on the requirement projected by VRDE in March 2005 to meet the requirement of test facilities for the UGV with Gross Vehicle Weight of 10 Ton at a maximum speed of 82 kilometre per hour (KMPH).

Audit enquired (September/October 2016) about the necessity of sanctioning the work after the UGV project was closed in February 2008. DRDO HQ stated (December 2016) that the UGV testing ground was planned for then on-going as well as pipeline/futuristic unmanned systems testing and not for any 'specific' project and it was to facilitate an isolated test ground with safety provision for arresting moving UGV, in case of emergency/uncontrollable operation.

The reply is not tenable as the requirement of testing ground was projected specifically to meet the requirement of testing the UGV being developed on a 2.5 Ton 'B' vehicle with Gross Vehicle Weight of 10 Ton at a speed of 82

²⁵UGV project- sanction (February 2004) by the MoD to VRDE as a Technology Demonstration Project for 'Development of Unmanned Ground Vehicle (UGV) on 2.5 Ton 'B' vehicle' at an estimated cost of ₹11.52 crore was closed (February 2008) without acceptance of the user whose requirement was for a 50Kg Chemical/Biological/Radiological/Nuclear (CBRN) UGV. This was reported in CAG's Audit Report No.35 of 2014.

KMPH .The trials of this UGV had already been completed utilizing the existing VRDE test tracks, as the Testing Ground was not available then. The project of 2.5 Ton 'B' vehicle UGV was itself closed in February 2008. Thus, the delayed sanctioning of the Testing Ground did not serve the intended purpose .Besides, as the Army is currently in need of UGV of 50 Kg capacity only, the testing facility is not likely to be optimally utilized. Army in a Project Review meeting (August 2012) had intimated DRDO that the ongoing development of larger UGV would be stopped and henceforth all developments shall be directed to develop the smaller 50 Kg UGV. Also, since construction of the track, the VRDE has had only one project of development of CBRN mini-UGV for reconnaissance and that too a 50Kg UGV for which presently existing ground testing facilities would have sufficed.

Thus, sanctioning of the vehicle testing ground at a cost of ₹5.20 crore after closure of the UGV project was irregular being in violation of the principles of undertaking new works .

6.3 Infertuous expenditure of ₹19.53 crore

To demonstrate the missile in the range of 1200M and 1500M as stipulated by the Army Combat Vehicles Research & Development Establishment (CVRDE), Avadi procured 20 LAHAT missiles in spite of reservation of the foreign supplier due to technical constraints related to stability of the missile. During demonstration trials, the missiles failed to achieve the stipulated criteria/range of 1200M to 1500M. Army refused to accept the missile, thereby the payment of ₹19.53 crore made to the supplier was rendered infertuous.

General Financial Rules 2005 stipulates that every officer incurring or authorising expenditure should be guided by high standards of financial propriety. Every officer is expected to exercise the same vigilance in respect of expenditure incurred from public moneys as a person of ordinary prudence would exercise in respect of expenditure of his own money. The above stipulation is reiterated in the Purchase Management Manual 2006 governing procurements by Defence Research and Development Organisation (DRDO). It also stipulates that the concerned authority should be satisfied that the selected offer meet the intended requirement.

Audit noticed that Combat Vehicles Research & Development Establishment (CVRDE), Avadi took up a project inspite of the fact that there was no requirement from users, resulting in an expenditure of ₹19.53 crore being rendered infertuous.

The case is discussed below :

Ministry of Defence (MoD) accorded (December 2009) sanction for Technology Demonstration (TD) project 'Development of fire control system with laser target designator for missile firing from Main Battle Tank (MBT) Arjun 'to be executed by CVRDE at a cost of ₹49.50 crore, which was further revised (May 2015) to ₹82.70 crore with PDC of May 2017 to pursue the missile development indigenously. As a potential option, laser homing anti tank (LAHAT) missile manufactured by M/s Israel Aircraft Industries (IAI), Israel, which uses a laser target designator (LTD), was identified (June 2010).

In August 2010, Director General, Mechanized Forces (DGMF) had fixed the minimum range of the missile as 1200M with 80 *per cent* hit in the range between 1200M and 4000M. M/s IAI stated that the LAHAT missile was meant for range beyond 1500M and they would not commit on missile firing in a range less than 1500M due to technical constraints related to stability of the missile. DRDO HQ however, intimated (November 2010) the DGMF that the missile would be effective even at the shorter range of 1200M and had taken upon itself the responsibility to see the results during demonstration at 1200M.

Accordingly, CVRDE concluded (January 2011) a contract with M/s IAI for demonstration of missiles at a cost of US\$ 2.8 million.

In July 2011, DGMF revised the 'acceptance criteria' stipulating with 67 *per cent* hit in the range 1200M to 1500M and also increased the number of missiles to 14 to be fired up to 5000M. Accordingly, an amendment to the order was issued (July 2011) for increasing the quantity to 20 missiles at a total cost of US\$ 4.5 million. The missiles were delivered in May 2012 and ₹19.53 crore was paid to M/s IAI.

Audit noticed (December 2015) that in trials (2013), against the criteria of 67 *per cent* of missiles hit in a range of 1200M and 1500M, only 33 *per cent* of missiles had hit the target. Hence, the Army declared that the LAHAT missiles did not meet the acceptance criteria. Subsequent to non-acceptance of the missile, CVRDE/DRDO decided to pursue the development of missile indigenously.

In response to Audit observation (December 2015/October 2016), DRDO HQ stated (December 2016) that M/s IAI's apprehension on short range was based on the simulation results but not on actual firing performance. Further, LAHAT missile alone was found suitable for 120mm calibre gun of Arjun MBT. Hence, in anticipation that missile can be manoeuvred for user's requirement, the project was taken up to check the performance of the LAHAT missile.

The reply of DRDO HQ is not tenable as analysis of the results of firing and simulation results of LAHAT missile revealed that meeting low range performance requirements completely is not possible with the LAHAT missiles. Further, the very fact that the missile would not meet the low range criteria of the user, was underscored by M/s IAI (i.e. the manufacturer) itself even before placement of the supply order on them. Thus, the decision to proceed with the procurement/demonstration of the missiles is open to question as it has delayed the indigenous effort by five years besides unfruitful expenditure of ₹19.53 crore.