

NETWORK BUSINESS SYSTEMS

SOFTWARE SYSTEM DOCUMENTATION

MANUFACTURING RESOURCES PLANNING

FEATURES

- 12 Month Independent Master Sales Forecast
- 12 Month Independent Master Production Schedule
- Capacity Planning by Mfg. Cell and Machines
- Provides for easy what if scenarios
- Supports Process and Job Shop Mfg.
- Allows for consolidation of parts demand for work order planning

REPORTS

- 12 Month Sales Forecast w/ Gross Margin
- 12 Month Comparison of Sales Forecast to MFG. Plan
- 12 Week/52 Week Production Plan
- Breakdown of Materials with Detail
- Forecasted Parts needs from Sales Forecast
- Forecasted Parts needs from MFG Plan
- Capacity planning by Cell, Machine

INTEGRATED WITH:

- IBS Mfg/Inventory System
- IBS Sales Systems

The integration of the IBS MRP System extends throughout the entire IBS Software Systems, and is dependent on information that is generated within virtually every major IBS software module.

SYSTEM OVERVIEW

"Manufacturing Resource Planning"...(abbreviated as MRP or MRP II) is a broad concept that can generally be agreed as the process of utilizing sales and manufacturing data to provide a working plan for a manufacturing business to successfully operate under. The actual definitions of the words confirm this.

"Planning... Any detailed scheme, program, or method worked out beforehand for the accomplishment of an objective."

"Resource... A available supply that can be drawn upon when needed."

The IBS Manufacturing Resources Planning System provides a common forum for sales and manufacturing management to plan and coordinate the most vital functions of the business...future sales and manufacturing activity. Sales management can generate projections of future sales in the MASTER SALES FORECAST, based on historical trend analysis and in consideration of future projections. Manufacturing can independently operate the MASTER PRODUCTION SCHEDULE utilizing the master sales forecast as the guideline. The coordination of the two can generate detailed planning models that can be used to pilot operations all the way through to the financial statements.

One main theory of operation within the IBS MRP system is the "12 MONTH PERPETUAL PLANNING MODEL". This means first that the system is capable of projecting up to 12 months in the future. It also means that if you are in the month of January 2001, then December is the end of the following year. When you move from January into February, then January becomes the end of the planning period, in 2002. Again, when the first of each month happens that is always the beginning of the next 12 week forecast period and the month you just finished is now immediately 12 months later.

With this in mind, depending on the cycle of your MRP processing you will need to update the month you just closed to a 12-month future month at the first of each new month.

SALES VS. MANUFACTURING

The IBS MRP System is intended to start with the Master Sales forecast which is then turned into the Master Production Schedule. Parts needs analysis and Capacity planning will feed information back to the Master Production Schedule and ultimately to the Master Sales Forecast. Whether you are a market driven company that primarily manufactures product in a process method, or a job shop company that manufactures product according to contracts, the IBS MRP system will bring reality into your planning methods.

MRP RELIABILITY

Conceptually, the process of MRP utilizing the IBS MRP system is very simple. Imputing sales and manufacturing projections and coordinating the two together to facilitate MRP can be done very quickly with the powerful functions built into the programs. However, there are some very serious responsibilities that must be accurately managed and maintained in order to generate MRP data that is useful. These responsibilities are all day-to-day functions that should be thoroughly reviewed for accuracy and timeliness prior to relying on any MRP data. Listed below is a checklist. Once you have done a thorough audit of these procedures and feel comfortable that all is on order, you will have not only set up for useful MRP but also verified a very large portion of your operations.

INVENTORY LEVELS: This is the starting point for calculated materials acquisitions. Inventory levels must be maintained accurately and timely with perpetual count auditing. This includes the assigned field, which represents customer back orders and work in process materials that have been requested by a work order but not yet issued.

INVENTORY LEAD TIMES: The time of materials acquisition is directly affected by lead-time. Immediate knowledge of a change in the primary vendor lead-time should be updated to the system. Periodic reviews should be scheduled to verify all lead times.

INVENTORY MATERIAL AND FREIGHT COSTS: The cost of materials will affect the financial planning aspect of the MRP. As material costs change, so should the system. You can use the automatic material cost update routine that operates automatically as you receive new goods and updates the inventory master file. For freight cost, inbound freight should be separated for ease of calculation from the balance sheet. Freight costs can be either allocated as a percentage of the material cost or by direct allocation. In order to support the percentage allocation method you can use a simple ratio of inbound freight divided by purchases. This percentage can be entered into the system setup file. You can also change this and recalculate this cost on all goods at any time. You should use the direct method for any imported goods or

materials that have a high cost compared to the percentage. There should be a periodic review of freight costs.

SPECIAL NOTE ON COSTING: Almost all functions listed in this section some way or another affect the standard cost of goods manufactured. With that in mind, before any long term MRP planning is started it makes good sense to always recalculate all manufactured costs up front.

INVENTORY LOT SIZE: This number will determine the allocation of the setup time cost in each manufactured part and therefore affect the calculated final cost and flow on through to the financial planning aspect of the MRP. A periodic review of the actual quantities manufactured should be scheduled to determine the lot size from actual operations.

INVENTORY RECEIVING: MRP Cash Flow Planning and MRP Materials Acquisitions will be directly affected by receiving data. Inventory should be entered into the system as soon as it arrives, upon verification of purchase order authorization. It should not be updated unless it is approved for use. This would make inventory available that may not be usable. This process should be as short as possible, not less than a few days. Once approved, the receiving entry should be updated immediately...releasing the materials for use.

Since the IBS Accounts Payable system is integrated into the IBS Purchase Order system, all inventory that has been received but not yet invoiced will be reported in the MRP Cash flow report. You may need to make a journal entry for this data if it amounts to a significant amount. You should consult with your accountant in this matter.

INVENTORY DEFECTIVE/MRB: As with the inventory counts, any materials that are defective or need review prior to use should be transferred into the IBS Defective Inventory Management System.

PURCHASING: MRP Materials Acquisitions is directly affected by all outstanding materials purchases. All purchases for materials should be entered into the system as they occur. All purchases of subcontractor services should be entered as they occur, with the proper work order number entered for direct cost allocation.

PURCHASE ORDER DELIVERY DATES: The time of materials acquisition is directly affected by delivery date. As purchase order become delinquent on delivery, they should be corrected with the new delivery date. The key date is the line item date in the purchase order. Prior to any MRP calculation this should be reviewed.

PURCHASE ORDERS STILL OPEN: The quantity of materials acquisitions is directly affected by what is still on order. All open and unreceived purchase orders should be maintained and reviewed for validity.

PURCHASE ORDER VENDORS/PRIMARY: The primary vendor that is entered into the inventory master file should always be maintained correctly. As changes are made, this should be changed also.

MANUFACTURING ROUTING MASTER OPERATION TIME AND SETUP TIME: MRP Capacity planning is directly affected by this data. All manufactured parts should be thoroughly reviewed to keep the estimated operation and setup time as accurate as possible. A periodic

review should be scheduled. Depending on the volume of work orders, it is possible to also review as work is completed and make any necessary changes.

MANUFACTURING BILLS OF MATERIALS: The actual make up of materials and quantity of materials acquisitions is directly affected by the accuracy of the bill of materials. All bills of materials must be accurate. This should be done as they are created. Changes must be made immediately. Also, in the event that you are going to make a scheduled change in the future, then you can create a new part number identical to the old that has a suffix to make it unique...and create the proper bill of materials and routing. Use this part number for the future scheduling, and just transfer the changes to the old part number when you go live with the new configuration.

MANUFACTURING CELL CONFIGURATIONS: MRP Capacity planning by cell is only as good as the breakdown. As you change your manufacturing configuration, such as location, size, manpower resources, etc., you must immediately update the file. You will also need to modify any work order routings that need to reflect the changes. Also, the direct labor account is crucial to the automation of time input from the manufacturing system to the IBS Payroll system. This provides automatic reporting of each manufacturing employee to the proper general ledger account as time is input against each specific job operation. Remember, each operation is tied directly to a manufacturing cell, so direct labor allocation is automatic. All other time is allocated to the default labor account in the employee master file. This default account should be the indirect labor account for the department the employee normally works in.

MANUFACTURING CELL COST ESTIMATES: MRP financial planning is directly affected by this data. As you make changes to manufacturing cells, this may affect cost also. As overhead costs and direct labor costs change you will need to periodically review this data and make adjustments to the cell estimated costs. This includes floor space cost allocation, depreciation, etc.

MANUFACTURING CELL CAPACITY: MRP capacity planning is directly affected by this data. You will need to maintain the total hours available per each cell/department as employment levels change. Also, remember to calculate the hours with consideration of any breaks or lunch and estimated down time. You will not want to use the full payroll hours for each employee...due to the fact that it is realistically impossible to expect full output from punch in time to punch out time.

MANUFACTURING TIME INPUT FROM SHOP FLOOR: MRP Capacity planning is directly affected by this data. Unclosed time cannot be considered as well as any time not updated that is in an error condition. Time input from the shop floor should be input daily and updated as soon as it is confirmed as error free.

MANUFACTURING MACHINES AND MACHINE TYPES: MRP Capacity planning by machine is only as good as the breakdown of machine types. This data should be modified as it changes, along with any manufacturing routings.

ACCOUNTS PAYABLE INVOICE INPUT: MRP Cash Flow Planning is directly affected by this data. Invoices should be entered as they are received and vouchered with proof of receipt and proof of authorized purchase. You should not enter in an invoice unless you have received

the inventory. This would create incorrect balance sheet data by overstating accounts payable and understating inventory values.

PAYROLL EMPLOYEE PAY RATES: MRP Financial Planning is affected by this data, as manufactured goods interface the IBS Payroll system. Even if you do not use the IBS Payroll Module, you will need to maintain the employee master file system with current pay rate information in order to feed actual work order labor costs and calculated materials standard costs.

PAYROLL EMPLOYEE DEFAULT GENERAL LEDGER ACCOUNT: Although this does not directly affect any MRP data, it certainly affects the ease and ability to allocate labor costs efficiently in the IBS general ledger. Direct labor costs and factory overhead costs are easily calculated if set up correctly. As mentioned in the section above on manufacturing cells, the default account for all direct manufacturing employees should be an indirect labor account that corresponds to the account structure in the IBS general ledger...set up per department. In other words, your general ledger should have a structure in the cost of goods sold section that provides for a minimum of a direct labor account, indirect labor, and factory overhead...per cell. By doing this you will set up for easy calculations of average direct labor and factory overhead cost per account/cell.

ACCOUNTS RECEIVABLE OPEN INVOICE: MRP Cash Flow Planning reports this data in the cash flow planning area. Utilizing the unique IBS Deposit Slip system will support up to the minute accuracy of accounts receivable.

SALES BACK ORDERS: These numbers are included in calculated materials needs in the MRP system. Customers back orders should be reviewed for validity on a periodic basis.

BASIC SYSTEM OPERATIONAL FLOW/MRP PROCESSING

Prior to any serious MRP sessions, NBS encourages you to review the checklist above along with any other special procedures you have in place.

RECALCULATING FIELDS

You should always recalculate on order, work in process, assigned, and standard manufacturing costs as a minimum.

MASTER SALES FORECAST

The IBS Master Sales Forecast is a primary function of the MRP system. This is where the planning session begins. You will be utilizing historical sales analysis, future market projections, historical manufacturing data, new product strategies, etc. to assist in developing the Master Sales Forecast. The initial plan should be a true sales goal for the Company with a realistic approach to the capabilities of that you are already aware of. Important facts like lead times and material availability, new product development time, market conditions can induce factors that must be considered.

PROCESS MANUFACTURING

For a process manufacturer where a steady line of product is manufactured on an ongoing basis, the Master Sales Forecast will provide the backbone for the MRP. Products can be made to stock with considerations for seasonal fluctuations, etc.

JOB SHOP MANUFACTURING

For a job shop manufacturer where all manufacturing is derived from specific customer orders, such as government contracting or pure subcontractor manufacturing, the Master Sales Forecast may only be used for scheduling anticipated re-orders or future orders your company may be going after.

The built in options within the main entry program "Master Sales Projection:FOENTQTY" are extremely powerful. You can enter in sales quantities by monthly, weekly, daily sales and further separate into domestic and international quantities. The F1 key prompts you as to the power function keys available.

You can quickly build a sales forecast and even project future increases and decreases in sales quantities and sales prices and costs. The Sales Forecast report will show all quantities entered and totaled, the cost each and extended total, the sales price each and extended total, and the gross profit dollar and percentage. The report will subtotal by report group with a grand total at the bottom of each month and at the end of the 12-month period.

You can calculate parts needs from the Master Sales Forecast to determine the inventory quantity needs and costs.

MASTER PRODUCTION SCHEDULE

The IBS Master Production Schedule is the counterpart of the Master Sales Forecast. Functionally it will allow you to do the same thing as the sales forecast, without the cost or sales price factor. The reason for not including this information is because the intention of the manufacturing forecast is to attempt to supply products in sufficient quantity to fulfill the sales forecast. There is a report "Print Sales/Prod Comparison:FOLIST" that generates a 12-month vertical comparison of the Master Sales Forecast quantities to The Master Production Schedule quantities to analyze the differences.

12/52-WEEK PRODUCTION PLAN

The process of entering the Master Production Schedule is where the IBS MRP system intelligence goes to work. The program "Print 12 Week Production Plan:FOPROD-W" can be utilized to coordinate the economic manufacturing cycle to the Master Sales Forecast. You can easily see the net stock condition of inventory from your planning.

This report tracks beginning inventory, back orders, the Master Sales forecast, the Master Production Schedule, and mathematically the net stock of each part scheduled. The report organized this data by week.

The 52 Week Production Plan is simply a full year look, week by week, of the same data as the 12 Week Production Plan.

PARTS NEED ANALYSIS

Once you have organized your Master Sales Forecast and the Master Production Schedule, you are now ready to calculate your parts needs. This can be done by either the Master Sales Forecast or the Master Production Schedule.

The first step is to breakdown all parts on hand to the lowest level of materials. The program "Breakdown Parts on Hand:FONHANDP" is used to accomplish this. What happens is that all materials throughout the entire IBS inventory system are broken down into the lowest

levels, depending on how the "BREAKDOWN FLAG" is set in the inventory master file. If the flag is set to "Y", then all finished goods for that part will be broken down. If the flag is set to "N", then all finished goods for that particular part will not be broken down. You can use this to control if certain inventory items are not to be broken down so the parts cannot be used in other assemblies, or if they can be broken down for use if necessary. If you have made changes in the manufacturing process to materials (such as fabrication, machining, welding, etc.) other than basic assembly...then you will probably not set the flag to breakdown. On the other hand if you have simple assemblies that can be torn down if necessary then you have the option to choose to break the assembly down to the lowest level of materials which makes them available for other use. This feature can be set at any bill of materials, no matter where in the process of an assembled item.

Now, when you actually calculate the parts needs, the same inventory master file breakdown flag works the same way. In this case you will usually have the breakdown flag set to "Y" for all parts so that you can generate a true report of material needs at the lowest level. In the case that you have an opportunity to purchase a part that you usually manufacture (it has a bill of materials), you could set this flag to "N" for the parts needs calculation and trap the load at that level. This further supports the ability to make or buy any part.

During the process of calculating parts needs, you are asked to calculate for one or all parts. You are then asked for the number of months ahead you wish to calculate parts needs for. After that you can decide if you would like to print a summary of parts needs at the end of the detailed report. This summary can be set to print for only short or only over purchased parts, or to print all parts in the calculation. You are further asked to include on order quantities or not. This allows you to completely ignore the open purchase orders or include them.

Once you have ran the parts needs calculation program, you can reprint the report without going through the calculation process again. Be advised that this is a reprint only and is intended to be used in the case that multiple copies are desired or possibly the printer jams or maybe you chose the wrong printer.

PARTS NOT ON A BILL OF MATERIALS

This is a report of all parts not currently spoken for within a bill of materials, both raw materials and finished goods. This report extends the quantities times the current standard cost as stored in the part master file.

CAPACITY PLANNING

The capacity planning section of the IBS MRP System deals with assisting you with determining if your scheduled work fits within your work cell capacity, or your machine capacity.

There are several reports in this section of the IBS MRP system that allow you to deal only with actual work orders, or only projected work orders, or both. You will be given the opportunity to alter the available hours during this process, without altering the work order cell master file. This allows you to consider moving resources to compensate for excess scheduled work or lack of work.

CASH FLOW PLANNING

SYSTEM SETUP REQUIREMENTS

If you are running the IBS Inventory and IBS Manufacturing Systems then you are ready to start utilizing the IBS MRP System. If you are just starting out you will need to complete the setup process for the IBS Inventory and IBS Manufacturing Systems, prior to use of this module.

MENU STRUCTURE/PROGRAM DOCUMENTS

3. INVENTORY/MFG.

6. MRP PLANNING FUNCTIONS

MENU #1

1. MASTER SALES FORECAST

MENU #1

1. Enter/Edit Sales Forecast:FOENTQTY
2. Print Master Sales Forecast:FOQTYLST
3. Print Sales/Prod Comparison:FOLIST
4. Sales Prjctn vs. Actual Sales:FOPROD

2. MASTER PROD. SCHEDULE

MENU #1

1. Enter/Edit MFG Forecast:FOENTMAN
2. Print 12 Week Production Plan:FOPROD-W
3. Print 52 Week Production Plan:FOYEAR2
4. Parts Routing Requirements:WOPRJCTN
5. Man. Req. For Production Fore:WOPRJPLN
6. Change Group Code:FOCHGGRP

3. PARTS NEEDS ANALYSIS

MENU #1

1. Breakdown Parts on Hand:FONHANDP
2. View Parts Breakdown:FOGUT
3. Print Parts Breakdown:FOPRINT
4. Print Parts Breakdown w/Detail:FOPRT2
5. Parts Need for Man Forecast:FOREQMNF
6. Parts Needs for Proj. Sales:FOREQUIR
7. Purchase Requirements:FOREQMAN
8. Parts Not on B.O.M.:FONOBOM
9. Reprint Parts Needs/No Calc.:FOREQSEL

4. CAPACITY PLANNING

MENU #1

1. Projected Load:WORPT4
2. Standard Load by Cell:WORPT1L
3. Standard Load by Machine:WORPT1M
4. Actual Load by Cell:WORPT2L
5. Actual Load by Machine:WORPT2M
6. Actual Load by W.O. #:WORPT3
7. W.O. Status by Part #:WORPT6
8. W.O. Load Sched.Cell&Part:WOSCHEDP

5. CAPACITY PLANNING

MENU #2

1. Load Sched by Cell & WO#:WOSCHEDL
2. Prodctn Delivery NO DETAIL:WODELIV
3. Prodctn Delivery DETAIL:WODELIV2

6. CASH FLOW PLANNING

MENU #1

1. Cash Flow Planning Report:CASHFLOW