

CHAPTER-4

Infrastructure, Human Resources and Supply of Spares



Audit Objective: Whether infrastructure, Human Resources and Spares & Equipments for refits & MLUs were available?

4.1 Background

For efficient, economic and effective execution of a refit, it is essential that there is adequate and state of art infrastructure, sufficient & experienced human resources, and timely supply of machinery & spares. Against the backdrop of shortcomings in timely completion of refits and MLU we examined the adequacy of the above three essential factors at the dockyards. The results are given in the succeeding paragraphs.

4.2 Infrastructure Facilities

The infrastructure available at NDs and NSR& was as under:

Table 4.1

Sl. No.	Infrastructure/ Manpower	ND Mumbai	ND Visakhapatnam	NSRY Kochi	NSRY Karwar	NSRY Port Blair
1	Dry Docks/Floating Dock	05	03	-	-	01
2	Jetties / Wharfs	07	28	02	03	01
3	Slipway	02	01	01	-	-
4	Ship lifts	-	-	-	01	-

Brief details of infrastructure at main dockyards at Mumbai & Visakhapatnam are detailed below:



ND Mumbai has five docks viz. CG Dock, Duncan Dock, Bombay Dock, Torpedo Dock and PIM Dock. Normally, big ships are docked in CG Dock and Duncan Dock. While Bombay Dock is normally used for low draught ships and yard crafts, Torpedo Dock is used for smaller ships. PIM Dock is used for small yards. The dockyard has two main constraints - docking and berthing constraints for the present size of assets of Indian Navy and Indian Coast Guard. Resultantly, the yard has been exploited by using multiple docking¹ to accommodate more number of ships in the same period. However, the yard was not able to meet the annual dry docking requirement of refits and operational ships during emergency docking.

ND, Mumbai admitted (June 2012) that geo-physical constraints such as space, depth of water, tide, etc., affect berthing and docking operations of large sized ships like INS Virat. The draught of the ships vis-à-vis tidal conditions further determine the date and time of docking. They added that decongestion has been achieved to a certain extent with the shifting of Offshore Patrol Vessels (OPVs)/survey vessels to Karwar. However, the sanction issued in 1985 by the Government to decongest ND, Mumbai by developing a new dockyard at Karwar has yielded only partial results even after a period of 25 years. This aspect has further been discussed in Para 4.4.2.



ND, Visakhapatnam has three big docks and has been undertaking multiple docking and docking arrangements have been utilised to full capacity leaving very little scope for accommodating new ships. Given

¹ Multiple docking is concurrent docking of more than one ship in the dry-dock simultaneously.

the planned inductions at Visakhapatnam, the constraints have to be viewed in the light of the fact that there was no further scope for constructing new docks.

ND, Visakhapatnam intimated (May 2012) that a case for creation of ship lifts facility at the yard had been taken up as part of Annual Technical Works Programme (ATWP).

4.3 Earlier Audit Findings

Shortcomings in planning and creation of infrastructure at NDs Mumbai and Visakhapatnam were commented in PAR Report of the CAG of India, No. 5 of 2007. The report brought out delays in replacement of old, ageing, Beyond Economical Repair (BER) and obsolete equipment. In their AN, the MoD had agreed (February 2011) to create the required facilities for newly acquired platforms along with induction of ships. For the old and BER equipment, the Ministry had stated that in certain cases no replacement action had been taken as equipment was no longer required and ATWP would take care of procurements after taking into consideration the augmentation of facilities.

The creation of repair/refit facilities at refitting yards, the availability of man power etc. were examined afresh as discussed hereunder.

4.4 Creation of Additional infrastructure



A floating dock (Navy)

ND, Mumbai saw creation of infrastructure in 1950s, 1960s and 1970s based on Naval Dockyard Expansion Scheme formulated in the Master Plan of 1950 and 1960. The facilities created in the yard since end of 1970s, however, did not follow Master Plan Concept. Additional work centers were set up with induction of new types of platforms. This resulted in an incremental approach to the refit process, which was further hampered by the docking and berthing constraints at the yards.

One of the reasons for lack of a plan was that every major class of ship inducted into the Navy was initially based at Mumbai necessitating the yard to augment some facilities temporarily for the technology and equipment of the class. In late 1990s, naval assets were progressively transferred from Mumbai to Eastern Region. Further, many of the required facilities were seen as a stop gap arrangement as a new Naval Base was under operation at Karwar since 2005.

We examined the creation of additional infrastructure at various dockyards between 2005-06 and 2009-10 as tabulated below:

Table 4.2

(₹ in crore)

Yard	No. of projects sanctioned	Sanctioned Cost	No. of projects completed	Cost of completed projects	No. of projects in progress	Cost of projects in progress	Remarks
ND, Mumbai	24	195.77	12	29.57	11	162.57	One project costing ₹ 3.65 crore being fore-closed.
ND, Visakhapatnam	55	589.10	42	230.09	13	359.01	-
NSR, Karwar	5	6.90	2	4.63	3	2.27	-
NSR, Kochi	13	92.98	3	7.93	9	81.93	One project costing ₹ 2.42 crore is fore-closed.
Total	97	884.75	59	272.22	36	605.78	

Only 6 per cent of the projects sanctioned for four yards between 2005-06 and 2009-10 had been completed as of October 2011. The value of completed projects was only ₹ 272.22 crore (3 per cent of the total value of projects sanctioned), whereas the remaining projects worth ₹ 605.78 crore (68 per cent) were still in progress.

As delays in execution of infrastructure impacts the availability of required facilities for refits and MEI we enquired (August 2013) the further progress/status of completion of the infrastructure projects mentioned in the table above, however the reply was awaited (November 2013).

4.4.1 Delay in construction of Dry dock/wharves at Mumbai

Late dry docking constraints at ND, Mumbai are one of the main reasons impacting timely completion of refits. Our scrutiny of the steps taken to overcome these capacity constraints revealed the following:

The Cabinet Committee on Political Affairs (CCPA) approved (November 1985 and June 1986) ₹ 90.6 crore, revised (October 1994) to ₹ 101 crore for construction of wharves and dry dock at ND, Mumbai. The dry dock under construction since May 1995 collapsed in June 2000. By then an expenditure of ₹ 126 crore had been incurred/committed to the project. An internal Board of Inquiry attributed the collapse of dry dock to design inadequacies and, thereafter both the consultancy and the construction contracts were terminated in March and October 2001 respectively. Both the cases as of October 2013 were pending in the Apex Court.



Dry docking on a floating dock

Meanwhile the project was again revised, with a view to increase the size of dry dock and an Administrative Approval was accorded (April 2005) at a cost of ₹ 0.57 crore for balance construction of wharves and the consultant was directed to submit the detailed design. The work was tendered out in 2006 and again in June 2007. Only one quote at ₹ 13 crore was received, which was rejected as being too high. Revised CCS approval was obtained (August 2007), at ₹ 09.21 crore for construction of enlarged dry dock. The consultant, however, declined (September 2007) to work at the rates negotiated in December 2002 and the proposal for enhanced rates was approved (May 2008).

The work was finally contracted in June 2010 at a cost of ₹ 68.9 crore. Revision in the project cost to ₹ 110.6 crore was approved by the CCS in January 2012 and the physical progress was 21.6 per cent with an expenditure of ₹ 140.51 crore. The PDC is April 2014.

Thus, the project sanctioned in 1985 at a cost of ₹ 90.6 crore is now likely to be completed by April 2014 at a cost of ₹ 110.8 crore. Till commissioning of the facilities, the Navy would continue to face infrastructure constraints.

4.4.2 Inordinate delay in setting up of ship refit facilities

The CCPA had sanctioned (1985) setting up of the Karwar base entailing creation of repair facilities up to SR level for 22 warships and 23 yard crafts in Phase-I. The Government decided (1995) to implement a truncated Phase-I of the project involving facilities for 10 ships and 10 yard crafts over a period of 10 years commencing from 1995. Under this phase, the NSR, Karwar was commissioned (July 2006)



We found that posted strength at NSR, Karwar from 2005-06 to 2009-10 ranged from Nil to 23 only against the sanctioned strength of 39. Due to lack of facilities, 10 SRs including 5 yard crafts were off-loaded to trade at a cost of ₹ 3.58 crore. Besides, during 2008-09 no refit was undertaken by the yard.

Navy stated (July 2010) that the tradesmen were recruited only by the end of 2008 and early 2009. Further, these tradesmen were directly recruited and were in the process of familiarisation with the naval systems. Navy further stated (July 2012) that it undertook 8 refits at NSR, Karwar during 2010-12.

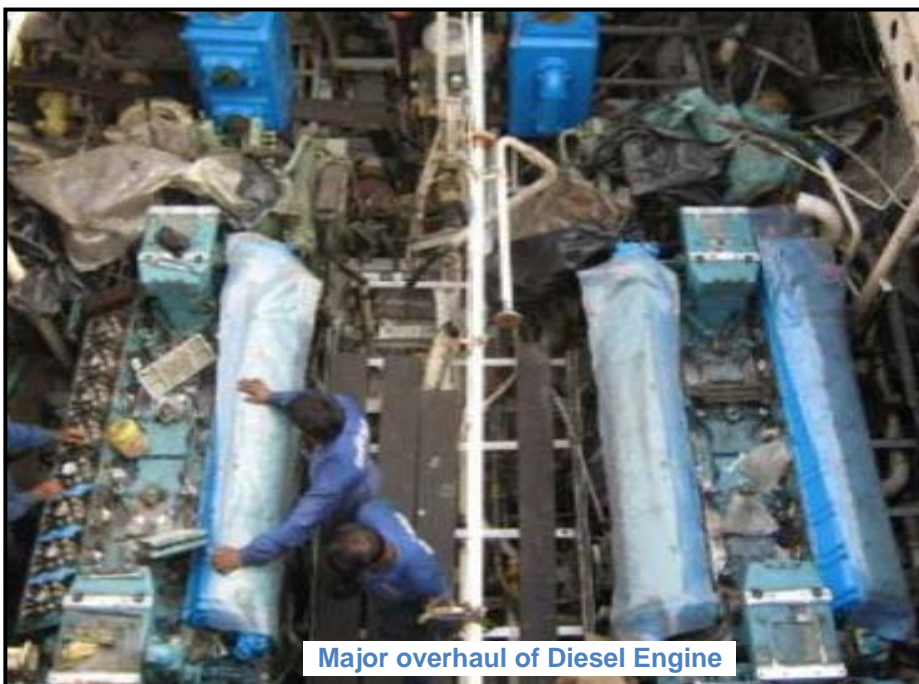
Thus, there was a lack of synchronisation in planning for infrastructure and concomitant manpower planning for such facilities.

4.4.3 Delay in setting up of repair facilities.

We noticed several instances of non-synchronisation in creation of repair facilities with the induction of new ships. This resulted in avoidable loading of works to trade as discussed below:

Case-I:

Three ships of Brahmaputra class were commissioned between 2000 and 2005. A Board of Officers had recommended (July 2002) the augmentation of repair facilities for Brahmaputra class of ships. However, no action was taken on the Board's recommendation. Another Board which assembled in January 2005 also recommended the same work. A suitable dealers for items of imported nature could not be located in India, cost of these items was excluded from the Board Proceedings (BPs). The IHQMoD (Navy) finally approved (October 2005) the BPs after incorporating certain additional equipment and sanctioned (November 2006) the facility at a cost of ₹ 1.96 crore. Out of 16 equipment projected, 15 were received between December 2007 and March 2008. One frequency converter set catered for in the sanction was deleted as the specifications provided in the BPs were found to be outdated. The equipment was yet to be ordered (January 2011).



Meanwhile, due to the delay in creation of facilities for Brahmaputra class ships, ND, Mumbai had to offload works valuing ₹ 5.88 crore to trade between 2000 and 2010. The Navy, stated (July 2010), that the

delay in according sanction was on account of time required for revision and preparation of new BPs and Approximate Estimates (A).

The reply was not acceptable as the repair facilities required for the class of ship commissioned between 2000-2005 were not set up till January 2011, with consequential financial implication.

Case -II:

Equipment G' is installed on board Brahmaputra, 1241 RE and G' class of ships. Equipment G' is the latest addition to the Navy and comprises of various mechanical units controlled by a microprocessor.

We noticed that though the first ship with Equipment G' on board was commissioned in year 2000, however, the case for setting up of repair facilities for Equipment G' was initiated only in August 2007 and approved in July 2008 at a cost of ₹ 1.14 crore. The work was completed in September 2010. Meanwhile, ND Mumbai had to offload work related to Equipment G' at a cost of ₹ 340 crore. In its reply, Navy accepted (December 2010) that due to delay in setting up of the facilities the repairs of system on board ships had to be offloaded to the OM.

4.5 Human Resources

The refitting yards are manned by industrial and non-industrial personnel. While the former are directly involved in the repair / refit related activities and are treated as direct labour for the purpose of costing; the latter are engaged in store keeping and maintenance of yard assets and treated as indirect labour. Thus, availability of industrial personnel as envisaged through sanctioned posts has a direct bearing on the refit capacity of the yard. The sanctioned and posted strength of the industrial personnel in the four yards selected for audit was as under:

Table 4.3

Year	ND Mumbai		ND Visakhapatnam		NSR Kochi		NSR Karwar	
	Sanctioned	Posted	Sanctioned	Posted	Sanctioned	Posted	Sanctioned	Posted
1-4-06	325	50	4542	437	79	64	39	Nil
1-4-07	325	6	4542	427	79	587	39	02
1-4-08	325	625	4542	416	79	599	39	02
1-4-09	325	68	4542	420	79	589	39	198
1-4-10	325	850	4542	43	79	580	39	23

The deficiency expressed in percentage terms worked out as under:

Table 4.4 (In percentage)

As on	ND(MB)	ND(V)	NSRY, Kochi	NSRY, Karwar
1-4-06	10.9	4.95	100	100.00
1-4-07	11.88	5.83	18.8	99.7
1-4-08	12.9	8.2	10	99.7
1-4-09	14.45	5.99	18.08	91
1-4-10	8.97	4.51	19.3	9.16

The table indicated that while manpower constraint was being experienced at all locations, the deficiency in manpower at Karwar was very significant, as brought in the Table 4.4 above.

4.5.1 Matrix Unit as unit of workload

The capacity of the various NDs/NSRYs is expressed through Matrix Unit (MU) which is defined as the number of man days of tradesmen required for undertaking a SR of a Missile Boat. This concept was taken from the Russian Navy, wherein, a time frame of 42 Man Days was envisaged for completion of SR of a Missile Boat. The Russian concept of SR, however, encompassed only hull related work in SR, with no work on ship's system(s).

However, this approach was not practical, due to progressively increasing of work on ship borne systems and aging of the ships. To reflect the extra effort, the Indian Navy refined the MU to 1500, 2250 and finally to 3000 man days in 1982, 1989 and 1990 respectively. The aggregate of all tradesman days of the yard constitutes the capacity of the yard.

The Refit capacity of the yard is calculated after considering the borne strength of industrial staff during the year and the number of working days in a year. As per extant orders for working out the MU the number of working days in a year has to be taken at 261 days.



As per norms in regard to utilisation of available MU 60 per cent of the yard capacity is to be allotted for refit, 20 per cent for repair and maintenance of yard services, 10 per cent for operational jobs, 5 per cent for maintenance of yard crafts and the remaining 5 per cent for miscellaneous duties including assistance to shore establishments.

We analysed the availability and utilisation of MU for Refit and Operational Jobs at various repair yards as tabulated below:

Table 4.6

Naval Dockyard, Mumbai								
Year	Total capacity (in MUs)	Refit capacity (60 per cent MUs)	MUs booked for refit & their per cent		Shortfall per cent	Ops capacity (10 per cent)	MUs booked for Ops & their per cent	
2005-06	547.24	38.3	242	44.22	26	54.2	118	21.56
2006-07	551.25	33.1	250	45.3	24.41	55.12	141	25.58
2007-08	541.53	34.91	225	41.55	3.3	54.15	13	3.95
2008-09	538.87	39.2	246	47.7	23.6	53.8	14	3.8
2009-10	525.7	35.46	240	45.5	23.2	52.57	10	3.3

Table 4.7

Naval Dockyard, Vishakhapatnam								
Year	Total capacity (in MUs)	Refit capacity (60 per cent MUs)	MUs booked for refit & their per cent		Shortfall Per cent	Ops capacity (10 per cent)	MUs booked for Ops & their per cent	
2005-06	402.8	241.6	202	50.15	16.1	40.27	52.47	13.3
2006-07	405.0	243.7	215	53.0	11.0	40.57	40.29	9.93
2007-08	401.94	241.16	218	54.24	09.0	40.19	56.7	14.11
2008-09	91.3	243	224	52.4	08.12	9.13	55.23	14.11
2009-10	401.28	240.7	225	56.7	06.5	40.12	52.24	13.2

Table 4.8

Naval Ship Repair Yard, Kochi								
Year	Total capacity (in MUs)	Refit capacity (40 per cent MUs)	MUs booked for refit & their per cent		Shortfall per cent	Ops capacity (10 per cent)	MUs booked for Ops & their per cent	
2005-06	585	22.7	10.11	1.8	55.54	5.8	15.27	28.6
2006-07	585	22.7	8.1	1.3	6.5	5.8	17.8	0.3
2007-08	55.16	22.06	6.2	11.28	7.80	5.51	43.3	8.19
2008-09	56.9	22.51	9.3	16.9	58.51	5.8	41.2	7.11
2009-10	54.50	21.0	8.45	15.50	0.88	5.45	3.8	59.8

From the above Tables and analysis, the following issues emerged:

- In respect of NDs at Mumbai and Visakhapatnam, though the number of posted industrial personnel had increased as given in the Table No. 4.3 during 2005-06 to 2009-10, the MU assigned for the NDs showed a decrease. This was not logical as MU depended on the posted strength of personnel.
- As per norms, 60 per cent of the available MU were to be utilised for Refit purpose. We noticed that none of the three yards could achieve this norm. Further, the excess consumption of MU for operational jobs at ND, Mumbai and ND, Visakhapatnam lacked justification as Fleet Maintenance Units (FMU) located in these places were responsible for maintenance of operational ships. Utilisation of man days (between 21.56 to 3.3 per cent as

against 10 per cent authorised) by ND, Mumbai for operational ships was indicative of incomplete or less than optimal refits.

- A brought out in Annexure-II of this Report, there has been significant increase in payment of overtime to the industrial personnel at the dockyards from ₹ 55.6 crore to ₹ 82.7 crore. Increase in overtime would have the effect of increase in available MU. However, this was not the case.
- There was a mismatch between the additional time taken for refits and utilisation of less than 6 per cent MU. Paragraph 2.2.2 of this Report has brought out that 113 (7 per cent) out of 152 refits were completed with a delay of 869 days, entailing a delay of 53 per cent in terms of number of days actually provided for refit with reference to OCRC. A such delays in completion of refits should have resulted in excess consumption of MU at dockyards / repair yards. However, we observed that time taken for refits and utilisation was less than 6 per cent of MU.

While, ND, Mumbai did not reply to our queries, ND, Visakhapatnam stated (September 2010) that over the years from 2007 onwards the MU booking for refit and maintenance of operational ships was such that about 0 per cent (approximately) of the yard capacity utilisation in totality was maintained for refit repairs and operational requirements. The yard also stated that the excess operational booking was mainly due to the fact that there were no fixed MU allotted for Ship Maintenance Program/Annual Maintenance Program (SMP/MP) and work package for various classes of ships. The reply was not acceptable as SMP/MP fall under the purview of ships' staff / MU and in exceptional circumstances only dockyard's assistance was to be requested.



Repair of Deck equipment

We also observed that refit capacity of NSR, Kochi, had been reduced from 60 per cent to 40 per cent. The Navy stated (December 2010) that the refit capacity of 60 per cent was an indicative figure and not a binding figure as the actual booking on the refit would depend upon the number of refits in a year and operational load on the yard. The non-existence of an MU at Kochi was also a key factor. IHQMoD (Navy) also stated (February 2012) that non-availability of certain expertise and dry docking facilities led to offloading at Kochi, commensurate with number of ships and defects reported.

The reply is not acceptable as the main activity of a refitting yard is to undertake refits, based on the capacity of the yard. Further, capacity utilisation of the yard in respect of refit ranged between 11.28 and 17.8 per cent during 2005 and 2009, which is even lesser than 50 per cent of the reduced refit capacity utilisation (i.e. 40 per cent) of the yard. This is indicative of gross under utilisation of refit capacity at NSR, Kochi.

IHQMoD (Navy) admitted (February 2012) that non-availability of expertise with MU with respect to certain equipment & weapons as also prolonged deployment of ships led to more booking of MU for operational ships.



Our analysis indicated that, MUs a norm for executing refit efficiently was inadequately designed as efficiency measure of refits in general and labour in particular. The Navy also admitted (May 2012) that basis for working out the MU was not known to them.

4.5.2 Under-valuation of yard capacity

We also noticed that NDs / NSR were not following the prescribed 26 working days in a year for working out the refit capacity. Detailed

working out of actual yard capacity and refit capacity available at ND Mumbai revealed the following:

Table 4.9

As on	Posted strength	Yard capacity As per norms (266 days in a year)	Yard capacity as per ND Mumbai	Under-valued/ under-utilised yard capacity
1-4-06	6750	598.50	547.24	51.26
1-4-07	6631	587.94	551.25	36.69
1-4-08	6525	578.55	541.53	37.02
1-4-09	6438	570.83	532.87	37.96
1-4-10	6850	607.36	525.77	81.16
Total MUs				244.89

Under valuation of available MUs worked out to 2,0 mandays (244.89 x 600).

ND Mumbai stated (June 2012) that they had referred the matter to the HQ MoD (Navy) for clarification on undervaluation of available MUs while ND Visakhapatnam intimated (May 2012) that they were taking 23 working days per year to arrive at the total capacity of the yard. Thus, computation of MUs lacked standardisation, and was arrived at in a divergent manner by various Repair Yards.

4.6 Supply of Spares

Machinery and Spares (MS) are essential ingredients for any refit and their timely availability is vital for completion of refits in time. Further, if a refit gets delayed because of lack of requisite spares, it has a cascading effect on the subsequent refits. The procurements of spares are made centrally as well as locally. While the central purchase is made by HQ MoD (Navy), the local purchase is done by the MOs and the refitting yards as per financial powers vested with them.

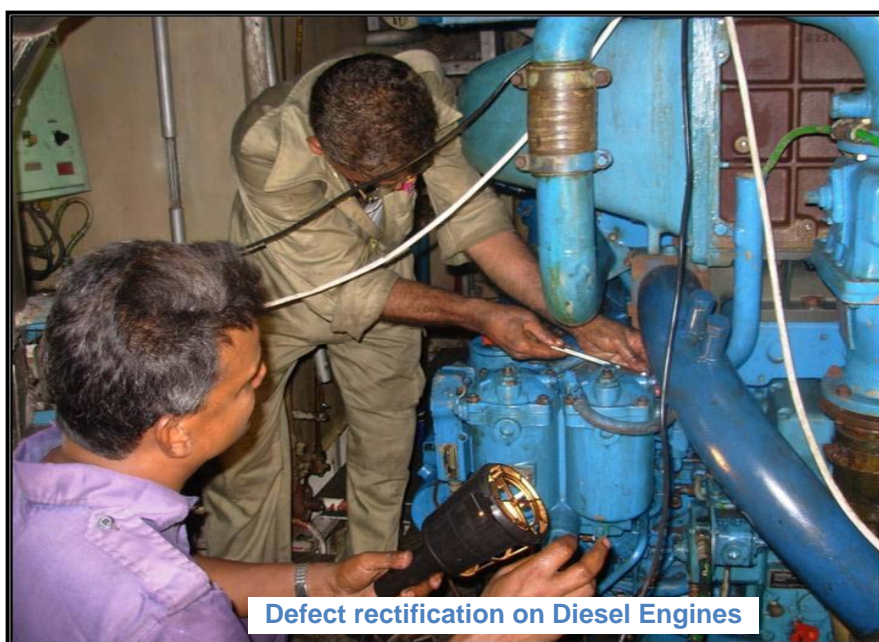
The RPP promulgated under the Relevant Order issued by Naval HQ describes the various measures for working out the list of spares required for the refit of the ships. This naval order describes the working out method, timelines for preparation and placing the demand and provision action to be taken by MOs.

4.6.1 Demand satisfaction of Spares

Demand satisfaction signifies the quantity of spares supplied by the MOs in response to demands for spares placed by the refitting yards. Demand satisfaction is an important indicator of performance of the agency that procures spares and is vital for timely completion of all refits.

4.6.2 Poor availability of Spares

RPP, *inter alia*, envisaged that the refitting yards have to forward Standard Forecast List (SFL) of spares, determined on the basis of standard work package (DIPart-I), to MOs 58 weeks and 8 weeks before the MR/NR and SR respectively. In the case of MR/NR, the MOs have to intimate to the yards regarding the expected date of supply (EDS) of items and also forward a list of items which are not likely to be available before 20 weeks of dockyard starting date (DSD). Thereafter, the refitting yards send, 18 weeks in advance, the firm demands to MOs. Similarly, the list of Post Defectation Demands (PDDs) for defects other than of routine type (DIPart II) are sent to MOs 13 weeks and eight weeks before commencement of MR/NR and SR respectively.



We noticed that non-compliance of SFL and PDD of ships based at Visakhapatnam was up to 7 per cent and 100 per cent respectively. At Mumbai, the non-compliance was 3 per cent for SFL and 92 per cent for PDD.

The details of availability of spares for various refits and MLUs undertaken on different ships are tabulated below:

Spares availability for Medium Refit/MLUs

Table 4.10

Sl. No.	Name of the Ship	Dockyard	Percentage of spares available	
			Forecast List	Post Defectation Demands
1	INS Ranvir	Visakhapatnam	73	45
2	INS Sukanya	Visakhapatnam	56	34
3	INS Ranvijay	Visakhapatnam	72	55
4	INS Cuddalore	Visakhapatnam	56	38
5	INS Savitri	Visakhapatnam	62	40
6	INS Khanjar	Visakhapatnam	73	48
7	INS Godavari	Mumbai	59	33
8	INS Ganga	Mumbai	68	53
9	INS Nirbhik	Mumbai	96	63
10	INS Nishank	Mumbai	60	53
11	INS Vibhuti	Mumbai	52	39
12	INS Vidhyut	Mumbai	94	39

Spares availability for Normal Refit/MLUs

Table 4.11

Sl. No.	Name of the Ship	Dockyard	Percentage of spares available	
			Forecast List	Post Defectation Demands
1	INS Konkan	Visakhapatnam	53	37
2	INS Kozhikode	Visakhapatnam	38	42
3	INS Ranjit	Visakhapatnam	72	31
4	INS Kora	Visakhapatnam	65	39
5	INS Vindhyagiri	Mumbai	65	62
6	INS Delhi	Mumbai	94	44
7	INS Talwar	Mumbai	60	52
8	INS Trishul	Mumbai	82	54
9	INS Tabar	Mumbai	81	53
10	INS Mysore	Mumbai	82	52
11	INS Ratnagiri	Mumbai	45	57
12	INS Ajay	Mumbai	33	35
13	INS Veer	Mumbai	27	42

Spares availability for Short Refit

Table 4.12

Sl. No.	Name of the Ship	Dockyard	Percentage of spares available	
			Forecast List	Post Defection Demands
1	INS Nishank	Visakhapatnam	47	0
2	INS Rana	Visakhapatnam	53	0
3	INS Vinash	Visakhapatnam	7	51
4	INS Cannanore	Visakhapatnam	46	8
5	INS Gharial	Visakhapatnam	50	24
6	INS Jalashwa	Visakhapatnam	3	25
7	INS Savitri	Visakhapatnam	8	53
8	INS Nirbhik	Visakhapatnam	44	44
9	INS Rajput	Visakhapatnam	55	44
10	INS Magar	Visakhapatnam	8	56
11	INS Mysore	Mumbai	100	56
12	INS Mumbai	Mumbai	81	46
13	INS Prabhal	Mumbai	54	56
14	INS Jay	Mumbai	84	53
15	INS Heppy	Mumbai	57	52
16	INS Nipat	Mumbai	48	8
17	INS Vipul	Mumbai	9	57

The above tables showed that availability of spares required for timely and effective completion of refits at the Dockyards, was less than optimal. The MO(V) indicated (June 2007) that availability of spares was generally only 50 per cent in refits, and that too at the end of the refit which was particularly so in case of Russian origin vessels. The MO (V) further indicated that non-availability of critical spares was so extensive that it had become a *fait accompli*. This resulted in postponement of essential routines and use of refurbished components, resulting in adverse impact on quality, reliability and longevity of equipment on board. In the absence of supply, the demands were met either by refurbishing old spares or by resorting to local purchases. In certain cases, the items were also cannibalised from other ships.

The Navy stated (February 2012) that significant improvements have been made in provisioning and procurement of equipment and spares of Russian origin and the response from the Russian and East European sources was over 95 per cent of tendered items. Further, it was stated that regular participation of firms in negotiation, conclusion of contracts and post contractual activities have been given adequate thrust which has led to faster and timely deliveries. It was also stated that this

mechanism which has been institutionalised would pay increasing dividends in the future.

Navy further stated that there was a mismatch between Forecast List (FL) data with Integrated Logistic Management System (ILMS)³ data and the compliance figures were not in consonance.

We affirm the data compiled with respect to demand satisfaction of the spares and the same was pointed out to the Navy in May 2012 that data relied upon by us was obtained from ND, Mumbai and ND Visakhapatnam. Navy was also requested to provide details of mismatch in the data. However, no reply was received (November 2012). Further, documentary evidence indicating 95 per cent satisfaction level for Russian origin spares, was also not furnished by the Navy.

4.6.3 Low demand satisfaction for refits – a system study

Audit Report (8Aof 2002) had highlighted that compliance rate for supply of equipment and spares had been abysmally low, with overall compliance for ships refitted at Naval Dockyard, Mumbai during 1997 to 2000 ranging between 44 per cent and 51 per cent only. Even after a decade, there was not much improvement in the situation. Therefore, we decided to scrutinise the reasons for continued low availability of spares required for refits.

Brought out earlier in this Performance Audit Report, the spares etc. required for refits are primarily procured by MOs and are supplied to the Repairing Yards. The Relevant Order provides, *inter alia*, that Refit Order is to be opened 6 to 58 weeks prior to commencement of refit for initiating provisioning of spares. Further, MO is required to intimate status of items and initiate procurement action 20 to 46 weeks before commencement of refit. The DPM 2009 also provides 20 to 23 weeks for completing procurement action. Similarly, Anticipated Beyond Economic Repairs (ABER) proceedings are initiated 2-3 years prior to Refit. Therefore, low availability of spares was inexplicable at least from the perspective of timelines stipulated and available.

The above concerns were raised to MO, Mumbai (February 2012) to solicit their views. In their reply, MO, Mumbai (February 2012) stated that:

³ ILMS is an online monitoring systems of Navy in respect of management of spare/equipment procured/store/issue.

- i. Though ELdemand is received 58 weeks in advance, it does not represent firm demands, as only 5 to 5 per cent of the EL get converted into firm demands. Therefore, provisioning action is not initiated based on ELdemands. Further, as per existing Naval Instructions initiation of indents cannot be based on EL demands which have to be firmed up by the repairing yards, before provisioning action can be initiated.
- ii. The Final Provisioning Quantity (PQ) i.e. quantities to be actually procured are arrived at following the Annual Review of Demand (RD), which is conducted once in a calendar year, depending upon origin of supply.
- iii. Firm ELdemands which are received prior to firming up of the RD can be utilised for computing the PQ. However, EL demands received post firming up of RD have to wait for the next RD cycle i.e. next year.

The reply clearly brings out that irrespective of how early the EL are projected, the provisioning action could commence only with the RD cycle. MO, Mumbai further stated (February 2013) that IHQ DM revised the timelines for receipt of ELdemands at depot, from 104 to 150 weeks, in December 2008. This provided additional timelines for the depot to undertake and plan provisioning of ELdemands thereby resulting in improved compliance of spares since 2012.

However, provisioning and procurement of spares is undertaken as per the RD. The RD, prepared by the MOs are forwarded to IHQ MoD (Navy) for further action and procurement, based on the delegated powers. Given the timelines, of various refits, usually ranging from 3 to 18 months, as per OCRC, it was unlikely that required spares could be procured and supplied within this time. Increase in timelines for projecting EL would only have limited utility as provisioning is undertaken post firming up as part of RD only. Thus, low demand satisfaction would continue.

4.7 Local purchase of Stores

Our scrutiny of procurement of stores for refit and ML of ships revealed instances of avoidable procurement and non-utilisation of stores as discussed in the next page:

Case-I: Avoidable procurement of stores

ND, Visakhapatnam, in May 2007 placed a demand on MO, Visakhapatnam for 19 types of aluminum materials for fabrication and installation of Equipment H' on board INS Ranvir during her MU which was reduced to 14 types in July 2007. However, in July 2007 the work was off-loaded to trade at a cost of ₹ 4.95 lakh. In February/March 2008 MO, Visakhapatnam procured stores worth ₹ 8.33 lakh and issued stores valued at ₹ 80.55 lakh for MU of INS Ranvijay. Subsequently, the yard in August 2008 off-loaded the job of INS Ranvijay at a cost of ₹ 58.50 lakh.

ND, Visakhapatnam stated (October 2009) that stores held in stock would be useful for similar works on other ships. The reply is an afterthought as the high grade aluminum was required for installation of Equipment H' during MU of INS Ranvir and INS Ranvijay. Further, the procurement was avoidable as it was known at the time of placement of purchase order that installation inclusive of material of Equipment H' onboard INS Ranvir, for which a demand was placed on board, had already been offloaded to trade.

Case –II: Unnecessary procurement of spares

NSRY Kochi projected (2006) the requirement of 27 items of spares for SR-2008 of INS Krishna. MO, Kochi raised (April 2006) indents and placed an order (July 2007) on M/s BHE for 19 items at a total cost of ₹ 8.33 lakh. The items were received in November 2008.

We found that NSRY Kochi had raised a demand for same items in 2002 also and these items procured in July/September 2003 at a cost of ₹ 1.22 lakh were lying at MO, Kochi at the time of placing the order again in July 2006. These items were not issued to NSRY Kochi as the refit of INS Krishna then was carried out in December 2002 at ND, Mumbai and the requirement of spares was borne by the MO, Mumbai.

On being pointed out (May 2009) by us, the MO, Kochi transferred the entire stock to the MO, Mumbai for meeting future requirements. Our examination at MO, Mumbai revealed that they were holding stock of the items (including those transferred from Kochi) worth ₹ 1.95 crore, though INS Krishna had been slated for de-commissioning in May 2012. The case reveals poor monitoring and weak controls in the procurement procedure and unnecessary procurement of spares.

Recommendations

- The capacity of the refitting yards should be re-assessed with reference to the posted strength of the Industrial personnel taking into consideration the automation, overtime and offloading.
- Action should be taken to recruit the tradesmen at NSRY Karwar at the earliest against existing sanctioned strength.
- Ministry needs to undertake a review with regard to availability and utilisation of earmarked MU capacity for refit, along with reasons and constraints for the inability to achieve the earmarked refit capacity.
- The IHQMoD (Navy) should ensure that creation of necessary repair facilities are synchronised with the induction of new ships to ensure availability of infrastructure and facilities. Since timely availability of spares is critical for efficient refit programme, Navy should take steps to streamline the procurement system through better co-ordination and effective controls.
- IHQMoD (Navy) may consider the need to review and revisit the system of demand satisfaction in refits and consider refit specific procurement of spares.