Action Taken Note on Para No 2.1 of Report No. 21 of 2022 on 'Management of Fabrication activities at Vikram Sarabhai Space Centre"

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2.1	**Management of fabrication activities at Vikram Sarabhai Space Centre** **Vikram Sarabhai Space Centre executed contracts for fabrication of structures for its various launch vehicles programmes without ensuring due diligence and strict compliance to the provisions of the DOS Purchase Manual. There were cases of single tender contracts continuing for prolonged periods of time, idling of infrastructure created, irregular expenditure in facility augmentation, deviations from codal provisions, as well as poor contract management.**	
2.1.1	**Introduction** Vikram Sarabhai Space Centre, Thiruvananthapuram (VSSC) is a center of Indian Space Research Organisation (ISRO) under Department of Space (DOS), responsible for the design and development of launch vehicle technology. The Materials and Mechanical Entity (MME) of VSSC serves as the nodal agency for developing, processing and realizing quality materials and hardware for expendable and re-usable launch vehicles. The activities of MME include fabrication of mechanical hardware required for the launch vehicle programme and the development and manufacture of materials consumed in the fabrication activities. The mechanical fabrication activity consists of external fabrication of hardware including fabrication of strap-on motors, solid motor cases and light alloy structures; and procurement/development/manufacturing of materials, plates, forgings and alloys which are consumed in the process of the fabrication activity. An audit of the management of fabrication contracts was conducted for the period 2014-15 to 2020-21 to examine whether due process was followed in	

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	management of the fabrication activities and whether the management of contracts relating to fabrication activities were in compliance with extant rules. Out of 8088 contracts/supply orders valuing, 7,677.31 crore entered into by VSSC during the said period, Audit selected 52 contracts valuing, 1,156.56crore. The contracts were selected based on materiality and representation from all areas of mechanical fabrication at MME viz. Fabrication of Motor Cases, Light Assembly Structures, Plates/Forgings/Rivets/Sheets/Jo Bolts and Procurement/development of Materials. Audit findings are discussed in the following paragraphs.	
2.1.2	**Audit findings**	
2.1.2.1	**<u>Irregular award of contracts for prolonged durations on the basis of single tendering:</u>** As per Rule 160 of General Financial Rules 2005 (Rule 173 of GFR 2017), all government purchases should be made in transparent, competitive and fair manner to secure best value for money and contract should ordinarily be awarded to the lowest evaluated bidder whose bid has been found to be responsive and who is eligible and qualified to perform the contract satisfactorily as per the terms and conditions incorporated in the corresponding bidding document. Para 11.1 (2002/2009 edition) of DOS purchase procedure (Para 3.9 of DOS Purchase Manual 2015) provides that subject to the norms/guidelines approved by the Space Commission, DOS may promote development of cost-effective space industry by associating with Private industry.	

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	Audit noticed from the sample selected instances where VSSC executed its procurements on single tender basis for prolonged periods without exploring alternate vendors, resulting in loss of opportunity for obtaining advantage of competitive pricing and passing on significant benefits to the identified vendors. The cases are discussed below.	
2.1.2.1.A	<u>**Procurement of solid motor case:**</u> MME of VSSC had identified (1991) manufacturing facilities for fabrication of solid motor cases for the launch vehicles of ISRO at M/s Walchandnagar Industries Ltd., Pune (WIL) for Head End Segment (HES) and Nozzle End Segment (NES) and M/s Larsen and Turbo Limited, Mumbai (L & T) for Middle Segment (MDS). VSSC had established the testing facilities required for fabrication of the motor cases at a cost of Rs.4.02 crore at L& T in March 2003 and at a cost of Rs. 8.90 crore at WIL in August 2016. Initially WIL was using the testing facility established at L& T. It was seen that VSSC initially entered into contracts with WIL and L& T in August 2003 for a duration of 10 years and the prices were fixed at Rs.1.02 crore per unit for HES, Rs. 93.50 lakh per unit for NES and Rs. 96 lakh per unit for MDS. The contracts provided for price escalation clause. Subsequently, VSSC entered (March 2008) into contracts for the supply of HES/NES with WIL for Rs. 45.01 crore and on L & T for the supply of MDS for Rs. 67.26 crore for a duration of 10 years. The quantity of HES/ NES was increased (amendment in May 2016) from 44 to 78 for a value of Rs. 78.25 crore. Similarly, the contract for supply of MDS was amended (June 2016) from 66 to 123, to cater to the requirement of subsequent years and value of the order increased to Rs.121.98 crore. While granting approval to the amendment of the contract with WIL, DOS directed (July 2016) VSSC to	The contractors for fabrication of solid motor cases did not include the scope of Proof Pressure Testing (PPT). PPT is carried out under separate contractors and charges are paid towards labour, electric power and consumables only. Hence, availing discounts in the contracts for fabrication of motor cases does not arise. It may be noted that M/s. WIL and M/s. L &T are supplying 3m class of motor cases since 1991. These vendors established the manufacturing facilities for these hardware and subsequently, the Department qualified M/s. L & T for supplying the middle segment (MDS) and M/s. WIL for Head End Segment (HES) and Nozzle End Segment (NES). Thus M/s. L & T and M/s. WIL respectively were meeting the requirement of MDS and HES/NES for S139 motors for PSLV and GSLV. Therefore, S139 motor cases were procured through two independent single tenders on M/s. L & T and M/s. WIL for difference segments. These two vendors have been consistently delivering segments for motor cases for the launch vehicle programmes and a throughput i.e. 60 segments (12 motor cases) per annum,

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	quickly select additional vendors and float limited tenders to all the vendors so as to award the contract to lowest bidder as provided in GFR and DOS purchase Manual. Subsequently, based on its assessment of need (March 2018), VSSC conducted limited tendering (January 2019) during the procurement of three sets of 5139 Hardware (three HES, three NES and nine MOS with a total of 15 units). Four vendors were shortlisted out of which the order was placed (May 2019) on the lowest bidder, M/s Sree Venkateswara Agencies Private Limited (SVAPL) at a cost of Rs.11.49 crore. During the period 2008-2019, VSSC incurred, 163.67 crore towards fabrication of solid motor cases. Audit observed that VSSC continued to place single tender orders on the two vendors (WIL and L& T) since 1991 for 28 years without exploring alternate vendors through limited/open tendering modes for obtaining the advantage of competitive prices. Limited tendering was conducted only in January 2019. Audit worked out the difference in prices of SVAPL (May 2019) against the indexed Contract Price of WIL (March 2008/May 2016) and L & T (March 2008/ June 2016) and found it to be to the extent of, 36.03 crore and, 62.21 crore respectively (Annexure-2.1). Thus, executing the procurement in Single Tender Mode resulted in significant advantage to WIL and L& T. Further, though VSSC established test facility at WIL and L& T from Government funds, the contracts/ orders for the delivery of motor cases however did not provide for discount commensurate with investment of facility as provided under 'Bay Forge Contract' and 'Contracts with MIDHANI' as discussed under Para 2.1.2.15 and 2.1.2.16 of this report. Further, the establishment of facility at the premise of the vendors had resulted in loss of opportunity for obtaining	was being met. During the period of 1991-2008, the quantity required was not high enough to justify the additional efforts and cost involved in qualifying a new vendor. Therefore, the Department continued the contract with the proven sources. Beyond 2008, launch vehicle requirements increased, owing to the cabinet approval for the continuation programmes of PSLV (Phase-4 with 15 Nos.) and GSLV (Phase 3 with 6 Nos.). This was followed by approvals for 15 flight of PSLV in 2015 and 30 flights of PSLV in 2018. It may be noted that Department took effort in developing new vendor for the fabrication of 1m class of solid motor cases used in PSOM-XL strap-on motors for PSLV in 2010 (in addition to qualified vendors for 1m class), wherein M/s. SVAPL won the contract. However, the vendor could deliver the first hardware only in 2014 against the delivery schedule of 12 months (the first off schedule delivery is 12 months from PO placements t o FIM supply). Subsequent to the successful delivery of 1m class solid motor cases form new vendor, EOI was floated in 2016 for the 3m class motor cases to identify additional vendors. New vendors expressed interest subjected to the condition that the manufacturing facilities shall be commissioned only on awarding the contract. Subsequently, a contract for 3 sets of S139 motor cases (3 HES, 3 NES and 9 MDS) was placed with M/s. SVAPL who was the L1 bidder. This

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	the advantage of competitive bidding and passed on significant advantage to the vendor since Government purchases are to be awarded to the lowest evaluated bidder as per GFR. VSSC stated (March 2021) that time available between the approval of the project and requirement of the hardware for the mission was just sufficient to realise the hardware from the established source. The reply cannot be accepted, as while contracts were being continued with WIL and L & T since 1991, VSSC was able to identify alternate vendors within three years of receiving such instruction from DOS. The reply also indicates that VSSC was unable to coordinate project approvals with procurement lead times. DOS stated (March 2022) that the new vendor (SVAPL) whose cost is though lesser than that of the existing larger stabilized vendor is not possible to meet the programme requirements. VSSC however did not identify additional vendors to the award the contract to the lowest bidder as provided in GFR and DOS purchase procedures for a price advantage.	party falls under the MSME category with limited resources and therefore its capability to manufacture 3m class hardware was to be proven in due course. Hence, to protect the programmatic schedules of launch vehicle programmes, Department had to continue the contracts with proven 2 vendors until the new vendor realized and qualified the hardware for flight use. In this regard, it may be noted that even though the order was placed with M/s. SVAPL in 2019 with a delivery schedule of 12 months for the first set (5 segments), the party is yet to deliver the first segment even after 48 months and not fully proven. Therefore, the approach of the Department to continue the contract with proven vendors even when M/s. SVPL was offered the fabrication of the same hardware at a lower cost, is fully justified. The approach has enabled the Department to meet the launch requirements. With regard to the Audit query on comparison of investment of facilities under M/s.Midhani and M/s. Bay Forge contracts, both are not comparable with M/s. L & T & M/s. WIL PPT contracts due to the following: 1) M/s. L&T and M/s. WILs PPT facility cannot be utilised for other requirements as they are designed and built exclusive for ISRO requirements only. Hence the royalty clause is not applicable and PPT charges are paid towards labour, electric power and consumables only.

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		2) M/s. Midhani and M/s. Bay Forge funded facilities can be utilized for meeting other commercial / aerospace requirements and hence royalty and discounts commensurate with investment of facility are included.
2.1.2.1.B	**Procurement of strap on motors:**	
	According to GFR, Government purchases are to be awarded to the lowest evaluated bidder. This was reiterated (July 2016) by the Member Finance of the Space Commission (representative of Ministry of Finance in DOS). Member Finance noted that same item is being procured from different vendors with different prices with different terms and conditions and recommended to float limited tenders from the identified vendors with standard procurement terms, subject to matching of the lowest prices. Audit noticed that in the following cases, VSSC executed contracts on single tender basis, even while alternate vendors for the products were available. These cases are discussed below (i) VSSC (August 2002) had identified M/s Walchandnagar Industries Limited (WIL) and M/s Ramakrishna Engineering Company (RKE) for the fabrication of PSO Motor cases. VSSC entered (July 2003) contracts with WIL and RKE for fabrication of 12 and 36 numbers of PSLV Strap On (PSO) motor cases respectively. The validity of the contract was 10 years. VSSC decided (January 2007) to switch over from PSO Motor to PSO XL Motors for future PSLV launches and accordingly, amended both the contracts (February/March 2008) to include fabrication of 20 PSO-XL Motor cases each.	During the initial phase of PSLV, M/s. WIL and M/s. RKE were the only Indian industrial partners who could support 1m motor case fabrication. M/s. RKE was a small scale industry with a small production unit and their committed throughput was only 2 to 3 motors per year. Therefore, their cost of fabrication would be less in view of the lower overheads. However, considering the then requirement of the space programme for 6 to 12 motors per year, it was found inevitable to develop the vendors. Therefore, separate single tenders were floated to the two vendors who showed interest and development orders were placed in 2003. For taking advantages of the lower unit cost, order for 36 Nos. was placed with M/s. RKE whereas order for 12 Nos. was placed with M/s. WIL. As part of vendor development, exclusive fabrication lines were established and qualified at both these industries. VSSC decided subsequently (January 2007) to switch over from PS0 Motor to PSO-XL Motors for future PSLV launches and accordingly amended both the contracts (February/March 2008) to include fabrication of 20 PSO-

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	Audit observed that there was a variation in the unit price of the PSO-XL motor cases fixed in respect of WIL (Rs. 28.80 lakh) and RKE (Rs. 19.35 lakh). As such, the unit price charged by WIL was Rs.9.45 lakh more than that charged by RKE. VSSC awarded two contracts on single tender basis to two vendors, which was in violation of the GFRs. Further, awarding of orders to two different contractors for the same item at different prices resulted in extra payment of Rs. 1.89 crore (excluding price escalation) to WIL for fabrication of 20 PSO-XL Motor cases at the rate of Rs. 9.45 lakh per unit. DOS/ VSSC (March 2022/ January 2020) stated that price comparison of RKE and WIL was not possible due to the difference in the engineering category and production line of the two different firms. The reply is not acceptable, as orders were placed with both the contractors for the same product. By awarding contracts to two firms on single tender basis, VSSC failed to optimise the procurement at the lowest prices and thereby did not safeguard the financial interest of the Government as provided under GFR.	XL Motor cases each. The contract price for PSO-XL was firmed up after price negotiation with both M/s. RKE and M/s. WIL. Equal number of motor cases (20 Nos.) were ordered on both considering the programmatic requirement, delivery performance. Further, when the delivery performance was reviewed in 2011 against the amendment in 2008, there were 13 motors to be delivered by M/s RKE, whereas it was just 3 Nos. in the case of M/s WIL. M/s RKE could complete the delivery i.e. 20 Nos. of PSO-XL motor cases only by 2017, after 9 years. Therefore, it may be noted that the approach of the Department in depending on two vendors was right and has resulted in achieving the PSLV missions. If the decision was to rely on the L1 vendor alone, the PSLV programme would have resulted in significant time, cost overrun and schedules could not have been achieved.
	(ii) VSSC raised (December 2011) another indent for fabrication of 36 PSO XL Motor cases. The indent was processed on single tender basis (2012) and the existing contract with WIL was amended (August 2012) with a price per unit of Rs. 28.80 lakh along with price escalation using the base price as on January 2004. The price charged by WIL as of August 2012 with escalation was in the range of Rs. 43.21 lakh per unit. Audit observed that VSSC did not invite a quotation from RKE for the above procurement. WIL supplied 36 fabricated units during the period 2012-17	When the delivery performance was reviewed in 2011, M/s RKE had delivered only 7 Nos. of PSO-XL motor cases against the 20 Nos. ordered (2008), whereas M/s WIL had delivered 17 Nos. In view of the number of PSLV launches required from 2012-13, it had become essential to order more motor cases. A new vendor, M/s SVAPL, was being developed since 2010, but was yet to successfully deliver the first hardware. In such a scenario, considering the delivery performance & programmatic requirement, M/s

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	and VSSC released a payment of, 18.92 crore. During the same period, the price per unit payable to RKE as of March 2017 would have been Rs. 27.67 lakh including escalation. Accordingly, the charges payable to RKE for the same supply would have been only, Rs.9.96 crore and may have resulted in a cost saving of Rs.8.96 crore. Audit observed that awarding of contract on single party basis when an alternate supplier was available at cheaper price was against the GFRs. Audit further observed that VSSC amended the existing contract without proper examination of the financial effect involved in the amendment, which was in violation of the DOS purchase procedure. VSSC stated (January 2020) that even though they had price advantage from RKE, it was not advisable to fully depend on them as it would affect hardware requirement of PSLV programme. DOS stated (March 2022) that process for distributing the procurement between identified contractors at a competitive price shall be attempted in future orders. The reply is to be seen in view of the fact that VSSC did not consider matching the lowest prices being offered by WIL, nor did it attempt to distribute the procurement between the two identified contractors for a price advantage.	WIL was the only qualified vendor available with the required capacity and delivery performance. In view of the large number of pending deliveries from M/s RKE, it was not feasible to invite quotations from M/s RKE and load more numbers. Therefore, it may be noted that if the Department had loaded more numbers on M/s.RKE purely on the basis of price advantage, the PSLV programme would have suffered significant cost and time overrun. The Department had rightly adopted the strategy with due diligence of distributing the additional procurement considering delivery performance and throughout, which has helped PSLV to be a highly successful vehicle, not only for national programmes but also to be a preferred vehicle in the commercial launch services market for many years. Audit has indicated the cost saving for the delivery of 36 Nos. of fabricated units during 2012-17, if these were delivery by M/s. RKE instead of M/s. WIL. It may be noted that this is purely national, as M/s. RKE failed to demonstrate the required performance or enhancement in capacity during this period. M/s. RKE completed its delivery of 20 Nos. against the order in 2008 in 2017 only. Between the two vendors qualified, price differential prevailed for reasons of critically of schedules. It may be noted that during the same period 2008-2017, M/s. WIL delivered 56 Nos. of fabricated units, considering the additional 36 Nos. ordered on M/s. WIL in 2012.

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		Further, it may be noted that VSSC had made all efforts to match the lowest price; however, M/s WIL was firm on the negotiated prices.
	(iii) While awarding the contract to WIL (March 2008} as mentioned in SI. No. (i) above, the price for fabrication of each set of PSO-XL Motor case was quoted as, 28.80 lakh plus price escalation as on scheduled date of delivery indexed to the price level as on January 2004. VSSC further amended (August 2012) the quantity of PSO-XL Motor cases from 20 to 56 with no change in the pricing clause. Subsequently, VSSC entered (May 2016 and February 2017) into new contracts with WIL on single tender basis for fabrication of 12 PSO-XL motor cases on the same pricing terms (viz., fabrication of each set of PSO-XL Motor case as Rs. 28.80 lakh plus price escalation as on scheduled date of delivery indexed to the price level as on January 2004). Thus, VSSC continued to source its requirement of PSO-XL motor cases from WIL on the prices fixed in July 2003, with incremental escalation costs. The actual price per unit of PSO-XL motor case of WIL was, 53.64 lakh8 as on May 2016 and, 53.23 lakh9 as on February 2017.	In the early phases of the PSLV Continuation Programme, the requirement of PSLV strap-on motor cases (PSO motor cases) was only 6 to 12 motors per annum. Consequently, two vendors, M/s. WIL and M/s. RKE were developed and qualified. As the number of PSLV launches went upward and also in view of the delayed delivery by M/s. RKE, efforts were made in 2010 to locate one more source through Limited Tendering and M/s. SVAPL was identified. A contract for delivery of 24 Nos. of PSO-XL was placed on M/s. SVAPL, who took 4 years to deliver the first hardware. Therefore, contrary to the audit observation that VSSC did not attempt to identify alternate vendors in 2012, VSSC had already selected M/s. SVAPL in 2010 as an alternate vendor.
	Meanwhile, based on the recommendation of a committee, VSSC decided (September 2015) to develop additional sources" for fabrication of 12 sets of PSO-XL Motor cases. Accordingly, VSSC undertook limited tendering process (Sept 2015 and August 2016) and identified M/s Kay Bouvet, Satara at a unit price of Rs.19.50 lakh and M/s ARF Engineering Ltd., Chennai and the KCP Ltd., Chennai at a unit price of Rs.24.60 lakh per set, with no concept of price escalation.	In the year 2015, PSLV Continuation Programme – Phase 5 was approved with 15 flights. The realization of motor cases was in a crisis due to the following. a) The throughput of PSO-XL motor cases was far less than the demand b) M/s. RKE was not performing on the delivery c) M/s.SVAPL's throughput was less than their commitment.

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	Audit observed that against the price per unit of, 53.64 lakh charged by WIL, the price per unit charged by other suppliers as in May 2016 was Rs.19.50 lakh and Rs.24.60 lakh which was much lower than the price offered by WIL. Despite being aware that much cheaper and competitive new sources were available in the market, awarding a fresh contract with WIL at a price escalation, payable against a 12 year old base price was not prudent, which resulted in incremental payment of Rs. 6.51 crore on account of escalation under the contracts. VSSC stated (January 2020) that alternate suppliers were identified considering the increased requirement of PSLV in 2017. The reply is not acceptable, as the requirement of PSLV increased from 20 to 56 in the year 2012 itself but VSSC did not attempt to identify alternate vendors at that stage. Further, VSSC already had alternate vendors in 2016 and yet opted to source the requirement from WIL at a higher price in May 2016 and February 2017. Admitting the audit observation, DOS stated (March 2022) that VSSC has taken due initiatives and developed more sources with price level satisfactory.	Under these circumstances, Director, VSSC constituted a high level committee to study the shortfall, which recommended to develop further new vendors and to extend the contract with all the three qualified vendors viz. M/s WIL, M/s RKE and M/s SVAPL. In line with the recommendations of the Committee mentioned above, three additional vendors viz. M/s Kay Bouvet, M/s ARF & Ms KCP were identified through Limited Tendering. In 2016, a contract was placed on M/s Kay Bouvet, who had quoted 33% less than the estimate and in 2017, further orders were placed on M/s.ARF and M/s.KCP. New contracts were also placed with the qualified sources viz. M/s.Wil, M/s.RKE and M/s.SVAPL. Though a price discount was requested from all the existing 3 parties, only M/s.RKE agreed for it. While awarding contracts to the new vendors viz. M/s. Kay Bouvet, M/s.ARF & M/s.KCP, the parties did not insist on Consumer Prices Index (CPI) based escalation whereas M/s .WIL and M/s.RKE insisted on the same along with the same terms and conditions as that of the previous contract. It may be noted that M/s.WIL was not permitted to increase their base price since 2008 and the original price with CPI based escalation has been continued. With regards to the Audit observation that VSSC opted to source the requirement from M/s.WIL at higher prices in 2016 & 2017, it has been made clear from the preceding paragraphs that the PSO-XL motor cases were being

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		consistently delivered only by M/s.WIL, whereas the other qualified two vendors at the time viz. M/s.RKE & M/s.SVAPL were yet to deliver as per their respective commitments with the required throughput. Further, it may be noted that, M/s.Kay Bouvet commenced its delivery only in September 2020 against the order placed in April 2016. A Limited Tender was floated in 2018 involving all the six parties and entered into a rate contract with all at the L1 rate towards meeting a requirement up to 60 motor cases per year. Work orders have been issued to all except M/s.Kay Bouvet due to poor delivery performance. It is understood that M/s.ARF is not existing now due to financial crisis and the performance of M/s.KCP is not satisfactory with respect to product quality. Therefore, it may be noted that the Department has applied due diligence in distributing the procurement of PSO-SL over multiple qualified vendors, considering their capacity and delivery performance and it may be prudent to comment on the basis of quoted price.
2.1.2.1.C	**<u>Fabrication of Light Alloy Structures</u>** The Aerospace Division of Hindustan Aeronautics Limited, Bangalore (HAL-ASD) has a dedicated facility established with ISRO funding for the realization of Light Alloy Structures (LAS) and Tankages for ISRO's Launch Vehicles programmes. VSSC entered into contracts with HAL for the supply of LAS and Tankages for PSLV and GSLV as shown in Table 2.1.	 HAL-ASD is a state-of-the-art aerospace facility established and funded by the Department exclusively for the manufacturing of aerospace quality Light Alloy Structures (LAS) and propellant tanks with specialized

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<tr><td></td><td>Table 2.1: Contracts & Purchase orders awarded to HAL for fabrication of LAS and Tankages
<table>
<tr><th colspan="2">PSLV</th><th colspan="2">GSLV</th></tr>
<tr><th>Contract date</th><th>Value (Rs.Crore)</th><th>Contract date</th><th>Value (Rs.Crore)</th></tr>
<tr><td>February 1996</td><td>25.07</td><td>March 1997</td><td>39.43</td></tr>
<tr><td>March 2004</td><td>67.46 (amended to 75.70)</td><td>July 2003</td><td>46.14</td></tr>
<tr><td>March 2007</td><td>4.77</td><td>December 2003</td><td>46.13</td></tr>
<tr><td>March 2008</td><td>55.67</td><td>March 2004/ March 2005</td><td>92.65</td></tr>
<tr><td>January 2016</td><td>298.02</td><td>March 2007</td><td>40.18</td></tr>
<tr><td></td><td></td><td>March 2010</td><td>55.39</td></tr>
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Thus, VSSC continued to procure LAS and Tankages from a single supplier for almost 20 years from February 1996 to January 2016. In order to meet the urgent PSLV launch requirements, five alternate vendors (Taneja Aerospace and Aviation Ltd., KCP Ltd., Gauges Industries, Sree Venkateswara and L & T} were engaged during the period from the year 2008 to 2019 on fast-track mode.

Audit observed that the rates of these alternate vendors were lower as compared to the prices of HAL (Table 1 and Table 3 of Annexure-2.2}. The difference between prices of HAL and the other vendors was to the extent of, 77.10 crore (Table 2 and Table 4 of Annexure-2.2}. Audit scrutiny of the fabrication contracts of HAL also revealed that only emergency orders were placed on the alternate suppliers and regular supplies were continued to be sourced from HAL. Awarding of contract on single party basis when</td><td>machine tools and equipment. The facility is operated by M/s.HAL, which is a CPSE under the Government of India.

Alternate vendors were developed over a period of time to increase the throughput of LAS to meet the increased launch demands. Being small scale vendors with minimum overhead expenses, they were cheaper in comparison with HAL-ASD. However, the Department cannot depend fully on these small vendors to meet the increased demand of LAS. Moreover, HAL-ASD is the only vendor having the end to end facilities for various manufacturing operations. HAL has higher overheads when compared with other industries. The new smaller vendors are developed after careful evaluation on their technical capability and infrastructure availability to meet the stringent quality and throughput requirements. Also, these small-scale vendors do not have end-to-end facilities at that given point of time.

It may be noted that the small scale vendors were initially developed to cater to 1m class of structures based on the infrastructure and technical capability available with the party. Subsequent to the upgradation in infrastructure by the vendors, they were developed for the realization of 2m class of structures and recently, from 2018 onward, some of these vendors, were considered for 3m class and above structures and recently, from 2018 onward, some of these vendors, were considered for 3m class and above structures as alternate vendors to HAL-ASD. However, the lead time required for realization of the first hardware of</td></tr>
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	alternate suppliers were available at a cheaper price was not in order and resulted in undue benefits to the contractor. VSSC stated (January 2020} that HAL was the only source available at that point of time capable of delivering LAS structures to the requirement of ISRO and that alternate vendors were developed subsequently to meet the increased demand of the hardware. The reply is not acceptable, as VSSC released purchase order (April 2019} valuing, 387crore to HAL on single tender basis even after the alternate vendors were identified in the year 2008. Admitting the audit observation, DOS stated (March 2022) that when additional vendors prove their expertise and rate of production, VSSC expects to arrive at a more competitive price between HAL and these new vendors, as envisaged in the Audit observation. The reply of DOS highlights the need to identify and develop larger heavy industries after careful evaluation of their technical capability and infrastructure, so that these are available to meet the quality required by !SRO and the need for ISRO to have a competitive advantage as to pricing.	this class of structures is 10 to 12 months from the date of supply of Free Issue Material (FIM) as it involves development of tooling and other infrastructure specific to each product. HAL-ASD has a production capacity of LAS for 8 launches per annum, whereas, the alternate vendors together have a production capacity of 4 launches per annum. Further, it may be noted that HAL-ASD is the only work center, where all infrastructure and capabilities for LAS manufacturing are currently available and time-tested. The structures realized at HAL are directly delivered to launch activities after all processing whereas, all other vendors have their operations distributed over various work centers demanding transportation and handling at each facility. This puts some constraints on the throughput of structures from newly developed industries, which was not commensurate with the then prevailing launch requirements. Moreover, the alternate vendors required more lead time for their first off realization and subsequent sets owing to their financial constraints and shortage of skilled manpower to realize aerospace quality structures. It may be noted that HAL-ASD is a dedicated facility wholly funded by the Department with end-to-end capability and highly skilled manpower provided by HAL. The Department is mandated to fully utilize this capacity and any under-utilization can lead to a re-deployment of this manpower by HAL to other areas resulting in inconsistent

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		delivery of aerospace quality structures. Therefore, a diligent and balanced approach by the Department is required in sourcing the Light Alloy Structures considering the capacity, production rate and also the need to maintain reliable source for consistent aerospace quality hardware. Hence, the technical acumen and facility available at HAS-ASD shall not be compared with other developed vendors. A comparison between HAL and other vendors on price alone would not bring out the demand stipulated.
2.1.2.1.D	**<u>Procurement of steel</u>** VSSC entered (February 2016} into a contract with M/s Mishra Dhatu Nigam Ltd. (MIDHANI} for manufacture and supply of six types of forged rings and two types of plates made of M250 grade Maraging Steel12. The procurement was executed on proprietary basis by giving the justification that MIDHANI was the only indigenous manufacturer having all the required facilities for realising M250 products to VSSC's specification. The prices under this contract were arrived by increasing the prices under the previous contract (December 2009 to March 2012} with MIDHANI by 25 per cent to 48 per cent. MIDHANI was also the sole supplier of M250 Maraging Steel rods to VSSC till December 2015. In December 2015, VSSC identified an alternate contractor M/s Star Wire (India} Pvt. Ltd. through limited tendering process and started placing orders for manufacturing and supply of M250 Maraging Steel rods on the alternate contractor also. During the period from December 2015 to August 2017, VSSC procured Maraging steel rods from both MIDHANI and M/s Star Wire (India} Pvt. Ltd. Audit observed that while the	Maraging steel is being procured by the Department in different forms such as rods, rings, plates, etc. for its launch vehicle programmes. Processing of Maraging steel required Vacuum Induction Melting (VIM) and Vacuum Arc Re-melting (VAR) furnaces. M/s MIDHANI was developed by the Department for the supply of this material during the initial phases of launch vehicle development. Maraging steel is used for critical applications where high tensile strength and good fracture toughness are demanded. The stringent specification requirements of the Department for this material is unique especially on fracture toughness. Proper control & scrutiny has to be ensured over the melting and pre-processing operations which plays a major role in achieving the unique property requirement of the Department.

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	prices charged by MIDHANI were higher than those of M/s Star Wire (India) Pvt. Ltd. by 32-34 per cent in three purchase orders placed between December 2015 and May 2016, the prices of MIDHANI fell sharply during December 2017 with a difference of only seven per cent between the two suppliers (Table-1 of Annexure- 2.3). This indicates that stiff competition from the alternate supplier had an impact on the price charged by MIDHANI, which was earlier the sole supplier. Audit however, observed that though M/s Star Wire (India) has been an alternate supplier of M250 Ma raging Steel rods since December 2015, VSSC did not develop it as an alternate supplier of M250 Maraging Steel rings and plates. VSSC also did not search for any other potential supplier of Maraging Steel rings and plates and continued to source their requirement from MIDHANI at the escalated prices charged by MIDHANI under the new contract (February 2016). The incremental expenditure on the procurement due to the escalation in the prices of December 2009 and February 2016 was to the extent of, 59.79 crore, as detailed in Table 2 of Annexure-2.3. VSSC stated (January 2020) that the price difference was because MIDHANI had indigenously developed Maraging Steel Plates at its facility whereas Star Wire had imported the raw materials directly. VSSC added that import option was not viable considering the larger and time bound requirement of rings and plates for the Launch Vehicle Programme. DOS stated (March 2022) that indigenous development is costlier compared to import since the material processing, right from the raw materials till realisation of the plates, is stringent involving multiple clearances at stages which effects the yield. The reply is not acceptable, as VSSC had established the facility13 at MIDHANI as an import substitute to save cost.	M/s.Star Wire (India) Pvt. Ltd. or any other supplier in the country could not be developed as alternate supplier of Maraging steel rings and plates because the required melting facilities (VIM and VAR) were not available with the vendor. M/s.Star Wire (India) Pvt. Ltd. Was importing the required input material in ingot form and converting it into rods. It may be noted that pricing of Maraging Steel rods with that of rings/plates are not comparable considering the large difference in terms of processing. For plates, the ingots are forged into slabs and then rolling in plate mill is done for realising 10750X2250X7.8 mm plates with control of deformation imparted in finishing pass required for achieving our fracture toughness requirement. The plates are rolled with stringent control of roll pass schedule for achieving the specification requirements at either Midhani or at facilities of SAIL viz. M/s. RSP & M/s BSP. For rings, the ingots are forged to ring stocks and ring rolling is carried out at VSSC funded ring rolling mill at M/s. Bayforge. Here again the ring rolling is carried out with controlled imparting of 40-50% reduction in final pass of rolling. Control is exercised on every stage of working of ring stock with requirements of quenching immediately after final rolling pass to achieve the required fracture toughness.

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		In the case of rods, the ingots are rolled directly in a rolling mill for realising the end product sizes Due to the above-mentioned differences in the processing stages for realising plates/rings as compared to rods the observation of reduction in pricing of Maraging Steel rods from M/s. Midhani after the induction of M/s. Starwire also in tendering process shall not be attributed to stiff marked competition. However, M/s. Star Wire (India) Pvt. Ltd. has commissioned a Vacuum Induction Furnace (VIM) in February 2022 and the Department has already placed an order with the vendor for one type of Maraging Steel Ring. On successful qualification of the product, M/s. Star Wire (India) Pvt. Ltd. also shall be included in the future tenders for Maraging Steel Rings and Plates, for specific types. The assumption that VSSC established the facility at MIDHANI as an import substitute to save cost has more angles. As mentioned earlier, VSSC has unique requirements with respect to the material properties (especially fracture toughness), that requires a close control/scrutiny during the material processing operations to ensure the properties as well as yield. These properties are not specified in any international aerospace materials standards and therefore there is a risk in the availability of obtaining the material with the specific properties through import route in the required quantity. The establishment of

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		the facilities at MIDHANI has mitigated this risk, as it has ensured the availability of the material with respect to the required quantity and schedule.
2.1.2.2	**Price escalation in contracts not reported to the Contract Finalization Committee:** According to Para 7.8 of DOS Purchase Procedure (October 2009 edition) and Para 12.5 (f) of DOS Purchase Manual 2015 the purchase committee shall consider the payment terms quoted and decide on their acceptance. As mentioned in paras 2.1.2.1.A and 2.1.2.1.B, VSSC had identified WIL and L&T for fabrication of solid motor cases and strap on (PSO XL) motors. Contracts for these items were entered in August 2003 and the prices were fixed at, 1.02 crore per unit for HES, 93.50 lakh per unit for NES, , 96 lakh per unit for MDS and , 28.80 lakh for PSO XL motors, The escalated prices for the subsequent contract were to be reckoned from the base year January 2004 for WIL and Dec 2007 for L& Ton the prices of the previous contract (July 2003/ August 2003). However, VSSC did not work out and report the escalated prices viz., 1.84 crore per unit for HES, Rs. 1.69 crore for NES, 1.39 crore for MDS and ~ 1.84 crore and ~ 53.64 lakh for PSO XL motors to the Contract Finalization Committee (CFC-1)/ appropriate approving authorities14 while finalizing the subsequent contracts (May/June 2016). Thus, VSSC did not disclose the correct cost per unit to the approving authorities to enable them to take a considered decision. DOS/ VSSC (March 2022/ January 2020) stated that while submitting proposal to the approving authorities, only the base price was included as	In the Contracts, unit cost of fabrication of the motor case segments denotes the base price and is shown as the Reference Cost. During award of contract, it was agreed to have CPI based escalation methodology and there was no escalation in the reference price. Purchase committee review is based on the terms and conditions of the contract. Price escalation solely based on variations in Consumer Price Index (CPI) was applicable on unit cost to effect at the time of product delivery. This has been the practice followed in the Department in all long lead contracts of this nature. It may be noted that when order amendments were reviewed by appropriate Committees, it was informed that all the terms of the contract remain unchanged and the price escalation applicable on base price was deliberated in the meetings with respect to the unit cost at the time of order amendment. There was no change in Scope warranting escalation.

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	escalation would be known at the time of segment delivery. The reply is not acceptable, since the escalated price as of May2016/June 2016 was to be reckoned from the base price of January 2004/ Dec 2007. The escalated price on the date of the Purchase committee should have been submitted to the committee for their information.	
2.1.2.3	**Under utilisation of Titanium Sponge Plant** To meet the strategic and aerospace requirements of the country, a National Committee was constituted (2005) considering the importance of indigenization of Titanium Sponge Plant15. Based on the recommendation of the committee (May 2005), DOS decided (January 2006) to establish a Titanium Sponge Plant at Kerala Metals and Minerals Limited, Chavara (KMML) and signed MoU (January 2006) with KMML for manufacture of Titanium Sponge. KMML was to supply the raw material to MIDHANI for use in fabrication of Titanium Alloy16 Rolled Rings which are used in launch vehicles. The facility was established by DOS (October 2012) at the premises of KMML at a total cost of Rs. 143.11 crore. VSSC entered (October 2012) a contract with KMML for a duration of 21 years for supply of Aerospace Titanium Sponge. Till 2018, nine orders valuing, 54.98 crore were released to the firm during the period from June 2013 to September 2017 and KMML supplied Titanium to VSSC. VSSC reported issues (February 2019) in the Titanium sponge developed by KMML and decided to procure Titanium alloy through import.	The Department has been utilizing the Titanium Sponge Plant (TSP) at M/s. KMML from 2013 for realizing the raw material for Titanium alloy rolled rings processed at M/s. MIDHANI. Apart from the Department, Advanced Technology Vessels Project (ATVP) of Defence also utilizes this plant. This is Tripartiate Contract between VSSC, KMML and DMRL. The maximum achieved production capacity of M/s. KMML TSP is about 250MT per annum with 51% yield for aerospace grade. It may be noted that the plan is being utilized continuously to meet the demands of national programs for the Space and Defence applications. During the period from September-2017 to November-2021, no purchase orders were placed by the Department for Titanium Sponge against KMML. However, it may be noted that during this period ~195 MT Aerospace Grade-I Titanium Sponge produced by KMML was sold to ATVP

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	Subsequently VSSC procured Titanium Products through 21 import purchase orders (from April 2019 to January 2021) having total value of, 13.58 crore. DOS did not order Titanium products during the period from September 2017 to November 2021. As a result, the plant built at the cost of, 143.11 crore was not used to meet requirements of VSSC during the period. DOS stated (March 2022) that Titanium sponge developed at KMML was used towards requirements of the strategic programmes and the urgent requirements of ISRO were met through import route. DOS added that it issued orders on KMML in November 2021. DOS however did not clearly indicate whether the issues reported in the Titanium Sponge developed by KMML in February 2019 were solved especially in the background of the fact that the plant at KMML is being upgraded to cater to the strategic requirements.	being a strategic requirement and pending supplies against VSSC orders placed before September-2017 were completed by KMML. This was based on decision taken by JPMC. A fresh PO had been placed by VSSC in Nov-2021 for 210 MT and ~190 MT (which is within +/-10% quantity tolerance) has been delivered and PO has been completed. Requirements of aerospace grade Titanium beyond the available capacity/yield of plant only are imported by M/s. MIDHANI for meeting the demand of Titanium alloy products for VSSC. Aerospace grade Titanium Sponge supplied by M/s. KMML is meeting all the specifications for realizing Titanium alloy products and there were no quality related problems. Issues reported in February 2019 in Titanium alloy products were related to processing of rings at Midhani with Titanium sponge as FIM from M/s. KMML. It may also be noted that issues encountered in processing Titanium alloy rings have been successfully resolved in due course.
2.1.2.4	**Non-recovery of penal interest** According to Para 10 (3) (5) (f) read with Para 5.4.1.2 of DOS Purchase Manual 2015, payment of advance against a Contract/Purchase Order in indigenous supplies should be resorted to in select cases. Wherever payment of advance is considered necessary or unavoidable, it should be allowed after getting an acceptable Indemnity Bond in the cases of Public Sector Enterprise.	 The contract was related to the developmental efforts for indigenizing the C-103 Columbium alloy material for aerospace application through M/s. MIDHANI. Advance payment was made against an indemnity bond submitted by M/s. MIDHANI, Hyderabad. Adjustment of advance payment against deliveries effected in the PO has been

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	VSSC entered (January 2011) into a contract with MIDHANI (Central Public Sector Enterprise) on proprietary basis for manufacture and supply of 60 Columbium Alloy C103 sheets/ plates. According to contract terms 40 per cent of the total contract value was to be paid by VSSC on submission of contract confirmation, proforma invoice and Indemnity Bond by MIDHANI. The stipulated date of delivery as per the contract was 31 March 2013. The remaining 60 per cent plus packing charges and taxes was to be paid against acceptance of material and dispatch documents within 30 days. Accordingly, VSSC released (February 2011) advance amount of Rs.4.52 crore, which was 40 per cent of the total contract value of Rs.11.30 crore. Delivery, as per contract, was to be completed by March 2013. However, MIDHANI could not complete the delivery on time and was able to supply only five out of 60 sheets as of March 2015. Due to the continuing delay, VSSC short closed (January 2018) the contract and reduced the supply quantity by issuing an amendment and order value reduced to Rs.2.72 crore. Reduction in the supply quantity resulted in idling of excess advance of, Rs.3.43 crore17 with MIDHANI. Though VSSC requested (March 2015) MIDHANI to refund the excess advance along with penal interest, however, MIDHANI (June 2015) did not agree to pay the penal interest. VSSC decided (June 2017) to adjust the excess advance amount against the payment for the delivered items, however the status of such recovery was not available on record. Audit observed that though the contract envisaged payment of a large advance, there was no provision for obtaining a Bank Guarantee/Indemnity Bond to safeguard the financial interest of the Government. Further, VSSC	done (**Annexure – I and Annexure-II**). There is no provision in this contract for levy of penal interest on advance payment recovered. In view of the observation of audit, a clause for levy of penal interest on the advance in the event the contractor's inability to complete the delivery as per contract terms will be incorporated in future contracts.

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<tr><td></td><td>did not include a clause for levy of penal interest in the event of the contractor's inability to complete the delivery as per contract terms, due to which VSSC was unable to impose the recovery of penal interest from the firm.

Admitting the audit observation, DOS/ VSSC (March 2022/ January 2020) stated that suitable penal interest clause will be insisted upon in future contracts. DOS added (March 2022) that excess advance of Rs.3.43 crore was recovered from the Vendor.</td><td></td></tr>
<tr><td>2.1.2.5</td><td><u>Avoidable payment of escalation in the procurement of PSLV alloy structures:</u>

Based on an indent (January 2018) for the procurement of 24 sets of PSLV alloy structures to be processed on single tender basis, VSSC obtained (April 2018) a quote from HAL after taking the approval (March 2018) of DOS.HAL quoted a price of Rs.451.51 crore for the base year 2018-19 with an escalation of seven per cent per annum payable from the year 2019-20 onwards. VSSC finalized the contract with HAL in April 2019. The time taken at each stage of the procurement was as shown in Table 2.2.

Table 2.2: Finalization of contract with HAL for procurement of PSLV alloy structures
<table>
<tr><th>Activity</th><th>Date</th><th>Time taken (months)</th></tr>
<tr><td>Submission of indent</td><td>January 2018</td><td>0</td></tr>
<tr><td>Approval of DOS</td><td>March 2018</td><td>2</td></tr>
<tr><td>Receipt of quote from HAL</td><td>April 2018</td><td>1</td></tr>
<tr><td>Constitution of sub-committee by CFC-I of DOS to negotiate the quote</td><td>August 2018</td><td>4</td></tr>
</table></td><td>The contracts between VSSC and HAL ASD are entered with a base price with yearly escalation of 7% for the outstanding payment from every April. It may be noted that the 7% escalation is not applicable for the advance amount paid in the previous financial year. In the extant case, the base year specified in the HAL quotation was 2018-19 with 7% escalation per annum and accordingly, the contract was entered in 2019-2020 after due approval. It may be noted that even if VSSC changes the base year from 2018-19 to 2019-20 as pointed out by Audit, HAL would have escalated the base price resulting in the same scenario of additional expenditure as per practice.

However, in case of all other contracts signed with M/s. HAL, best efforts were taken to reduce the cycle time for getting various clearances and approvals as required by the DOS purchase procedure & guidelines and contracts</td></tr>
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<tr><td>Price of Rs. 427.56 crore negotiated by the Sub-committee</td><td>October 2018</td><td>2</td></tr>
<tr><td>Purchase proposal sent to DOS for approval</td><td>Dec 2018</td><td>2</td></tr>
<tr><td>Approval of the proposal by DOS</td><td>Feb 2019</td><td>2</td></tr>
<tr><td>Contract awarded</td><td>April 2019</td><td>2</td></tr>
<tr><td></td><td></td><td>15</td></tr>
</table>
As shown in the table, VSSC took 15 months to release its contract from its date of indent. Audit observed that VSSC did not prescribe a realistic time frame for each stage of procurement in the above case as stipulated in the DOS Purchase Manual. Audit further observed that during negotiations, VSSC did not change the base year indicated in quote of HAL from 2018-19 to 2019-20 with the result that VSSC made escalation payment of, 10.32 crore from the year of entering into the contract (May 2019) itself. The price negotiation exercise undertaken by VSSC was deficient to this extent.
VSSC stated (March 2021) the escalation payment to HAL occurred as a result of the procedural delays in the contract finalisation. The reply only serves to reinforce the need to adhere to a prescribed time line for each stage of the procurement which serves· to reduce or avoid delays and the resulting increase in costs. DOS while accepting (March 2022) the audit observation furnished a reply generally that best efforts will be ensured in future to reduce the time for getting clearances and approvals. However, DOS was silent on its strategy and action taken to streamline the underlying contract management issues.
</td><td>are entered with M/s. HAL within the applicable financial year. In the extant case, the placement of contract spilled over into the next financial year, resulting in escalation payment. As part of Contract Management VSSC has evolved a system/strategy to reduce cycle time to 6 months.</td></tr>
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2.1.2.6	**<u>Augmentation of facility for Light Alloy Structures without approval of Law Ministry</u>** According to Rule 204 (iii) of GFR 2005, In cases where standard forms of contracts are not used, legal advice should be taken in drafting the clauses in the contract. As mentioned in Para 2.1.2.1.C of this draft report VSSC issued (August 2002) a single tender enquiry to HAL for fabrication and supply of 62 (11 types) Light Alloy Structures (LAS) for the GSLV MKIII project at an estimated cost of, 81.80 crore. While submitting the tender, HAL expressed the requirement of facility augmentation by way of machineries and building requirements for Computer Numerical Control (CNC} machines, assembly hangar, stores for raw materials/ finished hardware, etc. The proposal for facility augmentation was sent to Ministry of Law & Justice (MoLJ), Department of Legal Affairs, which did not agree (March 2003) with undertaking civil works, plant and machinery in the land belonging to HAL. MoLJ stated that being the licensee, VSSC had no right to construct building or any other machinery or to effect improvements in the land and suggested that VSSC should have a lease agreement with HAL DOS, however conveyed the sanction (March 2003) for entering into a contract for fabrication of 62 LAS (11 types) and also approved the facility augmentation, stating that the proposal of VSSC to enter into the contract was similar to a contract cleared by MoLJ in 1996. Accordingly, VSSC entered (March 2003} into a contract with HAL for the procurement at a cost of, 120.06 crore18 including cost of facility augmentation cost of Rs. 70.60 crore towards machinery and civil works. The cost of contract was amended	The Aerospace Division of Hindustan Aeronautics Limited (HAL-ASD) is a dedicated facility established with Department funding for the realization of Light Alloy Structures (LAS) and Tankages for the Launch Vehicles Programme. The Department has been utilizing this facility for the fabrication of LAS and Tankages for PSLV an GSLV since 1996. When fabrication requirements of LAS for ISRO's new launch vehicle project, GSLV MkIII, were projected in 2003, there was no Indian industry capable of processing 4m class hardware at that time. It may be noted that, HAL - ASD was the only work center, where all associated infrastructure capabilities and expertise for LAS manufacturing were available. Hence, it was decided to augment the HAL-ASD facilities to cater the requirements of GSLV MkIII structures. Efforts to develop a different vendor for this purpose at that time would definitely had resulted in much larger investment and prolonged development cycles for making it a qualified vendor for Department needs. If VSSC had opted to go for a lease agreement with HAL for the incremental infrastructure for GSLV MkIII as suggested by MoLJ, it would have resulted in a significant change over in the mechanism of realizing hardware from the Department funded HAL ASD facility. Further, the uncertainty in the duration required by HAL for obtaining

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	twice (March 2004 & March 2005) to Rs. 152.49 crore including cost of facility augmentation of Rs.82.95 crore. Audit observed that sanction of facility augmentation in HAL when MoLJ had specifically disagreed with the same was not in order and resulted in irregular expenditure of Rs.82.95 crore. VSSC stated (January 2020} that the decision taken by DOS was final. The reply is not accepted, as the decision of DOS to carry out facility augmentation in HAL was based on an old (1996) proposal concurred by M. However, the most recent proposal for facility augmentation was refused by MoLJ. Relying on an old order defeated the due diligence carried out by MoLJ, as required by GFR in the present case. DOS did not furnish (March 2022} reasons as to why the department entered into lease agreement with HAL against the instructions of MoLJ.	the required approvals and funds for establishments of these incremental facilities and entering into a lease agreement with VSSC would have resulted in detrimental schedule impact on GSLV MkIII development programme. Therefore, the Department had no option but to continue with the same mode of establishing the incremental facilities as that followed for the proposal in 1996 in the interest of the space programme.
2.1.2.7	**<u>Irregular payment of manpower charges in the thermal painting for Light Alloy Structures:</u>** As mentioned in para 2.1.2.1.C, HAL-ASD has a dedicated facility for the realisation of Light Alloy Structures (LAS) for ISRO's Launch Vehicles programmes. DOS entered a contract (October 2011) with HAL towards application of Thermal Protection painting on 148 LAS of ISRO's Launch Vehicles programmes viz. PSLV (62), GSLV MK II (30) and GSLV MK III (56) for a total contract value of, 18.49 crore. Against the order value, payment of, 53.66 crore including seven per cent escalation, was made to HAL (March 2021). The contract with HAL was a manpower contract (materials were issued as free issue), as the facility was established by DOS. However, the basis on	For the thermal painting of launch vehicle structural hardware/assemblies, M/s. HAL established a dedicated facility at HAL-ASD with Department funding. The intension was to realise LAS at M/s. HAL in ready-to-use condition for further downstream flight operations, avoiding multiple transportation requirements. Since the additional TPS requirements are being addressed on emergent basis to meet launch schedule, the existing contract provision were utilized. Also, the TPS cost towards additional structures were carried out based

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	which the man hour rates and number of man hours required for the job was worked out was not available on record. In the absence of records, Audit could not ascertain whether the contract value negotiated by VSSC was fair and competitive. Further, though the contract provided for thermal painting of only LAS, VSSC made payment of, 34.86 crore towards thermal painting of additional structures also. However, revision in the scope of work in the contract was not on record. DOS stated (March 2022) additional work were carried out based on the logged hours at HAL and certified by VSSC resident engineer. The reply is not acceptable as according to Para 11.4 of the agreement, any work which is beyond the scope of the work of the contract can be carried out by HAL based on specific written instruction of Contract Manager (Deputy Director, MME) or as decided in the periodic review meetings between VSSC and HAL and not based on logged in additional hours.	on the prevailing TPS cost with applicable escalation. Please note that mutually agreed man hours between HAL and VSSC for carrying out additional scope of activity is available as per clause 11.4. All the logged hours for the various TPS activities based on log sheet have been verified by the resident team and the mutually agreed hours was certified for payment in the invoices. It may be noted that General Manager, External Fabrication Activities, VSSC is identified as the Contract Manager (not Deputy Director, MME as mentioned in the Audit observation) and there is a Permanent Resident Team posted at M/s. HAL-ASD for coordinating the activities. Thus the Contract Manager is having direct control over data/time logging and process verification. A provision was incorporated in the contract terms and conditions clause 11.4, to execute thermal painting on hardware which are not explicitly mentioned in the scope of the contract. According to this clause, requirements for additional works are discussed in periodic review meetings and the works are taken up at rates based on mutually agreed man-hour estimate with the consent of Contract Manager (**Annexure-III -** TPS Mutually Agreed hours, **Annexure-IV -** Extract of Logged hour data for TPS activities, **Annexure - V** & Certified invoices based on mutually agreed hours, **Annexure- VI).** No work was carried out which was beyond the scope of work, as it was in line with clause 11.4 of the contract.

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		Even then the payment towards such works are effected on actual man-hours, consumed for the operations. M/s. HAL is have a well-established system of logging the man-hours supervised by the resident team of Contract Manager. The invoices raised by M/s. HAL for payment are reviewed and approved by the Resident Team in concurrence with the Contract Manager. All verifiable documents with regard to logging of man-hours and payments are available at any point for auditing. As such, there has not been any revision in the scope of work of the contract and additional works to meet the urgent requirements of various launch vehicle structures were taken up based on the above referred clause of the contract for execution as explained above.
2.1.2.8	**Irregular Clubbing of procurements:** As per Para 1.5 of DOS purchase Procedure 2009 (Para 4.5.1 of DOS Purchase Manual 2015); the Centres/Units shall club the requirements considering the consumption pattern of the item, shelf life, obsolescence, etc. However, VSSC did not club the requirements in two cases, as discussed in Table 2.3. Table 2.3: Procurements not clubbed	Subsequent to the productionisation of launch vehicles, the Department has always been keen in consolidating the requirements for procurement of bought-out items or raw materials to effect the cost advantage. About the case referred in the query on procurement of Jo-Boltz, requirements of Jo-Bolts are widely varying with respect to its type and size. Price advantage based on order quantity is normally obtained for a particular type and

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<table>
<tr><th>Item</th><th>Vendors</th><th>Loss of discount (Rs. Lakh)</th><th>Remarks</th></tr>
<tr><td>Jo bolts</td><td>M/s WESCO and M/s Avdel</td><td>56.61</td><td>Both vendors offer quantity discount ranging from one to four per cent on their quoted prices and also offered additional discounts for increase in the quantity. During 2013-14 to 2015-16, VSSC did not club its requirements of Jo Bolts and was therefore unable to avail of the quantity discount to the extent of Rs. 56.61 lakh.</td></tr>
<tr><td>Aluminium Alloy Sheets</td><td>M/s Kalapurna and M/s Val-Met</td><td>41.68</td><td>Audit scrutiny of the orders relating to Aluminium Alloy sheets revealed that ALCAD sheets were procured within short gaps (one day to nine months) through both vendors, but the requirement was not clubbed due to which quantity discount of Rs.41.68 lakh could not be obtained.</td></tr>
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DOS stated (March 2022) that Jo Bolt requirement were projected by various project divisions at different time frames and common items were not there
</td><td>size of the item. It may please be noted that though there were multiple files processed, no common items or types were processed in a single year. Considering the long lead nature of this imported item and the uncertainty of delivery schedules, consolidation over a longer period was not attempted. Recently, initiatives are being taken to process Rate contract (RC) for the items which are all repetitive in nature.

Procurement of Aluminum alloy ALCLAD sheet are being undertaken based on the requirement received from various user Divisions/Projects after identification of approved budget against each mission at different periods. Subsequently, indenting actions are initiated and procurement order is placed as and when requests are received with budget approval. Hence requirement s were not clubbed.</td></tr>
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<tr><td></td><td>in most of the cases to obtain the quantity discount. The reply is not acceptable as the annual requirements of various project divisions are to be clubbed for the general consumables such as 'Jo bolts' to obtain the benefits of bulk discount. Further, out of 18 purchase orders for Jo Bolts issued during the period, 17 purchase orders were released from the same division of VSSC.

DOS added (March 2022) that the requirement of Aluminium Alloy sheets were projected by different projects at different time frames hence could not be clubbed to obtain the quantity discount. The reply is not acceptable as the annual requirements of different projects are to be clubbed to obtain the benefits of discount. Further, considering the short gaps of one day to a few months in issuing the purchase orders for Aluminium Alloy sheets, VSSC may have managed the procurements to club requirements from the various projects.</td><td></td></tr>
<tr><td>2.1.2.9</td><td>Inadequate Indigenization efforts

Para 2.1 of DOS Purchase Manual stipulates the policy of DOS to develop indigenous sources of supply such as import substitution, identification of dependable source, ensuring quality of products ordered and their timely supply. Though VSSC had indigenously developed Jo bolts, Aluminium Alloy, further developmental efforts, as detailed in Table 2.4 were not found on record.

Table 2.4: Partial indigenization efforts

<table><tr><th>Item</th><th>Audit Observation</th></tr></table></td><td>1. <u>Jo-Boltz</u> : It shall be noted that only one type of Jo-Bolt (PLT 215-0812) has been developed at M/s. Ankit Fasteners, as per National Aerospace Standard (NAS) and it is under final stage of qualification as per the recommendation of Expert Committee. After final qualification it is planned to induct Jo-Boltz (PLT 215-0812) immediately through purchase order. Purchase Indent No.2023000006 has been processed for the realization of Jo-Boltz needed for final qualification.</td></tr>
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<tr><th>Para No.</th><th>Audit Observations</th><th>Reply of the Department</th></tr>
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<tr><td>Jo Bolts</td><td>VSSC successfully developed (Annual Report for the Year 2015-16) Jo bolts (Part No PLT 215 0812) in-house at one of its work centres M/s Ankit Fasteners. However, further developmental efforts by signing an MOU/Agreement with the firm did not materialize. VSSC stated (March 2021) that qualification testing and approval of the product in line with international standards were being reviewed by an expert committee for induction into program. DOS stated (march 2022) that indigenous Jo bolts will be inducted shortly</td></tr>
<tr><td>Aluminium Alloy</td><td>VSSC had indigenously developed (Annual Report for the year 2015-16) AA2014-T651 alloy required for fabrication of strap on of Launch Vehicle Mark 3 (LVM3) in-house. The annual requirement of AA2014-T4/T6 sheets (as of February 2018) was to the extent of Rs.2.84 crore. Audit observed that VSSC reported in September 2019 that it had commissioned a facility at BALCO which is not operational. VSSC had finalized transfer of the facility to HINDALCO but this was yet to materialize (March 2021). DOS stated (March 2022) that an integrated proposal to transfer ISRO funded facilities from BALCO to HINDALCO is under its consideration.</td></tr>
</table>
Thus, VSSC was not able to utilize indigenous products in its launch vehicles.</td><td>2. <u>Aluminium Alloy Sheets</u>: It may be noted that an integrated proposal to transfer the ISRO funded facilities from M/s. BALCO to M/s. HINDALCO is under consideration as per directive of NITI Aayog. M/s. HINDALCO visited the facility in order to assess the suitability for its usage. The details on assessment are awaited.</td></tr>
<tr><td>2.1.2.10</td><td><u>Loss of interest on receipt of royalty:</u>

According to GFR (Rule 64 of GFR 2005) the Ministry/ Department shall ensure that the procurement of supplies are made in a cost-effective manner.

VSSC entered (February 2002) into a contract with M/s Fomas, Tamil Nadu (presently M/s Bay Forge Limited - BFL) for establishment of ring roller mill and supply of seamless rolled heat treated and proof machined rings for a duration of 21 years from the date of commencement of production (July 2004) i.e., up to 2025. According to Clause 31 of the contract, BFL was to pay royalty of six per cent of ex-factory value of domestic sales of rolled</td><td>It was earlier pointed out that M/s. Bay Forge Limited has been strictly instructed to credit the proceeds promptly to the Department every quarter without fail and requested to condone the delay in remittance for the period January 2012 to October 2020. It may be noted that the remittance of royalty by M/s. Bay Forge Limited is currently up to date.

It was earlier pointed out that M/s. Bay Forge Limited has been strictly instructed to credit the royalty amount promptly to the Department every quarter without fail and</td></tr>
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	rings and 4.5 per cent for export orders. In addition, the scrap metal at the premises of M/s Bay Forge were also to be auctioned and revenue generated was to be transferred to VSSC. According to Clause 31 of the Contract, BFL shall make payment on quarterly basis to VSSC. Audit scrutiny however revealed that in order to recover the royalty from sales and receipts from auction of metal scrap, VSSC neither raised its quarterly demands nor collected the due receipts in time (March 2021). As a result, payment of revenue to VSSC was delayed from one to 14 months. The loss of interest was to the extent of, 80.51 lakh. Admitting the audit observation (March 2022), DOS stated that Bay Forge has been strictly instructed to credit the proceeds promptly to VSSC every quarter without fail. Audit however observed delay in remittances of the revenue from one month to 14 months from the month in which it is due till its receipt.	requested to condone the delay in remittance for the period January 2012 to October 2020. The Contractor is promptly remitting the royalty amount every quarter without fail from November 2020 onwards and the remittance of royalty from the vendor is currently up to date. However, in the absence of a provision for levying interest, it is not feasible to demand or collect interest for the past period (from January 2012 to October 2020) from the supplier.
2.1.2.11	**<u>Non-revision of rate of cost benefit:</u>** VSSC established (February 2004/March 2005) melting and heat treatment facilities at MIDHANI to enhance manufacturing capacity of M250 Maraging steel products required for various launch vehicle programmes of DOS at a cost of , 60 crore. According to the terms of the MoUs, MIDHANI would pass on certain benefits to VSSC in lieu of the funding, such as cost reduction of Rs.300 per kg of rings and prates on account of melting facilities and , 50,000 per plate on account of heat treatment carried out in Roller Hearth Furnace. VSSC entered (February 2016) a contract with MIDHANI on proprietary basis for manufacture and supply of six types of forged rings and two types of	It may be noted that under the terms of the arrangements with MIDHANI, the equipment established at MIDANI is the property of the Department. Further, it is to be noted that the Department is not incurring any cost towards the maintenance of the equipment, which is under the scope of MIDHANI. Additionally, increase in the maintenance charges due to the aging of the equipment, if any, is not being loaded to the Department. Moreover, the exemption of depreciation and financial cost is of benefit to the Department. In view of MIDHANI meeting the maintenance

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	plates made of M250 Maraging Steel. Prices under this contract were arrived at by increasing the prices under the previous contract (December 2009) by 25 to 48 per cent. Audit observed that though the prices charged under the new contract were increased when compared to the previous contract, the cost benefit to be passed on to VSSC was indicated as per the rate fixed in February 2004/March 2005. Though VSSC accepted the escalated/revised price quoted by MIDHANI, it did not ensure commensurate increase in the rate of obtaining cost benefit from MIDHANI. Instead, it obtained the cost benefit at an 11-year-old rate. This resulted in excess payment of, 4.35 crore to MIDHANI under this contract as detailed in Annexure-2.4. While admitting to the Audit point that MIDHANI continued to provide the same price reduction to VSSC, DOS stated (March 2022) that there is also a clause that MIDHANI shall not include depreciation and financing cost in its price. Reply is not acceptable. The exemption of depreciation and financial cost on prices however is a benefit provided by MIDHANI since the equipment is financed by DOS and this benefit is in addition to rate of cost benefit. The reply, however, was silent on the revision in cost benefit rates.	expenses of the equipment owned by the Department and also the benefit extended to the Department through the exemption of depreciation and financial cost, the Department feels that there is no case for a proportional or otherwise increase in the cost benefit and hence no excess payment can be inferred, as it would set off the revision in cost.
2.1.2.12	**<u>Undue benefit to contractors in cases of delayed deliveries</u>** According to para 10.3 (5) (e) read with Para 10.3 (6) (c) of DOS purchase Manual, 2015 (Para 13.3.4 of DOS Purchase Procedure - October 2009 Seventh Edition) contracts with provision for advance payments shall invariably incorporate Liquidated Damage (LD) clause at the rate of 0.5 per cent for the undelivered portion of the order value per week subject to a maximum of 10 per cent. Rule 204 of GFR 2005 (Rule 225 of GFR 2017) further envisages that no price variation will be admissible beyond the original scheduled delivery date for defaults on the part of the supplier.	The Purchase Orders referred above are dated during the period 2003 to 2016. The applicable LD as per the Purchase Procedure prevailing at that point of time and as per the terms and conditions of the contract are deducted. Also, it may be noted that LD is applicable to the extent of delays attributable to the contractor only. The delivery period for the hardware are calculated based on the date of last input, like FIM/approvals on Process plan/ manufacturing drawings, provided by the Department.

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	Audit test checked compliance to these provisions in eight out of 47 contracts (pertaining to items for which complete data was available) and found that VSSC either did not levy or under levied LD to the extent of Rs. 18.26 crore in spite of delays in deliveries attributable to the contractors. Further, VSSC fixed the maximum rate of recovery of LD as 2.5 per cent in two contracts and five per cent two more contracts, as against the prescribed rate of 10 per cent. VSSC did not incorporate LD clause in one contract. Audit further observed that VSSC paid, 11.44 crore on account of price variation for the period of delay where in the delay was on the part of the contractor, in contravention to the GFRs. This resulted in undue benefit of Rs. 29.70 crore, as detailed in Annexure-2.5. Thus, under levy/non-levy of liquidated damages and releasing payment on account of price variation for the period of delay on the part of contractors resulted in undue benefit of Rs.29. 70 crore to the contractors. Without furnishing specific reply to the eight cases observed in Audit, DOS furnished a general reply (March 2022) that LD recovery is done based on the percentage incorporated in the purchase order and appropriate approvals.	In the development phase of GSLV MkIII structures, contract envisages changes in the some of the activities/ inputs from Department/ clearances/ design changes etc. Since all new LV development activities are shouldered between HAL and VSSC "Contract for Fabrication and Supply of GSLV MKIII Light Alloy Structures" vide PUV/02/1405/02/0410 dt 26.03.2003, the Liquidated Damage Clause was not applicable vide Clause 13 (copy of relevant pages attached in **Annexure VII**). However, in all subsequent contract the applicability of LD clause was enforced. Based on the then prevailing DoS Purchase procedures, during 2000 periods, the applicable LD to the extent of 2.5% or 5% was made applicable in all contracts entered by VSSC. This has been verified and endorsed by relevant Purchase Committee like SPC, CFC-I, CFC-II etc. Since 2015 onwards based on the current DoS Purchase Procedure, the application of LD to the extent of 0.5% per week subject of maximum of 10% of value due to the fault of Contractor has been enforced in all contracts. All invoices are certified by the Resident Team/Authorized Person based on the schedule and actual delivery dates only. Also the PV clause was made applicable for long contracts, upto the scheduled delivery only. In case the

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		actual delivery of hardware is beyond the schedule delivery period, LD amount as applicable for the delayed period was deducted.
2.1.2.13	**<u>Idling of defective material</u>** VSSC issued (November 2018) purchase order for the procurement of steel plates from M/s Jindal Stainless Hisar Limited at a cost of, 1.59 crore, to be supplied as Free Issue Material (FIM) to the fabricators of PSO XL. Para 4 of the terms and conditions of the tender stipulates that the contractor shall guarantee the product for a period of 12 months after acceptance of the stores and defects discovered if any will be rectified by the contractor at his own cost. Further, as per the terms of the purchase order issued to M/s Jindal, all sheets shall be ultrasonically inspected either at final product stage or intermediate stage, the dispatch shall be affected after obtaining pre-dispatch clearance from VSSC and after inspection of the plates in the presence of the VSSC engineers. Against the supply (July 2019) of plates, an amount of~ 1.40 crore was paid to the firm. FIM was supplied to three fabricators and processing charges of~ 35.26 lakh was reimbursed to them. VSSC reported (November 2019) that the steel plates were rejected due to unacceptable low density inclusions in the material and consequently the material could not be put to use. Audit noticed that VSS.C did not take action to obtain replacement for the entire defective material, as the supplier had provided replacement of only 64 fresh sheets worth t 39.93 lakh. The remaining material worth ~ 99.85 lakh21 remained unutilised. DOS stated (March 2022) that these sheets met all acceptance criteria but due to the low-density inclusions, they had been kept aside as a measure of abundant precaution. DOS added that additional tests are being carried out	15CDV6 sheets procured from M/s.JINDAL were duly meeting all the technical specifications specified in the purchase order. The batch was completely meeting all the Technical specification requirements specified as per VSSC:MMPS:1201S:2011 applicable for 15CDV6 sheets. Low density inclusions observed during radiographic examination of weld are a part of fabrication review & acceptance stage. Low density inclusions were observed during radiography of weld at fabrication stage in 10 sheets out of 72 sheets supplied in a batch. The batch was completely meeting the material procurement specification as per purchase order. In spite of the inclusion content as noticed during radiographic inspection stage that is not part of the acceptance procedure for raw material, M/s. JINDAL agreed to replace the sheets of which 64 sheets have been supplied so far and the balance 8 sheets will be supplied in due course of time. The balance 8 sheets from M/s. Jindal are under processing and will be delivered by Q3 of 2023-24.

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	on this to ascertain its quality. The reply is not accepted, as the material supplied was not to the requirement of ISRO and remained unutilised.	
2.1.2.14	**<u>Non stipulation of Maximum ceiling on Price Variation Clauses in contracts:</u>** In terms of Para 10.10 (h) (iv) of DOS Purchase Manual 2015 read with Rule 204 of GFR, 2005, the price variation clause should provide for a ceiling on price variations, particularly where escalations are involved. It could be a percentage per annum or an overall ceiling or both. Audit scrutiny of 52 contracts revealed that while in 32 contracts there was no price variation clause, in 10 contracts22, price variation clause was incorporated at fixed annual rate on cumulative basis. In remaining 10 contracts, price variation was incorporated using different formulae based on price indices. Further, there was no ceiling on price variations in these 10 contracts. Price variations to the tune of~ 11.70 crore were paid in four out of these 10 contracts. Price variations in remaining six contracts could not be arrived at due to inadequate information. The details are given in Annexure-2.6. VSSC did not record reasons for not adopting uniform standard price variation clause and ceiling on price variations. Admitting the audit observation for future guidance and adoption, DOS stated (March 2022) that the price variation formula varies in different contracts, the essence of the formula is drawn from that stipulated in the GFR with minor variation. Reply of DOS is not acceptable. The department did not adopt uniform standard price variation clause and ceiling on price variation as provided under DOS	Depending upon the nature of purchase orders, the Department is following different methods of price escalation adhering to the GFR guidelines. All efforts are taken to avoid undue payments. In all major long term contracts for fabrication of light alloy structures and solid motor cases, price escalation clause is included. As per the prevailing contract terms, escalation @7% per year is enabled in HAL contracts for light alloy structures and escalation based on Consumer Price Index (CPI) is enabled in solid motor case hardware contracts. In purchase orders for the procurement of Maraging steel materials, the Department is forced to follow a different pricing mechanism owing to the import elements involved in the manufacturing at M/s.MIDHANI. These are typically longer duration orders lasting from 24 to 42 months depending on the quantity. Maraging Steel is a super alloy wherein elements like Nickel, Cobalt, Molybdenum and Titanium are used, which are imported. Price of these basic elements is dependent on the international pricing mechanism and thus is highly instable. The price variation

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	purchase manual and GFR.	formula incorporated in these contracts takes in to account the base metal prices existing as on the date of the contract and the actual cost of procurement. Metal making being an energy intensive process, the cost of power and furnace fuel (LPG) is also considered. Additionally, manpower cost as well as the variation in Consumer Price Index (CPI) is also accounted. Considering these aspects, it was found that fixing a limit is practically not feasible. It is to be noted that the Department verifies the documentary evidence for the actual cost of these variables and certifies them prior to final settlement of price variation claims as per the applicable formula incorporated in the contract.
2.1.2.15	**<u>Blocking of Government money in Advance payments to suppliers:</u>** (i) VSSC enters into various long-term contracts with private contractors for fabrication, testing and supply of various segments/components for the satellite launch vehicles. Scrutiny of 21 such long-term contracts revealed that while VSSC released huge advance payments to the tune of ~ 127.83 crore on signing of the contracts, supplies commenced after a lapse of seven to 73 months from the date of release of advance, resulting in blocking of Government money for such periods. In 20 out of these 21 contracts, supply commenced only after 12 months from receipt of advance. The details are given in Annexure-2.7. The interest on this amount alone was to the extent of~ 36.53 crore23. Further, in 11 cases the advances were released in the last week of March, indicating poor budgetary management.	**(i) Contracts for Light alloy structures and Solid motor hardware (2003-2019):** As per the DOS purchase procedure and GFR guidelines, advance payment is made to the manufactures of light alloy structures and solid motor case hardware primarily for realization of necessary tooling and completing necessary engineering documentations like process plans, manufacturing drawing generations etc. The ceiling amount on advance payment is also limited as per the GFR guidelines and DOS purchase procedure. It may be

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	VSSC justified (March 2021) payment of advance to the time required by contractors in the delivery of the product, development of process, change in the design of the product, delay in supply of FIM and in conducting qualification tests. Without furnishing specific reply to the 21 cases observed in Audit, DOS furnished a general reply {March 2022) that the delay in delivery of the hardware is generally due to a new vendor development that has to realize tooling and process, or due to delay in FIM issue. The reply is viewed in light of the fact that fabrication contracts are mainly labour intensive, as required facilities are established with support from ISRO and raw materials are supplied by VSSC as FIM. Thus, huge advances were blocked due to management issues at VSSC. As such, VSSC needs to manage the supply of FIM and process development and thereby bring about better financial management of the contracts. Further, in three cases, there was no provision for advance payment in the contracts and in another case, the supplier did not claim any advance amount. (ii) VSSC issued (June 2016/0ctober 2017) a purchase order on MIDHANI for the supply of six units of Titanium Alloy Sheets for PS4 Propellant Tank for ~ 76.91 lakh. VSSC released {October 2017) advance payment of~ 20.94 lakh to MIDHANI however, the Tank was not supplied by MIDHANI as of March 2021. No action was taken by VSSC to obtain refund of the advance payment made. VSSC stated (January 2020) that the existing facility at MIDHANI was not able to convert Titanium sponge to Titanium Plates. DOS added (March 2022) that a wider mill was under commissioning at MIDHANI. The fact remained that the advance payment remained blocked with the supplier for	noted that escalation is not applicable for the portion of the advance amount paid to the parties. Also vendors need to pay for the subcontracting operations done through approved sources for various manufacturing activities. In view of the above, utilization of advance amount towards progress of hardware realization is taken care without blocking the Government funds. **(ii) Advance payment to suppliers: Titanium alloy plated for PS4 propellant tank** The referred purchase order was placed with M/s. MIDHANI for conversion of Titanium Sponge to Ti6Al4V plates (6 Nos.) as an indigenization effort. Vendor had carried out rolling trails at their sub-contractor's site and which were not successful. Subsequently M/s. MIDHANI had discussions with various other rolling mills in the country to realize these plates but could not succeed in development. Presently, a wider Plate Rolling Mill has been commissioned at M/s. MIDHANI and Ti6Al4V plates made ready by Midhani in March-2023. Though these plates were meeting our mechanical property requirements, it was rejected once again by VSSC-QC as microstructure was not meeting our specification requirements.

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	nearly four years.	Indigenization effort for realizing wider plates of Ti6Al4V was initiated optimistically to achieve the desired output within the schedule. However, there was delay in realizing the plates in view of reasons mentioned above. Even though advance payment was with the party, the raw materials required for processing of these plates have been procured by them using the advance paid to them and melting of ingot has been completed. Further efforts by the party have been continuing. Party has again taken a fresh melt and would be processing the ingot and delivering the plates by October-2023 at the same rates offered in the contract meeting the stringent VSSC quality requirements.
2.1.2.16	**<u>Irregular Changes in the technical specification in the purchase of Aluminium Alloy</u>** According to Rule 225 (xiv) 2017 the terms of the contract including the scope and specification once entered into should not be materially varied. Wherever material variation in any of the terms and conditions becomes unavoidable, the financial and other effects involved should be examined and recorded and specific approval of the authority competent to approve the revised financial and other commitments obtained before varying the conditions. All such changes should be in the form of an amendment to the contract duly signed by all parties of the contract. Audit scrutiny of contract entered into between VSSC and M/s Kalapurna Steel (February 2018) revealed that against the ordered quantity of five types	The Alternate sizes offered by the party is of higher width/ length from which components are realizable and hence alternate size offered by the party is technically acceptable. There is no change in technical specification (BS L 164/165 & BS 5L 100) and order was amended after getting due approval from competent authority. In view of the above, the audit paras may be dropped.

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	alloy sheets, the vendor offered alternate size different from the size of the purchase order with a discount ranging from 7.5 to 17 per cent. Audit observed that VSSC agreed to the revision proposed by the vendor without placing on record justification of how the alternate size would serve the intended purpose. Audit further observed that a formal amendment to the order was also not issued. DOS stated (March 2022) that the discount offered by the party is reasonable. DOS added that Purchase order amendment proposal was duly discussed, reviewed and approved in detail by the purchase committee. However, the fact remains that the revision of the scope and specification is against the provisions of the General Financial Rules.	
2.1.3	**Conclusion:** VSSC executed contracts for fabrication of motor cases, light alloy structures and steel structures for its various launch vehicle programmes without ensuring due diligence and strict compliance to the provisions of the DOS Purchase Manual. There were cases of single tender contracts continuing for prolonged periods of time. VSSC did not explore alternate vendors for these items, which resulted in loss of opportunity for competitive pricing. There were non-following of the due process and codal provisions in procurement. Due to which there were avoidable and excess payments in the procurement of solid motor cases, strap on motors, light alloy structures and steel, avoidable payment of escalation due to undue time taken (15 months) in the finalization of tender, irregular expenditure due to augmentation of facility without approval from Law Ministry, etc.	

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	Audit also observed instances of poor contract management. Lack of better financial management of the contract resulting in loss of interest on receipt of royalty, loss due to non-revision of cost benefit, undue benefit to the contractors in delayed deliveries and idling of defective material, etc. There were also instances of violation of provisions of the DOS Purchase Manual, due to lack of internal control such as price escalation not reporting to the contract committee, irregular clubbing of requirements, inadequate indigenization efforts, nonstipulation of maximum ceiling on price variation clauses in contracts, underutilization of Titanium Sponge established at the premises of the third party, irregular changes in the technical specification of the purchase order, etc. As such, VSSC may put in place a mechanism to ensure that provisions of the DOS Purchase manual are adhered to, before any decision to purchase is made.	