

# **Training Manual**

# PRINCIPLES AND TECHNIQUES OF MANAGING INVENTORY

**Training Manual** 

# Pharmacy Unit (GHS) & Procurement & Supplies Directorate (Moh) October 2008

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**Funding Organization:** 



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# Part 1

# **SECTION 1**

# **1.1 INTRODUCTION TO INVENTORY SUPERVISION**

Inventories are a major component of any logistics system and as such require to be planned, managed and controlled in order to achieve the basic aims of:-

- Minimising costs at acceptable levels of investment.
- Providing the desired levels of customer service.

Their purpose includes:-

- The decoupling of supply and demand through the creation of buffer stocks.
- The build up of anticipation stocks to meet planned or expected demand.

Inventory management needs to recognise it cannot work in isolation within the logistics system. It can have a significant effect, through the inventory policies it employs, on many of the inter-related activities, for example; distribution networks, warehouse design and operation, inward and outward bound transport, and should be capable of identifying these areas of cost trade-off which will optimise the efficiency of the total operation.

# **1.2 OBJECTIVES**

In the development of an inventory system to achieve the two

basic functional objectives related to investment cost and service level, the control process should be designed to:-

- i. Express the policies in quantitative terms to achieve consistency of operation.
- ii. Adopt the simplest effective mathematical techniques to ensure that routine calculations can be easily performed.
- iii. Provide decision rules in quantitative terms that will trigger inventory control response.
- iv. Provide for exception reporting of non-routine situations promptly.
- v. Provide appropriate levels of information to be available to challenge, and where appropriate, override system decisions.

# **1.3 RESPONSIBILITIES AND ACCOUNTABILITIES**

The major responsibility of inventory management is the management of materials and materials systems throughout the defined acquisition and supply chain from procurement to consumption point.

As a result of this responsibility, inventory management is accountable for the physical and financial levels of stockholding, the service level provided to customers, the control parameters within the inventory system and all the decision related processes in the total operation. In addition inventory management is responsible for:-

- i. Controlling each individual item, through its acknowledged characteristics, on a day to day basis.
- ii.Ensuring the effective use of personnel involved in the management process.
- iii. Providing information and feedback on the effectiveness of the inventory system.

# 1.4 STRATEGY, PLANNING AND OPERATIONAL CONTROL REQUIREMENTS

Inventory management is largely looked upon as a day to day operation concerned with meeting specified short term targets. It does, however, have a major role to play in the short, medium and long term developments of an organisation and should be an integral part of the business planning cycle.

# **1.5 STRATEGIC REQUIREMENTS**

Awareness of the expected development of the business in terms of future production, suppliers, customers, volumes etc. are all essential to enable inventory management to make recommendations, measure the impact and plan the necessary actions to meet the long term requirements.

Decisions on what product lines to stock, where to stock them and the form of the distribution network, to achieve the continuing optimisation of investment cost and service level is an on-going process in which inventory management needs to be involved.

#### **1.6 PLANNING REQUIREMENTS**

Most inventory planning cycles follow the business planning cycle based on a one year time frame.

Information on the expected changes in such factors as seasonality, volumes, supplier lead times, required service levels, product and operational costs, and special requirements, within the medium term time frame need to be available to inventory management with sufficient lead time to establish and implement any changes to the processes and/or control of the inventory system.

#### **1.7 OPERATIONAL REQUIREMENTS**

These refer specifically to those elements which create, in the short term, constraints or opportunities within the inventory process. They are generally concerned with specific action taken or which are required to be taken to meet changes in the levels or form of activities not previously identified within the medium term planning cycle.

#### **1.8 CONTROL REQUIREMENTS**

In most inventory systems, the parameters and controls that determine the key triggers which result in the levels of inventory held on a line by line basis are not always capable of being responsive quickly enough to meet unexpected short term variations and deviations. At this stage inventory management may see fit to intervene.

It is essential that inventory management, at such times, have available sufficient data and information, in a usable form, to

apply alternative decision making processes to maintain the inventory system effectiveness.

In doing so the consistency of decision making is a major objective in achieving the alternative course of action.

# **1.9 BASIC CONCEPTS OF INVENTORY CONTROL**

A typical example of the cycle of events, over time, of any item is often referred to as the Stock-Time Curve.

It identifies the results of:-

- The pattern of stock carried resulting from the supply and demand activity. (The complete curve).
- The time of receipt of supplies (TS) and the quantity received. (Q)
- The point in time when orders should be placed. (ROL)
- The average stock carried. (SS + Q/2)
- The stock held against uncertainty and variability of demand. (SS)
- The point in time when stock outs occur. (SO)

# **1.9.1 COMPONENTS OF INVENTORY**

The four basis components of inventory can be identified as being:-

# i. REPLENISHMENT OR CYCLE STOCK

This is the stock resulting from the ordering policies and is ed.

determined by the frequency of ordering and the quantity ordered.

# ii. SAFETY OR BUFFER STOCK

This is the stock held for protection against the uncertainty of demand and, where applicable also of supply.

# iii. ANTICIPATION OR INVESTMENT STOCK

This is the stock procured in advance of requirement: e.g. schedules; planned requirements such as, product launches, promotions; seasonal demands; purchases to take advantage of market exploitation.

# iv. MOVEMENT OR TRANSIT STOCK

This is stock which is in transit between suppliers and customers and can be separately identified.

The day to day control of inventory is through the management of the Stock-Time Curve to achieve the optimum cost and service equation.

### **SECTION 2**

### **2.1 CLASSIFICATION OF DEMAND**

Whilst recognising that each item within the inventory system identified by its description and/or item code, has its own individual set of characteristics, it would not be possible to devise a different set of processes and controls for each item.

Conversely, in establishing an inventory system for a range of widely different items it can be clearly seen that no system of control can be applied to the whole range.

It is necessary, therefore, to have a process for classifying items into groups or types to enable the relevant system, to satisfy the investment cost and service level objectives, to be identified and applied.

In reviewing the item range in any inventory system, therefore, some or all of the following elements need to be considered in assisting to predetermine the system to be applied.

#### 2.2 RANDOM/PREDICTIVE DEMAND

This initial item classification is usually carried out by firstly identifying any item which has a predictive demand.

By process of elimination the remainder of the item range will be classified as having a random demand.

It is necessary to set precise rules for the identification of predictive demand items.

In this context predictive relates only to those items which have a quantity and time commitment for when they will be

required.

# These would include:-

- Items which are called off on a schedule basis by a customer with no deviation in quantity or time against the original forecast.
- Items provided for a sales campaign or promotion which will cease on the sale of the initial supply and not generate any further demand.
- Items provided in advance of a new product launch, sales campaign or promotion, but note that these items may later become random demand items.

It can be seen that these do not include any items with any uncertainty in the demand - this is the criterion.

Any item, therefore, where there is uncertainty in the demand over time, will be classified as random.

Having completed the initial review and classification the remaining sections apply largely to random demand items.

# 2.3 STABLE, TREND, SEASONAL DEMAND

A key element in the determination of the system to be employed for any item or group of items is the expected general demand pattern.

These fall into three major groups:-

# 2.3.1 STABLE DEMAND

A stable demand pattern is one where although the demand rate varies, it varies about a constant average over time. As such, it will provide no evidence of an increasing or decreasing trend.

### **2.3.2 TREND DEMAND**

A trend demand pattern is one where the average demand rate varies over time showing the tendency to increase or decrease.

In reviewing the general pattern of the demand, care needs to be taken in establishing the time period over which the assessment is made to ensure that the trend slope is sufficiently established.

### 2.3.3 SEASONAL DEMAND

A seasonal demand pattern is one which shows a variation in the average demand, at different points in time throughout the planning cycle, and can generally be related to market forces which influence the demand patterns.

The periods of seasonality can vary from very short periods of one or two weeks to periods covering longer periods of time e.g. three or four months.

In addition seasonal demand can be expressed in two forms. The first shows an evolving pattern of development into and out of the seasons. The second is typified by a step function change in demand pattern for each of the seasons.

Where the inventory system contains a wide range of items a full analysis on an item by item basis can be daunting. Inventory management will need to apply its knowledge and experience in establishing the category for each item and use sampling techniques for groups of like items to reduce the level of activity to manageable proportions. Where the pattern is not obvious from the data available the use of graphical representation can often provide the answer.

# **SECTION 3**

# 3.1 PROFILE OF DEMAND

In this section we look at some of the methods and techniques which can be used in demand analysis to identify key elements when formulating inventory policies.

# **3.2 CAPTURED AND LOST DEMAND**

The generally accepted purpose for holding stock is to enable a supplier to satisfy the demand from a customer, in total, at the point in time when the request is received.

Inventory management processes should be designed to capture such data and develop policies to meet the pattern of demand.

In the best situation such demand would be recorded, whether it is satisfied in total, in part or not at all, at the time of receipt, by the supplier, and all unsatisfied demand 'back ordered' to be supplied when stock becomes available.

Such a process would ensure that the true level and pattern of demand would form the basis for the inventory policies of the company.

The only acceptable alternative to this process is in handling scheduled items which are called off by a customer at specified future points in time, in specified quantities.

Where, due to the practices and processes employed "true" demand is not recorded, inventory management needs to be aware of the effects this has on the inventory system and wherever possible to be able to measure the effect. It can be

seen that if the period order is recorded the total demand is overstated; in the case of the satisfied demand this would be equal to the 'true' period demand; if the satisfied and unsatisfied demands were added together an overstatement of demand would again arise.

In addition, however, in the first two instances the variation about the average would be statistically significant compared with the 'true' demand pattern creating a requirement for increased safety stock

# SECTION 4

# 4.1 FORECASTING TECHNIQUES

As part of the inventory system the ability to forecast future demand patterns is an essential feature.

Some of the possible changes in demand pattern, both of the average demand and the variation in demand, have been illustrated previously. In addition within any of these patterns can occur the freak or 'rogue' demand which may or may not have an identifiable cause.

To be able to predict these changes, before they occur, in order to be able to adjust the control parameters within the system, is the purpose of forecasting.

There are a wide variety of methods for short and long term forecasting of demand varying from guesses or estimates, through simple, to extremely sophisticated mathematical techniques.

In practice in inventory systems it is usual to make some quantified forecast and modify or overlay this with known additional information, where appropriate.

All the techniques described are based on a knowledge of past demand patterns which are used as a basis for extrapolating and predicting future demand.

It is important to note that the process of forecasting is attempting to forecast average demand.



#### 4.2 SHORT TERM FORECASTING

All short term forecasting systems are designed to establish, firstly, an estimate of the demand in the current period i.e. an estimate for the latest period in which the actual demand is known.

The second stage is then to use this estimate as a basis for predicting future demands.

#### **4.3 SIMPLE AVERAGE**

This method of predicting future demands is attractive due to the simplicity of calculation.

An example of the method can be seen from the following where the period demand was;

58 66 56 58 60 62

Therefore Average Demand =

 $\frac{(58+66+56+58+60+62)}{6} = \frac{360}{6} = 60$ 

With no apparent increasing or decreasing trend it would be reasonable to assume that an estimate of 60 for the next period would be acceptable. It should remembered that the range of the variations are not relevant for this type of item providing there is a generally constant average. The forecast of 60 would be the forecast for 1 period ahead, 2 periods ahead and so on until further information became available to recalculate. This can only be used, therefore, for stable demand items. In selecting items for using this technique the problem of how many past demands to include will always be present. The more individual demands included in the series, the less emphasis placed upon the random fluctuation. The less individual demands included, the greater the chance the pattern has changed and the less reliable the estimate.

#### **4.4 MOVING AVERAGES**

This method is also used where the demand pattern indicates a trend and from the demand data a smoothing of the pattern of demand will help to establish both the trend and the expected future demand. Using the data for period 6 (YEAR 3) to period 8 (YEAR 4) in the example in the previous Section the calculation of the simple moving average would be as follows:-

Year	Period	Demand	Lagged Demand	Total	Moving Average
3	6	54			
	7	81			
	8	71			
	9	80		286	71.50
	10	75	54	307	76.75
	11	79	81	305	76.25
	12	97	71	331	82.75
4	1	91	80	342	85.50
	2	71	75	338	84.50
	3	81	79	340	85.00
	4	79	97	322	80.50
	5	55	91	286	71.50
	6	56	71	271	67.75
	7	73	81	263	65.75
	8	71	79	255	63.75

The first moving average is calculated from adding the first four demands and dividing by the number of periods i.e. (54 + 81 + 71 + 80)/4 = 71.50.

The second moving average is calculated by omitting the first demand i.e. 54 and adding in the latest one i.e. 75.

The calculation becomes (81 + 71 + 80 + 75)/4 = 76.75.

The process continues by omitting the oldest demand and adding in the latest.

The forecast demand would be a continuation of the last moving average i.e. 63.75.



In the above example the calculations were based on a four period moving average. The selection of the number of periods is arbitrary and will give differing results.

The larger the number of periods used the slower will be the response to changes in demand.

The smaller the number of periods used, the quicker the response to changes in demand. This is particularly relevant where there are 'step' changes.

The lagged demand represents the demand figure which is dropped from the four period calculation to obtain the total, i.e. in period 10 the demand for period 6 (54) is dropped and the demand for period 10 (75) is added.

The simple moving average, however, has the drawback that there is no built in trend in the calculation and therefore the predicted demand will not provide a trend pattern.

#### **4.5 SEASONAL INDICES**

Where items show a continuing tendency to repeat a seasonal pattern of demand, over time, the use of mathematical techniques may be replaced by a simpler form of calculation.

The process requires analysis of past demand to identify a series of indices which can be applied to a forecast demand. The forecast demand can be of either a short or long term nature although the approach is usually applied to the latter.

An example of the calculation is shown below:

	Year 1	Year 2	Year 3	3 Year Total	%
1 <sup>st</sup> Quarter	125	140	183	448	21.43
2 <sup>nd</sup> Quarter	270	245	295	810	38.76
3 <sup>rd</sup> Quarter	186	174	190	550	26.32
4 <sup>th</sup> Quarter	84	96	102	282	13.49
TOTALS	665	665	770	2090	100.00

The seasonal indices are calculated by aggregating the historic data and expressing the 3 year total for each Quarter as a percentage of the annual total of 2090.

If it is assumed that the annual forecast for year 4 is 830 then the seasonal demand pattern based on the above data would be:

Quarter 1 830 x 21.43% = 178 Quarter 2 830 x 38.76% = 322 Quarter 3 830 x 26.32% = 218 Quarter 4 830 x 13.49% = 112

This can be illustrated by a further example related to a period split of an annual current demand of 2400. If the forecasted demand for the next year was 3350, the forecast per period,

# using the seasonal indices would be as follows:-

Period	Current Demand	% of Total	Forecast Demand
1	140	5.83	195
2	150	6.25	209
3	170	7.08	237
4	180	7.50	252
5	250	10.42	349
6	280	11.67	391
7	290	12.08	405
8	280	11.67	391
9	190	7.92	265
10	170	7.08	237
11	160	6.67	224
12	140	5.83	195
TOTAL	2400	100.00	3350

#### **SECTION 5**

#### 5.1 ESTABLISHING WHEN TO ORDER

As previously stated the purpose of stock is to meet an unknown future demand albeit, the demand may have been predicted using a forecasting technique. However, to ensure stock is available it is necessary to calculate at what point an order should be placed to maintain the availability to meet future demands.

#### **5.2 ORDER POINT CALCULATION**

The components in the calculation to establish the point at which an order should be placed are covered by the following:-

# 5.2.1 LEAD TIME

The lead time is defined as the interval between deciding that an order needs to be placed and the order being physically available for issue.

This should not be confused with supplier delivery time, which will cover a shorter period, but does not include the administrative processes prior to and following the delivery time as well as the physical activity of receiving and storing the stock. In most inventory systems the lead time is set to a fixed time period.

The time period can be established through:-

 Agreement with supplier on delivery time plus the duration for raising and receiving an order. and

for placing and receiving an order. In this instance either the average time can be used or some arbitrary level set at a point higher than the average which will cover most lead time occurrences.

# 5.2.2 LEAD TIME VARIABILITY

Although most inventory systems tend to use a fixed lead time the measurement of lead time variability can be included in the calculation.

As with demand variability it can be assumed that the spread and variability of lead time will follow a normal distribution pattern. It is therefore possible to calculate the standard and/or the mean absolute deviations to arrive at a more 'correct' assessment of lead time.

Example

21 Days
5 Days
= 1.64 Standard Deviations
(5 x 1.64) = 21 + 8.2 = 29.2 days

It can be seen from the example that significant fluctuations in lead time will have a major effect on the level of stock needed to cover the period of time. There is an alternative way to record the variation in the lead time. Usually this can be done by monitoring each order placed with a supplier, recording the overall lead time. Over time a table can be built as follows:-

TOTAL LEAD TIME	% OF ORDERS RECEIVED IN LEAD TIME
3 weeks	50
3.5 weeks	75
4 weeks	90
4.5 weeks	95
5 weeks	99
5.5 weeks	100

This is an example which shows an average lead time of 3 weeks. Like with demand variability management must make a decision on how much variation of the lead time it will cover.

Suppose we wish to cover 95% of the lead time, then we would need 4.5 weeks of cover. Since the average is 3 weeks, the variation is 4.5 -3 weeks or 1.5 weeks.

# 5.2.3 LEAD TIME DEMAND

In calculating the lead time demand two factors have to be considered.

- 1. The average demand during the lead time.
- 2. The variation in demand during the lead time.

The first of these is a straight forward calculation of multiplying the average demand by the lead time, for example.

Average Demand 100

Lead Time 3 weeks

Therefore average demand during lead time is  $100 \times 3 = 300$ 

The second calculation is to cover the variability of demand during the lead time and represents the buffer stock or safety

stock to cover the uncertainty of demand and to provide a given level of service. Once again the measurement is made using the standard or mean absolute deviation calculation.

# 5.3 WHEN TO PLACE AN ORDER

In the previous section we have seen how to calculate an order point based on the various factors involved. However, it is also necessary to establish the position of the stock in hand with which to compare the order point trigger.

The transactions in any inventory system, manual or computerised, cover the general activities of Issue, Receipt, Order Placed, Adjustments etc. to achieve a current stock balance.

However, the current stock balance may not indicate what can be described as the 'free stock' position, and it is this level of stock that is required to be measured against the order point trigger.

To achieve this it is necessary to adjust the current stock balance with the following:-

- *add stock on order from suppliers.*
- *add stock in transit from suppliers (if not included above).*
- *subtract stock allocated to customers from current stock balance.*
- *subtract stock on hand for future special requirements.*

Only after these adjustments are made to the current stock balance should a comparison with the order point trigger be made.

### **SECTION 6**

# 6.1 ESTABLISHING THE ORDER QUANTITY

The order quantity is the component of inventory that can be classified as the cycle or working stock.

Its purpose is to satisfy the average demands which the inventory system has predicted require to be met. In determining the order quantity a number of factors have to be considered which ensure that inventory management continue to maintain an economic approach which will optimise the costs of the operation.

# 6.2 COSTS IN STOCK CONTROL

The three costs involved in establishing order quantities are:-

- 1. Average cost of placing an order.
- 2. Average cost of holding stock.
- 3. Average cost of running out of stock.

# 6.3 AVERAGE COST OF PLACING AN ORDER

The costs of placing an order include:-

- all the costs related to the decision process in identifying the time to place an order, this will include all the labour and equipment costs.
- all the costs related to the actual process of planning an order together with any progressing and control activity.
- all the costs related to receiving, inspecting and storage activity together with the administrative costs of notifying that stock is available.

All the above costs are included when considering items purchased from suppliers. However, when the items are sourced from an organisation's own production facilities an

# additional cost is involved.

 all the costs related to the set up time and change costs together with any initial spoilage costs.

The average cost of placing an order can vary enormously from company to company. The difficulties in establishing the order cost tends to provide a wide range of values and in many companies this is significantly underestimated.

# 6.4 AVERAGE COST OF HOLDING STOCK

The holding cost is usually expressed as a percentage of the unit cost of the item. The main components of the holding cost are:-

- *interest on capital.*
- *all costs related to tax, insurance etc.*
- *all costs related to the storage i.e. provision of the facilities.*
- *all costs allowed for deterioration, spoilage and obsolescence.*

The value of the cost of holding stock varies from 15% to 30% per annum but due to the difficulty in establishing an accurate guide it could be expected that it is often underestimated.

# 6.5 AVERAGE COST OF RUNNING OUT OF STOCK

The stocking of an item implies that a cost is incurred whenever the item is not available. The cost of nonavailability can be identified as loss of revenue or profit that is the lost sales and the loss of customers for future purchases.

To establish these costs is extremely difficult as the assessment of the two factors are largely based on judgement. In general, therefore, although this can be included in the cost

equation it is more generally ignored due to the uncertainty of the accuracy of assessment.

# 6.6 ORDER QUANTITIES

There are two methods mainly used to calculate order quantities.

- 1. Economic Order Quantity (EOQ).
- 2. Coverage Analysis.

The first of these methods relies on the collection of data which has been described above for each individual item. The second method is based on information readily available and through an iterative process establishing the optimum order quantities for a range of items.

# 6.7 ECONOMIC ORDER QUANTITY

The purpose of calculating an economic order quantity is to balance the costs of ordering and the costs of holding stock, such that the two costs are equal or that the sum of the two costs is the minimum total cost.

# 6.8 COVERAGE ANALYSIS

The use of coverage analysis as an alternative method of obtaining an optimum ordering policy has the advantages, over the EOQ approach, of not having to collect data related to establishing the average order cost.

The process is carried out in two stages namely:-

Stage 1 Establishing the optimum ordering policy subject to placing the same total number of orders as at present.

Stage 2 Adjusting the total number of orders to minimise the total cost.

# SECTION 7

## 7.1 STOCK EVALUATION & PERFORMANCE MEASUREMENT

Evaluation and performance measurement requires that targets are established, against which actual achievements can be compared. Inventory systems enable this to be done through the provision of both volume and financial data when planning the inventory environment. However, care must be taken to fully understand the basis upon which the targets have been set as well as ensuring that the evaluation and performance measurements are compatible in the collection and presentation of the data, to the target setting process.

# 7.2 TARGET SETTING.

Targets are often arbitrarily set by management without full understanding and due consideration of whether they are realistic.

These are often expressed in very general terms such as three weeks stock, stock value of fifty thousand Ghana cedis, service level of ninety eight percent. These could be considered more of an objective than a target.

Targets should be established based on the process, controls and activity related to the inventory system. If as a result of the system, the results are not in line with the objective, action will need to be taken to change the output of the system.

Inventory systems are generally designed to control stock at Stock Keeping Unit (SKU) level. Through this process target setting becomes relatively simple.

# 7.3 INVENTORY RECORD ACCURACY

# THE NEED FOR RECORD ACCURACY

Accurate inventory records are a must. They're an essential ingredient which enable us to provide a satisfactory level of customer service. An accurate record is a key element to determine the need for replenishment of inventory. The timely replenishment of inventory items assures material availability when orders are released.

Accurate records are also essential if we are to analyse inventory levels on an ongoing basis, identify excess amounts of the inventory and make appropriate dispositions. Inaccurate inventory records can result in lost sales, shortages which can affect the release of manufacturing orders or shutdowns in manufacturing due to lack of components. Inaccurate inventory records can lead to excess inventories if the records are understated - a replacement order might be generated when it really is not required. Inaccurate records can lead to missed schedules, late deliveries to customers, excessive expediting, and additional freight costs. Inaccurate records can also lead to overplanning which can result in both high inventories and high obsolescence.

The basic requirements for accurate inventory records are:-

- 1. A good record keeping system.
- 2. Effective audits to verify the level of accuracy in the inventory.
- 3. An ongoing system to detect the errors in a timely manner, determine their cause and make appropriate corrections to the inventory balance.

A key ingredient for maintaining a high level of accuracy is the right management attitude.

The "right management attitude" has to be that errors in the

#### inventory records are not tolerated.

Management has to approach the inventory record accuracy with an attitude of zero defects. If Management shows any degree of unconcern about the level of record accuracy, the achievement of a satisfactory level of record accuracy will be extremely difficult.

Another aspect of management's participation is to develop the organisational structure such that there is specific assignment of responsibility for the accuracy of the inventory. If the storeroom clerks realise that they are personally responsible for the accuracy of the inventory that they control, and that they are expected to maintain this high level of accuracy, you will have made a great step forward in accomplishing the goal. If the receiving clerks know that their performance is in part measured by the timeliness and accuracy with which they complete the receiving documentation, the chances of errors being created in the inventory record due to improper recording of receiving transactions will be minimal.

Even if management has the attitude that it will not tolerate inaccurate records and has identified and assigned responsibility, it must still provide the appropriate tools and resources so that the responsible individuals can carry out that responsibility. These "tools" will include adequate training, appropriate equipment such as counting scales, documents which are easily understood and are not prone to errors, and facilities for locking the storeroom.

The continuation of management support in assisting those assigned with responsibility for inventory accuracy is extremely important. Management must accept the fact that the quest for inventory accuracy is a continuous project. It has a beginning to

be sure, but it will never end.

The cost of achieving record accuracy is a cost of management time - the time it takes management to do the job of "managing". It really doesn't require the expenditure of substantial resources, it takes priority as to where the manager's expertise may be applied. The only really significant costs might be those associated with providing the kinds of tools and equipment and training that those responsible for the inventory may need.

A high level of record accuracy usually saves more money than the cost of achieving that level. In many cases and in many companies the annual physical inventory has been eliminated because the reliability of its current records do not require a physical inventory be taken in order to verify that accuracy. The additional inventory that is often kept on hand for the staging of components prior to the beginning of manufacturing runs can be eliminated. The staging of components prior to the beginning of a production run is carried out primarily to insure that all the components needed for the run are, in fact, available. If the inventory records are accurate there is essentially no need to stage any components.

Accurate inventory records can also eliminate double checking and recounting and all the other time delays that are second nature when record accuracy is highly questionable. Accurate records can often avoid excess inventories and shortages as well. Finally, an accurate record many times will help us avoid inventory obsolescence by permitting us to stock smaller quantities of our components.

How do we know that we have a level of inventory accuracy that is adequate for the management of the business?

In many companies intuitive judgements are made of the level

of accuracy needed, but when we speak of inventory accuracy here we want to be able to make an accurate measurement of performance. In addition, we need to identify the cause of errors - not to chastise or criticise employees who cause the error - but to determine how the error occurred and to provide the training or change in procedures or whatever it takes to prevent it from occurring again. This is one of the key elements for achieving inventory records accuracy; eliminate the cause of the error and prevent that error from recurring.

If we simply determine that there is an inventory error and then only make an adjustment to bring the inventory record back into proper balance, we will never reach a level of inventory accuracy that is consistent and acceptably high.

# 7.4 AUDITING INVENTORY RECORDS

The measurement of inventory accuracy performance stems from our ability to audit inventory records. The inventory record audit is done in conjunction with either a periodic or a cyclic physical inventory. The physical inventory involves the counting of items in stock and then comparing the quantities counted with the perpetual inventory record balance. If the quantity counted and the perpetual inventory record balance do not coincide, then a reconciliation of the difference is required. Once the reason for the imbalance has been identified, the record balance is adjusted to agree with the quantity actually on hand.

This auditing process is followed regardless of whether the physical inventory is periodic or whether it is cyclic. The periodic physical inventory is usually conducted once a year, or it may be done more frequently on a quarterly or even a monthly basis. A cyclic physical inventory is a process of continuously counting the inventory day-by-day throughout the entire year.

Each day only a selected number of items in the inventory are physically counted and reconciled. During an entire year's period, all the items in the inventory would probably be counted at least once, and some of them more frequently. In the periodic physical inventory, normally all the items in the entire inventory are counted all at one time.

In most situations, cycle counting has definite advantages over the periodic physical inventory. As an example, in cycle counting a few very highly trained people can be used continuously throughout the year to perform the physical count. By contrast, the typical periodic inventory uses a rather large number of people who are not generally experienced and trained in the process of doing a physical inventory. The inventory itself is usually conducted once a year in a very hectic manner and in a short period of time.

# 7.5 ADVANTAGES OF CYCLE COUNTING

One of the major advantages of performing a cyclic physical inventory are the timely detection and correction of the causes of inventory discrepancies. A good strong cycle counting programme can also lead to complete or partial elimination of the annual physical inventory with its high costs and questionable accuracies. A strong cycle counting system provides the opportunity to develop specialists who become very efficient in obtaining good inventory counts, reconciling differences and finding solutions to system errors. These specialists become familiar with the parts and make fewer mistakes in identification of the items than would other, less experienced personnel. They can concentrate their work in problem areas to help eliminate them.

The constant surveillance provided by cycle counting y balance

maintains system integrity. If a situation should arise where the inventory balance is questioned, a cycle count can be performed quickly to identify the error or verify that the balance is correct. The cyclic counting programme provides for continuous systematic improvement of record accuracy as well as the ability to maintain an accurate statement of the financial assets of the company throughout the entire year.

The periodic or annual physical inventory would appear to have more disadvantages than it has advantages. The method by which the inventory is taken is very inefficient in the utilisation of manpower and frequently requires overtime. Quite often the production plant and the warehouse must be shut down so that the physical inventory can be conducted.

Perhaps the most important disadvantage of the annual physical inventory is that at the time the inventory is taken it is usually too late to find out what happened, much less to try to correct the causes of any errors that are found. An inventory record error which occurred early in the year is not going to be an item fresh in the mind of the person who caused the error. Therefore it becomes extremely difficult to make the necessary corrections to prevent that error from recurring.

In review then, the objectives of a cycle counting system are:-

- 1. The identification of the cause of any inventory record error.
- 2. The correction of the conditions that led to the error occurring.
- 3. The maintenance of a high level of inventory accuracy and
- 4. The correct statement of the company's inventory asset.

# HOW ACCURATE SHOULD THE RECORD BE? WHAT IS AN ACCEPTABLE LEVEL OF ACCURACY?

If we accept the management attitude "zero defects", then the target level of accuracy should be 100%. Practically speaking however, the achievement of 100% accuracy is unlikely. Therefore, the key to a high level of inventory accuracy is <u>continued improvement</u>.

# 7.6 INVENTORY RECORD ACCURACY - ABC ANALYSIS

### REVISITED

The desired Inventory Record accuracy is usually expressed as a percentage where the inventory record as compared to the physical count does not differ by more than some specified tolerance. As an example, the table Level of Accuracy shows three inventory classifications.

#### LEVEL OF ACCURACY

INVENTORY CLASS	ALLOWABLE TOLERANCE QUANTITY	ALLOWABLE TOLERANCE VALUE
А	$\pm 0.2\%$	GH¢100
В	$\pm 1\%$	GH¢100
С	<u>+</u> 5%	GH¢100

Tolerances are specified by user. If variance is less than quantity or value tolerance, accept count.

Each classification has a different allowable tolerance for error in both count (quantity) as well as value. The allowable tolerance may vary for different groups and should be established to identify significant errors. "A" items, which normally constitute the higher value items in the inventory should be assigned a tighter tolerance than "B" items. Tolerances for low cost "C" items, particularly those that are scale counted, might not be tighter than the accuracy achievable by scale counting.

While using an ABC inventory classification system as a basis for judging the allowable quantity and value tolerances we shouldn't neglect other factors. In fact, the allowable tolerance should be based on the damage that a wrong record can cause in the entire system. A high volume item, regardless of its cost, would usually be available in inventory in sufficient numbers. Quite often it is the low usage items, or those that are used intermittently, which will cause the most trouble when it comes to inventory shortages. Tolerances should be established, therefore, on a combination of a percentage quantity deviation, and an absolute value deviation and operational impact to the business.

The percentage quantity deviation of the physical count is usually related to planned usage over a specified period of time. The effectiveness of cycle counting in improving the accuracy of the inventory records can be evaluated by the reporting and plotting of the level of accuracy.

# 7.7 CYCLE COUNT ACCURACY

The chart Measuring Accuracy of Records depicts the basic

direction for the constant improvement of the inventory accuracy. As an example, on 8/26 there were 125 items cycle counted. Of the items counted, there were 25, or 20% of the items counted which were determined to have significant error.

DATE	ITEMS COUNTED	ITEM SIGNIFICA NUMBER	S WITH ANT ERRORS PERCENT	NUMB 0 – 5%	BER OF IT 5 – 10%	EMS WITH 10-25%	<b>PERCEN</b> 25 – 50%	T ERROR OVER 50%
8-26	125	25	20%	19	2	2	1	1
8-27	130	19	15%	16	1	1	1	-
8-28			TRY TO TO ZE	DRIVE ERO	TRY	TO DRIVE	IO LEFT	

The breakdown of those 25 items however, shows that 19 of them have an error between 0 and 5%, two of the items have an error between 5 and 10%, two between 10 and 25%, one item between 25% and 50% and one item over 50% error.

One 8/27 another cycle count was taken and this time there were 130 items counted. Of these, 19 or 15% of the items counted had significant errors. This is a 5% decrease from the previous cycle count.

If we again analyse the number of items with percent error, we find that 16 of the 19 items counted had errors between 0 and 5% and none of the items counted had an error over 50%. The objective here is that, of the items with significant errors, the more items that have a lesser percent error, the more accurate the inventory. The key is constant improvement which is achieved by working to make the significant errors less and less and by reducing the number of items that have a large percent error.

# 7.8 CYCLE COUNT WORKLOAD ANALYSIS - HOW OFTEN AND WHEN?

The selection of the items to be counted requires some basic planning of the workload in order to insure that every item in the inventory will be counted the appropriate number of times during a year. Counting all the items at least once a year may be a requirement if the cycle counting system is to replace the annual physical inventory. The items which we need to count more frequently must be scheduled on some routine basis to insure that this is accomplished. One way to determine how many counts will be required is to perform a workload calculation.

#### 7.9 ESTABLISHING FREQUENCY OF CYCLE COUNT

The table below shows the typical calculations that might be performed to determine the number of items to be counted on a daily basis. As can be seen by this particular analysis, the C items, of which there are 4,000, will be counted at least once a year. The B items, of which there are 1,500, will be counted twice a year, and the A items, of which there are 250 will be counted six times a year. The total number of counts is 8,500. Assuming there are 250 workdays in a year, this will require that a minimum of 34 items be counted each day if all the items are to be counted during a year as planned.

WORKLOAD							
INVENTORY CLASS	NUMBER OF ITEMS		ANNUAL COUNT FREQUENCY		TOTAL COUNT		
С	4,000	х	1	=	4,000		
В	1,500	х	2	=	3,000		
А	250	х	6	=	<u>1,500</u>		
			TOTAL		8,500		
	Number of Work Day	ys per Year	Divided by		<u>250</u>		
	Items to be Counted	per Day		=	34		

Ideally, the frequency of cycle counting a particular item should increase as the risk of error increases. The risk of error is not the same for all the items in a typical inventory. There are a number of techniques which can be used to vary the cycle count frequency of the simple ABC classification approach. Items to be cycle counted might be selected on the basis of the level of inventory activity or the event of an inventory transaction. As an example, when a re-order is placed, the inventory should be relatively low which will make it easier to count. The inventory will be even lower if the cycle count occurs at the time when the receipt of the replenishment order occurs.

Another technique for selecting an item to be cycle counted would be when an inventory record becomes zero or certainly when it becomes negative. A cycle count could be triggered when a predetermined number of inventory transactions have been recorded. The idea here is that the items with frequent inventory transactions would tend to be more inaccurate than those which have a low level of activity.

Taking a cycle count when a reorder is required has the advantage that if an inventory error is detected the order quantity or timing can be adjusted. The quantity might be increased or decreased as appropriate, or perhaps it may be found that the reorder is not even necessary! One potential problem with this approach is that care needs to be taken that the counting procedure does not interfere with the normal placement of the order. If the order is delayed because of the cycle counting process, then a shortage may occur. Likewise, the system of selecting items for cycle counting when the item is received must not delay material availability for issue while the inventory is being counted.

The Zero Balance method is based on the idea that the ideal time to count the inventory is when there is none to count! The

zero balance system can be operated by any of the storeroom personnel. As they pick the last item in a bin, this can be recorded and submitted to the cycle counting personnel. These can then be checked to insure that in fact there is no inventory. This is a quick, easy and economical way of getting record checks. A negative record balance should trigger a high priority cycle count request, since it represents an obvious problem of record inaccuracy.

All the methods described have advantages and disadvantages. One rather unusual disadvantage is that some of these approaches tend to develop an uneven workload for those who are doing the cycle counting. As with any system, good judgement in the selection of the approach to the cycle counting problem is essential. A good basic method for the selection of the items to be counted and the frequency of the counts is the ABC inventory classification method. This should then be supplemented with other cycle counting techniques which are based on activity criteria.

The functions performed by those taking the cycle count can consist of a variety of tasks. The number of these tasks that are performed is dependent on the organisational structure and also what computer applications might be available. Some of these functions include preparing for the cycle count, which would include obtaining the list of items to be counted and determining where the items are stored. The next function would be the actual taking of the physical count, the totalling of the counts for all the storage locations and the compilation of all the information.

Finally, there is the function of performing a recount of items which have questionable variance when the count is compared to the record balances.

The actual recording of the physical count is usually done on a cycle count record or document of some type. This document generally contains the item number and description of the item to be cycle counted, the location or locations where it is normally stored and the unit of measure. The form will also include an area in which the actual physical count can be recorded, as well as the date and time of the count along with the name of the person who performed the count.

During the period in which the cycle count is taken, care must be exercised to insure that all the documents concerning the particular item have been posted to the inventory records or have been otherwise accounted for. It is important to identify all the potential movement on the item for that day to insure that items which may be in movement, in inspection, being staged or otherwise transported to some other areas either become part of the physical count or are identified as inventory transactions which will not have been posted to the inventory record.

#### 8.0 CYCLE COUNT RECONCILIATION

Once the physical count has been completed and the information totalled, the physical count is compared with the inventory record balance. If, as previously discussed, the variance is within the specified tolerances then the inventory record is adjusted to agree with the cycle count. If the variance exceeds the specified tolerance, then a significant error has been identified and will require further investigation. This reconciliation process includes checking to insure that all the documents are identified and accounted for. The identity of the item is double checked to be sure that the item has not been misidentified. A recount of the item may be initiated to confirm the original cycle count.

The audit trail of the inventory transactions should be reviewed to determine whether all the inventory transactions have been accounted for and whether an error in the quantity recorded in a previous transaction may be the cause for the error in the physical balance. If the count is less that the record balance, a check of all outstanding requirements and allocations should be made to be sure that these are still required, and a check of completed production or sales orders should be made to determine if the required item has been properly deducted from the record.

If the cycle count quantity is greater than the record balance then special emphasis should be made on checking the outstanding balances of all replenishment orders to determine if any have been received. In any event the thorough investigation to determine the specific causes of the inventory discrepancy requires persistent effort. if may require, as an example, that we continue to count the same item repeatedly for a number of days or even weeks in order to identify the true nature of the error.

# It is absolutely essential that the cause of the error be identified.

If this is not done, it will be impossible to take the corrective action needed to cause improvement in the level of inventory accuracy. Reporting of the aggregate results of the cycle count should be thorough and complete. It should include the accuracy of the physical count as it is compared to the inventory record balance. This should address the tolerances for quantity and value that have been established.

Refer now to the table below, Cycle Count Accuracy Summary by Items and Value. This is an example of the type of report discussed above.

VALUE	UP TO + GH¢50		FROM GH¢50 UP TO + GH¢200		MORE THAN + GH¢200		TOTALS BY ITEM	
<u>ITEM</u>								
UP TO <u>+</u> 5%	128	77%	6	4%	5	3%	139	84%
FROM 5% UP TO <u>+</u> 10%	3	2%	2	1%	2	1%	7	4%
MORE THAN <u>+</u> 10%	15	9%	3	2%	2	15	20	12%
TOTALS BY VALUES	146	88%	11	7%	9	5%	166	100%

#### CYCLE COUNT ACCURACY SUMMARY BY ITEMS AND VALUE

- A. 12% of the items counted had errors greater than  $\pm$ 10%. However, from a financial point of view 75% of these (15 out of 20) had a financial impact of only  $\pm$  GH¢50.
- B. From a financial point of view these errors may be very significant.
- C. Ideally the more items with the least percentage error by value and by physical count the better.

This is an example of the type of report discussed above. This particular report combines both the item count percentages and the GH¢ value tolerances. The rows under "Items" (far left side) is broken down into three groups. The first group contains those items which are within  $\pm 5\%$  when comparing the physical <u>count</u> to the inventory record balance. The second group contains those that are from 5% to 10% and finally, the third

group contains those that exceed 10%. Under the Column Totals by Item (far right side) we see that 84% or 139 items out of 166 were within the physical count parameter of  $\pm 5\%$ . The next group is the one in which the error exceeds  $\pm 5\%$  up to  $\pm 10\%$ . In this category there were seven items from the total of 166 or 4%. Finally, we have the group of items which exceeded  $\pm 10\%$ . There were 20 items here, or 12% of the total.

Reading horizontally across the top row entitled Value the tolerances for value have been established as up to  $\pm$ GH¢50 in the first column, those which exceed  $\pm$ GH¢50 up to a total of GH¢200 in the second column, and those that exceed GH¢200 in the third column. On the very bottom row, reading horizontally, we see the Totals by Value of the total count of 166 items. There were 146 or 88% in which the GH¢ value variance was within GH¢50. In the category called  $\pm$ GH¢50 up to  $\pm$ GH¢200 there were eleven items or 7%. Finally, there were nine items which had a value impact of more than  $\pm$ GH¢200.

This particular chart provides a total picture of the performance within each allowable tolerance range for both the quantity of the error and dollar value. In addition to this basic inventory accuracy information, the cycle counting report should include the total dollar value of the adjustments after reconciliation. This should be broken down into the total amount of the inventory write-ups and the write downs as well as the net value of the write-ups and write downs combined. It is important to note that measurement of inventory accuracy base only on the net financial inventory adjustments are usually misleading.

Finally, the cycle count report should include some information concerning the reconciliation and analysis of the errors. A breakdown of the major categories which have caused the errors can be a valuable tool to monitor the progress of the cycle counting programme. A record of the number of errors

caused by late transactions, wrong quantities, wrong codes, wrong locations, extension errors and other categories can be very helpful in directing improvement efforts in the correct areas.

The last item reported from the cycle count should be a statement concerning the number of items yet to be counted in the calendar or fiscal year. This is important information to insure that any requirements placed on the cycling counting programme to satisfy financial auditors are met.

In summary then, the primary advantages of a strong cycle counting programme are:-

- *1. The effective detection of errors and*
- 2. The maintenance of a high level of inventory record accuracy.

The perpetual inventory record balances are used as an audit trail for the reconciliation of the cycle count. Because a perpetual record is maintained, a cycle system can be employed. Cycle counting eliminates many of the undesirable conditions that are normally associated with annual physical inventories. Cycle counting can improve customer service, reduce stockouts, increase production efficiency, reduce inventory investment and safety stocks and provide the means for better cost control. Cycle counting provides the means to detect and correct errors in a timely fashion.

In the cycle counting system, specialists are developed who become very efficient in the process of obtaining good counts and in the knowledge of the process of reconciling the variances and being creative in finding solutions to prevent repeated errors. These specialists become very familiar with the items and therefore avoid mistakes. They provide a high level of inventory accuracy through the constant surveillance of

the inventory and concentration of effort in problem areas.

The importance of maintaining accurate inventory records cannot be overlooked as essential for an effective material requirements planning system. It leads to the reduction of excessive inventory and to the avoidance of obsolete inventory.

The problem of the year-end inventory write-off is averted and a correct statement of the company's inventory asset can be maintained throughout the entire year. The ideal situation is the optimum combination of a sound inventory system and a cycle counting programme that provides reliable inventory information on a timely basis

# PART II

# B. LOGISTIC MANAGEMENT OF MOH/GHS COMMODITIES

# A. INTRODUCTION TO LOGISTICS MANAGEMENT OF MOH/GHS, STANDARD OPERATING PROCEDURES

The standard operating procedure remains the official document of the M.O.H to guide the flow of medicines and its related information. The S.O.Ps describes the key activities in the stores operations with responsibilities for those activities at the regional and service delivery points levels.

These S.O.P.s are designed to help managers:

a. Operate an efficient and effective medicines supply system.

b. Ensure adequate supplies of medicines

c. Protect the financial investments that medicines represent

- d. Maintain the medicines management infrastructure
- e. Reduce waste and loss due to expiry and breakages

In management of logistics, some or all of the following activities are done in a timely and effective manner:

A. ORDER - Determine supply needs and place order

**B. RECEIVE** - Ensure the correctness of received medicines

# C. STORE

- i. Store medicines properly and maintain serviceability safety, and security of stock
- ii. Account for the quantities and value of the stock on hand at the risk of expiry and spoilage.

# D. ISSUE

Issue and maintain adequate supply of medicines

E. INVENTORY CONTROL

Issuing medicines to the dispensary

F. REPORTING Record and report accurate information about supplies and their consumption.

# G. QUALITY ASSURANCE Ensuring that the quality of medicines is maintained

# B. TASKS AND ACTIVITIES FOR MANAGING LOGISTICS-HEALTH FACILITY LEVEL

The Health Facility is the level that initiates all medicines activities and it is the source of the data that is used to manage the system.

Health facilities:

- 1. Requisition of medicines , the medicines that are needed to treat patients, and
- 2. Provide RMS the information it needs to fill the orders it receives

Once the products/medicines have been ordered, received and stored at the Health facility, they are then ready to be issued to the service providers within the facility. The services providers will then dispense the products to the clients.

# C. ACTIVITIES AND TASKS FOR COMMODITY RE-SUPPLY

To get medicines, health facilities must complete a variety of 're-supply' activities on periodic basis eg. Monthly. The major components of re-supply activities are:

- a) Submit requisition to supply source (R.M.S)
  - 1. Determine the requisition quantity
  - 2. Submit by due date
- b) Receive the products form the RMS/Supplier
  - Check the quantity and quality of the products

you receive

- Store and maintain the products/medicines in the store room.
- Do entries in the Stores Receipt Voucher (SRV), Stores Received Advice (SRA) and Store Ledgers
- c) Implement the process for making payment
- d) Ensure that logistic management activities are done properly, with fewer errors, and in a timely manner.

# **D. SETTING MAXIMUM AND RE-ORDER QUANTITIES**

The MAXIMUM STOCK QUANTITY is the highest quantity of a product a facility should have on hand at any time.

The RE-ORDER QUANTITY is the quantity that is used to determine if an order needs to be placed or not. The Maximum and Re-order Quantities are based on recent consumption. They are calculated for each product the facility keeps and is expressed in units. Eg (tablets of paracetamol)

### E. WORKSHEET FOR SETTING MAXIMUM TOCK/REORDER QUANTITIES(TO BE COMPLETED EVERY SIX MONTHS)

The maximum and Re-order quantities that you calculate are written on the Tally Cards – this will be used to complete the Requisition each month.

**Remember:** Repeat this process and calculate your Maximum Stock and Re-order levels every six months, so that your stock levels reflect current trends in consumption. You should also re-calculate your stock levels if there are frequent emergency orders. Re-calculate your maximum stock and reorder quantities for any products that require

emergency orders two months in a row.

# F. INVENTORY MANAGEMENT

Inventory Management at the Health Facility Level includes two main activities:

✓ Monitoring the quantities of stock on hand, and

 $\checkmark$  Monitoring the quality of the products.

Monitoring the quantities of useable stock on hand helps to ensure that stock records are kept up-to-date so that quantities of stock on hand can be maintained between the maximum and re-order levels. This will help to ensure that there are enough products to meet client needs. Monitoring the quality of our products helps to ensure that patients will always receive medicines that are high of quality.

We monitor our quantities of stock on hand by doing stocktaking on a regular basis (quarterly)

We monitor the quality of the products by conducting regular visual inspection of the products and by maintaining the stores in good order.

# **G. STOCKTAKING**

Stocktaking is the process of counting by hand the number of each type of product in your store/dispensary.

Stocktaking is conducted for both managerial and financial reasons.

The management functions of stocktaking are to:

- Verify the accuracy of storekeeping records.
- Ensure efficient organisation of stocks in storage
- Ensure that all stocks are useable

The financial function of stocktaking is to determine the value

of stocks held in storage to the organisation to complete picture of its assets. This should be done on a quarterly basis and obligatory at the end of the year.

# H. ADJUSTMENTS

When conducting stocktaking, there may be differences between the number of products that are counted and the balance recorded on the Tally Card/Store Ledger. If the stocktaking count shows the balance recorded and the balance tally card is higher or lower than the quantity of the product counted, then an adjustment needs to be made on the card.

One method for evaluating the effectiveness of stores operations is to monitor losses and adjustments as a percentage of the total stock managed. Adjustments of more than 5% of the total stock quantity managed, is a signal that there are problems that needs to be corrected.

All losses (including product expiry, damage or theft) are reported on the Stock Valuation Form.

The Stock Valuation Form tracks both the quantities and value of products lost.

# I. STOCK RECORDS

The minimal information that should be collected on stock records for medicines includes:

Product name/ description (including the form(e.g. capsule, tablet, liquid suspension, et. cetera. and strength)

- Stock on hand / beginning stock balance.
- Receipts
- Issues
- Losses/adjustments

- Closing/ending balance
- Transaction reference(e.g. Issues voucher number or name of supplier or recipient)

A logistics information system must have three different types of records: Stock-keeping records, transaction records and consumption records.

See sample form:

- ✓ Stock Cards
- ✓ Bin Cards
- ✓ Requisition/Issue Vouchers
- ✓ Receiving Forms
- ✓ Ledger Books
- ✓ Delivery/Issue Vouchers

# J. SCHEDULED DELIVERY SYSTEM

Delivering commodities form the upper levels RMS to the health facilities through scheduled delivery system. The RMS is responsible for developing, communicating, implementing and maintaining a coordinated schedule for the delivery of health commodities to the health facilities they serve. The scheduled delivery system consolidates deliveries and this results in overall time cost savings.

# Example of scheduled delivery system: Western

Region Medical Store(W.R.M.S.)

The Western Region is divided into four routes, namely: Route 1 Nzema East/Elubo/Half Assini Route 2 Tarkwa/Prestea/Asankragua/Enchi/Dadieso Route 3 Bibiani/Wiawso/Juabeso/Essem

Route 4 Metropolis/Daboase

# THE EXPECTED DATE FOR ALL REQUISITION AT W.R.M.S

- At least one week before route distribution begins
- All requisitions to reach RMS or office of DDHS from where they will be passed on to the RMS
- Requisitions sent by EMS or Fas

# Delivery Starts First Week of the ensuing month

Route 1  $5^{\text{th}}$  to  $7^{\text{th}}$ 

Route 2  $18^{Th}$  to  $21^{st}$ 

Route 3  $8^{th}$  to 16th

Route 4 23<sup>rd</sup>

# K. DISPOSAL PROCEDURE

Disposal of obsolete and surplus items shall be by:

- a) Transfer to government departments or other public entities with or without financial adjustments
- b) Sale by public tender to the highest tender, subject to reserve price
- c) Sale by public auction, subject to reserve price, or
- d) Destruction, dumping or burying as appropriate

# DISPOSAL OF STORES, PLANT AND EQUIPMENT

Authority to Dispose

1) The head of a procurement entity shall convene a board of survey comprising representatives of departments with unserviceable, obsolete or surplus stores, plant and equipment which shall report on items and subject to a technical report on them, recommended the best method of disposal after the officer-in-charge has completed a Board of Survey form.

2) The Board of Survey's recommendations shall be approved by the head of procurement entity and the items

shall be disposed of as approved.

3) Where items become unserviceable for reasons other than fair wear and tear, such as through accident or expiry, a set procedure established by the board for handling losses shall be followed before the items are boarded and disposed off.

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