CHAPTER XIX : DEPARTMENT OF SPACE

19.1 Idle investment on development of a Linac tube

A Linac tube was developed for Solid Propellant Space Booster Plant of Satish Dhawan Space Centre, Sriharikota in March 2002 to improve performance of the existing 15 MeV Linear Accelerator system. Despite availability of idle time of the main system, the Linac tube was not installed for eight years, leading to idle investment of ` 1.80 crore and additional maintenance cost of ` 32 lakh. Non replacement of the old Linac tube with the new one led to a two fold increase in the time taken for inspection of rocket motors.

The Solid Propellant Space Booster Plant (SPROB), one of the divisions of Satish Dhawan Space Centre (SDSC), Sriharikota, a constituent unit of Department of Space, (DOS), had imported a 15 MeV Linear Accelerator system[1] from the United Kingdom in 1984 for meeting inspection requirement of Polar Satellite Launch Vehicle (PSLV) rocket motors. In 1999, this system started giving low X-ray output of about 1500 radiations per minute against a nominal output of 3000 radiations per minute. Though the reduced output was found to be sufficient for meeting the existing inspection demands, the time taken for inspection increased two fold. Experts indicated that the Linac tube might have decayed and needed replacement. Therefore, SPROB entered into a Memorandum of Understanding (MoU) in March 2001 with the Society for Applied Microwave Electronic Engineering Research (SAMEER), Mumbai, an autonomous body under Department of Information Technology, for development of a Linac tube which was a critical sub-system of the Linear Accelerator system. The duration of development, including commissioning of the Linac tube by SAMEER and acceptance by SDSC SHAR[2] was 20 months i.e. before October 2002. The total cost of development of the Linac tube was ` 1.80 crore which was payable in installments. The final installment of 10 per cent was payable after installation, commissioning and final acceptance of the tube with respect to its performance with the existing 15 MeV Linear Accelerator system of SPROB.

SAMEER completed development of the Linac tube and SPROB conducted the evaluation test at SAMEER and accepted the tube in March 2003. SAMEER required only 40 days for interfacing the Linac tube and final

[1] The system is a type of particle accelerator that greatly increases the velocity of charged subatomic particles or ions by subjecting the charged particles to a series of oscillating electric potentials along a linear beamline.
[2] as in MoU

evaluation tests. However, SPROB decided not to install and commission the tube due to heavy workload on the existing Linear Accelerator System. SPROB also decided to keep the Linac tube in the custody of SAMEER until its installation. After completion of all obligations of development, SPROB amended the financial terms of the MoU and released the final payment to SAMEER, without interfacing the tube with the main system and without ensuring satisfactory performance of the tube, duly integrated with the main system. SPROB, therefore, continued to carry out inspections with the available low output and with two fold increase in inspection time. Since the newly developed/acquired tube was not integrated with the main system, SDSC entrusted the work of maintenance of the tube to SAMEER till its installation and commissioning. The maintenance of the tube included high power activation of the tube twice a year for which SPROB paid ` 32 lakh to SAMEER as charges. Such activation of tube was carried out four times during April 2003 to 2007.

It was observed in audit that the tube had been lying idle since March 2003, even after incurring an expenditure of ` 32 lakh for activation of the tube. It was further observed that SPROB placed a separate order in March 2008 on SAMEER at a total cost of ` 5.10 crore for development of another 15 MeV Linear Accelerator System, which would serve as a standby to the existing 15 MeV Linear Accelerator system. SPROB also decided that the Linac tube already developed by SAMEER would be installed in the new 15 MeV Linear Accelerator system, which is slated to be completed by December 2011.

Thus, the decision of SDSC to not undertake installation, interfacing and commissioning of the Linac tube resulted in idling of the tube costing ` 1.80 crore for eight years. The tube has neither been put to any use nor proved that it would work with Linear Accelerator system.

SDSC replied in April 2009 that:

- The tube was developed as a general preventive measure policy to keep in stock and to facilitate replacement as and when need arises;

- The main system, being of a single point nature, was initially linked with all PSLV/GSLV launch activities and ISRO could not afford to keep the machine idle to facilitate replacement of old tube with the new one; and

- The development work helped organisations like SAMEER to master hi-tech Linac tube technology and become self-reliant in the production of Linac Machines.

In March 2011, SDSC again reiterated its stand by replying that Linac Tube was still in the custody of SAMEER and as decided earlier it would be installed in the new system which was due for delivery in December 2011.

DOS replied in December 2009 that:

- Originally the MoU with SAMEER was entered with the requirement of interfacing the tube with the machine but extensive efforts put in by engineers resulted in machine performing up to required standards and hence the tube was kept as standby option;

- Tube was fully tested by an expert team at the special lab of SAMEER and functionality of the system was proven. Hence, it was not essential to test it again after integration into the main system; and

- SAMEER had confirmed in April 2008 that the tube would deliver the required specifications and work satisfactorily.

The replies of DOS and SDSC may be viewed in light of the following facts:

- The main system was operated at low output even after intervention made by engineers and increased time taken for the inspection of motors.

- The tube had not been integrated with the main system and as such, the efficiency and functionality of the system developed by SAMEER remained to be proven.

- SAMEER required only 40 days for interfacing and evaluation tests and that the system was put into use only for 10 to 45 *per cent* of available working days in a year during September 2004 to October 2009. Therefore, the contention of SDSC that it could not afford to keep the machine idle to facilitate replacement of old tube with the new one is not acceptable.

- SDSC itself specified various evaluation tests and its final acceptance after integration of the tube with the main system in the MoU. Even the expert team, while accepting the tube after evaluation tests at SAMEER, had recommended commissioning of the tube along with associated interface within the warranty period.

- In the Design Review meeting held in February 2009, SDSC itself raised the issue of the performance of the tube as the tube was developed five years back. To this SAMEER had indicated that it would undertake fabrication of new tube as a fall back option.

19.2 Avoidable payment of electricity duty and cess

Failure of two units of Department of Space to claim the available exemption of electricity duty and cess resulted in additional expenditure of ` 1.49 crore which was avoidable. An amount of ` 1.05 crore was refunded/adjusted at the instance of Audit.

Article 287 of the Constitution of India stipulates that no law of a State shall impose or authorise imposition of tax/duties on consumption or sale of electricity consumed by the Government of India or sold to the Government of India for consumption.

Audit test checked records relating to payment of electricity charges of two units of Department of Space, viz., Master Control Facility (MCF) Bhopal and Space Application Centre (SAC) Ahmedabad. It was observed by Audit in September 2008 that MCF Bhopal paid electricity duty and cess to Madhya Pradesh State Electricity Board/MP Madhya Kshetra Vidyut Vitaran Company Ltd., Bhopal, for the power drawn and consumed for its facilities, even though Government of India is exempt from payment of such duties according to Article 287 of the Constitution. MCF Bhopal paid an amount of ` 37.57 lakh as electricity duty and ` 6.44 lakh as cess during the period from January 2005 to October 2008. Audit similarly observed in March 2009 that SAC Ahmedabad paid electricity duty of ` 1.05 crore for the period from August 2002 to April 2009 to Uttar Gujarat Vij Company Ltd, Ahmedabad for the power drawn and consumed for its facilities. This resulted in additional expenditure of ` 1.49 crore which was avoidable.

MCF Hassan replied in January 2009 that the Electricity Company stopped charging electricity duty and cess from November 2008 onwards and the matter of reimbursement/ adjustment of excess duty and cess paid had been taken up with the Chief Engineer. SAC Ahmedabad replied in May 2009 that the exemption of electricity duty was likely to be effective from the next bill and refund of excess duty paid was under active consideration.

DOS stated in December 2009 that Madhya Kshetra Vidyut Vitaran Company Ltd. and Uttar Gujarat Vij Company Ltd. had stopped levy of electricity duty/cess in the case of MCF and SAC with effect from November 2008 and

March 2009 respectively and matter was being pursued vigorously with senior state government authorities for refund of electricity duty/cess.

SAC Ahmedabad further intimated in January 2010 that the entire amount has been adjusted/refunded by Uttar Gujarat Vij Company Ltd.

Thus, payment of electricity duty and cess aggregating ` 1.49 crore could have been avoided had the two units processed the bills more carefully in accordance with the provision of the Constitution. After being pointed out by Audit, ` 1.05 crore was adjusted/refunded by the Uttar Gujarat Vij Company Ltd.