A Study of Vendor Management Inventory with Reference to TATA STEEL

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Abstract

The bond between the distributors and customers addresses the success rate in the process of inventory management. Vendor Management Inventory (VMI), through the effective use of technology, fosters a lasting relationship between them. Under this system, the distributor (seller) of products (e.g. Steel) monitors and manages a customer’s (buyer’s-in) inventory levels, often through a system of automated data collection and analysis. When product inventories drop below a specified level (re-order point), the distributor dispatches a delivery based on previously agreed-upon criteria. As a result, the buyers will be able to have the inventory available as soon as the need arises, without incurring the costs and risks of keeping a large surplus on hand. This paper tries to highlight the process of VMI and its benefits over any other form with specially considering the processes adopted in Tata Steel, Jamshedpur, India.

Introduction

Vendor Managed Inventory (VMI) is a means of optimizing Supply Chain performance in which the manufacturer is responsible for maintaining the distributor’s inventory levels. The manufacturer has access to the distributor’s inventory data and is responsible for generating purchase orders. Traditional approaches to inventory planning based largely on rules of thumb rather than formal data analysis –lead to out-of-stock situations and supply inefficiencies. The complexities and uncertainties represented by today’s constantly evolving global supply chains demand a dynamic new approach, and that’s called inventory optimization. In a VMI partnership, the supplier, usually the manufacturer but sometimes a reseller or distributor, makes the main inventory replenishment decisions for the consuming organization. This means that the vendor monitors the buyer’s inventory levels (physically or via electronic messaging) and makes periodic resupply decisions regarding order quantities, shipping, and timing. Transactions customarily initiated by the buyer (such as purchase orders) are initiated by the supplier. Indeed, the purchase order acknowledgement

Key Words: VMI; Tata Steel; Supply Management; Technology; Buyer-seller
from the vendor may be the first indication that a transaction is taking place: an advance shipping notice informs the buyer of materials in transit.

VMI model is an integral element laid down in the supply chain. As per this, one manufacturer supports all the retailers/customers through distribution centre (DC) of several types: Manufacturer Owned DC, Retailer/Customer Owned DC and a 3rd Party Owned DC. It depicts how the process works from manufacture to customers. Although VMI have the term “managing the inventory” it does not necessarily mean that vendor should have a huge inventory. A lean manufacturer would be able to get the best advantage of this concept than a traditional manufacturer if managed carefully. Having a front end working in VMI model and the back end of the business working with lean manufacturing makes a powerful combination. Historical improvements in supply chain effectiveness have been achieved through efficiency gains. This includes:

- Spending less time on physical inventory counts.
- Less time finding misdirected inventory, and
- Less time entering data into large customized systems.
- Even innovations such as cross-docking were essentially ways of accelerating the distribution system and reducing the cost of intermediate steps.
- Advance shipping notices (ASNs), bar coding and other electronic enhancements brought savings by decreasing supply chain inventory, speeding up the distribution process and saving handling costs for both shipper and receiver.

VMI, however, includes these concepts but is also the first approach which allows information to be used more intelligently and effectively. Therefore, strategic elements as well as a technological competency are the two primary mechanisms necessary for successfully gaining benefits from VMI.

Why VMI?

As there are various inventory models like Min/Max, Bonded Inventory, In-Plant Stores, Consignment Stores, Kanban, and VMI etc. that different organization does apply according to the needs of the organization, the genuine question that needs attention is ‘why VMI?’.

Success in supply chain management usually derives from understanding and managing the relationship between inventory cost and the customer service level. The most attractive projects yield improvements along both dimensions, and this is certainly the case with VMI. To begin, we examine how each partner in a VMI relationship reduces cost and improves service.

- **Reduced Cost**: Demand volatility is the key problem facing most supply chains, eroding both customer service and product revenues. In traditional retail situations, sales fluctuations are made worse by management policies. Ordering patterns may be aggravated by demand uncertainties in general, conflicting performance measures, planning calendars used by buyers, buyers acting in isolation, and product shortages that cause order fluctuation.

  Many suppliers are attracted to VMI because it mitigates uncertainty of demand. Infrequent large orders from consuming organizations force manufacturers to maintain surplus capacity or excess finished goods inventory, which are very expensive solutions, to ensure responsive customer service. VMI helps dampen the peaks and valleys of production, allowing smaller buffers of capacity and inventory. Buyers are attracted because VMI resolves the dilemma of conflicting performance measures. End-of-month inventory level for example, is a key performance measure for retail buyers, but customer service level (tracked by some sort of out-of-stock measure) is also applied. These measures are contradictory. Buyers stock up at the beginning of the month to ensure high levels of customer service, then let inventory drop at the end of the month to “meet” their inventory goals (disregarding the effect on service level measures) The adverse effect is even more pronounced when end-of-quarter incentives are tied to financial reporting. The combined result of this behavior is a monthly order spike to the supplier.

- **Improves Services**: With VMI, the frequency of replenishment is usually increased from monthly to weekly (or even daily), which benefits both sides. The supplier sees a much smoother demand signal at the factory. This reduces costs by permitting better resource utilization for production and transportation; it also reduces the need for large buffer stocks. The vendor can make replenishment decisions according to operating needs, and also has heightened awareness of trends in demand. The consuming organization benefits from legitimately lower cycle stocks, not just low end-of-month inventories intended to make performance lead
the reward system. Even if the buyer has surrendered ownership to the supplier, many benefits arise from improved transportation and warehouse efficiencies. Moreover, service levels will go up at the end of the month or quarter.

**Issues when Implementing VMI**

Initial problems with VMI often relate to systems/data limitations. Initially it is probably best to narrow the focus of VMI and to better understand configuration, operational, and procedural issues prior to larger-scale implementation. For success it is key to be able to move vendor relationships in a direction of minimizing total supply chain cost. The cost saving benefits will then be available to all parties. Before introducing VMI in full-scale operation, one should do a pilot testing so that if any changes to be done with the whole set-up, it could be done earlier without actually being implemented in real time situation that might result in disaster to the organization. A pilot program may incorporate the following elements:

- A few vendors (any that are already running VMI with other customers) who represent top suppliers in terms of relationship, competency, and willingness to test VMI concepts in an active supplier-distributor relationship should be considered.
- An EDI (Electronic Data Interchange) protocol standard to transmit information every night has to be agreed upon.
- A set of SKUs involved must be decided upon.
- Initially a high degree of human involvement may be required till the system stabilizes.
- At this point, the pilot program often runs into process and conceptual concerns that are typical of organizations moving to true full scale VMI. These include:
  - The belief that the consumer can manage its inventory better than their vendors due to the customized nature of their systems and the responsiveness of their replenishment team, and their dedication to minimizing inventory while maintaining appropriate stocking levels in support of high customer cycle service rates.
  - The limitations of existing computer system.

The overall goal must be to support total value chain cost minimization by pushing decision making on replenishment activities furthest up the supply chain. This approach supports cost savings because the value of pooling orders and producing to accurate demand patterns with timely information (i.e., variability minimization) yields lower inventory investment if executed effectively. The complexity, however, is in allocating the savings gained to each participating supply chain stakeholder effectively and fairly.

As a benchmark to measure progress of the pilot program, the company can initiate improvement goals for vendors involved in the pilot program. However it is important that VMI be implemented in its truest sense, else it will be difficult to assign a cause to any failures.

Pilot programs tend to reveal several challenges for implementing the concept. Some of the challenges that generally occur are:

- Redefining the relationship with the vendor
- Handing over previously considered proprietary information
- New processes and job tasks.
- Setting up new metrics for measuring the vendor's performance.
- Establishing Electronic connections

These are the few common issues that generally occur during the pilot program. These and other issues will need to be resolved collectively by supply chain partners and can take considerable time but, nevertheless, move the organization in the right strategic direction.

These are the various issues that every organization faces and even TATA-STEEL is no exception to it. The main research of the project hovers around what exactly VMI is all about and how TATA-STEEL is going over to the problems that they are generally facing while implementing VMI for organizational benefit.

**VMI: A Back Seat Driver**

What have organizations been able to gain as a direct result of incorporating both the strategic and technical elements
of VMI in their operations? From our research, VMI can have a number of benefits, including lowered investment in the supply chain (due to better forecasting), JIT delivery and less overstocking) and greater inventory turnover. Its primary benefit, however, is improved customer service due to fewer stock outs and more optimal product mixes. Mfg/vends also stand to benefit from VMI, as it allows them to schedule production and transportation more efficiently (including ordering raw materials), to observe end-user consumption and general market trends more closely, and to develop closer ties with their customers. In summary, the benefits are as follows:

<table>
<thead>
<tr>
<th>Typical Benefits to Vendor</th>
<th>Typical Benefits to Distributor/Retailer</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lower inventory investment (raw and finished)</td>
<td>• Fewer stock outs with higher turnover</td>
</tr>
<tr>
<td>• Better scheduling and planning</td>
<td>• Better market information</td>
</tr>
<tr>
<td>• Better market information</td>
<td>• More optimal product mixes</td>
</tr>
<tr>
<td>• Closer customer ties and preferred status</td>
<td>• Less inventory in channel (transfer costs)</td>
</tr>
<tr>
<td></td>
<td>• Lower administrative replenishment costs</td>
</tr>
</tbody>
</table>

As previously mentioned, it is clear that a number of critical components must come together to form a successful VMI program. If these components are present the results can be dramatic. There are various organization implementing VMI to give a new dimension to their work and to increase its productivity in the long run. VMI generally acts as a back seat driver to enhance the productivity of the organization and to make it competitive for the ever changing market scenario. Following are the organizations that implement VMI successfully: Wal-Mart and Proctor & Gamble, Western Publishing-Golden Books, VF Corporation’s Market Response System, Spartan Stores, K-mart, ACE Hardware, Fred Meyer, Grand Union, Oshawa Foods and Panduit, one of the largest manufacturers of components for the electrical industry.

Methodology and Data Collection
In order to study the vendor management inventory at Tata-Steel, the project will make use of two sets of methodologies.

• Analytical study on the basis of various secondary data pertaining to the processes the company is following, and
• Analysis of primary data (collecting the information about procurement of raw material from various places/analyzing the warehouse inventory) mostly through observation method for substantiating the figures generated from secondary data.

Primary Data
• OBSERVATION METHOD: Observation method is a method under which data from the field is collected with the help of observation by the observer or by personally going to the inside of works.
• INTERACTION METHOD: This method of collecting data involves presentation or oral-verbal stimuli and reply in terms of oral-verbal responses.

The entire primary data is being collected from Home Delivery Section of TATA-STEEL and the Strategic Sourcing Department along with the Supply Management Department.

Strategic Sourcing Group (SSG) at Tata Steel uses analytical skills and cross-functional expertise from throughout Tata Steel and its suppliers as the need may be. The SSG has a dedicated group of Analysts from different streams of engineering background. Each Commodity Analyst is attached to a set of specific commodities. Analysts work on developing commodity specific strategies and act towards building a relationship that benefit both customer and the supplier. Analysts identify, evaluate and negotiate with suppliers and manage overall pricing issues along with the Segment Leader and Commodity Analyst. They are responsible for meeting our objectives and constantly looking for ways to reduce cost. They formulate sourcing strategy for the assigned commodities by working with the cross-functional teams called ‘Commodity Competence Team’ (CCT).

Analysts provide tools, resources and knowledge through techniques such as Benchmarking, VE, QIPs and VMI (i.e. Vendor Managed Inventory), E-Procurement, and Knowledge Management. These tools contribute to optimize overall costs, material flow and response time on all sides -- with our suppliers, and with our customers. One of our goals is to reduce the number of discrete one-time purchase orders and include more products and suppliers in Annual Rate Contracts (ARC's) list.

• Steering Committees
• Strategic Sourcing Team Structure
• Commodity Competence Teams
• Strategic Sourcing Group – Roles
Secondary Data

Data which are already available have been collected and analyzed by someone else. Secondary data may either be published or unpublished data. As a researcher one must be very careful in using secondary data, because the data available may be sometimes unsuitable.

Overview of Tata Steel’s Supply Chain Management

The long journey of Tata Steel has seen the Company re-define its performance parameters in a number of ways to become the global steel industry benchmark for value creation and corporate citizenship. It ensures a total commitment to its ethical business practices and a people orientated vision. The Tata Steel Group has always believed that mutual benefit of countries, corporations and communities is the most effective route to growth. Tata Steel has not limited its operations and businesses within India but has built an imposing presence around the globe as well.

Tata Steel’s B2B Procurement Platform

The e-Procurement site is TATA STEEL’s B-to-B procurement platform and is one of the first, among many future-looking initiatives being undertaken by Tata Steel to tap the tremendous opportunity offered by Information Technology, especially the Web, towards conducting business with its partners in a better way. The site offers Web based multi-directional flow of transactional and business information, between transaction participants which forms the backbone of the Internet revolution as applicable in the B-to-B scenario. All cross-organizational elements of the Inbound Supply Chain, including Enquiry/RFO details, Online and Offline Quotation logging, Order Placement, Delivery compliance monitoring, Order amendments, Material Receipt and Payment tracking are covered and may be transacted through this site. In addition, value-added services such as Negotiation Chat Room with Bid revision tracking (Reverse Auction), Transactional correspondence (mails initiated on a transaction hitting appropriate mailboxes) and e-Mail notifications and acknowledgements, are also offered. While the site incorporates all the basic functionalities that may be required, a continuous effort towards providing value-added services and features is on. As and when, such modules are released, the “New Releases” link shall be updated to help users understand the procedure involved in using the product.

Raw Material Sourcing and Procurement

Tata Steel’s Indian operations are self-sufficient in iron ore through its captive mines. The mines and collieries in India give the Company a distinct advantage in raw material sourcing. It is 60% self sufficient for coking coal and the rest is procured mostly through imports.
out the receiving, issue of Road Permit, invoice verification, warehousing, issue including home delivery and material requirement planning of all stock items. Supply Management Department (SMD) is one of the core departments, which is an interface between the Suppliers and the Operations. This is one of the crucial cost centers, which is responsible to indent and stock all the items that are ordered by the departments under various sections in TATA STEEL.

**Quality Objectives of Supply Management Department**

- Achieve service level of 95%
- Achieve items delivered through home delivery above 12000 numbers and cycle time less than 15 days.
- Achieve customer satisfaction index above 90%
- Keep number of red invoices to zero.
- Keep cycle time of issue of road permits to 2 days for request from departments for urgent items.
- Achieve zero accidents.
- Achieve quality certification as per TS:13001:2.0
- Achieve EMS 14001 certification as part of work.
- Achieve GRN cycle time less than 3 days.

**Procedure for Material Procurement at TATA Steel’s SMD Department**

This Part of the procedure is applicable to Refractory materials. The Unit Leader Refractory Planning is responsible for implementation of this part of the procedure.

- The Refractory Orders are released on the Vendor with terms and condition to supply material at site with payment terms based on material consumption certification.
- Vendors’ truck arrives to Refractory stores.

- **For Material Based on Consumption**
  - The Asst Foreman notes down details and issues a Lorry Challan.
  - Vendors’ truck moves to consuming department and unloads material with his own labor.
  - Material is consumed and the consumption report is certified by the shop’s Foreman and reservation No. is generated and noted in the Lorry Challan.
  - Vendor collects Lorry Challan and attaches all other documents such as original Invoices, Cenvat documents and TCGC.
  - Vendor hands over all the documents in Refractory Planning Office.

- **For Material Based on Direct supplies**
  - The Truck driver submits all documents at Refractory Planning Office.
  - The Asst Foreman notes down details of material and quantity in Lorry Challan and hands it over to the Truck driver.

- The Truck moves to consuming department with Lorry Challan and unloads the material with vendors labour.
- The Reservation No. is created by consuming department and noted in the lorry Challan.
- All the Invoices of Vendor and Lorry Challan is sent to Refractory Planning Office.
- The Reservation number, Vendor’s Invoice Number and Lorry Challan is noted in the register in Refractory planning Office.
- Data Entry Operator enters data and raises GRN and simultaneously charges against the reservation.
- The Excise report is taken out and sent to excise section with Vendor’s Cenvat Invoice.
- The Invoice Verification is done and the Original Invoice is filed in Invoice Verification Serial file and extra copy is filed in suppliers GR file.

**Findings**

Materials management in Tata Steel has a long history alike Tata Steel itself. Tata Steel management has always opted for a change and adopted strategies to be abreast with the world-class management practices. The first Materials management system in Tata Steel was Burroghs, and then came IBM in 1993. It took 6 years for IBM to mature and to meet the requirements of Supply Management of this process industry. The expanding operations demanded an Enterprise solution, which could integrate all the business functions that comprise Supply Chain Management, Logistics, HRM, Marketing and Finance etc. So, in 2001, Management adopted SAP and implemented it within a record time of 9 months, with the help of Price Water house Coopers.

With the adopted strategies for material management, Tata-Steel was finding it difficult to manage the in-house Inventory which was zooming up at a very high pace every financial year, thereby raising the holding up cost and hitting the Bottom-Line hard. In view of reducing the Inventory, Tata-Steel came up with the idea of Implementing Vendor Management Inventory for taking care of the inventory at bay, the first of its kind till now. VMI better known as, had a successful result in the retail sector and automotive sector was being tried out at a manufacturing unit at large was obviously a great move.

To implement VMI big time it needed to modify the supply chain management to get the optimum result out of it. VMI had a very long history wherein if not implemented properly will hit the whole system and can bring down the whole company in no time. The modification that Tata-Steel did was segregating the materials into A,B,C,D class of items for easy reference and close monitoring of the level of Inventory.

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Materials Management under SAP has been advocated through segregation of the items in SMD under A,B,C & D Class. This ABCD indicator is being assigned to all the materials according to some criteria, to help the planners in their Planning Approach. This classification has been made on the basis of two criteria:
- Last Year Consumption Value (LYC value)
- Consumption Quantity

**Basis of ABC Classification:**

ABC Class: Moving Items (Consumption qty in past 24 months >=24)
D-Class: Slow Moving Items (Consumption qty in past 24 months <=23)

ABC is further subdivided on the basis of LYC (Last Year Consumption) Value.
Top 80% LYC Value Items: A Class
Next 15% LYC Value Items: B Class
Last 5% LYC Value Item: C Class

i.e. A items are High consumption value
     B items are Medium consumption value
     C items are low consumption value

**High Cost/ Slow Moving** Items are the ones, which accumulate high capital (say 80% as per Pareto Analysis) and are D-Class items. The movement of such items is slow and blocks capital for a long time. So, it does not stand advisable to stock such goods in high quantity and is a matter of great concern to the management.

<table>
<thead>
<tr>
<th>Class Type</th>
<th>Total value in Rs.</th>
<th>Total No. of Items</th>
<th>% Share in Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>76,792,478.70</td>
<td>180</td>
<td>0.3206</td>
</tr>
<tr>
<td>B</td>
<td>3,317,455.93</td>
<td>24</td>
<td>0.0138</td>
</tr>
<tr>
<td>C</td>
<td>317,833.81</td>
<td>15</td>
<td>0.0013</td>
</tr>
<tr>
<td>D</td>
<td>159,126,366.22</td>
<td>3821</td>
<td>0.6643</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>239,554,134.66</strong></td>
<td><strong>4016</strong></td>
<td><strong>1.0000</strong></td>
</tr>
</tbody>
</table>

Looking at the consumption it was found out that inventory cost of Tata-Steel was as much as 239 crores which were obviously alarming as per the company of Tata-Steel's stature. So bring it down it needed to come up with new innovative idea. So, VMI was planned and was ready for implementation.

VMI was implemented at Tata-Steel way back in the year 2002-03 and VESUVIUS being one of the prominent Vendors along TATA-REFRACTORIES to be associated in implementing VMI. Some of the Vendors along with there productions are given below:

**Buy of Refactories (Vendor Wise) Year 2009-10**

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Vendor's Name</th>
<th>Quantity in Kg</th>
<th>Loc. curr. amount</th>
<th>% of total value wise Buy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC82</td>
<td>TATA REFRACTORIES LTD.</td>
<td>6965719.230</td>
<td>258236182.910</td>
<td>37.12</td>
</tr>
<tr>
<td>V216</td>
<td>VESUVIUS INDIA LTD</td>
<td>2256805.400</td>
<td>88127436.030</td>
<td>12.67</td>
</tr>
<tr>
<td>TF2F</td>
<td>TRL CHINA LIMITED</td>
<td>2495144.800</td>
<td>7081011.500</td>
<td>10.18</td>
</tr>
<tr>
<td>A751</td>
<td>ACE REFRACTORIES LIMITED</td>
<td>1126606.800</td>
<td>5755088.121</td>
<td>8.27</td>
</tr>
<tr>
<td>O009</td>
<td>OCL INDIA LIMITED</td>
<td>734681.000</td>
<td>3668870.122</td>
<td>5.27</td>
</tr>
<tr>
<td>R50F</td>
<td>RHI REFRACTORIES ASIA LTD.</td>
<td>483335.300</td>
<td>3147856.788</td>
<td>4.53</td>
</tr>
<tr>
<td>O083</td>
<td>ORIENT ABRASIVES LTD</td>
<td>859268.200</td>
<td>2035446.830</td>
<td>2.93</td>
</tr>
<tr>
<td>S489</td>
<td>SINGHBHUM REFRACTORY</td>
<td>1162032.970</td>
<td>16875752.760</td>
<td>2.43</td>
</tr>
<tr>
<td>M165</td>
<td>MAITHAN CERAMIC LTD.</td>
<td>1265720.000</td>
<td>16824363.430</td>
<td>2.42</td>
</tr>
<tr>
<td>R48F</td>
<td>RHI REFRACTORIES</td>
<td>218351.700</td>
<td>16652000.200</td>
<td>2.39</td>
</tr>
<tr>
<td>C92F</td>
<td>CALDERYS</td>
<td>168110.400</td>
<td>14714737.180</td>
<td>2.12</td>
</tr>
<tr>
<td>GA21</td>
<td>FOSECO INDIA LTD.</td>
<td>152195.000</td>
<td>12971292.830</td>
<td>1.86</td>
</tr>
<tr>
<td>M340</td>
<td>MURUGAPPA MORGAN THERMAL</td>
<td>72294.590</td>
<td>9498421.970</td>
<td>1.37</td>
</tr>
<tr>
<td>A02H</td>
<td>AEGIS BUSINESS LTD</td>
<td>194688.000</td>
<td>7669605.320</td>
<td>1.10</td>
</tr>
<tr>
<td>N53F</td>
<td>SOJITZ CHEMICAL CORPORATION</td>
<td>58549.000</td>
<td>6421295.240</td>
<td>0.92</td>
</tr>
</tbody>
</table>
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i.e. A items are High consumption value
    B items are Medium consumption value
    C items are low consumption value

**High Cost/Slow Moving** Items are the ones, which accumulate high capital (say 80% as per Pareto Analysis) and are D-Class items. The movement of such items is slow and blocks capital for a long time. So, it does not stand advisable to stock such goods in high quantity and is a matter of great concern to the management.

<table>
<thead>
<tr>
<th>Class Type</th>
<th>Total value in Rs.</th>
<th>Total No. of Items</th>
<th>% Share in Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>76,792,478.70</td>
<td>180</td>
<td>0.3206</td>
</tr>
<tr>
<td>B</td>
<td>3,317,455.93</td>
<td>24</td>
<td>0.0138</td>
</tr>
<tr>
<td>C</td>
<td>317,833.81</td>
<td>15</td>
<td>0.0013</td>
</tr>
<tr>
<td>D</td>
<td>159,126,366.22</td>
<td>382</td>
<td>0.6643</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>239,554,134.66</strong></td>
<td><strong>4016</strong></td>
<td><strong>1.0000</strong></td>
</tr>
</tbody>
</table>

Looking at the consumption it was found out that inventory cost of Tata-Steel was as much as 239 crores which were obviously alarming as per the company of Tata-Steel’s stature. So bring it down it needed to come up with new innovative idea. So, VMI was planned and was ready for implementation.

VMI was implemented at Tata-Steel way back in the year 2002-03 and VESUVIUS being one of the prominent Vendors along TATA-REFRACTORIES to be associated in implementing VMI. Some of the Vendors along with their productions are given below:

**Buy of Refractories (Vendor Wise) Year 2009-10**

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Vendor’s Name</th>
<th>Quantity in Kg</th>
<th>Loc. curr. amount</th>
<th>% of total value wise Buy</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC82</td>
<td>TATA REFRACTORIES LTD.</td>
<td>6965719.230</td>
<td>258236182.910</td>
<td>37.12</td>
</tr>
<tr>
<td>V216</td>
<td>VESUVIUS INDIA LTD</td>
<td>2256805.400</td>
<td>88127436.030</td>
<td>12.67</td>
</tr>
<tr>
<td>TF2F</td>
<td>TRL CHINA LIMITED</td>
<td>2495144.800</td>
<td>7081011.500</td>
<td>10.18</td>
</tr>
<tr>
<td>A751</td>
<td>ACE REFRACTORIES LIMITED</td>
<td>1126606.800</td>
<td>5755081.210</td>
<td>8.27</td>
</tr>
<tr>
<td>O009</td>
<td>OCL INDIA LIMITED</td>
<td>734681.000</td>
<td>36688701.220</td>
<td>5.27</td>
</tr>
<tr>
<td>R50F</td>
<td>RHI REFRACTORIES ASIA LTD.</td>
<td>483335.300</td>
<td>31478567.880</td>
<td>4.53</td>
</tr>
<tr>
<td>O083</td>
<td>ORIENT ABRASIVES LTD</td>
<td>859268.200</td>
<td>20354446.830</td>
<td>2.93</td>
</tr>
<tr>
<td>S489</td>
<td>SINGHBHUM REFRACTORY</td>
<td>1162032.970</td>
<td>16875752.760</td>
<td>2.43</td>
</tr>
<tr>
<td>M165</td>
<td>MAITTHAN CERAMIC LTD.</td>
<td>1265720.000</td>
<td>16824363.430</td>
<td>2.42</td>
</tr>
<tr>
<td>R48F</td>
<td>RHI REFRACTORIES</td>
<td>218351.700</td>
<td>16652000.200</td>
<td>2.39</td>
</tr>
<tr>
<td>C92F</td>
<td>CALDERYS</td>
<td>168110.400</td>
<td>14714737.180</td>
<td>2.12</td>
</tr>
<tr>
<td>GA21</td>
<td>FOSECO INDIA LTD.</td>
<td>152195.000</td>
<td>12971292.830</td>
<td>1.86</td>
</tr>
<tr>
<td>M340</td>
<td>MURUGAMPA MORGAN THERMAL</td>
<td>72294.590</td>
<td>9498421.970</td>
<td>1.37</td>
</tr>
<tr>
<td>A02H</td>
<td>AEGIS BUSINESS LTD</td>
<td>194688.000</td>
<td>7669065.320</td>
<td>1.10</td>
</tr>
<tr>
<td>N53F</td>
<td>SOJITZ CHEMICAL CORPORATION</td>
<td>58549.000</td>
<td>6421295.240</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*Anvesha, Vol. 4 No. 1*
Process Flow of Material under VMI

Tata-Steel is implementing a 3-point-Stocking; i) Material Storing and Refractory, ii) In Plant Operation Sale and iii) Transit.

Refractory Planning Process

Before 2001 (Pre SAP Era)

- No Measurement and monitoring of VMI items.
- The monthly consumption and Receipt in tonnage and value from a single screen was not available. Specific program to be developed.
- Item wise and month wise analysis of Inventory was not being done in a single screen.

2001 – 2005 (After SAP implementation)

- Value of VMI items as compared to total consumption value is monitored and measured by SAP.
- We can get all the receipt and issue in a single screen Y125 in tonnage and value.
- The month wise and item wise total inventory can be compared plant wise, storage location wise etc.

2005 and beyond (Further developments in SAP)

- The analysis further helped to identify few fast moving items and a replenishment based model has been developed.
- The analysis of data from Y125 has helped to develop supplier wise tonnage and value and similarly quality wise tonnage and value.
- The detail analysis is possible by using different variants

Problem Areas

A new system brings with itself a new set of problems. So did SAP and VMI. The obvious ones for SAP along with VMI are:

- Changing the mindset of the very employees, who used it and were accustomed to the old and matured IBM system for Materials Management.
- SAP was not customized to the requirements of a Process Industry though it was indubitably an excellent tool for an auto industry.
- Wrong forecasting: Owing to the fact that it is a process industry and that there are MRO items (Maintenance, Repair, and Operations), which cannot be forecasted with 100% accuracy by using past consumption data.
- Issued to recipient after upload from IBM and still some material remaining with SMD
- Material lying with SMD and other departments
- Process/System/Operation faults pertaining to important day to day operations. For example:
- Fault in Auto Posting to Home delivery
- Goods not issued for whom it was procured
- Non-acceptance of Goods from the customer side due to late delivery
- Wrong reservation in the system by Supply Executives
- Deletion of reservation even after procurement of goods
- Indentation without reservation
- Excess material purchase
- Pending reservation
- Bought with reservation, but under QA11 process for more than unwanted time

Potential Problem that Tata-Steel is having with VMI

- No Clear visibility in order: This is one of the major problems that Tata-Steel is facing with VMI. Goods and Materials are coming into the system but it is not getting reflected in Sap so the invoice is also not generated (GRN). Not only this, Vendors are also in a fix in as to which material to supply to which all departments that’s being auto-posted in SAP.
- What percent of their total volume do the VMI vendors sell through Tata-Steel?: This is one of the issues that Tata-Steel need to address because VMI being the Strategic Partnership between two parties so they need to look out how much they are ordering to the vendors. After all even though Vendor are responsible for managing the inventory but no vendor will be happy to accumulate a pile up of raw material at there end.
- How flexible will the system be in the event of required changes and modifications?: It is quite evident from any company’s point of view because how reliable you are going to be on the vendors that the company is going to redefine or modify accordingly.
- Will there be minimum volume & what product items are being considered? As per the minimum volume of order is considered it should be the job of Vendor but obviously in strategic partnership both the parties should be in a win-win situation. Secondly the product line should be as such that those materials that are there in VMI should be fast moving items (specially A category) whose consumption in day-to-day basis is more than any of the material considered.
• Forecasting problem (especially MRO-Maintenance, Repair & Operation): Forecasting being one of the core activities in materials management, it becomes one of the key issues that have to be controlled by SAP. Tata Steel is a process industry and thus it has to maintain certain items for Maintenance, Repair and Operations (called the MRO Items). The frequency of usage of such items cannot be predicted accurately since these would be consumed only if there is a failure, refining, replacement etc. at the shop floor or the place of usage of that item. Break down, which is a common phenomenon in process-oriented industries, also demands that a spare stock should be kept to meet these unforeseen circumstances. Thus, predictability becomes even more difficult. Hence, forecasting problem prevails over the D-Class items unlike the A, B, C items, which can be accurately, planned using past consumption data.

• Wrong reservation in the system by Supply Executives: The fault in the auto posting system in the home delivery list is one of the main reasons for accumulation of inventory post SAP implementation. The reason being that the material has been procured against a reservation but has not been posted to the Home Delivery Section List to dispatch the same. Material in one storage location/department and reservation in other storage location/department, Manual reservations, reservations not met due to non release of cost centers, etc are the various problems pertaining to the reservations that have been made.

• Deletion of reservation even after procurement of goods: This is one of the major problem that has been hovering the Supply Management Department. There is no demarcation point beyond which the customer should not be allowed to delete their reservations. Thus SAP allows the customer to delete any reservation even after a material has been procured or is in the final stages of procurement which can no longer be controlled.

• Bringing down the Lead time for payments: This is the area that need to be considered for further improvement in VMI because the procedure that’s being followed at Tata-steel is that unless and until the material is not consumed by the respective department, GRN (good received number) is not generated and the payment to the vendors are put on hold till that time. At present the lead time is 37 days which needed to be reduced further. This is the benefit from the vendor’s point of view.

Measures to Improve

The inventory holding has to be brought down for effective working capital management and VMI plays a major important role in it.

• Refr. Material inventory is very high at any given time. This may be because Tata Steel enjoys captive mines. This aspect needs to be looked at. As holding Raw Material Inventory for a longer period would also mean losses of raw material due to gradual decrease in the quality.

• Items that are there under VMI should be reconsidered and more of the fast moving items to be taken under VMI for further improvement.

Recommendations and Conclusion

Logistics experts have recently published the results of the annual logistics survey that shows the acceleration of trends towards cycle time compression, reduced inventory, increased inventory velocity and greater use of EDI. According to these researchers, more industries are paying closer attention to supply chain management. The survey results show that information technology and supply-chain management will most affect the future growth and development of logistics.

The results of the survey forecast an increase in inventory turns, which survey respondents said will rise from 30% to 40% by the year 2000. They also show that pooling of shipments is re emerging as a Logistics strategy (14.2% '94, 17.8% '96 and 27.5% 2000). This implies that companies are becoming increasingly competitive in determining what inventory to carry while offering quicker and more customized service. According to LaLonde, this can be attributed directly to the application of VMI, which will increase from 4% of inbound shipments’ in ‘94 to 19% by the year 2000. However, the implementation of VMI would fetch much better result if the organization looks into the following points.

• Proper coordination between the ITS department and SMD department should be there for smooth flow of material to the required consumption department.

• Reduce the process flow of material incoming into the system. Curtailing the various points at which the material is being inspected so that there is a fast movement of raw material from one point to another. In a way relying more on the Vendors work and Quality.

• No invalid reservation should be shown in pending reservation data, and the same time invalid reservations should also be dealt with.

• Customer should not be allowed to delete a reservation after a DO/PR/SL is raised.

• Improvement in using SAP should be considered for proper flow of things thereby reducing the error being created.

• Intensity of Collaboration: The extent of cooperation between two business partners is difficult to measure.
Thus, just a simple differentiation into either a close or minor collaboration is made. In a minor cooperation where business relations might be stopped at any time it will be harder to establish the sharing of knowledge and information in a VMI process.

**Elements that need to be considered.....**

- How will the Vendors salespeople be compensated?
- How will special pricing and promotions be handled?

**Observation and Suggestion**

<table>
<thead>
<tr>
<th>Inspection of material takes 7 days</th>
<th>Developed self certified vendors removed quality inspection only random sampling by RFG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unloading takes 2 days</td>
<td>Better staff scheduling reduced to 0.5 days</td>
</tr>
<tr>
<td>GRN delayed due to some discrepancies and error report and misconception of maintaining inventory by holding GRN</td>
<td>Released Invoices for GRN immediately and inform vendor regarding any discrepancies immediately.</td>
</tr>
<tr>
<td>Vendors have to come to get GRN no. and then Submit bills</td>
<td>Information made available on net</td>
</tr>
<tr>
<td>Long IV time due to lack of transparency</td>
<td>Developed on line tracking system with bill rept. Sl.No. from IV section for vendors</td>
</tr>
</tbody>
</table>

Broad analyses of VMI across multiple industries have shown that it provides marked operational improvements for all parties in the supply chain. A system of automatic data collection and analysis is integral in making VMI the most efficient solution possible for buyers and sellers. The efficiencies associated with enabling those with mission-critical focus to manage inventory replenishment are too great to ignore. As far as Tata-steel is concerned by implementing VMI, the Level of holding Inventory at warehouse and inventory holding cost has come down to significantly from Rs.239 Crore to Rs.28 Crore.

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