

# Enterprise Resource Planning Performance Measurements



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# ***Introduction To “Class A” ERP Performance Measurement***

Financial performance has been the primary measure of success in most manufacturing companies. Manufacturing companies have developed financial planning systems and financial statements for measuring their performance on a regular monthly, quarterly, and annual basis. Financial plans are generally stated in terms of Sales, Gross margin, Income, Investment and Return on Investment (ROI). These financial performance measurements have been developed and documented by the accounting profession and are well accepted by management and stockholders of manufacturing companies.

Manufacturing companies have not, however, done as well at developing effective operating systems and operating performance measurements. Today, manufacturing companies need to establish effective operating systems and operating performance measurements to enable them to effectively manage business operations and meet business and financial objectives.

Much has been written about Manufacturing Planning and Control systems. In addition to numerous books, articles, video tapes and seminars are widely available on this subject. Material Requirements Planning Systems (MRP) were developed in many manufacturing companies during the 1970's. Since then, complete software packages supporting MRP have been established. This has resulting in a heightened awareness of the need for sound management leadership and direction if the software tools are to be effectively utilized. The focus in manufacturing management systems has moved toward a "total system of managing," referred to as Enterprise Resource Planning (ERP).

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# ***Introduction To "Class A" ERP Performance Measurement***

Enterprise Resource Planning is a method to effectively manage the total resources in a business enterprise. In high performance companies ERP extends beyond the four walls of the factory to include a company's trading partners – suppliers and customers.

This article describes in detail one of the milestones that each company must achieve – a level of excellence known as "Class A" ERP. In other words "doing the basics in manufacturing management with excellence."

A "Class A" level of performance is achieved by attaining a 95% score in each of a particular set of operating (non-financial) measures. The measures as well as the measurement process is defined in this article and organized as follows:

## **I. Enterprise Resource Planning (ERP)**

- Top Management Planning
- Operations Management Planning
- Operations Management Execution
- Closed Loop ERP

## **II. Performance Measurement: A Measurement Process**

- Performance Report Card
- Performance History

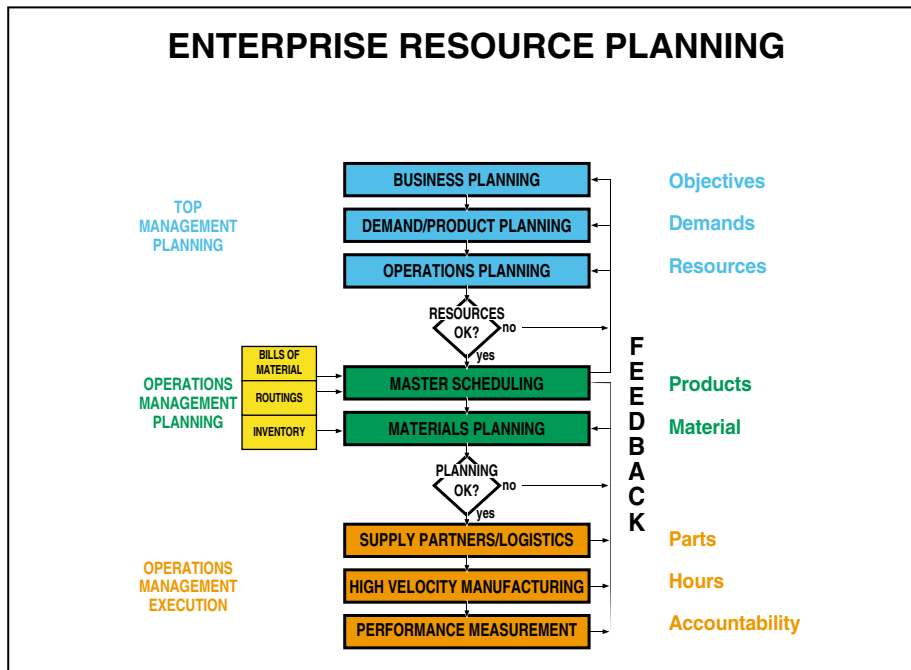
## **III. Detail Performance Measures**

## **IV. Conclusion**

# I. Enterprise Resource Planning (ERP)

Manufacturing companies need Enterprise Resource Planning to effectively run their business – a methodology to plan and control the total resources of the company and effectively focus these resources on the best marketplace opportunities. ERP embraces all functions of a manufacturing company – Marketing, Manufacturing, Materials, Engineering, Finance, Quality Assurance, Human Resources, Information Technology, Suppliers and Customers. They must work together to develop and execute a total company game plan if business objectives are to be achieved.

The functions of Enterprise Resource Planning can be discussed in three groups which represent levels of management planning and execution.

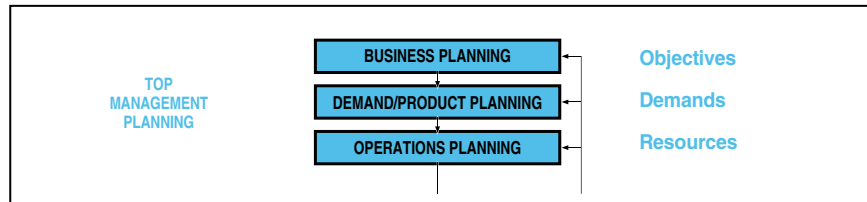


The three levels of management planning and execution are:

- **Top Management Planning**  
High level strategic plans
- **Operations Management Planning**  
Detailed and specific plans
- **Operations Management Execution**  
Executing the detailed and specific plans

# Top Management Planning

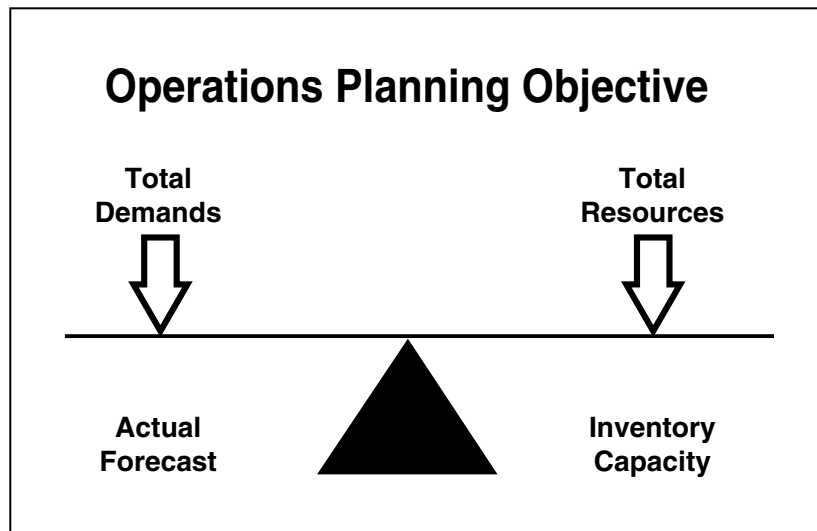
Top Management is responsible for developing a strategic Business Plan for the company. The *Business Plan* includes market, product and profit objectives.



The Demand *Plan* is the forecast of customer demand for the products which will generate the dollar sales volume required by the Business Plan

The Operations *Plan* is the allocation of manufacturing resources to produce the products required to meet the customer demand from the Demand Plan.

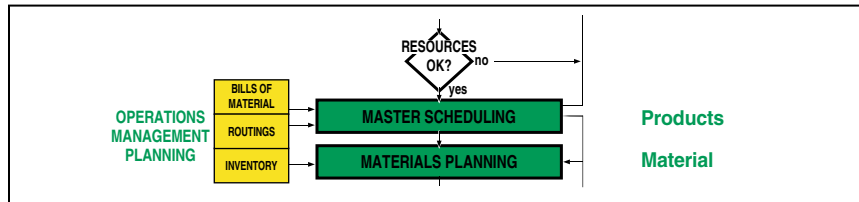
The Top Management Planning Process is a monthly function. The Business, Demand and Operations Plans of a company need to be reviewed and subsequently updated on a monthly basis. In most businesses, this monthly plan typically extends out twelve months. Each succeeding month the plan is extended one more month to provide a twelve month rolling plan.



The Top Management Plan is the responsibility of the president or general manager. The planning activity includes Marketing, Engineering, Manufacturing, Financial and Human Resource managers. The plan is the strategic "What, How Much, and When?" at the market, product, resource and profit levels. It acts as a framework or constraint within which more detailed operating plans can be developed. It is Top Management's definition of objectives for Operations Management Planning.

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# Operations Management Planning



Operations Management is responsible for taking the strategic plan and translating it into specific and detailed operating plans. Operations Level Management must plan the detailed material and

capacity requirements to meet the Business Plan.

Operations Management Planning is a weekly process. Both the development of the plan and the subsequent review and update of the plan need to be accomplished each week.

Operations Management plans the detailed product and mix to be produced with the Master Production Schedule. The *Master Production Schedule* is a specific, weekly statement of what is to be produced. It is a schedule of production, not demand. The Master Production Schedule is then translated into detailed Material and Capacity Plans. The *Materials Plan* is a statement of requirements for both manufactured and purchased material.

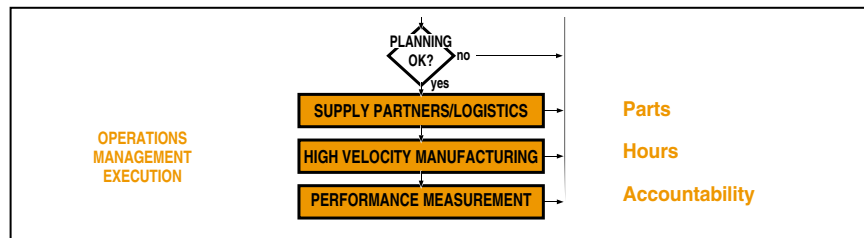
The Operations Management Plan is a detailed "What, How Much, and When?" of Material and Capacity Plans to meet the Business Plan objectives. It defines objectives for Operations Management execution.

The data base, which includes bills of material, inventory status and routings, is required to support the Operations Management Planning Activities. The Bill of Material specifies the parts or materials needed to produce the product. The Routing specifies the process or the operations that need to be performed. The Inventory Status includes the on-hand quantity and location of the items that are available to produce the product.

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# Operations Management Execution

Operations Management Execution is the detailed "What, How Much, and When?" in material, hours and dollars of production.



Operations Management Execution typically implies daily activities. As the performance of purchasing and manufacturing execution improves, the time interval in which the plan is developed and measured becomes less than daily increments.

*Supply Partners/Logistics* is responsible for executing the material plans for purchased materials, parts, and services. Manufacturing is responsible for executing the capacity and material plans in High Velocity Manufacturing.

The objective of Operations Management Execution is to produce products that meet customer needs, to execute the Business Plan and achieve Top Management's market, product and profit objectives. This cannot be accomplished and sustained without a high commitment to quality and continuous improvement by all employees.

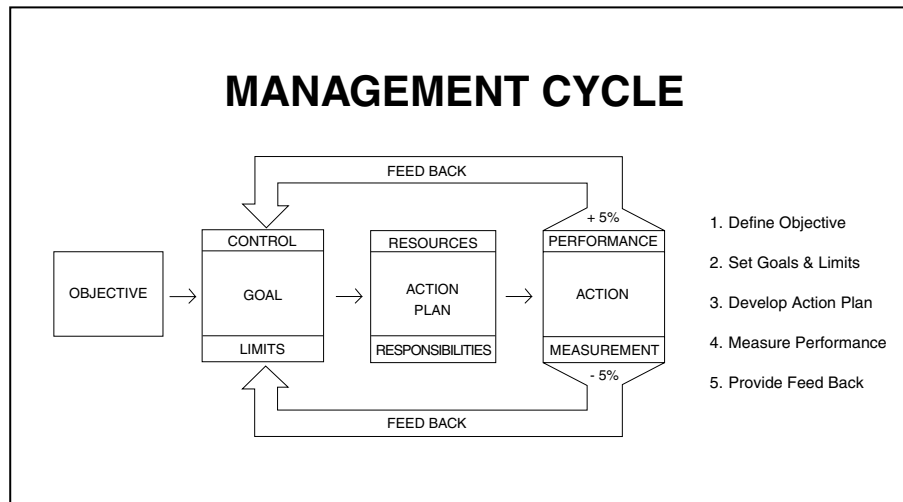
## Closed Loop ERP

For the first time, Top Management can be assured that their strategic objectives in the Business Plan are, in fact, driving the detailed operating plans. There is now an interrelationship between the Top Management planning and Operations Management planning and execution. No longer is the translation of the plan lost somewhere between the president or general manager's office and the activities on the manufacturing floor.

Closed Loop ERP provides the methodology to manage a manufacturing company. It is a formal process for a company management team to communicate objectives and measure performance. It defines objectives, performance measurements and accountability for each functional area, checking the performance of each function back to the Business Plan. It has checkpoints for all levels of management. It has a feedback loop. It has interactive planning and execution. It promotes teamwork and cooperation. It is a management process which has proven to be effective in running a manufacturing company.

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## II. Performance Measurement



Measurement is a very important part of the management process. Setting objectives, tolerance limits, developing action plans, allocating resources, assigning responsibilities, implementing plans, measuring performance for feedback and corrective action are all part of the Closed Loop Management process. A definitive set of operating performance measurements, similar to

the financial performance measurements, help manufacturing management close the loop in the management process, and truly manage the company operating performance.

### Five Steps To Performance Results

1. Establish measurable objectives.
2. Measure present performance.
3. Identify problem performance areas.
4. Develop an action plan with resources and responsibilities for solving the problem performance areas.
5. Measure performance on a regular basis and go to #3.

Performance objectives should be set to include a performance target and performance date, i.e.,

### Inventory Accuracy

- 75% by June 1
- 85% by September 1
- 95% by December 1

Performance measurements generally include tolerance limits or time fences, i.e.,

### Delivery Performance

- 95% within 72 hours by June 1
- 95% within 48 hours by September 1
- 95% within 24 hours by December 1

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## II. Performance Measurement

Performance measurement depends on valid plans and realistic objectives. Performance measurement enables management to close the loop on the management process.

The concept of "Class A, B, C or D" Companies was first introduced in 1977. the premise was that there are classes of companies based on different levels of performance. This was the first attempt to develop performance measurement for a manufacturing company. The performance measurements chart defines the "Class A, B, C or D" user, with numerical performance measurement, and indicates the characteristics for each class of user.

What level of operating performance are you getting in your manufacturing company? How do you evaluate your performance? Do you identify problem performance areas and prioritize them for management attention and action? Do you systematically monitor your operating performance and initiate action to improve your company's performance?

### Enterprise Resource Planning Performance Rating Chart

CLASS	PERFORMANCE	CHARACTERISTICS
<b>A</b>	<b>95%</b>	Complete Closed Loop System. Top Management uses the Formal System to run the business. All elements average 95% to 100%.
<b>B</b>	<b>80%</b>	Formal System in place but all elements are not working effectively. Top Management approves but does not participate. Elements average 80% to 95%.
<b>C</b>	<b>70%</b>	MRP is order launching rather than planning priorities. Formal and Informal System elements are not tied together. Some sub-systems not in place. Elements average 70% to 80%.
<b>D</b>	<b>50%</b>	Formal system not working or not in place. Poor data integrity. Little management involvement, little user confidence in system. Elements are 50% or below.

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## ***II. Performance Measurement***

*In pursuit of "Class A," the first year payback in direct benefits has proven to be over 250% Return on Investment for these companies.*

A good set of operating performance measurements will enable you to evaluate your operating performance, identify problem performance areas, assign responsibilities, and prioritize problems for management attention. They will enable you to monitor and improve the performance of your company. A systematic review of performance allows you to identify and diagnose developing problems early, and within reasonable tolerance limits to avoid crisis management. Performance measurements are an important management tool for monitoring and improving performance and for achieving the company business objectives.

Performance measurement can be started today. A new computer or new computer reports are not required. Much of the information required for Performance Measurement is already available in most companies. What is needed is a management team that understands the importance of the performance measurement concept. A team that will set performance objectives will systematically measure performance, and will begin to practice Performance Measurement as part of the Closed Loop Management Process.

The Performance Report Card (on page 10) will enable you to evaluate your company's operating performance. It should be used as a tool to review and record your performance. The Performance Report Card includes performance objectives and the performance measurement for each functional area and a total performance rating for your company. After reading the rest of this article, fill in your performance, calculate your average performance, and determine your company's class of performance.

The Performance History (on page 11) should be used to record your monthly performance. It will enable you to monitor performance of your company by functional area and in total on a regular basis. You can begin taking the actions required to improve your company's total performance. Companies who have successfully used this approach have seen their monthly performance improve leading to "Class A" in 12 months. In pursuit of "Class A," the first year payback in direct benefits has proven to be over 250% Return on Investment for these companies.

# PERFORMANCE REPORT CARD

COMPANY \_\_\_\_\_ BY \_\_\_\_\_ DATE \_\_\_\_\_

	FUNCTIONAL AREA	RESPONSIBILITY	PERFORMANCE OBJECTIVE	PERFORMANCE MEASUREMENT
TOP MANAGEMENT PLANNING	BUSINESS PLANNING	GENERAL MANAGER	RETURN ON INVESTMENT	
	DEMAND/PRODUCT PLANNING	SALES	SALES PERFORMANCE	
	OPERATIONS PLANNING	MANUFACTURING	PRODUCTION PERFORMANCE	
OPERATIONS MANAGEMENT PLANNING	MASTER SCHEDULE	MANUFACTURING	MPS PERFORMANCE	
	MATERIALS PLAN	MATERIALS	SCHEDULE RELIABILITY	
DATA BASE	BILLS OF MATERIAL	ENGINEERING	BILL OF MATERIAL ACCURACY	
	INVENTORY CONTROL	MATERIALS	INVENTORY ACCURACY	
	ROUTINGS	ENGINEERING	ROUTING ACCURACY	
OPERATIONS MANAGEMENT EXECUTION	SUPPLY PARTNERS LOGISTICS	PURCHASING	SCHEDULE PERFORMANCE	
	HIGH VELOCITY MANUFACTURING	MANUFACTURING	SCHEDULE PERFORMANCE	
	DELIVERY PERFORMANCE	GENERAL MANAGER	DELIVERY PERFORMANCE	
<b>PERFORMANCE</b>		CLASS	AVERAGE	TOTAL

# PERFORMANCE HISTORY

YEAR \_\_\_\_\_

FUNCTIONAL AREA	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
TOP MANAGEMENT PLANNING												
BUSINESS PLAN												
DEMAND/PRODUCT PLAN												
OPERATIONS PLAN												
OPERATIONS MGMT. PLANNING												
MASTER SCHEDULE												
MATERIALS PLAN												
BILLS OF MATERIAL												
INVENTORY CONTROL												
ROUTINGS												
OPERATIONS MGMT. EXECUTION												
SUPPLY/PARTNER LOGISTICS												
HIGH VELOCITY MANUFACTURING												
DELIVERY PERFORMANCE												
PERFORMANCE												
TOTAL												
AVERAGE												
CLASS												

### III. Detail Performance Measures

#### Business Plan

The objective of the Business Plan is to develop the market, product and financial plans for the company. The Business Plan is the responsibility of the president or general manager. The Business Plan is top management's strategic plan of "What, How Much, and When?" for markets, products and profit to meet the company's overall business objectives. The Business Plan should state dollars of Income, dollars of Investment and a rate of Return on Investment for each month and for the year. (Return on assets is also used if investment control is not part of the company Business Plan).

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
BUSINESS PLAN	INCOME	INCOME = PLAN
	RESPONSIBILITY	INVESTMENT = PLAN
General Management	RETURN ON INVESTMENT	RETURN ON INVESTMENT = PLAN

The key measurement of the Business Plan is Return on Investment (ROI). ROI is the percentage derived from the ratio of income over investment. In other words, the Income earned from the Investment required to support the Business Plan. Return on Investment is useful to evaluate the success of present as well as the potential of new markets and products.

$$\text{Business Plan Performance} = \frac{\text{Actual ROI}}{\text{Planned ROI}} \times 100$$

"Class A" Business Plan performance is meeting Income, Investment and Return on Investment objectives within 5% of plan for a 95% Business Plan performance.

#### Demand Plan

The objective of the Demand Plan is to develop a plan of orders received (bookings) and/or shipments for the company's products. The Demand Plan is the responsibility of the Sales or Marketing vice-president or department head. The Demand Plan should be stated in dollars and units by product line by month and for the year. The Demand Plan is the "What, How Much, and When?" of the products required to meet the anticipated customer demand.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
DEMAND PLAN	DEMAND PLAN REVIEW	DEMAND PLAN = BUSINESS PLAN BY DOLLAR & UNITS, BY MONTH
	RESPONSIBILITY	ORDERS RECEIVED = DEMAND PLAN BY DOLLARS BY UNITS, BY MIX BY MONTH
Sales	FINISHED INVENTORY	FINISHED INVENTORY = PLAN BY MONTH

The key measurement for the Demand Plan is Demand Plan Performance. Sales management develops the Demand Plan and it is their responsibility to bring in the orders to meet the plan. Demand Plan Performance is the Orders Received as a percent of the Planned Sales by month.

$$\text{Demand Plan Performance} = \frac{\text{Orders Received}}{\text{Planned Sales}} \times 100$$

"Class A" Demand Plan Performance is meeting the Sales dollar plan (by product line) within a 5% tolerance limit for a 95% Sales Dollar Performance, meeting the Sales Unit Plan (by product line) within 10% for a 90% Sales Unit Performance. (The Sales Mix Plan at the Master Production Schedule (MPS) level is often tracked for individual item forecast performance within 15% for an 85% Sales Mix Performance.)

### III. Detail Performance Measures

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
OPERATIONS PLAN	OPERATIONS PLAN REVIEW	OPERATIONS PLAN = SALES PLAN ± Δ INVENTORY BY MONTH
RESPONSIBILITY	PRODUCTION CAPACITY REVIEW	PRODUCTION RATES CAPACITY CONSTRAINTS PLANNING HORIZON
Manufacturing	OPERATIONS PLAN PERFORMANCE	ACTUAL PRODUCTION = PLAN BY MONTH

#### Operations Plan

The objective of the Operations Plan is to determine the production rates required to meet the Demand Plan and maintain a desired level of finished inventory or backlog. The Operations Plan is the responsibility of the Manufacturing vice president or department head. It is the "What, How Much, and When?" for production rates and levels of output. The Operations Plan should be stated in units of production by product line by month and for the year.

The key measurement is Operations Plan Performance. Once the Operations Plan has been agreed upon by Top Management, it is Manufacturing's responsibility to produce. Operations Plan Performance is the actual units produced (by product line) as a percent of Planned Production by month.

$$\text{Operations Plan Performance} = \frac{\text{Actual Production}}{\text{Planned Production}} \times 100 = \%$$

"Class A" Production Plan Performance is meeting the Production Plan within a 5% tolerance limit for a 95% Production Plan Performance

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
MASTER PRODUCTION SCHEDULE	MASTER PRODUCTION SCHEDULE REVIEW	SUM OF MASTER PRODUCTION SCHEDULES = MONTHLY PRODUCTION PLAN
RESPONSIBILITY	MASTER PRODUCTION SCHEDULE POLICY	MPS TIME FENCE POLICY MPS CHANGE REVIEW MPS CONSUMPTION REVIEW
Materials/ Manufacturing	MASTER PRODUCTION SCHEDULE PERFORMANCE	ACTUAL PRODUCTION = MASTER PRODUCTION SCHEDULE BY UNIT & OPTION BY WEEK

#### Master Production Schedule

The objective of the master Production Schedule is to establish the detail product mix to be produced weekly within the monthly product line rates of the Operations Plan. The Master Production Schedule is the responsibility of Materials or Manufacturing Management. It is the "What, How Much and When?" at the product, model, feature, option or product mix level for scheduling production to meet the Demand Plan.

The key measurement is Master Production Schedule Performance. Master Production Schedule Performance is the actual units produced as a percent of units planned to be completed by week.

$$\text{Master Production Schedule Performance} = \frac{\text{Actual MPS}}{\text{Planned MPS}} \times 100 = \%$$

"Class A" Master Production Scheduling will produce the product mix within a 5% tolerance limit for a 95% Master Production Schedule Performance.

### III. Detail Performance Measures

#### Materials Planning

The Objective of Materials Planning is to determine the schedules for materials required to produce the product and to maintain material priorities for production. Materials Planning is the responsibility of Materials Management. It is the "What, How Much and When?" of product at the materials level. The Materials Plan is stated in manufactured and purchased material schedules required to produce the Master Production Schedule.

The key measurement is Schedule Reliability Performance. Schedule Reliability indicates whether the orders are being scheduled and rescheduled with current due dates to maintain valid priorities that meet the Master Production Schedule. It measures the reliability of the plan that is being delivered to Purchasing and Manufacturing on a weekly basis. Schedule Reliability is the number of orders with valid due dates as a percent of the total number of open orders. This measure can be calculated separately for manufactured and purchased materials planning.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
MATERIAL REQUIREMENTS PLANNING	RELEASE RELIABILITY	ON TIME RELEASED VS. TOTAL ORDERS RELEASED
	MATERIAL AVAILABILITY	MATERIAL AVAILABLE ORDERS VS. TOTAL ORDERS RELEASED
RESPONSIBILITY		
Materials	SCHEDULE RELIABILITY	ORDERS WITH CURRENT DATES VS. TOTAL OPEN ORDERS

$$\text{Schedule Reliability Performance} = \frac{\text{Orders w/Correct Due Dates}}{\text{Total Open Orders}} \times 100$$

"Class A" Materials Plan Performance is developing a reliable materials plan within a 5% tolerance limit for a 95% Schedule Reliability Performance.

#### Bills of Material

Bills of Material specify the parts or materials and the quantity or amount of each, along with the assembly or process relationships required to produce the product. The Bills of Material are the responsibility of the Engineering function.

The key measurement is Bill of Material Accuracy. Bill of Material Accuracy indicates whether the Bill of Material as defined in the computer database represents the product as it is currently being produced. Any error in the Bill of Material (i.e., any individual component) causes the entire bill to be in error. Bill of Material Accuracy is the number of single level Bills of Material that are in agreement with actual production as a percent of the total number of single level bills audited. Accuracy is part number, quantity unit of measure and correct structure.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
BILL OF MATERIAL	PRODUCT STRUCTURE	PARTS, QUANTITIES LEVEL BY LEVEL FOR ASSEMBLY
	ENGINEERING CHANGE CONTROL	PLANNED AND ACTUAL EFFECTIVITY DATES
RESPONSIBILITY		
Engineering	OBSOLETE & SURPLUS INVENTORY	OBSOLETE INVENTORY = 5% OF TOTAL INVENTORY

Total bills audited should include a statistically significant sample such that all single level bills are audited at least once per year.

$$\text{Bill of Material Accuracy} = \frac{\text{Bills In Agreement}}{\text{Total Number of Bills Audited}} \times 100$$

"Class A" Bill of Material Performance is maintaining the Bill of Material accuracy within a 1% tolerance limit for a 99% Bill of Material Accuracy Performance.

### III. Detail Performance Measures

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
INVENTORY CONTROL	INVENTORY ACCURACY	PHYSICAL COUNT VS. INVENTORY RECORD
RESPONSIBILITY		
Materials	INVENTORY MANAGEMENT	INVENTORY INVESTMENT = INVENTORY PLAN

#### Inventory Control

The objective of Inventory Control is to maintain accurate and timely inventory status information. Inventory Control is the responsibility of the manager in charge of the stockroom or warehouse. This is the "What" and "How Much" of the inventory that is on hand and available to produce the product.

The key measurement is Inventory Record Accuracy. Inventory Record Accuracy indicates the accuracy of the on-hand inventory record as compared to the physical inventory (part number by location). The count is either

right or wrong, within agreed upon tolerance limits. Only materials that need to be weighed or scale counted will have a tolerance different than 0%. Inventory Record Accuracy is the number of parts, by location, where the physical count equals the inventory record as a percent of the total number of parts counted.

Total parts counted should include a statistically significant sample such that all parts and locations are counted minimally once per year.

$$\text{Inventory Record Accuracy} = \frac{\text{Number of Parts Correct}}{\text{Number of Parts Counted}} \times 100$$

"Class A" Inventory Control Performance is maintaining inventory accuracy within a 2% tolerance limit for 98% Inventory Accuracy Performance.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
ROUTING	WORK CENTER ACCURACY	WORK CENTER DEFINITION
RESPONSIBILITY		
Engineering	OPERATION SEQUENCE ACCURACY	OPERATION SEQUENCING
	METHOD & STANDARDS ACCURACY	METHODS & STANDARDS

#### Routings

Routings specify the operations that must be performed to produce the product. Routings are the responsibility of Manufacturing, Manufacturing Engineering and Industrial Engineering. The Routings should specify the sequence of operations, the machine or work center, the tooling or fixtures, process instructions, and the setup and run hours for each operation.

The key measurement is Routing Accuracy. Routing Accuracy indicates whether the Routing, as defined in the computer data base, represents the sequence of

operations as they are actually performed in production areas. Any error in a Routing (i.e., any individual operation) causes the entire Routing to be in error. Routing Accuracy is the number of routings that are in agreement with the actual production methods as a percentage of the total Routings audited.

Total Routings audited should include a statistically significant sample such that all Routings are audited at least once per year.

$$\text{Routing Accuracy} = \frac{\text{Routings in Agreement}}{\text{Total Routings Audited}} \times 100$$

"Class A" Routing Performance is maintaining the routing within a 2% limit for a 98% Routing Accuracy Performance.

### III. Detail Performance Measures

#### Supply Partnerships/Logistics

The objective of Supply Partners/Logistics is to deliver purchased materials and services on the date needed with the required quality and best total cost. Supply Partners/Logistics Plan Performance is the responsibility of Purchasing management. It is the detailed *What, How Much, and When?* for purchased materials, parts and services to execute the plan. The Purchasing Plan states the purchased items scheduled to be delivered each day, in order to achieve the Master Production Schedule.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
SUPPLY PARTNERS/ LOGISTICS	SCHEDULE PERFORMANCE	DELIVERY DATE VS. DUE DATE
	PURCHASE ORDER RELEASE	SCHEDULE RELEASE VS. QUANTITY BUY ORDER
RESPONSIBILITY		
Purchasing	PURCHASE DOLLAR RECEIPTS	DOLLAR RECEIPTS VS. PLAN

The key measurement is Schedule Performance.

Schedule Performance indicates whether purchased material is being delivered on the date needed by Manufacturing. It is the number of Purchased items delivered as a percent of the Purchased items due each day.

$$\text{Purchasing Schedule Performance} = \frac{\text{Items Delivered}}{\text{Items Due}} \times 100$$

"Class A" Purchasing Performance delivers purchased material and services to the day scheduled within a 5% tolerance limit for a 95% Purchasing Performance.

#### High Velocity Manufacturing

The Objective of High Velocity Manufacturing is to produce the quantity of manufactured materials on the date needed to meet the Master Production Schedule. High Velocity Manufacturing is the responsibility of Manufacturing. It is the daily execution of the *"What, How Much, and When?"* of labor and material under the responsibility of Manufacturing. It is a detailed execution of the *"What, How Much, and When?"* of labor and material on the shop floor.

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
HIGH VELOCITY MANUFACTURING	SCHEDULE PERFORMANCE	COMPLETION DATE VS. DUE DATE
	OUTPUT PERFORMANCE	ACTUAL OUTPUT VS. PLANNED OUTPUT
RESPONSIBILITY		
Manufacturing	PRODUCTIVITY PERFORMANCE	PRODUCTIVITY VS. PLAN

The key measurement is Schedule Performance.

Schedule Performance indicates whether manufactured materials are being completed on time in the factory. Schedule Performance is a daily measure of the number of operations/work orders completed as a percent of the total number of operations/work orders due that day. High Velocity Manufacturing performance is typically stated in terms of work center schedule performance or assembly line schedule performance.

$$\text{Manufacturing Schedule Performance} = \frac{\text{Operations Complete}}{\text{Total Operations Due}} \times 100$$

"Class A" High Velocity Manufacturing Performance meets daily manufactured schedules with a 5% tolerance limit for a 95% Performance.

### III. Detail Performance Measures

PERFORMANCE MEASUREMENT		
FUNCTION	OBJECTIVE	MEASUREMENT
DELIVERY PERFORMANCE	BUILD PERFORMANCE	ACTUAL BUILD VS. PLAN
RESPONSIBILITY	SHIP PERFORMANCE	ACTUAL SHIP VS. PLAN
General Manager	DELIVERY PERFORMANCE	DELIVERY VS. PROMISE

#### Schedule Performance

The objective of Schedule Performance is to build the product on time, ship the product on time, and deliver the product to the customer when it was promised or requested. It is the "What, How Much, and When?" in units delivered to meet the Demand Plan. Since Schedule Performance in delivery is dependent on the entire company working together, the responsibility for this measure rests with the president or general manager.

The key measurement is Delivery Performance. It measures whether the product was shipped to the

customer on the date promised or requested. Delivery Performance is the number of orders/line items shipped on time as a percent of the total number of orders/line items shipped. "On time" implies that item quality has been confirmed, directly or indirectly.

$$\text{Delivery Performance} = \frac{\text{Orders/Items Shipped On Time}}{\text{Total Orders/Items Shipped}} \times 100$$

"Class A" Schedule Performance promises and delivers the product on time within a 5% tolerance limit for a 95% Schedule Performance Level.

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## ***IV. Conclusion***

Performance Measurement is an important part of the management process. Setting objectives and tolerance limits defines acceptable performance levels. Performance Measurement is a necessary step in achieving these performance levels. It provides measurements, accountability, and a method of tracking results. Formal measurements and accountability help management pinpoint problems and responsibilities. It removes the fables, stories, finger pointing, one-liners and old alibis. Management then has the ability to examine cause and effect relationships more closely. They can monitor performance and measure results. Performance Measurements helps to mature both the management process and the management team.

If a company is to develop this maturity in the management process, achieve these results and become “Class A,” a team effort is necessary. Required is a management team that is committed to managing the resources of the business in a new way with:

*A new communication system*  
CLOSED LOOP ERP

*A new method of management*  
THE CLOSED LOOP MANAGEMENT PROCESS

*A new set of accountabilities*  
PERFORMANCE MEASUREMENT

*A new set of values*  
INDIVIDUAL RESPONSIBILITY FOR  
CONTINUOUS IMPROVEMENT

*A new quality of life*  
INDIVIDUAL SELF-ESTEEM

*A new level of performance*  
“CLASS A”

Our challenge to you is this — *Begin measuring your company performance today!* Join the growing list of “Class A” companies and enjoy the benefits that come from this first step in the Journey to Manufacturing Excellence.

The challenge continues to grow. Every day without improvement is a day where the competition gets one step closer. “Class A” ERP is not a destination, but only a point in the journey through which everyone must pass on the way to becoming a truly World Class Company.