

Chapter 7
Measures of Performance

Reviewing key performance indicators is an important part of any working S&OP process. Experience suggests a set of standardized measurements (sometimes called *key performance indicators-KPI's* or *vital signs*) that should be published during the process, and reviewed at the meetings that make up the process. Some performance indicators will be reviewed in the early steps of the S&OP process, but not at the executive meeting. The *critical* metrics will be reviewed in the executive meeting.

Vital signs reviewed during the S&OP process:

Measure whether the needs of customers are being met (on-time and in-full).
Measure whether the financial objectives of the business as defined by the business plan are being met.
Identify problems and then assist in prioritizing problems so they can be solved.
Provide a scorecard for monitoring improvement.

The sales and operations planning system should include capabilities to capture and report the following:

1. Customer service performance by family and overall
Customer delivery performance (on-time and in-full – OTIF) to request date
Customer delivery performance (on-time and in-full) to promised date
2. Performance to budget (dollars) by family and overall
Latest sales plan vs. budget dollars
Profit projections for year
Inventory versus budget dollars
3. Performance to plan (units) by family
Actual shipments versus plan typically expressed as percentage attainment.
Actual sales versus forecast (some measurement of accuracy or variability) typically expressed as attainment, percentage error, or mean absolute percentage error.
Actual supply versus supply plan expressed as percentage attainment, or percent variability from plan.
Actual inventory versus inventory plan (make-to-stock products) expressed as a percentage.

76 SALES AND OPERATIONS PLANNING STANDARD SYSTEM

Actual backlog versus backlog plan (make-to-order products) expressed as a percentage.

The way these are actually reported will vary from company to company. In nearly every company, the “performance to plan” metrics will be reviewed as part of the family by family review, so summarizing them to a scorecard is somewhat redundant. For example, Figure 7 – 1 shows common performance to plan metrics displayed as part of the S&OP display itself. Metrics on this make-to-stock example show actual sales to budget, actual sales to plan, actual production to plan, and actual inventory to plan expressed as a percentage of the budget or plan for the period. (The formulas used to calculate these metrics are explained below as part of the general discussion of measurements.)

Figure 7 – 1
S&OP with Typical Performance to Plan Metrics

CALENDAR	CUM	History			Year-to-Date Planned	Current		Current Year Planned	Next Year		
		AUG	SEP	OCT		NOV	DEC		JAN	FEB	MAR
ANNUAL OPERATING PLAN					Year-to-Date YTD Results			Current Year Expected Results			
Budgeted Sales	14300	2000	2300	2100	20700	2100	2200	25000	2345	2471	3171
Perf to Budget	17440	1680	1330	1950	22400	2002	2110	26512			
Cum Diff Perf to Budget	3140	2820	1850	1700	1700	1602	1512	1512			
SALES					YTD Results			Expected Results			
Last Sales Plan	16172	1960	2268	2000	22400	2100	2200	26700	2400	2500	3200
Current Sales Plan	17440	1680	1330	1950	22400	2002	2110	26512	2345	2471	3171
Actual Sales	17440	1680	1330	1950	22400						
Difference	1268	-280	-938	-50							
Curr as % of Last Sales Plan	108%	86%	59%	98%	100%	95%	96%	99%			
Cum Difference	1268	988	50	0							
SHIPMENTS					YTD Results			Expected Results			
Customer Orders by Promised Date	17440	1680	1330	1950	22400			26512			
Actual Shipments	17440	1680	1330	1950	22400						
SUPPLY					YTD Results			Expected Results			
Last Supply Plan	12110	1960	2268	2000	18338	1750	1800	21888	2150	2850	3150
Current Supply Plan	12530	2100	1470	2100	18200	1750	1750	21700	2100	2800	3150
Actual Supply	12530	2100	1470	2100	18200						
Difference	420	140	-798	100	-138						
Curr as % of Last Plan	103%	107%	65%	105%	99%	100%	97%	99%			
Cum Difference	420	560	-238	-138	-138						
INVENTORY					YTD Results			Expected Results			
Last Inventory Plan	3088	2240	2660	2800	2800	2450	2050	2050	1800	2150	2100
Current Inventory Plan	2240	2660	2800	2950	2950	2698	2338	2338	2093	2422	2401
Actual	2240	2660	2800	2950	2950						
Difference	-848	420	140	150	150						
Curr as % of Last Plan	73%	119%	105%	105%	105%	110%	114%	114%			

Even though some metrics are part of the family by family review, some companies like to have a summary scorecard that highlights overall and family by family performance. Often this would be reviewed first during the partnership and executive meetings. Other companies prefer to have an overall scorecard (summary statistics only) and a scorecard for each family.

Since in many companies the executive review of the sales and operations plan itself is “by exception”, not every family will be reviewed in detail. The scorecard by family is a quick reference to current performance for each family.

In the end, each company needs to decide what kind of reporting makes the most sense for it. The important thing isn’t the number of reports or displays or their formats, the important thing is that performance review of the vital signs is part of the S&OP process.

There may be other key performance indicators that are reviewed in the five step S&OP process. These additional metrics include:

- Actual supply versus MPS or finishing schedule
- Schedule stability
- Supplier performance
- Master production schedule versus supply plan

In some cases, these will be reviewed in the earlier steps and not in the executive meeting. In cases where executive management considers them critical, they will be reviewed in the executive meeting as well – or they will be part of the reference data provided but not formally reviewed.

How to Measure

Generally speaking, any measurement requires a sample, a tolerance, and a standard. The samples define what data is used for the measurement and may be taken differently depending upon the specific measurement. In some cases, the sample used for performance measurement could be based on random selection. In other cases, the sample could be all of the activities occurring during a specific period of time. In all of the vital signs described below the sample size covers all the events or data points during the period of time being measured.

Performance measurements must have reasonable tolerances. For example, on-time performance for a supplier might be defined as “delivered on the due date *plus or minus 1 day* and *plus or minus five percent of the order quantity*. In this case, the tolerance of “plus or minus 1 day” indicates that an order can be delivered a day