Chapter 3:

Financial Considerations and Contract Management

3.1 Financial Considerations and CFA approval

3.1.1 Cost Estimates and Revision in Costs

Ships require many years to plan, budget, design and build. The complexity of their weapons, equipment and systems implies that, in general, their construction period is longer than that for comparable equipment like fighter aircrafts or tanks. The long build periods introduces an element of uncertainty and difficulty in estimating cost of ship building projects. Apart from the long periods, modern, state-of-the-art weapons and sensors, some of which are imported or under development, add to the ambiguity with regard to their costs. Despite such uncertainty, cost estimates need to be assigned to each project while seeking the sanction of the CFA, in this case Cabinet/Cabinet Committee on Security. This requirement puts an onus on the Ministry and Navy that the cost estimates are firmed up with due care and professionalism taking into account the exigencies that may arise in the future. The cost estimates would not only need to be current but also would need to provide for escalation during construction periods.

Audit examination revealed that estimation of costs in the case of the P15A, P17 and P28 ships has been done more as a formality for obtaining approvals to the ship building projects from the Cabinet/CCS rather than as a professional and meaningful exercise which would lead to effective controls and monitoring. Audit obtained no assurance from the documentation provided that the Ministry has in place a system which comprehensively verifies the costs/estimates received from the shipyards. In fact, audit noted that cost estimates projected were simplistic, based on the previous projects completed several years ago and did not provide for escalation cost of modern technology and equipment or for the exchange rate variations for the imported items.

The simplistic and *ad hoc* approach towards costing these ship-building projects is illustrated below:

Project	Date of Approval / Sanction	Approach for estimating costs / Assumptions	Remarks
15A	June 2001	Cost estimates based on last of P15 ships at 1999 price level	*The CCS approval was based on a price level two years old and while preparing the estimated cost increase for these two years was not incorporated.* *The last P15 ship was still under construction and its costs were revised in 2006*
		Weapon/sensor package would be worked out in the contract.	*The estimates were unrealistic as the construction period for the project was not taken into consideration and escalation was not provided till the anticipated date of completion.* *Combat capability which constitutes a significant part (48 per cent) of costs was not decided while presenting estimates* *Costs of on-board spares was also not included*

17	January 1998	Based on a price level of 1994 Calculated taking escalation @ seven *per cent* on the indigenous components (including labour, labour heads, direct expense, sub-contract etc) and 2.5 *per cent* on imported equipment Based on total construction period of 78 months, thus, escalation was calculated only till 2002-03.	*The CCS approval was based on a price level four years old* *While preparing the estimates, no basis for selecting the particular escalation rate was ascribed. For instance, for imported items, generally, Ministry has been taking three per cent and subsequent to 2004-05 higher rates like six per cent with respect to Russian equipment. This has, in fact, been the major cause for cost growth as seen in the next section.* *Assumption of completion period as 78 months was not realistic as the previous frigate project took over 100 months for completion.*
28	March 2003	Price level of 2001-02	*Estimates unrealistic as the construction period for the project was not taken into consideration* *No escalation provided till the anticipated date of completion.*

Despite the fact that there are inherent uncertainties in the ship construction process, there was no recognition of this fact and Navy did not account for the probability of cost escalation when estimating costs. Although it would have been prudent to factor in the experience gained in the ship building activities and process over the past years, the same was not done.

3.1.2 Cost Growth: An analysis

Cost escalation has been a long-standing feature of Navy's ship building programmes and was commented on in the 1998 audit review for both P15 and P16A ships. While MDL completed the Project 15 ships after incurring expenditure of Rs 3196.82 crore against the original estimate of ₹ 1014 crore, an increase of more than 315 *per cent*, GRSE constructed the P16A ships at a cost of

₹ 2833.11 crore against the originally approved cost of ₹ 414 crore, an increase of 684 *per cent.*

The three ship building projects under audit review have also already witnessed massive revisions in cost for which MOD had to approach the CCS for approval. Analysis of the revised cost estimates is discussed below.

The cost of building a ship has four main components: labour, material, equipment and other costs. The shipbuilding contract also includes an element of profit at the rate of 7.5 *per cent*. As per the original cost estimates, in terms of total cost across three projects, equipment accounted for a major portion (almost 62 *per cent)* of costs, followed by labour (19 *per cent*), other cost (15 *per cent*) and material (3 *per cent*).

The cost growth in respect of Project 17 and Project 15A is tabulated below:

Component wise revision of cost under P-17

(₹ in crore)

Component	Original Sanction January 1998	Revised Sanction March 2006	Percentage increase
Cost of major equipment and material	1414.34	4062.75	187.25
Shipyard Cost	506.44	2373.27	368.62
Basic Cost	1920.78	6436.02	235.07
Profit	137.22	482.70	251.77
Total Cost	2058	6919	236.20
B&D Spares	192	965	402.60
Modernisation of MDL	0.00	217	0.00
Total	**2250**	**8101**	**260.04**

The sharp increase in costs was mainly due to the increase in cost of weapons and equipment. This was primarily due to change in weapons and equipment from the originally envisaged choices. The initial estimates of Russian equipment were based on Russian supplies made for P16A and P15 in the 1980's and early 1990's. The commercialisation of the military hardware industry of Russia, which replaced the State controlled regime, also pushed up purchase prices. Additionally, costs rose because of the effort to indigenize various equipment. Another major issue was the increase in labour man days to be used in construction which increased by 40 *per cent* from an estimated 15 lakh to 21 lakh man days. This increase, coupled with the wage revision in MDL in 1998 contributed to the higher total costs. Other factors included costs incurred for hiring installation specialists, increase in sub-contracting impacting costs, and increase in material overheads.

Component wise revision of cost under P-15A

(₹ in crore)

Component	Original Sanction June 2001	Revised Sanction February 2006	Percentage increase
Cost of major equipment and material	651.00	5232.00	703.69
Shipyard Cost	2237.00	4326.00	93.38
Profit	217.00	686.00	216.13
B&D Spares	465.00	1401.00	201.29
Model testing, etc.	10.00	17.00	70.00
Total	3580.00	11662.00	225.75

Project 15A costs are bifurcated into fixed costs (labour, equipment and material) and variable costs (weapon and sensors) as per contract. While the pronounced increase in fixed costs was due to the wage revision in MDL in 2003 and in 2007, the increase in the variable element was due to the fact that the initial sanction for weapon and sensors was purely on a rough estimate basis. Costing data on new weapon systems and other systems like the Long Range Surface to Air Missile (LRSAM) and Multi-functional Radar (MFR) likely to be installed on the new ships was not available as these systems were still in the developmental stages, at the time of sanction.

As regards the P28 ships, the project was sanctioned in March 2003 at a cost of ₹ 3051.27 crore. This cost is proposed to be revised to ₹ 7974.99 crore (161 *per cent* increase). However, as of November 2010, the revision in cost estimates is yet to be approved by the CCS.

Design of P28 Class of Ships

From the above, it is clear that not only were the cost estimation for materials, labour, shipyard efforts made poorly, the weapons, sensors and equipment package that was envisaged earlier underwent changes. Selection of these items was also not finalized at the time of sanction to the projects.

Unrealistic cost estimates and uncertainty in weapon and equipment package ultimately led to delayed signing of contract, frequent changes in the design of ships and monitoring mechanism being rendered ineffective. These aspects are discussed separately.

☑ **Recommendation**

- ***There should be an institutionalized mechanism in place in NHQ and the Ministry to verify the correctness of budgetary costs submitted by DPSU shipyards. Besides, NHQ and the Ministry should conduct independent cost estimation using internationally accepted best practices and compare the results thereof with the quotes received from the shipyard.***

- ***Sanctions for the warship constructions should be more realistic based on appropriate verifiable criterion and contain provisions for escalation of the anticipated build period so as to avoid significant cost revisions at a later date.***

3.2 Contract Management

In its previous review in 1998, audit had observed that there was considerable delay in concluding contracts, in the absence of which Navy was not in a position to enforce either economy measures or delivery schedules. At that time, Navy had stated that delay in conclusion of contracts was due to lack of agreement over certain contractual clauses. Audit review of the contracts in P15A, P17 and P28 showed that there has been no improvement in this area despite Ministry's remedial measures in this regard and instructions to sign contracts.

3.2.1 Delay in signing of contract

Audit observed considerable delay in the signing of the contracts for P17 and P15A. The contract in respect of P28 is not signed yet. Incidentally, even though the Defence Procurement Procedure, approved in July 2005, stipulates that the contract between the Ministry and the shipyard is to be signed within a period of 12 to 18 months from the date of approval of the competent financial authority (CFA) in case of construction of new design ships and within 9 to 12 months from the date of CFA approval for repeat orders, Ministry / Navy did not follow these provisions. The delays in signing of contracts in P17, P15A and P28 are tabulated overleaf.

PROJECT	DATE OF ORIGINAL SANCTION	START OF CONSTRUCTION[1]	ORIGINAL EXPECTED DATE OF DELIVERY[2]	DATE OF REVISED SANCTION	DATE OF CONTRACT / SHIPYARD
P17	January 1998	December 2000	December 2005	March 2006	**June 2008 / MDL**
P15A	June 2001	March 2003	2008	February 2006	**June 2008 / MDL**
P28	March 2003	March 2006	August 2008	Under consideration	**Not yet concluded/ GRSE**

[1] For first ship

[2] ibid

As can be seen from the table above, contracts have been signed much after construction has begun and in fact, have been signed after the originally expected dates of delivery. Although contracts were inordinately delayed, construction activities were commenced on the basis of the Letters of Intent / CFA sanctions issued. Thus, even before the contracts for P15A and P17 were signed in June 2008, the Navy had paid ₹ 2998.72 crore and ₹ 4942.9 crore to the shipyard in each case. These amounts were 84 and 219 *per cent* of the originally sanctioned costs. In the case of Project 28, as of September 2010, ₹ 1653.30 crore has been paid, i.e. 54.18 *per cent* of the sanctioned amount without conclusion of contract.

The delays in signing the contract stem from the unrealistic original cost estimates and estimated delivery period at the project initiation stage.

- In the case of the P17 class of ships, the signing of the contract was held up due to lack of agreement of the assessment of required man days between the Navy and the shipyard as also the revision in delivery schedule.
- The P15A contract though for construction of follow-on ships was delayed on account of the unrealistic assessment of the cost of various components at the time of initial sanction. Navy stated in October 2005 that certain design changes were made to accommodate new weapon systems and sensors and the super structure of the ship was modified to incorporate stealth features. The exact impact of these additional features could not be assessed initially by the Navy as it was for the first time that these features were being incorporated in the ships. Further, in this project also, there were delays due to protracted negotiations on issues relating to labour, labour overheads, material, outsourcing etc.
- Similarly, the P28 contract has not been finalised on account of disagreements on labour man-days to be used, changes in hull design and equipment.

Thus, the contracts between Ministry and the shipyards could not have been signed given the original unrealistic cost estimates, estimated delivery period and changes in the weapons and equipments impacting design and thereby costs.

3.2.2 Implications of contractual terms on construction activities

The Defence Procurement Procedure (DPP) which became effective from June 2005 also includes a Warship Building Procedure. The procedure stipulates that the contracts should be on 'Fixed Price' basis[3] indicating inter alia permissible price escalation, exchange rate variations, labour wage variation, increase in statutory levies and also mobilisation advance for undertaking preparatory activities for commencement of production. Further, as per DPP 2006 contracts are to be signed within a period of 12 to 18 months from the date of approval of the CFA in case of construction of new ships and within nine to 12 months from the date of CFA approval for repeat orders. In cases, where subsequent CFA approvals are necessitated, supplementary contracts are to be signed within six months of such approval. In case of delay in signing of contract, approval of RM is to be sought with full justification for the delay.

Audit found that the contracts signed for P17 and P15A ships have, by and large, followed DPP guidelines and are 'fixed price' contracts. Thus, in the P17 contract, although ships are being built on a 'cost plus'[4] basis, the contract has features of a fixed cost contract as prices are reimbursable on actuals subject to an over-all upper monetary limit. Similarly, while the P15A contract is a fixed price contract with respect to material and yard efforts (40 *per cent)* and variable[5] with respect to weapons and sensors (48 *per cent),* the total price payable is subject to element-wise ceilings. In respect of the P28 corvettes, though the contract is yet to be signed the first ship will be built on a 'cost plus' basis.

Given that the contracts for ship-building projects have been signed years after obtaining CCS approvals, commencement of production and issue of Letters of Intent, the sanctity of the contractual conditions is vitiated. The contracts are more in the nature of formalizing events / costs which have already occurred. The contracts were eventually signed only much after obtaining approval of CCS to the revised cost

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[3] Fixed price contracts are defined as those which provide for a firm price or an adjustable price with a ceiling price, a target price, or both.

[4] The first ship is being built on a cost plus basis, implying that payment will be on actual for allowable incurred costs. The 2nd and 3rd ships will be constructed on the 'frozen' cost of the first ship, subject to overall limit prescribed.

[5] Variable costs contain base prices with permissible price escalation, exchange rate variations, labour wage variation, increase in statutory levies etc.

estimates. Audit noticed that while deliberations were on for conclusion of these contracts, Navy was already mooting proposals for revision in cost estimates of P15A and P17 projects.

The contracts concluded i.e., for P15A and P17, also have infirmities so far as accountability towards timely completion of projects:

- Though both the contracts specify start date and delivery date of ships, timelines with respect to start and end dates for intervening milestones of critical activities to be undertaken by the shipyard have not been spelt out in the contract. Absence of contractually binding completion dates of critical milestones weakens objective review and assessment of shipyard performance. Similarly, shipyards were to prepare Programme Evaluation and Review Technique (PERT) charts, an important tool for project evaluation and control. However, the same was not done.
- The contract for P15 A specifically provides for receipt of binding data from Indian Navy in respect of critical items which would determine drawings to be made by the shipyards for ship building. The data was to be received during year 2007 and was not received in case of many items such as guns / missiles, composite communication system, engineering binding data etc. at the time of signing of contract in June 2008. Despite this, the contract retained the date of completion of first ship as May 2010. Evidently, the contractual terms were defective and the delivery dates could not be adhered to eventually.
- P17 contract, signed during the same period with the same shipyard, does not even mention the timeliness for receipt of binding data contractually. This aspect has been left to be mutually decided between Indian Navy and the shipyard.

In addition, although the contracts for P15A and P17 were signed subsequent to the Defence Procurement Procedure 2005 / 2006 taking effect, Ministry / Navy did not incorporate some of the provisions which would have benefitted them. For instance, DPP 2006 specifies release of five *per cent* and ten *per cent* of total contract value for Stage III and XIV respectively. However, the P15A contract stipulates that ten and five *per cent* will be paid to the shipyard for Stage III and XIV respectively. This allows the shipyard to draw five *per cent* more at

Stage III itself which was supposed to be drawn after completion of Stage XIV. The benefit so extended to the shipyard worked out was ₹ 232.60 crore.

Audit also observed that in the absence of contracts, a large part of the construction period was without an effective control framework. As such the rights and responsibilities of the contracting parties remained undefined thereby creating a project environment that was susceptible both to cost and time overruns. Although this lacuna was sought to be rectified through amendments to the Letters of Intent (in case of P15A), audit noticed that there were gaps. For instance, in the case of P15A ships, the LOI while specifying the stage payments for the fixed part of the contract, no stages were defined for variable component. For P17 and P28 no stages for payment are defined and payments are adjusted against the advances paid or otherwise, released as and when the bills are received from the shipyards.

In sum, the contractual arrangements for the shipbuilding projects suffered from deficiencies, and did not contribute to efficient ship construction which could enable objective assessment of performance of Indian Navy and the shipyard towards their responsibility. In this environment, neither the Indian Navy nor shipyards could be held accountable for their respective failures and deficiencies in performance with regard to terms and conditions of the contract.

3.2.3 Increase in cost due to in admissible items in the contract for P15A

Interestingly, despite the delay in finalization of contract and long drawn contract negotiation, inclusion of inadmissible items led to unnecessary expenditure of ₹ 10.88 crore. MDL's estimate for P15A towards yard effort, material and equipment included items such as mobile phones with sim cards, cordless phones, tata phones, procurement of enterprise boats, reimbursement of air and train fare etc. at cost of ₹ 10.88 crore. Audit scrutiny further revealed that items such as DVD Player Sony, 20 channels 400 MHz Digitizing oscilloscope, 400 watts Medal Halede and Discharge lamp etc. valued at ₹ 37.42 lakh were included twice.

☑	**Recommendation**
✓	***Conclusion of contract with the shipyards should be within the prescribed period in order to facilitate proper execution and monitoring of the project and to avoid time overrun, clarifying intermediate milestones and responsibilities of both shipyard and Navy to be fulfilled within stipulated timeframes.***

3.3 Release of funds

A mobilization advance is allowed by DPP for ship-building contracts to undertake preparatory activities for commencement of production activities. Before conclusion of contracts funds were to be released as per LOI placed on the shipyard which contained the following provisions:

1. P15A: The funds were to be released based on completion of specific milestones.
2. P17: No milestones were specified and MDL was to indicate funds requirement. However, means of release of funds not specified.
3. P28: Similar to P17 LOI provisions.

Audit noted that, in reality, large advances were being sanctioned on an *ad hoc* basis which were inadequately regulated and monitored by the accounting authorities[6]. For example, In the case of the P15A ships, since commencement of production, it was seen that MDL was unable to spend anything for the first three years although funds to the extent of ₹ 528 crore were released.

3.3.1 Excess release

[6] PCDA – Principal Controller of Defence Accounts. PCDA (Navy), Mumbai plays an important role as all stage payments as well as bills relating to material, labour, remuneration, overheads etc. are submitted to him for payment. The PCDA (Navy) pre-audits and releases the payments to the respective shipyards.

Audit noted that the release of funds did not match the expenditure for the three projects and shipyards were left with large amount of balances as shown in the following table:

Project 15A

(₹ in crore)

Year	Funds already available with yard	Total payment received in the current financial year	Total Funds available with yard	Total Expenditure booked	Balance left
(a)	(b)	(c)	(d)	(e)	(f)
2004-05	528.00	351.75	879.75	879.75	Nil
2005-06	Nil	757.68	757.68	757.68	Nil
2006-07	Nil	654.98	654.98	529.78	125.20
2007-08	125.20	706.59	831.79	647.34	184.45
2008-09	184.45	234.96	419.41	419.41	Nil
2009-10	**Nil**	**426.32**	**426.32**	**426.32**	**Nil**

In the case of P15A, an interest bearing advance of ₹ 312 crore paid to MDL in March 2002 remained unspent till the end of the financial year 2004-05 and was finally adjusted in December 2005 against the pending bills of P15A. In the mean time, MDL received a further advance of ₹ 216 crore in March 2003 despite the fact that MDL was unable to spend the advance of ₹ 312 crore.

Project 17

(₹ in crore)

Year	Funds already available with yard	Total payment received in the current financial year	Total Funds available with yard	Total Expenditure booked	Balance left
(a)	(b)	(c)	(d)	(e)	(f)
2004-05	425.00	511.92	936.92	796.92	140.00
2005-06	140.00	1072.50	1212.5	760.13	452.37
2006-07	452.37	877.03	1329.4	1181.73	147.67
2007-08	147.67	940.70	1088.37	719.30	369.07

2008-09	369.07	476.99	846.06	773.60	72.46
2009-10	72.46	582.34	654.8	632.16	22.64

In respect of Project 17, MDL was paid ₹ 75 crore and ₹ 37.50 crore in 1997-98 and 1998-99 on account of advances which remained unspent for two years.

Project 28

(₹ in crore)

Year	Funds already available with yard	Total payment received in the current financial year	Total Funds available with yard	Total Expenditure booked	Balance left
(a)	(b)	(c)	(d)	(e)	(f)
2004-05	282.91	-	282.91	-	282.91
2005-06	282.91	-	282.91	3.26	279.65
2006-07	279.65	314.02	593.67	331.67	262.00
2007-08	262.00	-	262.00	172.83	89.17
2008-09	89.17	297.81	386.98	386.98	Nil
2009-10	-	464.89	464.89	464.89	Nil

It was further noticed that large amounts were sanctioned to the shipyards as advance, even on the last working day of the financial year. In 2004-05, 2005-06 and 2006-07 advances totaling to more than ₹ 1000 crore were sanctioned in March with respect to Projects P15A and P17.

Release of large funds in March without any linkages with immediate utilization were clear instances of parking of public funds outside Consolidated Fund of India and were aimed at avoiding the lapse of funds. As per extant financial rules MOD was required to surrender the excess funds to the exchequer rather than parking them with shipyards.

3.3.2 Interest-bearing advances

The Ministry does not have any clear-cut policy on how to categorize advances, whether as interest-bearing or as non-interest bearing. The sanction for each advance individually clarifies terms and conditions. However, audit noted lapses even where sanctions clearly specified terms and conditions. Either the shipyard has not classified the advance as interest-bearing and hence not paid interest, or has delayed payment of interest, or has calculated interest in a manner to benefit itself. Poor internal controls in the Ministry and PCDA have resulted in poor monitoring of these advances leading to loss to the government.

PROJECT	EXAMPLES
P 17	**Terms and conditions vague:** Ministry of Defence sanctioned on 27th March 2001 an interest bearing advance payment of ₹ 274 crore for P17 ships to MDL. However, the interest was liable to be paid from 1 April 2002, i.e. after one year of its payment date, on the un-spent amount of outstanding advance.
	Wrong classification by MDL: MOD issued two sanctions for advances amounting to ₹ 425 crore in March 2004, one sanction in March 2005 for ₹ 140 crore and a sanction in March 2006 (as on-account payment) for ₹ 452.37 crore. Though it was stated that benefit of improved cash flow[7] was to be adjusted against pending contractual payments for the project, MDL categorized these two advances as non-interest bearing and did not pay any interest.
P 15A	**Terms and conditions vague:** An advance of ₹ 216 crore was sanctioned in March 2003 though MDL was unable to spend a previous advance of ₹ 312 crore sanctioned in March 2002. The advance of ₹ 216 crore was not classified as interest bearing, even though MDL invests surplus funds in approved securities.

3.3.3 Monitoring of advances

- Bulk advances are released to the shipyards against procurement of equipments but the accounting authority has not kept a track of their adjustments or credit verifications
- No mechanism exists to reconcile the expenditure booked against the projects in the books of PCDA and respective DPSUs.

[7] Improved cash flow means the interest generated from the advances will be ploughed back into the project.

- Demand register is a record maintained by Principal Controller of Defence Accounts for monitoring and liquidation of advance payments. It was noticed that PCDA (Navy) has not been maintaining Demand Register to regulate the payments made to GRSE against P28 and subsequent adjustments made against bills raised.

Recommendation

- ✓ ***PCDA (Navy) should maintain a statement of accounts for each shipbuilding project at the end of each financial year and also keep track of the liquidation of advances paid to the firms against equipment procurement and expenditure incurred through an effective and reliable mechanism.***