

**DEPARTMENT OF COAL**

**CHAPTER: I**

**Northern Coalfields Limited**

**Integrated Business Solution**

*Highlights*

Integrated Business Solution (IBS) was not utilised optimally leading to unnecessary purchases of Rs. two crore though the same material was available in other projects.

*(Para 1.6.8.1)*

Materials worth Rs.13.69 crore were not consumed since their procurement.

*(Para 1.6.8.3)*

IBS had various deficiencies in input control leading to unreliability of database.

*(Para 1.6.9)*

Purchases made during 2005-06 were identified as non-moving due to incorrect mapping of business rule. This led to over provision of Rs.24.93 lakh during 2005-06.

*(Para 1.6.11.1(i))*

The absence of uniform logic in programming in Material Module and MIS Module resulted in difference of Rs.1.32 crore in identification of non-moving stores in respect of Bina Project.

*(Para 1.6.11.1(ii))*

**1.1 Introduction**

Northern Coalfields Limited (NCL), a subsidiary of Coal India Limited (CIL), is engaged in extraction and sale of coal. It operates nine open cast-mining projects (OCPs) which deploy Heavy Earth Moving Machinery (HEMM), one Central Workshop (CWS) and one Central Store. The Board of Directors (BOD) of NCL approved (September 2000) implementation of the 'Integrated Business Solution' (IBS) in NCL Headquarters and all its units. An agreement was signed (March 2001) with CMC Limited at a total cost of Rs.11.03 crore for supply and installation of hardware and system software, installation/upgradation of Local Area Network (LAN) etc. The other items of work included preparation of Business Mapping Report, customisation of Ramco e-application, codification of stores items, development of production and sales software and their integration with Ramco e-application, integration of payroll package etc. The project was to be implemented in two phases, the pilot phase in Headquarters and in two units at Bina and Kakri and the roll over phase in other units. The pilot phase was scheduled to be completed by November 2001 and the roll over phase by November 2002. However, the pilot project was completed in September 2002 and the system comprising Phase I and Phase II was accepted in totality in March 2005. An amount of Rs.23.89 lakh was deducted from the bills of CMC on account of

liquidated damages for delay in service and supplies, ranging from three to twenty two weeks.

### ***1.2 Scope of Audit***

The Integrated Business Solution (IBS) contains six modules viz. Finance, Material, Maintenance, Production, Sales, and Management Information System (MIS). The scope of audit included examination of all the modules and the extent of integration of the total system.

### ***1.3 Audit Objectives***

It included examination of the following aspects:

- (i) Status of implementation of different modules;
- (ii) Mapping of the business rules;
- (iii) Completeness and correctness of the data output; and
- (iv) Achievement of the overall objectives of the organisation.

### ***1.4 Audit Methodology and Acknowledgement***

Audit was conducted through study and scrutiny of records/ documents, discussion and interaction with the Company officials and data analysis through IDEA on inventory database followed by verification, wherever necessary. Audit of IBS was conducted in March and July 2006.

Audit takes this opportunity to thank the Management and staff of the NCL for their cooperation and assistance in the conduct of this performance audit.

### ***1.5 Audit Criteria***

- (i) Objectives set by the Company at the time of introduction of IBS.
- (ii) Accounting policy adopted by the Company.
- (iii) Business Rules and procedures followed by the Company.

### ***1.6 Audit Findings***

#### ***1.6.1 Utilisation of IBS***

IBS is an ERP solution and encompasses all the activities of the organisation. During the course of Audit, it was observed that though the system was accepted and implemented in all projects by March 2005, only Material module was being used in all the projects.

#### ***1.6.2 Finance module***

The annual financial accounts of the Company could not be drawn up for the year ended 31 March 2006 through the system in projects like Bina and Kakri also, where IBS was implemented in September 2002 as a pilot project. Non-integration of the Inventory module with Finance module led to dependence on manual financial control on purchases. Mode of allocation of cost between coal and over burden (OB) was not defined in the system. As

such, due to lack of allocation of costs among the sub projects, the financial and physical efficiency of sub projects could not be determined.

The Management accepted (May 2006) that allocation of actual cost between coal and OB had not yet been implemented and stated (December 2006) that purchase order generation from projects together with budget certification through the system would be considered for implementation and efforts would be made for better utilisation of the Finance module at Kakri and Bina along with other projects.

### ***1.6.3 Production module***

This module consisted of basic data, machine wise and unit wise, relating to production of coal and OB for utilisation in various MIS.

Out of nine OCPs, this Module was being used in four OCPs only viz. Jhingurdah, Dudhichua, Amlohri and Khadia. Production related data was not being fed into the system in the remaining five OCPs. Therefore, electronic flow of data from the projects to Head quarters could not be consolidated for various managerial decisions and consolidated production reports for the Company as a whole could not be generated through the system.

The Management accepted (December 2006) that the desired level of usage had not been achieved.

### ***1.6.4 Maintenance module***

This module including equipment task, Plant & Machinery parts forecast, automatic work order generation, material planning, monitoring equipment parameters, generation of reports etc. was not utilised due to partial data entry.

The Management accepted (December 2006) that the desired level of usage had not been achieved.

### ***1.6.5 Sales module***

This module including facilities for sales order management, sales billing, sales realisation, sales ledger etc. could not be utilised for reconciliation of billed and realised amount as payments were made in lump without any reference to any bill or any project and there was no provision to cross-check the same.

The Management stated (December 2006) that wherever complete bill wise payment details were not available, adjustments were made on FIFO basis and further adjustments would be done during reconciliation. However, the Management could insist on a reference to the relevant bill numbers when payments were received, for ease of reconciliation.

### ***1.6.6. Material module***

The material module comprising Purchase planning, Purchase order processing, Inventory management, Inventory planning etc. was being utilized fully in all the OCPs. Audit observations on the data base of this module regarding error of logic in programming, data validation etc. have been discussed in the subsequent paragraphs.

### ***1.6.7 Management Information System (MIS) module***

This module was designed to depict summarised information on the entire business package with the facility for customisation to meet the requirement of various Projects as well as of various levels of management. However, the Management incorporated only inventory related data in the MIS module. The relevant data was extracted from the Material module of IBS. However, in respect of Gorbi and Central Stores it was extracted from the Plant care package, which was an old package. The extracted data was fed into the MIS module of IBS in Headquarters to generate different kind of standard reports. During audit data analysis was conducted on the inventory database of the module. Results of such analysis have been given in subsequent paragraphs.

This module was not integrated with the other modules of IBS.

The Management stated (December 2006) that due to poor connectivity and the old Plant care system being used in Central Stores and Gorbi project, MIS module could not be integrated with other modules of IBS. However, it assured that the MIS module would be integrated with other modules and old system kept as back up.

### ***1.6.8 Non-utilisation of IBS in ensuring inventory control management***

On introduction of the integrated on line ERP Package, it was expected that inventory would be managed on the basis of centralised store concept though stores might be located at different places. It was however, noticed that Minimum, Maximum, Re-order and safety levels were not fixed in the system to reduce the inventory holding costs.

The Management stated (December 2006) that the procurement and indenting of high value items of spares and consumables was centralised. It also stated that due to the special nature of the industry it was difficult to predict the breakdown of various HEMM. However, for timely supply of stores and spares they adopted various strategies like Depot agreement and rate contract with various suppliers. The Management reply was not tenable as fixation of Minimum, Maximum, Re-order and safety level at least for critical items was necessary for better inventory management.

***1.6.8.1*** It was observed that in 286 cases valued at Rs. two crore, purchases were made during 2005-06 though similar materials were lying unmoved for a considerable period in other OCPs. Since IBS was implemented in all OCPs by March 2005, stock in other OCPs should have been taken into consideration before deciding on fresh purchases.

The Management stated (December 2006) that it had instructed the projects to ensure gainful utilisation of these materials on priority basis before initiating any fresh purchase.

***1.6.8.2*** In respect of 2028 items valued at Rs.4.05 crore, there was no consumption since the date of last purchase. Of these 1417 items valued at Rs.2.08 crore remained unutilised for over three years.

***1.6.8.3*** There were 6738 items valued at Rs. 13.69 crore where no date of issue was available in the data base implying that these items were never utilised since their procurement.

The Management stated (December 2006) that the useable items would be identified and action for their use in other projects would be taken.

### ***1.6.9 Input control and validation checks***

To ensure correctness and reliability of the data it is necessary to ensure appropriate input control and data validation. The following lacunae were noticed in Audit regarding input control and data validation.

***1.6.9.1*** The system accepted dates after 31 March 2006 for incorporation in the database of 2005-06. In Kakri Project, 12 different items issued for consumption in April 2006 (financial year 2006-07) were shown as issued in 2005-06.

After this being pointed out in Audit, the Management stated (December 2006) that the necessary validation check in this regard had been put in the system.

***1.6.9.2*** In some cases the last issue dates and last receipt dates of materials were before the date of incorporation of the Company.

The Management accepted (December 2006) that there were some invalid dates of issue and these would be examined for further improvement of the system.

***1.6.9.3*** In respect of 1146 items pertaining to Gorbi and Central Stores, description of material was not mentioned. In respect of 2070 items the description was shown as “00” or “000000”.

The Management stated (December 2006) that Gorbi store was closed and items relating to Central Stores would be deleted on implementation of IBS at Central Stores.

***1.6.9.4*** In respect of 17253 items of Gorbi and Central Stores, the unit of measurement (UOM) was not mentioned. In respect of 20063 items UOM were shown as 30, 45, 71, 81 etc. instead of number, Set, MT etc. In respect of 216 items of same material, the description was different.

The Management stated (December 2006) that corrective action had been taken in respect of blank UOM. In respect of other points, they stated that the problems would be solved with the implementation of IBS at Central Stores.

***1.6.9.5*** NCL adopted an 11 digit code for stores and spares. It was noticed that in respect of 113 items, material code was less than 11 digits, making it incorrect.

The Management stated (December 2006) that these items were not in use and there was no financial implication. The Management reply did not justify the existence of less than 11 digit material code. Proper validation controls were needed to be incorporated and the irrelevant items that were no longer required should be removed from the data-base.

### ***1.6.10 Inadequate and incorrect mapping of business rules***

NCL prepared Business Mapping Report (BMR) detailing the business process for designing the system. It was observed in Audit that mapping of business process was inadequate in some cases and incorrect in some other cases as detailed below.

#### ***1.6.10.1 Inadequate mapping of business rules***

Advance payments made to the contractors and suppliers were not automatically linked at the time of passing the final bill in respect of work order or purchase order executed by them.

Separate Adjustment Vouchers were prepared for the purpose. Thus, it was possible for the user to bypass preparation of Adjustment Voucher and pass the final bill without adjustment of advance amount.

The Management stated (December 2006) that it would take up the matter with CMC for implementation in the next phase.

In case a vendor is black listed, his name and code can be deleted from the vendor master. However, names of black-listed suppliers should be maintained in a separate module so that the system could validate names of the suppliers before allowing any transaction with a supplier.

The Management stated (December 2006) that it had decided to flag such vendor codes instead of deleting them.

For repairing any equipment in the Central Workshop, one work order is generated in the system to book the material and labour utilised for the purpose. After completion of the repair job, the total cost is debited to the OCPs to which the equipment belonged.

It was however observed in Audit that Central Workshop has its own equipment, which are used for repairing of equipments of different OCPs. Before introduction of IBS, work orders were generated to draw material from stores for repairing own equipment also. Since there was no scope to debit any project for cost of such repair work, these work orders still remained open, though equipment had been repaired and put to use long back. No facility had been provided in IBS to take care of the booking of material consumed for own equipment. Therefore, after introduction of IBS, no work order was generated in such cases and the material was drawn from stores against requisitions. The earlier difficulty regarding booking material cost thus persisted even in IBS.

The Management assured (December 2006) that such work orders would be closed and charged to own expenses.

### ***1.6.11 Incorrect mapping of business rules***

#### ***1.6.11.1 Error in logic of programming***

- (i) As per the adopted accounting policy of NCL, 50 *per cent* provision is made in annual accounts against the stores and spares that have not moved for five years or more after purchase. Non-moving stores are identified at Headquarters. Data is, however, taken from the Material Module at OCPs in text form and fed into the MIS Module of IBS at Head quarters. Material in hand as on 31 March 2006 was treated as non-moving for more than five years, if the last issue date was prior to 1 April 2001. If the last issue date was not indicated, then the item was treated as non-moving if the last purchase date was prior to 1 April 2001. Analysis of inventory data relating to non-moving items showed that 218 store items valued at Rs.49.86 lakh, purchased during the year 2005-06, were identified as non-moving as on 31 March 2006 since last issue date in respect of these items was prior to 1 April 2001. This was incorrect because non-moving stores were to be identified with reference to the date of purchase of stores/spares, which remained unmoved for more than five years.

Thus, due to a logical error in programming, there was an over provision of Rs.24.93 lakh (i.e.50 *per cent* of Rs.49.86 lakh) during 2005-06.

The Management accepted (December 2006) that some changes in the programming logic were required and these were in the process of implementation.

- (ii) The logic applied in programming for identification of non-moving stores through the Material module was different in several ways from the MIS module. In MIS module, issue date as well as purchase date (where issue date was not available) was being considered whereas in Material module only the issue date was being considered for determining non-moving store. It was observed in Audit that the value of non-moving stores, as on 31 March 2006, generated through Material module in Bina Project was Rs.2.46 crore whereas the same generated through MIS module was Rs.3.78 crore.

The Management (December 2006) assured that they would adopt uniform logic in both the modules.

- (iii) In Material module, if issue date was not available in the data base, the corresponding closing stock lying for more than five years was not shown under non-moving stores.

The Management accepted (December 2006) that the prevailing logic for identification of non-moving items needed more refinement and assured adoption of new logic.

#### ***1.6.11.2 Transfer date considered as issue/receipt date***

Materials are regularly transferred among different OCPs. In the database, the field 'issue date' denotes material issued for consumption in the project itself while the field 'transfer date' indicates the date of transfer to other projects.

While extracting inventory data through an interface programme from the Material module for feeding the MIS module at Headquarters, the later of 'issue date' or 'transfer date' was considered the last issue date. Similarly, the later of 'purchase date' or 'transfer date' from other OCPs was considered as the last purchase date. As a result, last issue date and last purchase date included transfer date to/from other OCPs also though there may not have been any actual consumption or actual purchase. Data analysis in Audit revealed that, in respect of 668 items, date of transfer to other OCPs was considered as last issue date during 2005-06. Similarly, in 3495 items, transfer date from other OCPs was considered as purchase date. Thus, non-moving stores were being determined on the basis of wrong data in respect of last issue date and last purchase date.

The value of non-moving stores and spares for a period of more than five years as on 31 March 2006, as determined by the Management, was Rs.41.86 crore. As per accounting policy of NCL, 50 *per cent* provision of the above amount i.e. Rs.20.93 crore had been made in the accounts. Because of reasons brought out above, the quantum of provision made in the accounts was incorrect.

The Management stated (December 2006) that it had corrected the data transfer programme.

### ***1.6.12 Non classification of consumables***

Consumables consisting of mainly POL and small items of stores like elbow, flange, sockets, unions, valves and nipples etc. were not analysed for ascertaining the value of non-moving stores and spares under these categories. Consumables were of the nature of regular consumption and were not expected to lie unconsumed for long time. On analysis of closing inventories as on 31 March 2006, consumables valued at Rs.1.56 crore were found to be lying for a period of more than five years. No action was taken by NCL to ascertain unusable items of consumable stock and make necessary provision in the accounts.

The Management stated (December 2006) that it would include consumables for analysis of non-moving inventory.

### ***1.6.13 Non inclusion of World Bank spares in IBS***

World Bank spares were kept outside the scope of IBS though it was technically possible to incorporate the same. Thus, weighted average rate for the purpose of issue of similar spares and the closing stock valuation were vitiated. Thus, the Priced Stores Ledger (PSL) generated by the system did not include the value of World Bank spares.

The Management assured (December 2006) examination of the issue of merging data base of World Bank spares.

### ***1.6.14 Business continuity and disaster recovery***

IBS is an ERP solution and encompasses the total activities of the organisation. In spite of its critical importance for the overall functioning of the Company, it had not drawn any Business Continuity and Disaster Recovery Policy (November 2006).

The Management stated (December 2006) that the policy in respect of business continuity and disaster recovery was being taken up by Coal India Limited.

## ***1.7 Conclusion***

Implementation of IBS in NCL was delayed by more than 28 months. The absence of total integration among different modules was noticed besides under utilisation of the modules with the exception of the Material module. Besides, lack of input validation control in MIS module and errors in mapping of business rules were evident. Thus, the basic objectives of introducing an ERP package could not be achieved so far.

## ***1.8 Recommendations***

- Suitable modification may be carried out by CMC to provide automatic adjustment of advance amount at the time of payment of final bill.
- Minimum and maximum limits should be fixed for critical items in each OCP. The system should be capable of capturing excess, if any, of the stock held at various locations before initiating any purchase.
- In the Central Workshop, old work orders pertaining to own job should be closed.

- Important points regarding errors of logic and formulation of business continuity and disaster recovery plan brought out in Audit should be addressed by the Management urgently in a time-bound manner.

The matter was reported to the Ministry in December 2006; reply was awaited (December 2006).