CHAPTER TWO

2) PRESENT STRUCTURE AND SYSTEM OF PURCHASING MANAGEMENT IN NECSEM

2-1) BACKGROUND OF THE COMPANY

NEC Semiconductors Malaysia (M) Sdn. Bhd. (NECSEM) was established in May 1976 with a paid up capital of RM17 million. It is a subsidiary of NEC Corporation Japan. NECSEM is a multinational manufacturing company which produces semiconductor products including Transistors, Integrated Circuits and lately Memory for industrial and consumer products such as TV, VTR, audio sets and computers.

NECSEM is located in Telok Panglima Garang Free Industrial Zone where all goods purchase for usage at the production floor are exempted from tax and all goods produce have to be exported and is also exempted from tax too. Products are sold to sales agents in Hong Kong, Taiwan, Singapore, Japan, USA and Europe which are affiliates of NEC Corporation Japan.

Business started with low end products namely Transistor where demand is quite stable, production volume is high and of course prices are also low because of fierce competition in the market. Lately the company is moving towards higher end products with lower production volume but many ranges or types and the demand is very volatile. Average prices for Transistor, Integrated Circuit and Memory are RM0.05, RM0.50 and RM100.00 respectively, where as average production volume per month is 200 million pieces, 60 million pieces and 1 million pieces respectively.

Sales amount has increased around 30% for the past three years and sales in 1994 was RM360 million. It is expected to be doubled in 1995 and in 1996 it is expected to reach RM1.5 billion. In line with the increase in sales the number of manpower has increased, majority machine operators. Engineers and technicians also increased correspondingly but not administration staffs.

Material cost against sales ratio is around 60% and expected to increase further with the increase in Memory products because these products have higher material against sales ratio. In other words the volume and amount of purchases is going to increase with the expansion of Memory line. Data on purchase amount against sales, purchase by destination and purchase by material type are attached in Appendix A to C.

2-2) MANUFACTURING PROCESS FLOW

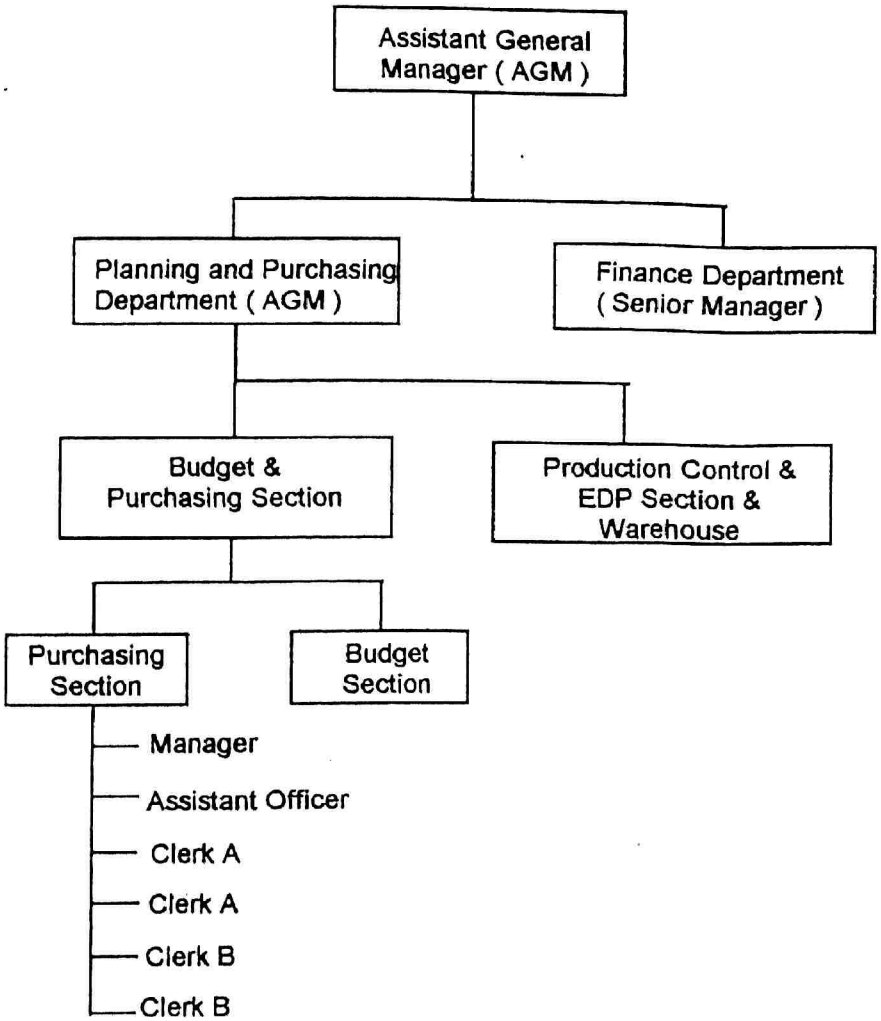
The manufacturing process flow of semiconductor assembly plant consists of nine processes starting with dicing of silicon wafer followed by mounting of chips to leadframe. Fine wire is used to bond the electrode to leadframe and then encapsulate with epoxy resin. The lead of the product are plated, marked, cut and formed, after which the product marking is done. The completed products are tested through a computerized tester for their electrical characteristics and performance. The last two processes are burnt-in-test and inspection where products are inspected for their appearance, electrical characteristics and finally to warehouse for shipment.

2-3) ORGANIZATION OF PURCHASING SECTION

In NECSEM, purchasing section is incorporated into Planning and Purchasing department and headed by a division Assistant General Manager which is also incharge of Finance department. In Planning and Purchasing department, the division assistant general manager is supported by two assistant as shown in the organization chart in Figure 1.

There are 45 staffs under Planning and Purchasing department out of which only 6 persons are fully in charge of purchasing. All of them have been very loyal to NECSEM with more than 7 years of experience. Most of them joined the company after completion of Form 5 education. Officially all the clerical staffs have to report to Assistant officer but in practice they report directly to the Manager because the former was transferred from other section and has only one year of experience in purchasing. Generally their job scope covers computation of standard material requirements, ordering, scheduling, processing of invoices and tracing of delivery.

Figure 1 : Organization of Planning and Finance Division.



2-4) CONTENT OF PURCHASES

Purchases can be classified into two categories namely stock and non stock items. Stock items refer to items which carry a stock number, frequencies of consumption are high, store at warehouse and stock level under the control of Planning

and Purchasing department. These items will not be treated as expenses until they are issued out from warehouse for consumption.

Non stock items refer to items which are purchase on ad-hoc basis. They are under the supervision or control of requestors and normally there is no repeat consumption, usually new items and usage is unpredictable and could not be planned. These items will immediately be treated as expenses upon receiving of goods and invoices.

There are two categories of materials purchase namely direct and indirect materials. All direct materials are stock items except materials purchased for trial run of new product line. Indirect materials could be stock items and non-stock items depending on the frequency of usage.

Direct materials consist of silicon wafer or pellet; leadframe or cradle; resin; wire; wire and solder tape; solder bar and ag-paste. These are the core raw materials content of the products manufactured. Indirect materials cover a wider range of material types. Therefore it is further sub classified into the following categories.

1) Subsidiary materials - ink, gases, and chemical
2) Factory supply - clothing, shoes
3) Machines parts - machinery parts
4) Production tools - tools with usage that is variable to production volume
5) Packing materials - inner and outer packing, tapes, cases, tubes

2-5) PURCHASING MANAGEMENT - METHODS AND PROCEDURES

In NECSEM, there are 3 methods to purchase an item namely :

1) purchase through issuance of Purchase order
2) purchase without Purchase order but with "Purchase Requisition Slip" (PRS)
3) purchase without Purchase order and PRS

Ordering through purchase order is the ideal way of buying goods. However there are instances where purchases could not be predicted or planned and required to be done urgently. Therefore the present purchasing management system also has the flexibility for purchases without purchase order. These items are normally meant for emergency used, for example piping and construction works which need to be done urgently otherwise it will affect product flow like stoppage of machines and ultimately effect the sales performance. However "Purchase Request Slip" has to be filled up upon receiving of invoice and hand over to Purchasing department to input into EDP system for the purpose of data collection.

Another type of purchase which do not require purchase order and PRS is accrued expenses like telephone, water and medical bills. These bills are send directly to Finance department for payment without going through purchasing department except the concerned department manager has to authorize the invoice.

As a conclusion, no matter which methods is applied, the basic procedures and ordering flow must be compiled by every requestor in buying an item. Each of the above mentioned methods has its ordering flow as shown in figure 2 to 4.

2-5-1) Purchase Through Issuance of Purchase Order

Referring to flow chart in Figure 2, the following steps should be followed for purchases using purchase order.

1) Requestor will fill-up the Purchase Requisition Slip (PRS) and get the concerned department's manager approval.

2) If the PRS is accepted and approved by department manager, it will then handed over to Purchasing section otherwise it will be returned back to requestor.

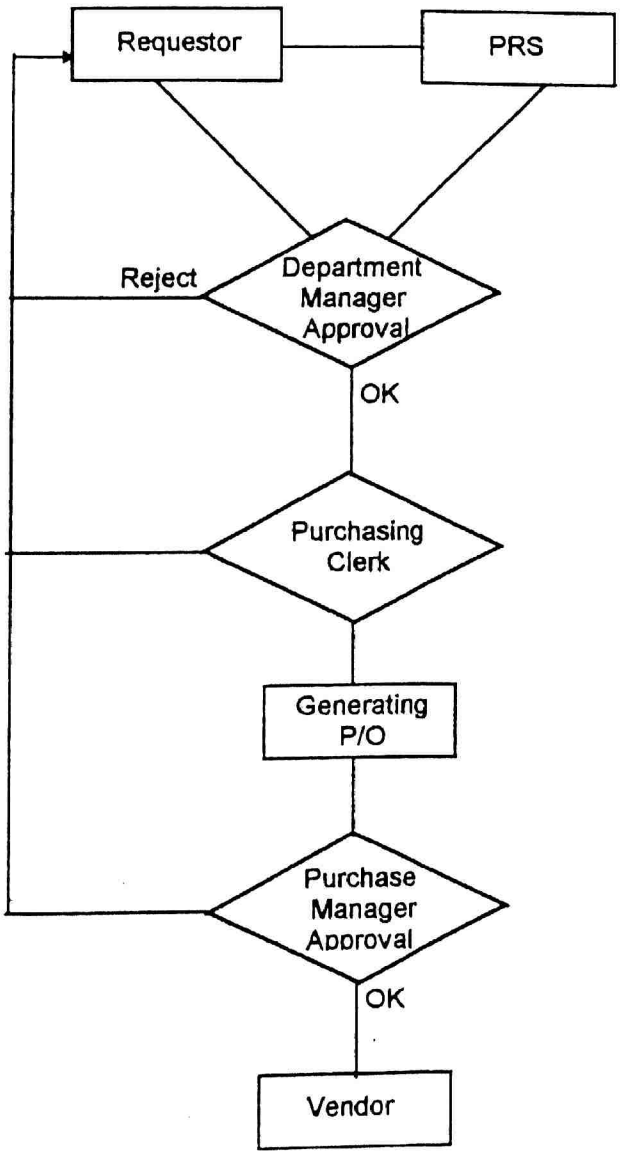
3) Purchasing members will check to ensure that all required informations are written in the PRS. If it is a purchase of non-stock item, vendor price quotation has to be attached. In the case of stock item, the stock number must be quoted in PRS instead of vendor name because vendors' profile already stored in the computer.

4) Then a purchase order is generated and checked against the source data in PRS.

5) Once the purchase order is confirmed correct, it will be handed over to Purchasing manager or Planning Asst. General Manager or director for authorization depending on the amount of purchase.

6) Finally the purchase order will be mailed out to vendor.

Figure 2 : Purchases Through Issuance Of Purchase Order

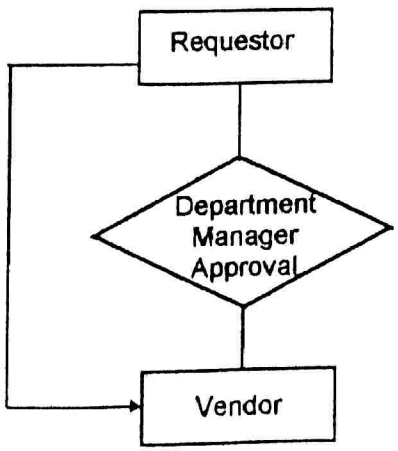


2- 5-2) Purchase Without Purchase Order But With PRS

There are two type of purchases without purchase order. However one of it require to fill-up PRS upon receiving of invoice and the other one only to submit to Finance department for payment.

This approach is very flexible. It allows requestor to negotiate and purchase goods or services directly from vendor before getting approval from the relevant authorizing managers. However once the invoice is received the requestor has to fill-up the PRS and get the authorized persons to sign, that is his department manager and purchasing manager before Finance department can proceed with payment. This method should only be allowed in the case of emergency where services or machine parts are required urgently. In this second method PRS is filled up after receiving of invoice where as in the first method PRS started the flow.

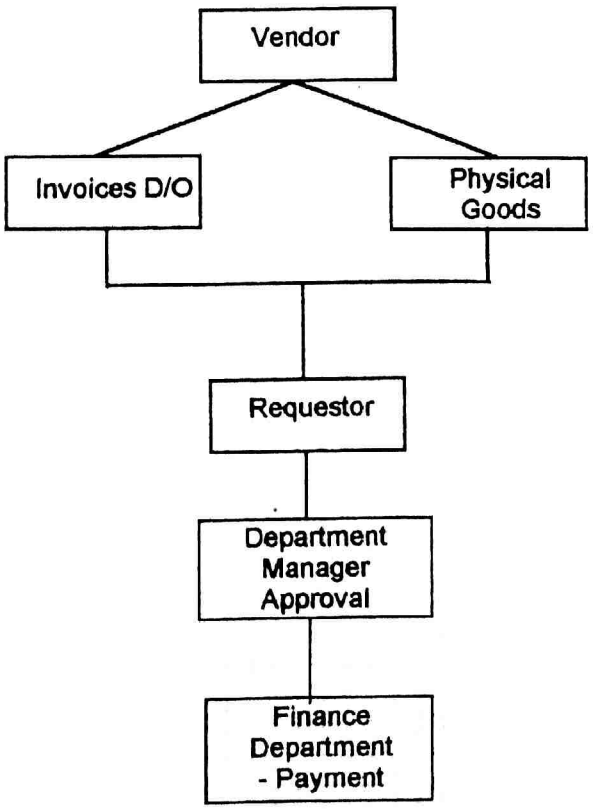
Figure 3 : Purchase Without Purchase Order But With PRS



2-5-3) Purchase Without Purchase Order And PRS

Figure 4 is the flow for purchases without purchase order and PRS. Invoice is authorized by concerned department manager and submit directly to Finance department for payment.

Figure 4 : Purchase Without Purchase Order And PRS



2-6) RECEIVING OF GOODS

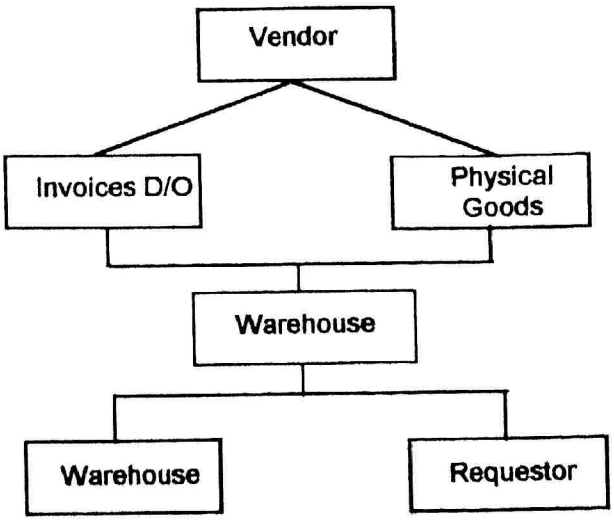
Generally all goods must be received by warehouse whether stock or non stock items, with or without purchase order. However in this company, warehouse only receives and store goods with purchase order number quoted in invoice. Here, there are two method of receiving goods, namely

1) items purchased with purchase order.
2) items purchased without purchase order.

2-6-1) Items Purchase With Purchase Order

. Here goods received will be checked against invoice and input into EDP systems. Stock item will be stored at the warehouse and non stock item will be delivered to the concerned requestors. This invoice will then be sent to purchasing section for verification against the purchase order issued to vendor. Any discrepancies in delivery is informed verbally by warehouse members to purchasing members who will then inform the vendor accordingly. Requestor is not allow to receive goods directly from vendor for ordering with purchase order unless the item is very bulky for example machinery. In such a situation, requestor has to send the invoice and delivery order to warehouse to input into EDP system after confirming the receiving. Refer to flow in Figure 5.

Figure 5 : Receiving Goods With Purchase Order



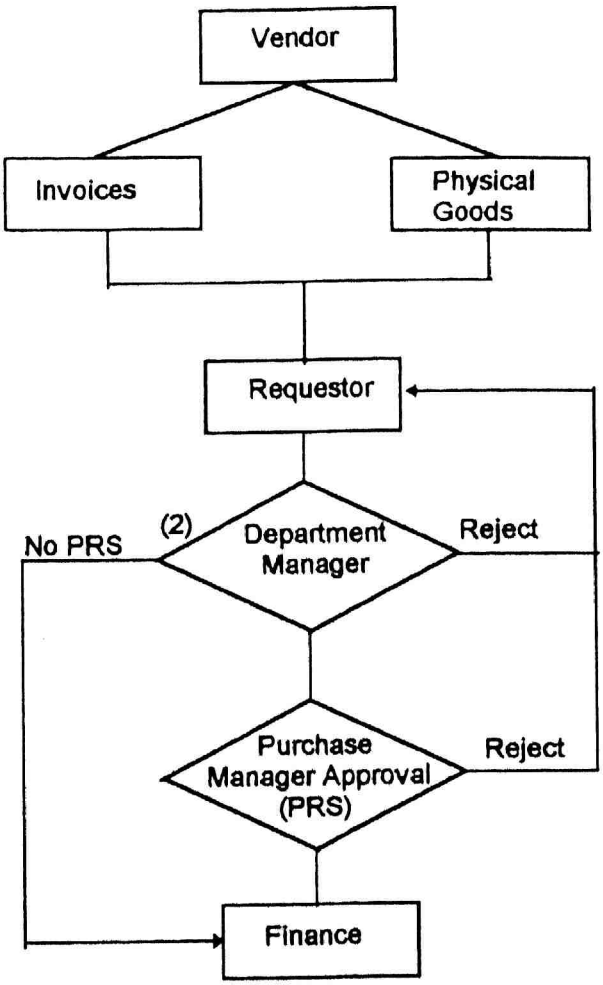
Invoices handover directly to purchasing

Invoices authorized by department manager

2-6-2) Items Purchase Without Purchase Order

Requestor is allow to receive goods as long as the delivery order is signed by him and the invoice is approved by the department manager. This invoice will then be handed over to Purchasing section for authorization if PRS is required otherwise it will proceed to Finance department for processing of payment. Flow chart in Figure 6 is the flow of receiving goods of without Purchase order.

Figure 6 : Receiving Goods Without Purchase Order



2-7) MATERIAL REQUIREMENT PLANNING (MRP)

In manufacturing context, one of the major improvement in purchasing system is how successful is the MRP system. The key reason is that there are many products using difference type of materials. This system will correlate the " product-material relationship" in determining the following :

1. What to order
2. When to order
3. When to schedule delivery.
4. How much to order

MRP system is very suitable for mass production where many products with high volume are produce at the same time. It is also applicable in an environment where many materials are use to produce one unit of product. In other words it has a standard quantity of material requirement to produce one unit of product with consideration of expected wastage in the production line. The formulae generated is as follow :

$$\frac{\text{Standard material requirement (pcs or kg) * Quantity to produce}}{\text{Expected yield loss}}$$

To obtain the absolute amount of material to purchase, use the result from the above formula and multiple with the unit price (per piece or kilogram) of the material. To complete the basic MRP concept, this computed material requirement is then link to Purchasing, Inventory and Shipping systems. Purchasing system will provide the information on how much purchase order has been placed for each material or backlog of goods yet to be received. Where as the Inventory system has the balance of material stock available and Shipping system gives the number of finished goods stock kept at warehouse and new order from customers. The inter-link within these systems will allow us to obtain standard consumption, material stock balance status and quantity required to purchase. With a given lead-time to vendor, a purchase order should be generated by the computer automatically.

2-8) INDIRECT MATERIAL – MINIMUM STOCK LEVEL

Purchasing of raw materials which fall under MRP system is very much different compared to the purchasing of indirect materials such as spare parts. Usage of these items are irregular therefore continuous control is necessary.

The formulae for minimum stock level is

(Average past 3 months usage * lead time) + safety stock

A check list is automatically is generated by computer once stock level for an item falls below or equal to the minimum stock level. The responsible person will check and get the approval from relevant persons for issuing of purchase order to vendor.