Chapter 6: Supply Base Management

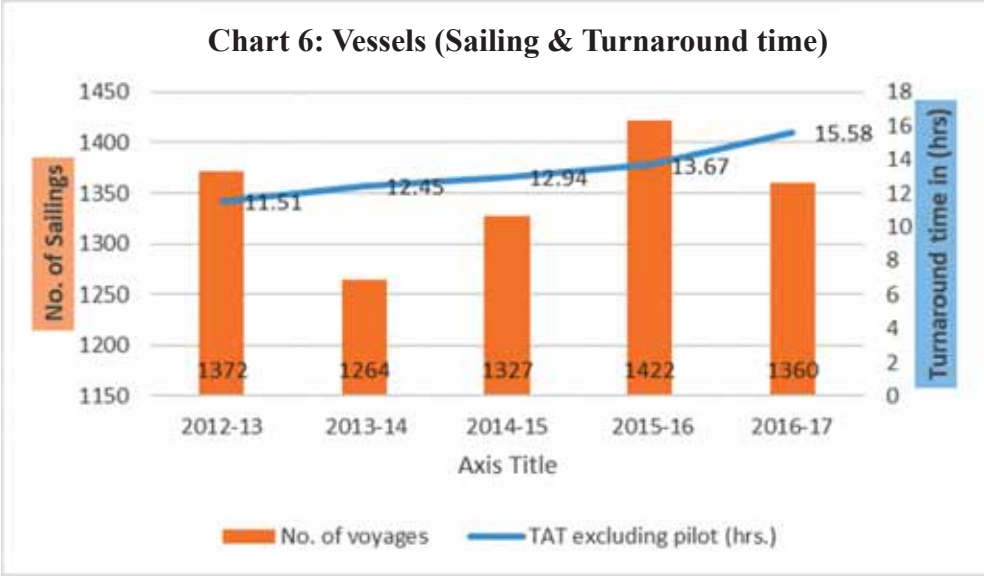
The supply base of the Company functions both as central warehouse and forward base for supplying cargo to offshore installations (rigs, platforms). Efficient operation of the supply base is necessary for effective and timely supplies to support production/drilling operations, optimum utilization of vessels and optimum inventory management. Audit analysis of the operations of Nhava Supply Base (NSB) and Kakinada Supply Base (KSB) indicated the following:

6.1 Turnaround Time (TAT) of vessels at base

6.1.1 Extra expenditure on excess Turnaround Time of vessels at NSB

The global benchmark for TAT[32] at a base was four to six hours[33]. The TAT of vessel (owned/ hired) being operated at NSB during the period 2012-13 to 2016-17 is presented in the Chart given below:

Chart 6: Vessels (Sailing & Turnaround time)



It may be seen from the chart that the TAT of vessels at NSB increased from 11.51 hours in 2012-13 to 15.58 hours in 2016-17. The number of voyages, however, varied during the period with the number peaking at 1,422 in 2015-16.

The extra operational cost incurred by the Company during the period from 2012-13 to 2016-17 due to failure in achieving global benchmark of six hours for TAT was assessed in audit at ₹154.63 crore. The details are at **Annexure VIIA**.

During 2012-13 to 2016-17, out of total five jetties, only 3-4 jetties were actually used for loading the cargo and of these, only two jetties were effectively used for loading cement and barite. The jetties were choked by backload and scrap materials affecting the vessel loading/

[32] *Turnaround time (TAT) of vessels is the time taken by a vessel at a supply base/port to unload material and load and move out including pilotage requirement, if any*

[33] *Source: EC agenda (June 2015)*

unloading process. NSB was also facing various constraints like shortage of space for material storage, shortage of material handling equipment and of skilled manpower.

NSB Jetty

Management stated (May/September 2017) that steps were being taken to upgrade the infrastructure for better coordination and supervision and better results. Fair wage policy was being implemented to motivate workers and to reduce the TAT. Ministry stated (December 2017) that the Company has agreed to take measures to improve the turnaround time.

Management/ Ministry response needs to be seen in conjunction with the upgradation of NSB which is discussed in detail in subsequent Para 6.2.

6.1.2 Turnaround Time at KSB

Audit observed that TAT of vessels at KSB was higher than the global benchmark of four to six hours which resulted in an extra expenditure of `27.15 crore. The details are at **Annexure VIIB**.

Management attributed (July/ September/October 2017) the reasons for high TAT at KSB to lack of automation in Kakinada Deep Water port in line with foreign ports/yards, supply of material by service contractor directly from their premises situated outside the port, longer time taken in loading vessels with maximum possible Potable and Drill water, loading and unloading of Synthetic Oil Based Mud (SOBM)

and Barites being done at a separate jetty and the need to give vessels call per rig priority over TAT as company hired vessels on time charter.

The reply has to be seen in the context of the fact that bulk handling plant was operated and maintained by a private contractor and agreement with the contractor provided for a minimum of eight hours shift to load 100 MT while the global benchmark for TAT was six hours.

Audit recommended that the Company may take steps, within the framework of agreement with M/s. Kakinada Seaports Limited (KSPL) to reduce the Turnaround Time at KSB by optimising operations.

Ministry accepted the Audit recommendation and stated (December 2017) that Company has agreed to take measures to improve the TAT at KSB for optimum utilization of vessels.

6.2 Delay in Upgradation of NSB as well as in setting up alternate supply base

Aerial view of NSB

NSB was established as a shorebase facility and was operational from 1983. With increasing supply requirements in western offshore over the years, the space at NSB became insufficient. The Company had carried out various studies for upgradation and modernisation of NSB through international Consultants during 2005 and 2011 and an in-house committee in June 2010. The Consultants as well as in-house committee recommended refurbishment of NSB to address the increasing supply requirements. In addition, the in-house committee also identified requirement of an alternate supply base to supplement the services from NSB.

The Company had also explored (February 2012) the possibilities of upgradation and operation of NSB through a PPP[34] project on 'Build and Operate' (BO) model, for a concession period of 15 years. The Company estimated a cost benefit of `262.87 crore from this proposal in manpower cost alone as compared to the cost of existing operational contracts. This proposal was approved (February 2012) by the Company. Drilling Services of the Company recommended (September 2013) setting up of an alternate supply base in the proximity of Gujarat coast to effect reduction in voyage duration, fuel consumption and vessel requirement, thereby leading to annual saving of `20 crore as compared to supply from NSB.

[34] *Public Private Partnership*

In this regard, Audit observed the following:

- Though the Company approved (February 2012) upgradation of NSB, no steps were initiated to upgrade NSB through a PPP project on BO model. Instead, NSB was executing upgradation works on an ad-hoc basis. These works consisted primarily of civil works like renovation/replacement of existing old structures based on perceived user requirement.

- The Company approved the proposal (July 2015) for hiring of alternate supply base and envisaged commencement of activities at the new supply base from February 2016. The Company floated NIT in March 2016 and pre-bid conference was held in April 2016. However, no further progress had been made till date (May 2018) in this regard. Thus, delay in setting up additional supply base resulted in foregoing potential savings of `41.75[35] crore (till May 2018) in logistics operation.

Management while accepting the facts, stated (May 2018) as follows:

- The upgradation was to be carried out in a phased manner and renovation of warehouses and upgradation of tubular storage were in progress. However, commensurate manpower was needed to accelerate the piecemeal upgradation.

- The present plan was to finalize additional base and move as much as 30 *per cent* operations to that base. Pre-bid minutes had been firmed up and the project was being monitored constantly to make up for past delays.

During the Exit Conference, Management accepted (October 2017) the delays and stated that once the alternative supply base was in place, the upgradation would be taken up in integrated manner.

Audit holds that fragile infrastructure and outdated systems at NSB resulted in higher cost of operations in NSB. Ad-hoc and piecemeal upgradation work without adopting an integrated approach as envisaged by the Consultants may not result in improvement in the efficiency of NSB/vessel operations. Moreover, delay in approving the pre-bid meeting minutes after a lapse of two years for a project requiring seven months for setting up, lacked justification as the Company continues to forego the savings it envisaged.

Audit recommended that the Company may devise and implement an integrated upgradation plan for NSB in line with the international best practices and operate NSB as an integrated Material Management warehouse for all stakeholders, with single point responsibility for inventory management, and with a disposal policy in place to deal with backloads. The Company may also establish a Non-Destructive Testing facility to check material to be sent to offshore so that after receipt of backload, segregation and tagging of materials may be carried out for easy identification of stores.

[35] *Savings of `20 crore per Annum worked out by company; 20 crore/12 (months)= `1.67 crore per month. Delay in hiring of alternate supply base (March 2016 to May 2018= 25 months);1.67 X 25 = `41.75 crore*

Ministry accepted the Audit recommendations and directed (December 2017) the Company to take necessary action in a time bound manner for modernization of NSB as per international standard and best practices including inventory management through relevant software.

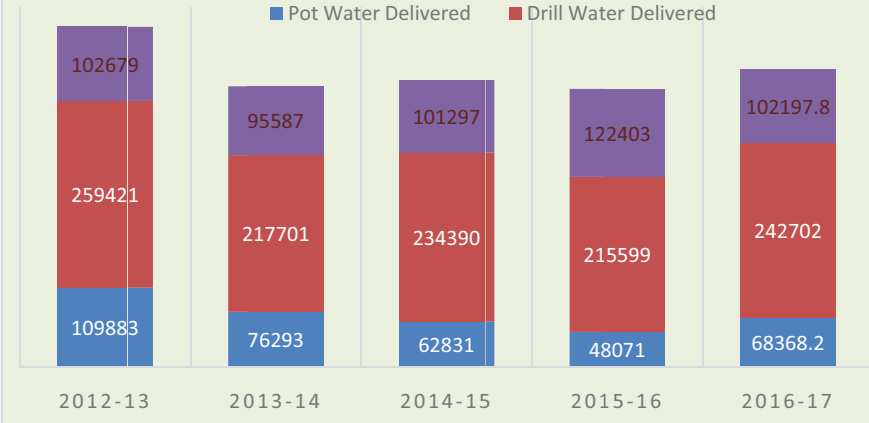
6.3 Insufficient sourcing of water to NSB

Offshore operations of the Company require potable water for drinking purpose and drill water[36] for drilling operations. The proportion of water is around 42 *per cent* of the overall cargo carried in a vessel.

6.3.1 Requirement of drilling and potable water

The Drill Water (DW) requirement was based on the drilling activity undertaken. The requirement of potable water (PW) depended on the number of Rigs/ platforms and did not vary substantially from voyage to voyage. The details of water supplied to offshore installations are at **Annexure VIII**.

Chart 7: Total quantity of Water delivered and Quantity of Water consumed by vessels



6.3.2 Sourcing of drill and potable water at base

Maharashtra Industrial Development Corporation (MIDC) was supplying water to NSB through an 11 Km long pipeline laid by City Industrial Development Corporation (CIDCO) from Dastan Phata which was passing through villages of Gavan, Kopar and Nhava. The volume of water pumped from the source at Dastan Phata and the volume received at the NSB during the period from 2012-13 to 2016-17 is as given below:

[36] *Drill Water is required for preparation of drilling fluid, or "mud", is pumped down inside of the drill pipe and exits at the drill bit.*

Table 6.1: Details of water pumped from Dastan Phata and receipt at Nhava
(in cubic meter per annum)

Year	Volume pumped at Dastan Phata	Volume received at Nhava	Volume Sanctioned by MIDC for supply to NSB
2012-13	1775780	490206	920000
2013-14	1817131	494180	915000
2014-15	1855482	494010	915000
2015-16	1746876	353390	915000
2016-17	1862813	325230#	915000

Source: Data furnished by NSB

It may be seen from above table that the volume of water received at NSB is significantly lower than that pumped at Dastan Phata. This volume of water pumped from Dastan Phata reduced from 28 *per cent* in 2012-13 to 17 *per cent* in 2016-17. This was due to unauthorised tapping of the pipeline en-route by the villagers. Since MIDC levied charges on the quantity of water pumped at Dastan Phata with additional charges on water exceeding the average sanctioned quantity of 75,000 cubic meter per month, the Company had to pay ₹7.99 crore during 2012-2017 for water it could not utilise.

The Company observed (January 2017) that underground and overhead tanks constructed by Raigad Zila Parishad were also fed from this pipeline and that the matter was also brought to the notice of CIDCO, who were responsible for maintenance of the pipeline. However, no action was taken by CIDCO.

6.3.3 Availability of storage of water in tanks on land and in rigs

The storage capacity of tanks at NSB was sufficient to meet only a day's requirement. Stoppage of supply by MIDC/CIDCO beyond a day would critically impact the demand of water at NSB and would necessitate augmented supply through barges at higher cost. The Consultants, M/s Peterson SBS (2011) and M/s Royal Haskoning (2012), had recommended increasing the storage capacity from 3,600 MT to 5,000 MT. Audit observed that action in this regard was yet to be initiated by the Company (December 2017).

The tender conditions for hiring of rigs stipulated that minimum storage capacity of water for 15 days requirement should be available in all rigs. Compliance with this requirement would have necessitated supply of water to hired rigs through vessels, only once in 15 days. However, the frequency of vessel visits to supply water was observed to be twice in a week. Normally water was delivered by the vessels along with other bulk material. It was further observed that due to shortage in supply, voyages were undertaken multiple times a week exclusively to deliver water to the rigs/platforms. Audit test checked the voyage reports of vessels during one year (2015-16) and assessed the cost of the trips undertaken to deliver only water to the installations/rigs for the year 2015-16 at `22.34 crore[37].

[37] *Vessel day rate for loading at Nhava and cost of HFHSD for 1,857 excess trips at the rate of ` 1,20,311 per day*

Management explained (October 2017) that such additional voyages were due to non-availability of sufficient quantity of water at NSB. However, Audit noted that optimum quantity which could be practically stored at the installations, were not delivered to them, thereby increasing the number of avoidable trips.

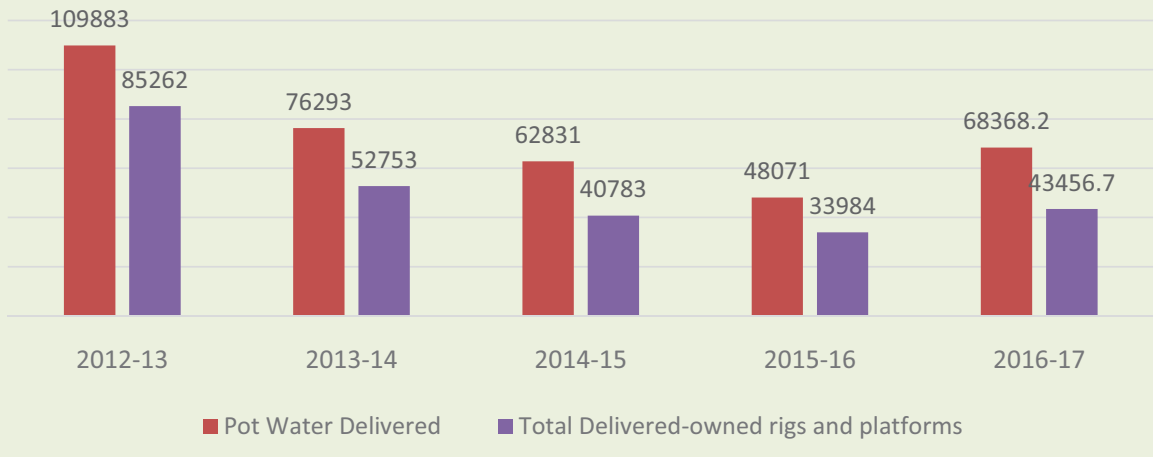
6.3.4 Impact of shortage of water on operations of the Company

The shortage of water was acute during the pre-monsoon summer months. The water requirement communicated by the rigs/platforms could not be met fully during this period and water supply was rationed based on availability. Consequently, preparation of mud required for drilling was affected and drilling work was disrupted. Audit observed that the idling time of the rigs, due to wait for supply of water increased from 137 hours in 2012-13 to 797 hours in 2016-17. It is pertinent to note that during the short period from 01 October 2015 to 08 November 2015 there were instances of idling of rigs for want of DW for a period of 173 hours (7.2 days). Considering the above, Audit observed that the rig waiting time cost the Company approximately `10.83 crore during 2015-16 calculated on the basis of rig hire cost without including the consequential delay/impact on operations.

6.3.5 Consumption of Pot water by rigs and platforms owned by ONGC

All the rigs/ platforms had provision for 'water-makers' onboard, which could produce PW. The chartered/hired rigs met almost their entire requirement of PW from the water-makers as PW supplied to them was chargeable. Audit observed that 64 to 78 *per cent* of PW supplied during the period from 2012-13 to 2016-17, was delivered to owned rigs deployed/platforms situated in Western Offshore. This was due to the fact that the water-makers were either not available onboard the owned rigs or their operational efficiency was low.

Chart 8: Total PW delivered to vessels versus Supply to own rigs/ platform consumption



Non-functioning/ inadequacy of water-makers in own rigs/platforms of the Company had been highlighted in CAG Audit Report 4 of 2002 (Para 4.1.7.8), Report 6 of 2005 (Para 2.3.2 *(vi)*) and in the report on Performance and Utilization of Rigs in ONGC (Audit Report 39 of 2015 Para 6.3 A, B). It was brought out in these Reports that replacement of water-makers was overdue in six out of eight owned rigs, while it was insufficient in the other two rigs. The Company in its reply had stated (April 2015) that the water-makers were being procured. However, Audit observed (June 2017) that only two out of five owned rigs could produce sufficient water to meet their daily requirements. The Drill Ship 'Sagar Vijay' deployed on the Eastern Offshore did not have a water-maker on board. Non-availability of water-maker resulted in avoidable procurement of 88,942 MT of PW from Kakinada Seaports Limited (KSPL) resulting in additional expenditure of ₹2.28 crore.

6.3.6 Return on Board of water by vessels

Audit pointed out (Para 5.5) that 52 *per cent* of bulk cargo carried was brought back to NSB as undelivered cargo ROB. Audit further observed that, on an average, the ROB of PW was more than 90 MT per voyage even while the supply of water from NSB was insufficient to meet daily offshore requirement.

With regard to issues brought out in Paras 6.3.1 to 6.3.6, Management stated (June/ September 2017) that storage tank of 5000 MT as recommended by the Consultants would be provided through upgradation of existing old tanks and planning of optimum quantity of water to be delivered to each rig would be carried out in consultation with drilling services. With regard to water brought back as ROB, it was stated that vessel movement was prioritized on the basis of deck cargo. The proposal for laying new pipeline along the existing line with a single connection for each village was being finalised with CIDCO.

Audit recommended that the Company may evaluate alternative options to ensure timely and adequate supply of water for offshore operations and operationalize the same at the earliest. Usage of water-makers onboard the own/chartered rigs may be ensured.

Ministry accepted the Audit recommendation.

6.4 Deficiencies in internal control procedures governing inventory management at shorebase

The shorebase was responsible for receiving the goods procured by the Purchase department, storage and their issue to the user departments upon requests raised by them through Stock Transfer Orders (STO). The Information Consolidation for Efficiency (ICE) Department of the Company has laid down the procedure to be followed in SAP system for recording of material movement. This stipulated that goods (materials, parts etc) requirement is raised by the Offshore Platform/Rig in the SAP system and are delivered from the shorebase.

Audit observed the following deficiencies in internal control procedures relating to inventory management in operation at shorebase:

6.4.1 Western Offshore

6.4.1.1 Management of supply of bulk cargo

Bulk cargo supplied by NSB included cement, barite[38] and HFHSD. For sending material to offshore, the first step is the creation of Stock Transfer Order (STO) followed by authentication of delivery by the stock holder. Audit observed that during the period from April 2016 to January 2017, bulk cargo was delivered to installations/rigs without raising the STO through the SAP system in 730 cases.

As per the accounting system of the Company, consumption of material was to be booked against the particular rig/ platform only when it was utilized. Audit observed that upto November 2015, the quantity delivered to/acknowledged by the vessels carrying the material was considered as Goods Issued (GI) for accounting of consumption in SAP. There were significant mismatches between the quantity acknowledged by the vessels (transporters) as receipt and the quantity acknowledged by the rigs/platforms (users) as receipt. Test check conducted by Audit revealed that during the period from 2012-13 to 2015-16 (till November 2015), the discrepancy noticed in the quantity of fuel (HFHSD) handed over to the transporters and delivered to the users were to the tune of 274.082 KL valued at ₹1.5 crore. In December 2015, the Company modified the accounting procedure and GI was prepared only when the quantity acknowledged by the users matched with the quantity handed over to the transporters. Pending resolution of the despatch and receipt quantity, 8,138 KL of fuel valuing ₹ 42.39 crore (period 2014-16) was lying in Material in Transit (MIT) in the books of the Company.

Audit also observed that GI for 253 items of HFHSD, 115 items of cement and 362 items of barite were not generated during the period December 2015 to January 2017, pending dispute on the quantity delivered by vessel and quantity acknowledged by the rig/platform. Audit further observed (March 2017) that fuel valued at `8.69 crore continued to be accounted as MIT/ Material at Site (MAS) with the Tanker B.C. Chatterjee in the SAP system although the vessel was de-hired in January 2016. The reason for discrepancy was absence of STO or issue of wrong STO. Despite the fact that some of the rigs had been de-hired subsequently and some of the Work Breakdown Structure[39] (WBS) elements had been closed, consumption by these rigs/ WBS were yet to be accounted in the SAP system. This resulted in under-reporting of capital work in progress and consequent under capitalization of the assets and lower depreciation being charged to the Profit and Loss Account.

6.4.1.2 Deficiency in material management procedures relating to casing pipes, tubulars, drill stores, well head, Xmas tree[40] spares etc.

No material should be lying under MIT for more than the reasonable duration of transit and its accounting. Audit observed that material supplied to vessels in January 2005 continued to appear as MIT as on March 2017.

[38] *Barite is a mineral commonly used as a weighing agent for drilling fluids*

[39] *Work Breakdown Structure is the process of subdividing project deliverables and project work into smaller, more manageable components as defined in the SAP ERP system.*

[40] *Xmas tree is a set of valves, spools and fittings connected to the top of a well to direct and control the flow of formation fluids from the well.*

Although a validation procedure was introduced (July 2006) in the system to reduce the quantity of MIT by restricting the creation of fresh STO by the user, if the same material was in transit for more than 60 days and the MAS was more than the requirement of three months consumption. Audit observed that there was no marked improvement (March 2017) in the number of items appearing under MIT.

In Western Offshore area, as on 31 January 2017, 9 *per cent* of the total material of value ₹2,164.64 crore was accounted as MIT. Although NSB has been in operation since 1983, there was no SOP laid down for receipt, issue and accounting of stores/ inventory. In the absence of an SOP and uniform set of procedures, the shorebase management at NSB was dependent on efficiency of individual practices. Audit also observed that casing pipes valued at ₹57.87 crore continued to be accounted under MIT for more than 1800 days as on 23 February 2017. The Company constituted a multi-disciplinary team in January 2017 to study and offer recommendations to address issues involved in reconciliation of cement and diesel issued by NSB and for resolving the dispute of goods issue at NSB. The report of the team was submitted in August 2017.

With regard to Para 6.4.1.1 and 6.4.1.2, Management stated (May 2017), that the booking of consumption of material was carried out by the user department. Inbound MIT of NSB was due to the material logistics section not handing over the material to stores for preparation of GR and that this was being actively followed up. The indenters had been advised (February 2017) to refrain from indenting more than the extra casings required since these ended up as inbound MIT and the utilization of SAP system for the issue and tracking of material would be discussed internally for implementation. However, Audit observed that the compliance with the recommendations of the multi-disciplinary team was incomplete (May 2018).

Audit recommended that the Company may finalise and implement an SOP for shorebase operations. Utilization of SAP system may be ensured for accounting of MIT and MAS. Standardized documentation may be developed for material/ equipment movements, accounting and reporting of inventory management across all units.

Ministry accepted the Audit recommendation and directed (December 2017) the Company to prepare SOPs for supply of materials for offshore operations and ensure implementation thereof.

6.4.2 Eastern Offshore

6.4.2.1 Non-Utilization of Offshore Logistics Management (OLM) Module of SAP System

The rigs raised indent for the material requirement to the stores either at Kakinada, Narsapur or NSB. In case of drilling materials stored at Narsapur and NSB, these stores issued Goods Issue Voucher (Delivery Note/MTN out) in SAP directly to respective rig location, though these material pass from stores to rigs through a chain of intermediaries like the Company's Logistic Department, stevedoring contractor and vessel contractor before actual delivery to the rigs.

Such material movements were not fully mapped as OLM Cycle of SAP is not utilised. This led to lack of effective monitoring of material movement in Eastern Offshore Asset.

Management replied (September 2017) that OLM module of SAP was not implemented at KSB due to lack of human resources and that they would expedite implementation after resolving the man-power issues.

6.5 Deficiencies in internal control procedure for stores/spares/equipment sent to outside agencies for repairs

NSB received material from offshore users after the use of store/equipment etc. This included items which were repairable and reusable, and those to be condemned. The repairable items were sent to outside agencies for repair and on return after repair, they were sent back to rigs/platform for their use.

Audit observed that records of the material sent for repairs outside NSB were not maintained in the SAP system. Audit observed that as per contract, materials sent for repairs to agencies outside NSB were to be returned within 90 days. During verification of manual register maintained by Drilling Services, it was noticed that out of 272 items sent for repairs during the period from 2012-13 to 2015-16, 56 items were yet to be returned to NSB as on 31 March 2017. This included 46 items not received for more than two years and 66 items received 93 days to 756 days after the time limit. The above deficiency pointed to lack of adequate procedures in place to monitor the non-receipt/delay in receipt of repairable materials.

Management and the Ministry assured (September 2017) that SAP system would be used and a system put in place to track outgoing/incoming of the materials sent out for repairs.

6.6 Deficiencies in internal control system at NSB governing physical verification of stores/spares

Proper storage and accounting of stores is part of sound inventory management. Examination of the practices adopted at NSB indicated that there was no SOP developed for storing and handling the material. This resulted in overstocking and the casing pipes, which formed the bulk of the inventory at NSB, being piled up without any demarcation.

Audit also observed that the Material Management group functioned only during office hours while the despatch of casing pipes and receipt of backload items were being carried out round the clock which can lead to non-accounting or delay in accounting of stores. The sheds/yards were operated by different stock holders. Backload materials were kept as a heap in the garden area, without any SAP MAT code, and irrespective of their condition, they were accounted as scrap.

The Company carried out physical verification of inventory through an independent agency in October 2016. The independent verification could, however, be done only for items with MAT [41]code and the report also highlighted gaps in internal control and stores maintenance procedure. The Consultant also observed that there was no system in place for proper handing over/ taking over of goods at the time of transfer. There was no closed-circuit camera installed in any of the sheds. Many items were seen to be lying for long period and kept in boxes which were not opened for many years.

Many times stock verifier observed that the trucks loaded with scrap items were moving out, and expressed doubt whether the same contains good items or scrap items. There was no proper check or control on such movement of goods.

Items marked for storage in covered sheds lying in open

Unused casings lying in the open

Management while attributing the deficiencies to shortage of manpower stated (September 2017) that attempts were made to improve the storage practices. Segregation of casing pipes had been carried out and good pipes were taken in to custody of Material Management Department. During 2016-17 though physical verification of 'A' category items were carried out, no discrepancies were reported. Management admitted that receipt of casing pipes/drill pipes by Drilling Tool Yard Store (DTYS) had been discontinued for a year and since the assets are not geared for the new system, materials were kept in heaps at premises. Further, due to limitation/ shortage of sheds, materials of more than one stock holder were stored under one shed leading to lack of control. Construction of new sheds, pipe rack and installation of CCTV camera in store section were to be initiated.

The reply has to be seen in the light of the fact that items returned from offshore neither had any MAT code nor were accounted for in SAP. They were also not subject to independent verification. There was steady backload of material from offshore, which included such unused casing pipes/ tubings. NSB did not have a Non Destructive Testing (NDT) facility to identify good/usable material from unusable material to be scrapped. The Company has to implement sound storage practices to ensure proper inventory control and accounting.

Audit recommended that the Company may improve the system of physical verification of the inventory and reconciliation, considering the nature of storage at NSB.

Ministry accepted the Audit recommendation and issued specific directions to the Company (December 2017) to take necessary action for modernization of NSB and that the best practices including inventory management through relevant software be implemented in NSB.

[41] *Material code in SAP*