Rev 19.0

Supply Chain Metrics Handbook (The White Book)

The Coca-Cola Company

Classified - Internal use

Supply Chain Metrics Handbook
Table of Contents

Summary of Changes

Description of Change	Revision	Issue Date
Added Summary of Change page.	**8**	**May 22, 2007**
SSDR - Added in the comments section of SSDR the potential categories that would be dubbed as a 'Defect'.		
TDC as a % of Revenue – Changed calculation numerator to be COGS + Sales & Services instead of COGS+Operating Expenses as Sales & Service Operating Expenses would have included more than just Supply Chain Expenses in the current reporting methods.		
RGB Turns - Added REFPET Turns to the RGB Turns metric.		
%Weekly Warehouse Out-of-Stock – Modified the calculation to have 'SKU OOS X SKU Forecasted Daily Sales instead of SKU OOS + SKU Forecasted Daily Sales'		
Unconstrained System Line Efficiency – Corrected example which stated planned maintenance at 2 hours/ week and changed to 2 hours/day.		
Sweetener Yield - Clarified that only sweetener that is utilized as a raw material at the plant, i.e., not in the Concentrate, needs to be considered.		
Constrained System Line Efficiency – Corrected example which stated planned maintenance at 2 hours/ week and changed to 2 hours/day.		
Manufacturing Productivity – Fixed the denominator on the example		
Cost-to-Serve – Added metric	**9**	**May 23, 2007**
Cash-To-Cash Cycle Time – Modified calculation by deleting requirement to subtract Accts Payable from Receivable	**10**	**June 5, 2007**
ROFTE – Changed from Return on Full Time Equivalent to Return on Labor to clarify that seasonal, contract and temporary labor is included. Added to the comments section that this includes all Supply Chain labor costs		
TDC as a % of Revenue – Added in the comments section that the calculation excludes depreciation expenses.		
Unconstrained System Line Efficiency – Clarified in the definition that 'Does not include scheduled downtime' instead of 'Does not include unscheduled downtime'.	**11**	**June 11, 2007**
Maintenance Inventory Turns – Deleted and moved to Tier II. Located in ExiM handbook.	**12**	**Sept 5, 2007**
Maintenance Cost per Case – Indicated that Fleet Maintenance Cost per Case must be divided by Sales Volume in Physical Cases not Production Volume		
Weekly Forecast Accuracy – Indicated that the KPI should be broken out by A, B, and C SKUs		
Weekly Forecast Accuracy – Deleted the statement *'which has a*	**13**	**October 11, 2007**

Description of Change	Revision	Issue Date
weighting effect and reflects the true accuracy and impact of larger SKU's' as we are now going to A, B, and C SKU measurements. Clarified the definitions for A,B, and C SKUs		
Unconstrained SLE – Clarified planned downtime		
SC Inventory Loss Ratio – Clarified that losses that are charged to a 3rd party are not included.		
FAQs – Added questions regarding SLE calculations		
Cash-to-Cash Cycle Time – Clarified that this does not include Auxiliary Materials.	**14**	**November 6, 2007**
Weekly Forecast Accuracy – Clarified when the forecast was frozen and also fixed the example as the error was not calculated properly in week four.		
Unconstrained SLE – Clarified Example		
Sweetener Yield – Defined what sweeteners are included.		
General – Added Benchmarking Numbers		
Appendix – Changed % Scheduled Downtime to relate to Manufacturing Flow Management.		
Used to review current metrics and gain feedback	**15**	**June 8, 2008**
General Changes • Reorganized handbook based on Supply Chain areas rather than the process wheel • Added metrics from the old white book that were still relevant • Added new logistics metrics	**16**	**October 15, 2008**
Cash-to-Cash Cycle time – modified to subtract days outstanding on accounts payable		
Weekly Forecast Accuracy – defined sales as settled sales, clarified when accuracy would equal zero. Recommended when reclassification should be done. Fixed error in table		
Supplier Service Defect Rate – Added definitions for supplier and delivery and provided a minimum report out for strategic suppliers.		
Transportation Cost per Case – Clarified there are haulage charges and that it includes all modes of transport; split KPI into two different KPIs added Delivery Cost per Case		
RGB Turns – Clarified that it was a best accounting estimate for the empties.		
Perfect Order – Pulled to Tier I		
Unconstrained SLE – Changed the industry average numbers; added clarification around skeleton crews.		
Manufacturing Cost per Case – Clarified that ingredients and packaging contained in the BOM should not be included in the costs.		
Productivity – Changed to Plant productivity to distinguish from logistics productivity metric		

Description of Change	Revision	Issue Date
General Changes – Added RACIs to every section **Total Supply Chain – New Section** • Order Fill- Redefined order fill as OTIF • Case Fill – Used SCALE terminology • Perfect Order – Added zero customer complaints as a requirement • Supply Chain Performance to Plan – New! **DOIP** • Deleted Weekly Warehouse OOS **Logistics Transportation** • Vehicle Crash Rate – New! • Transportation Backhaul Revenue Index – Deleted • Transportation Effectiveness – Changed name to Transportation Deadhead Factor • % of Inbound Truck Freight on Board (FoB) Origin – New! • Transportation Accuracy – New! **Fleet** • Quality PM Compliance – New! **Delivery** • Vehicle Crash Rate – New! • Breakage, Damage, Loss – New! • Delivery Performance to Plan – New! • Delivery KM Index – New! • Delivery Hours Index – New! • Delivery Reload Factor – New! • Delivery Cube Capacity Utilization – New! **Warehouse** • Number of Reloads per Truck Dispatched – Deleted • Warehouse Utilization - Adjusted World Class Benchmark • Warehouse Equipment Utilization – New! • Warehouse Absolute Inventory Accuracy – New! • Warehouse Net Inventory Accuracy – New! • Warehouse Productivity – Forklift Drivers – New! • Picking Accuracy – New! • Transportation Loading Accuracy – New! **Manufacturing** 1. Plant Productivity Changed to Facility Productivity 2. Concentrate Yield – Deleted 3. Final Syrup Yield – Clarified definition **EOSH** - New Section **Quality** - New Section **Procurement** • Supplier Service Defect Rate (SSDR) – New!	**17**	
Quality – Updated Definitions, – Updated Product & Package Quality Index (with examples). – Product Carbonation Index – Non Refillable PET- New!	**18**	

Description of Change	Revision	Issue Date
– Quality Index – In Plant - New! – Inspection Acceptance Rate- New! – Cost of Quality- New! **Various Updates to Examples and Clarifications of Definitions** • Changed Production Accuracy to Production Performance to Plan • Changed Transport Loading Accuracy to Warehouse Performance to Plan • Changed Transportation Deployment Accuracy to Transportation Haulage Performance to Plan • Changed Delivery Accuracy to Delivery Performance to Plan		
Updated Owners	**18.i**	**Apr'11**
Moved USLE under Tier 1 Metrics	**18.J**	**27th apr'11**
Added USLE situations and scenarios **Changed Word Version to docx**	**18.k**	**July, 1 2011**
Updated EOSH Part	**18 2e**	**9th July, 2012**
Updated Demand and SC Planning Part	**18 2e**	**9th July, 2012**
Updated Quality Part	**18 2e**	**11th July, 2012**
Updated Logistics Part	**18 2f**	**12th July, 2012**

Introduction to the Supply Chain Metrics Handbook

The following documentation is a comprehensive overview of Supply Chain metrics that will help manage the business.

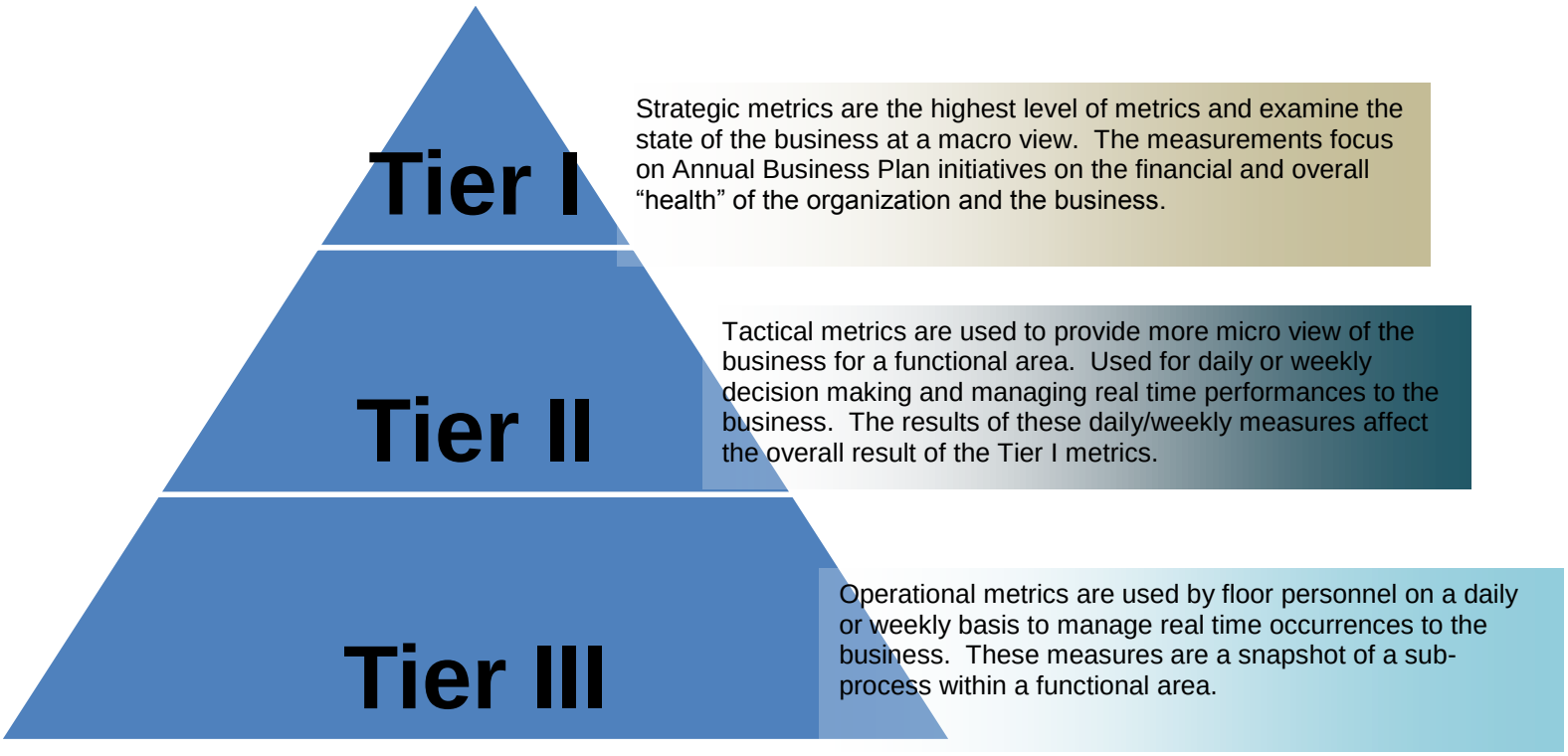
Handbook Layout

Line of Site
At the beginning of each section, you will find the Line of Site pictorial which provides linkage of the key required measures back to the overall performance of the Company.

RACI
Also at the beginning of each section with the exception of the Total Supply Chain section, you will find a RACI (Responsible, Accountable, Consult, Inform) chart which lists the minimum metrics that are required to manage the business along with the frequency it should be reviewed and the roles of all the players involved. All other metrics in the functional sections that are not included in the RACI are considered "nice to haves."

Owner
Each metric has a designated owner. If you have further questions regarding the definitions of these metrics, please contact the metric owner directly.

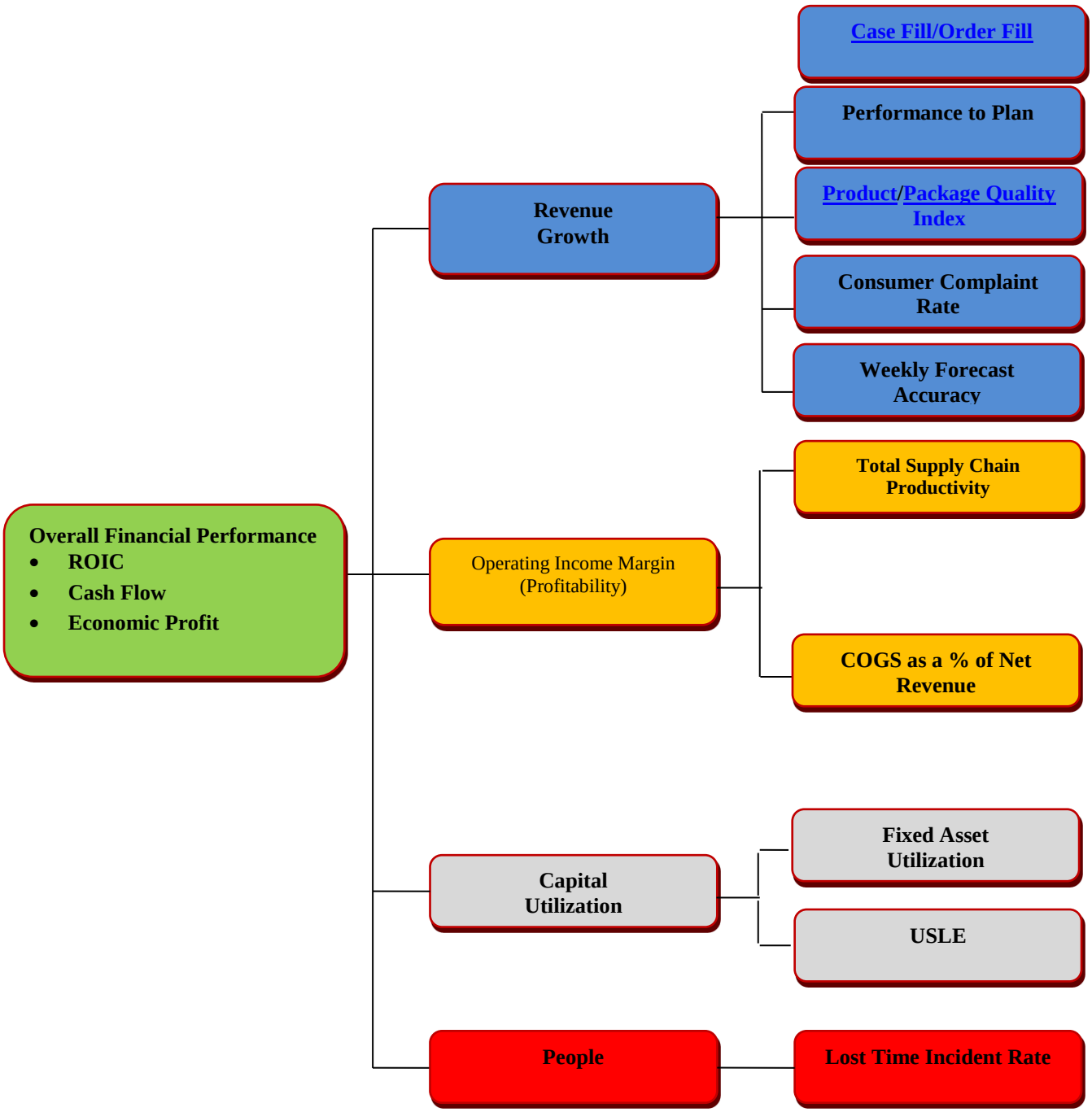
Metric Level
Each metric will have a designation of the Tier level group to which it belongs. The Total Supply Chain metrics are considered Tier I metrics and all other metrics within the following sections are Tier II or III and link back to the Tier I measures.



Total Supply Chain

(Metrics which cross multiple functions and are a measure of overall performance of the combined efforts of these functions)

Total Supply Chain Line of Site



Perfect Order

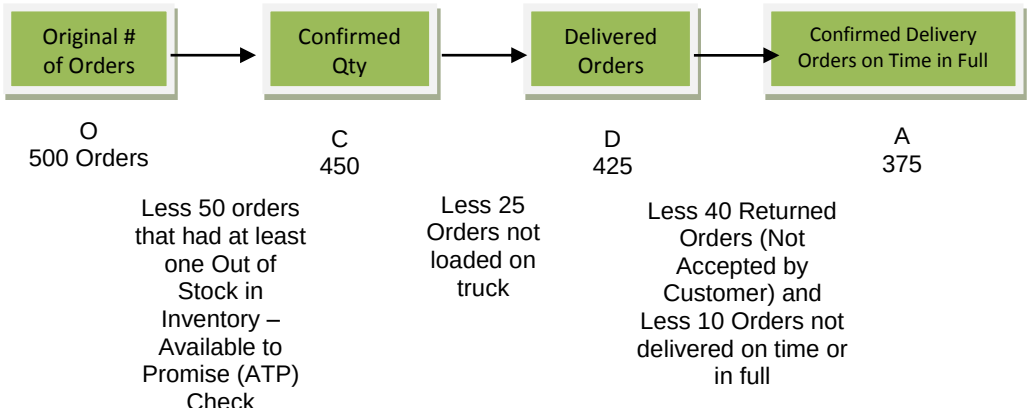
Category	Total Supply Chain
Metric Level	Tier I
Definition	A percentage of the orders that met all aspects of the expectations of customers.
Objective	Used to measure of the system's ability to meet customer requirements**.**
Calculation	$\frac{\sum \text{Perfect Orders}}{\sum \text{Total Original Orders}}$ ***Perfect Orders*** are the number of orders which were: completed as customer ordered, i.e., damage free, delivered on time, had zero returns, and had correct invoice. ***Total Orders*** are the total orders entered into the order entry system during the period.
Data Source	Order Management System and Transportation Management System
Collection Frequency	Daily
Related Supporting Metrics	Order Fill (On-Time-in-Full), Case Fill
Benchmark	**Industry Average** ≥ 95% **World Class** > 95%
Comments	Perfect order consists of the following: • Complete as customer ordered (each SKU ordered 100% filled) • Damage free (every container in saleable condition) • Delivered on-time (within time window committed to customer) • Zero returns (no returns of ordered saleable full goods) • Correct invoice (no discrepancies/disputes identified by customer) • No customer complaints If an organization does not have the capability of measuring Perfect Order, both Order Fill & % Lost Case Sales should be measured at minimum. Invoice Errors are often not known until many days after an order is completed. Use the number of corrected invoices in a month as a deduction from Total orders regardless of whether the original orders were in the current month (there will always be a lag).
Example	Total original orders in one month were 10,000; 200 orders were late, 1,000 orders were returned, and there were 500 orders in which invoice errors were corrected (current month and prior month orders). The Monthly Order Fill Rate is: $\frac{8,300}{10,000} = 83.0\%$
Metric Owner	Lou Swanson

Order Fill (On-Time-In-Full)

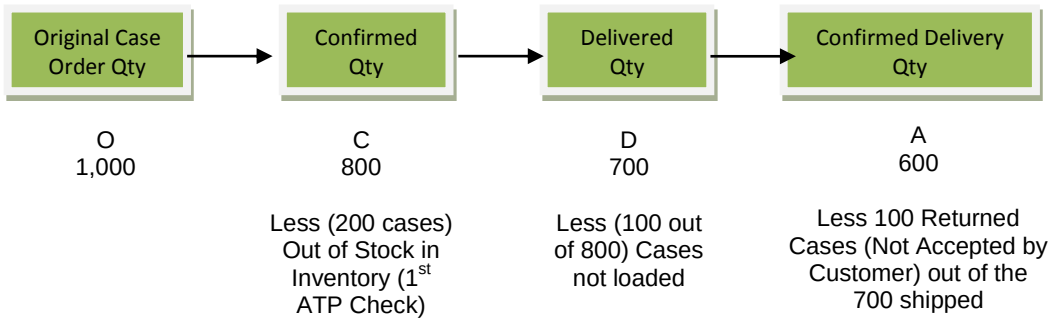
Process	Total Supply Chain
Metric Level	Tier I
Definition	The percent completion rate for orders.
Objective	A measurement of how often we are filling customer orders completely, that is on time and full, i.e., we satisfied the original order exactly to the customer's requirements.
Calculation	$\frac{\sum \text{Orders Delivered on Time in Full}}{\sum \text{Total Original Orders}}$
Data Source	Order Management System
Collection Frequency	Daily
Related Supporting Metrics	Perfect Order, Case Fill
Benchmark	**Industry Average**: ≥ 95% **World Class**: >97%
Comments / Scenarios	See Order and Case Fill Rate Scenarios below

Order and Case Fill Rate Scenarios

Order Scenarios for 2 SKUs - Total of 100 cases					This Scenario		Cumulative - All Scenarios	
Scen #	Situation	SKU	Orig Order Phys Case Qty	Case Qty Filled	Order Fill Rate	Case Fill Rate	Order Fill Rate	Case Fill Rate
1	Order Filled on Time and In Full	SKU #1	40	40	100%	100%	1/1 = 100%	100/100 = 100%
		SKU #2	60	60				
2	Order Not Filled. Customer did not pass credit check.	SKU #1	40	0	Not Included	Not Included	1/1 = 100%	100/100 = 100%
		SKU #2	60	0				
3	Order Filled In Full but outside appointment time (if applicable)	SKU #1	40	40	0%	100%	1/2 = 50%	200/200 = 100%
		SKU #2	60	60				
4	SKU Order Quantity Unavailable at time of order (Warehouse Plan)	SKU #1	40	0	0%	40%	1/3 = 33%	240/300 = 80%
		SKU #2	60	40				
5	Order received after preseller cut-off time	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
6	Customer did not pick up Order	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
7	Order was cancelled by the Sales Rep	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
8	**All Orders not delivered (examples):** -Truck not dispatched on time -Truck Breakdown -Driver availablity/hours -Vehicle Accident -Delays at Warehouse Plan -Customer Refuses Shipment	SKU #1	40	0	0%	0%	1/4 = 25%	240/400 = 60%
		SKU #2	60	0				

Example	In one day, the total number of original and delivered orders were as follows:  $\frac{A}{O} = \frac{375}{500} = 75.0\%$
Metric Owner	Lou Swanson

Case Fill Rate

Category	Total Supply Chain
Metric Level	Tier I
Definition	The percent completion rate for physical case orders.
Objective	A measure of the ability of the existing Supply Chain to meet aggregate demand of the customer base. Fill Rate is a critical measure that quantifies how well we serve our customers, and to that end, should be always measured against the original volume ordered by our customers, before any internal checking and confirmation process.
Calculation	$\frac{\sum \text{SKUy ConfirmedDeliveredQuantity}}{\sum \text{TotalSKUy OriginalOrder Quantity}}$ ***Original Order Quantity*** is the original order quantity from customer or the pre-seller (before Available to Promise check) ***Delivered Quantity*** is the quantity actually accepted by the customer at time of delivery
Data Source	Order Management System
Collection Frequency	Daily
Related Supporting Metrics	Perfect Order, Order Fill (On-Time-in-Full)
Benchmark	**Industry Average** ≥ 98 **World Class** 99.9%
Comments	Case Fill Rate does not take into account whether the order was delivered on time or not. On time delivery is addressed in the Perfect Order and Order Fill metric. See Order Fill Rate for Scenario Guidance.
Example	 $\text{Case FillRate} = \frac{A}{O} = \frac{600}{1000} = 60\%$.
Metric Owner	Lou Swanson

Total Supply Chain Productivity

Category	Total Supply Chain
Metric Level	Tier I
Definition	A measure of the net sales generated by Supply Chain labor used in the business.
Objective	Used to measure the productivity of the entire Supply Chain.
Calculation	$\frac{\text{Total Physical Cases Sold}}{\text{Total Supply Chain Labor Hours}}$ ***The Scope of Total Labor Hours*** is the Supply Chain hours which the scope includes procurement to shelf). ***Total Labor Hours*** includes Supply Chain indirect and direct labor, management – up to and including GM level, supervision, maintenance, cleaning and sanitation crews, and 3rd party (permanent, temporary, seasonal and/or contract for whom facility management provides day-to-day supervision of their work and provides the details, means, methods and processes by which the work objective is accomplished.) related to production, warehousing, and delivery. Contractors and temporary employees managed exclusively by an outside firm that provides their own supervision, details, means, methods and processes by which the work objective is accomplished are NOT considered in Total Labor Hours Employees hours of wholly owned subsidiaries that work on site should include any Lost Time Incidents and the total hours worked in the calculation
Data Source	Payroll records for labor hours, Temp agency invoices for temporary hours, and Volume Reporting for Physical Cases.
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	All labor hours that are associated with Supply Chain must be included in the denominator. Supply Chain hours does not include Sales Associates. Do not use the Labor Hours for Lost Time Incident Rate as LTIR is calculated using total hours for the operation.
Metric Owner	Paulo Mendes

Supply Chain Operations Performance to Plan

Process	Total Supply Chain
Metric Level	Tier I
Definition	A combination of the performance of Manufacturing, Logistics (Warehouse & Transport) and Delivery to meet their plans
Objective	A measure of the effectiveness of operations to meet planned requirements both in terms of time and quantity given a 1 week forecast from Sales.
Calculation	**Week 1** = %PP2P x %WP2Px %THP2P x %DP2P = 90% x 98% x 95% x 97% = 81% PP2P = average weekly Production Performance to Plan WP2P = average weekly Warehouse Performance to Plan THP2P = average weekly Transportation Deployment(Haulage) Performance to Plan DP2P = average weekly Delivery Performance to Plan Perform calculation against each week performance then sum the weeks and divide by total weeks in period. Week 1 = 81% Week 2 = 99% Week 3 = 94% Week 4 = 88% **Final result = (81%+99%+94%+88%)/4 = 90.5%**
Data Source	Planning Systems
Collection Frequency	Monthly
Related Supporting Metrics	Weekly Forecast Accuracy Production Performance to Plan Warehouse Performance to Plan Transportation Haulage Performance to Plan Delivery Performance to Plan
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Manufacturing, Warehousing, Transport, Delivery accuracies are against final schedule of previous day.
Example	Through S&OP/E processes, a 1-week frozen forecast for each week of the month is produced. Each day planners update schedules for production, loading, transport and delivery. Each week the actual performance against these plans is measured. Sum the results of each week and then divide by total number of weeks in period to get final result.
Metric Owner	Paulo Mendes

Weekly Forecast Accuracy

Category	Total Supply Chain
Metric Level	Tier I
Definition	An absolute measure of how well forecasts project actual demand, regardless of whether the forecast was high or low.
Objective	Used to measure how well the management team brings together information about the business to generate a sales forecast for a period, by SKU.
Calculation	$\left(1-\frac{\lvert SKU\,Forecast\,Sales-SKU\,Net\,Sales\rvert}{SKU\,Net\,Sales}\right)$ If | SKU Forecast Sales – SKU Actual Sales | > SKU Actual Sales, % Accuracy = ZERO ***SKU Net Sales*** is actual physical case settled sales for the SKU processed through that facility during the period. ***SKU Forecast Sales*** is forecasted physical case sales used for planning purposes, for the SKU, for the facility or for the frozen period. The forecast finalized this week, normally no later than Tuesday, for the following week demand, normally starting on Saturday, is frozen for measurement purposes.
Data Source	Advanced Planning Systems
Collection Frequency	Weekly
Related Supporting Metrics	% Good Forecast
Benchmark	**Industry Average**: A SKUs > 85 % B SKUs > 80% C SKUs > 75% **World Class**: TBD
Comments	Needs to be reported by A, B, and C SKUs: **A SKUs** = Those SKUs representing > 70% of the volume **B SKUS** = Those SKUs representing the next 20% of the volume **C SKUs** = Those SKUs representing the last 10% of the volume It is recommended that reclassification of SKUs be done quarterly, but must be done at minimum semi-annually.
Example	Calculate the Period % Accuracy by summing all absolute errors by SKU, and then divide by the total physical case sales in the period.

	Week 1	Fcast	Actual	Error	Accuracy
Week 1	SKU A 1	1200	700	500	**29%**
	SKU A 2	600	1000	400	**60%**
	Week 1 Total	**1800**	**1700**	**900**	**47%**
Week 2	SKU A 1	1400	900	500	**44%**
	SKU A 2	900	1400	500	**64%**
	Week 2 Total	**2300**	**2300**	**1000**	**57%**
Week 3	SKU A 1	1500	1400	100	**93%**
	SKU A 2	1000	700	300	**57%**
	Week 3 Total	**2500**	**2100**	**400**	**81%**
Week 4	SKU A 1	1300	500	800	**0%**
	SKU A 2	1400	1700	300	**82%**
	Week 4 Total	**2700**	**2200**	**1100**	**50%**
Period		**9300**	**8300**	**3400**	**59.0%**

Metric Owner	Paulo Mendes

Consumer Complaint Rate

Category	Quality
Metric Level	Tier I
Definition	The total number of Product Integrity and Package Integrity related Consumer Complaints verified per million physical individual containers sold. Verification of a complaint includes: • Receiving the sample and can conduct evaluation/analysis • Have information regarding consumer complaint from consumer perspective • Have identification information for product and/or package • Investigation and analysis of root cause • Feedback to consumer • Corrective and preventive actions to close out
Objective	1. To measure the trend of consumer complaints (YTD) in order to reduce the rate of current year against previous year. 2. To identify trends of specific Complaint types, for example: • Off Tastes in can product • Foreign Material in Refillable containers • Leakers 3. To identify multiple complaints within the specified criteria for investigation and corrective action planning.
Calculation	$\frac{\text{Total Number of Complaints}}{\text{1,000,000 containers sold}} = \text{Consumer Complaint Rate (CCR)}$ • Use of formatted spreadsheet for input and for calculation • Review trend analysis per complaint type on a year to date basis
Data Source	In Plant Consumer Response Program database (daily input) which updates into the Monthly Consumer report
Collection Frequency	Collected daily with input into in-plant database. Monthly report out.
Related Supporting Metrics	None
Benchmark	**Industry Average**: 0.2 per million container sold **Best in Class**: 0 per million containers sold
Comments	This can be split up into Package types and/or Complaint types (such as foreign materials, off tastes, etc.)
Example	Input Spreadsheet
Metric Owner	Saratha Packirisamy

Product Quality Index

Category	Quality
Metric Level	Tier I
Definition	This is the Beverage Product Quality Indicator (BPQI) which includes the following parameters: - Appearance - Taste - Brix - Carbonation - Microbiological - Acid/ Special Assay - Salt - Still beverage parameters
Objective	To indicate the Beverage Quality (as per specifications) on product sampled in the Market Place
Calculation	As per TCCC Quality Measures database. Example of calculation used in Quality Measures: Beverage Product Quality Indicator: $X = A \times B \times (C \text{ or } I) \times (D \text{ or } G \text{ or } H) \times E \times 100$ $A = \frac{(C_s - F_a)}{C_s}$ $B = \frac{(C_s - F_t)}{C_s}$ $C = \frac{(C_v - F_v)}{C_v}$ $D = \frac{(C_b - F_b)}{C_b}$ $E = \frac{(C_y - F_y)}{C_y}$ $G = \frac{(C_p - F_p)}{C_p}$ $H = \frac{(C_x - F_x)}{C_x}$ $I = \frac{(C_k - F_k)}{C_k}$ X = BPQI A = appearance parameter B = taste parameter C = carbonation parameter D = beverage °Brix parameter E = micro parameter G = acid parameter H = salt parameter I = vacuum parameter C_b = number of beverage °Brix data C_s = number of samples reported C_v = number of carbonation data C_y = number of micro data C_p = number of acid data C_x = number of salt data C_k = number of vacuum data F_a = number of non-conforming samples in appearance F_b = number of non-conforming samples in beverage °Brix F_t = number of non-conforming samples in taste F_v = number of non-conforming samples in carbonation F_y = number of non-conforming samples in micro F_p = number of non-conforming samples in acid F_x = number of non-conforming samples in salt F_k = number of non-conforming samples in vacuum
Data Source	Quality Measures Push Reports: QAR 408, 922, 933

For example, QAR 933 report:

Product	Primary Container	% Cfrm Tor	BPQI	% Appearance	% Cfrm Taste	% Cfrm CO2	% Cfrm Brix	% Cfrm Micro	% Cfrm Yeast	% Cfrm Mold	% Acid
Coke lt	REF Glass Btl 1.25 Ltr Stra	0	100	100	100	100		100	100	100	100
	Total Primary Containers	89	78	100	100	92		100	100	100	86
Fanta Grp	NR Plas Btl 2 Ltr Stra	75	56	100	100	75	75	100	100	100	100
	NR Plas Btl 500 Ml Stra	100	58	100	100	75	78	100	100	100	100
	NR Stl Can 330 Ml Stra		100	100	100	100	100	100	100	100	
	REF Glass Btl 1.25 Ltr Stra	91	100	100	100	100	100	100	100	100	86
	Total Primary Containers	92	78	100	100	87	88	100	100	100	94
Fanta Org	NR Plas Btl 2 Ltr Stra	100	100	100	100	100	100	100	100	100	
	NR Plas Btl 500 Ml Stra	90	62	100	100	89	70	100	100	100	100
	NR Stl Can 330 Ml Stra		100	100	100	100	100	100	100	100	
	REF Glass Btl 1.25 Ltr Stra	91	90	100	100	90	100	100	100	100	100
	Total Primary Containers	91	79	100	100	90	87	100	100	100	100
Fanta Pine	NR Plas Btl 2 Ltr Stra	75	100	100	100	100	100	100	100	100	100
	NR Stl Can 330 Ml Stra		100	100	100	100	100	100	100	100	
	REF Glass Btl 1.25 Ltr Stra	58	100	100	100	100	100	100	100	100	57
	Total Primary Containers	63	100	100	100	100	100	100	100	100	70
Fanta Strby	NR Stl Can 330 Ml Stra		100	100	100	100	100	100	100	100	0
	Total Primary Containers		100	100	100	100	100	100	100	100	0
Fanta Zero Org	NR Plas Btl 2 Ltr Stra										
	Total Primary Containers										
Krest Gin Ale	REF Glass Btl 1.25 Ltr Stra	0	100	100	100	100	100	100	100	100	
	Total Primary Containers	0	100	100	100	100	100	100	100	100	
Nestea Lmn	NR Plas Btl 500 Ml Stra	100	100	100	100		100	100	100	100	
	NR Stl Can 330 Ml Stra		100	100	100		100	100	100	100	
	Total Primary Containers	100	100	100	100		100	100	100	100	
Nestea Mang-Pine	NR Plas Btl 500 Ml Stra	100	100	100	100		100	100	100	100	
	NR Stl Can 330 Ml Stra		100	100	100		100	100	100	100	
	Total Primary Containers	100	100	100	100		100	100	100	100	
Nestea Pch	NR Plas Btl 500 Ml Stra	100	0	0	100		100	100	100	100	
	Total Primary Containers	100	0	0	100		100	100	100	100	

Collection Frequency

Based on analysis conducted on a Monthly basis and reported on a monthly basis

Benchmark

Industry Average	95%
Best in Class	100%

Comments

The Quality measures results are derived from samples taken from the market place and analyzed by TCCC Trade Sample laboratories.
There are several ways of viewing samples analyzed namely:

- Total Produced View – Sample Weighted View of all samples that were produced by a plant (regardless where they are sold).
- Total Sold View – Sample Weighted View of all samples that were sold in a sales territory (regardless where they were produced)
- Sales Weighted View – Same as Total Sold View but sales weighted (instead of sample weighted)

Collection Frequency	Based on analysis conducted on a Monthly basis and reported on a monthly basis.
Example	Sales Weighted BPQI calculation : for example, all packages for single product, single sales territory

Package	***% sales***	**Taste**	**App**	**Brix**	**CO_2**	**Micro**	**QI**	Sales weighted contribution
300ml can	*10.49*	99	100	100	100	100	99	**10.39**
2L PET	*15.95*	100	100	100	100	100	100	**15.95**
600ml PET	*37.06*	100	100	87	100	100	87	**32.24**
1.5L PET	*23.38*	100	100	100	100	100	100	**23.38**
300ml RGB	*13.12*	66.67	33.33	66.67	66.67	66.67	6.59	**0.86**
	100	**95.52**	**91.25**	**90.81**	**95.63**	**95.63**		82.82

Sales weighted attribute

Sales Weighted BPQI

Metric Owner	Saratha Packirisamy

Package Quality Index

Category	Quality
Metric Level	Tier I
Definition	This is the Primary Container Quality Indicator (PCQI) which includes the following parameters: - Net Content - Container Condition and label condition - Closure condition - Closure Function and application - Date code efficiency
Objective	To indicate the Primary Container Quality (as per specifications) on product sampled in the Market Place
Calculation	As per TCCC Quality Measures database. Example of calculation used in Quality Measures: Primary Container Quality Indicator: $X = A \times B \times C \times D \times E \times 100$ $A = \frac{(C_s - F_c)}{C_s}$ $B = \frac{(C_s - F_l)}{C_s}$ $C = \frac{(C_s - F_o)}{C_s}$ $D = \frac{(C_q - F_q)}{C_q}$ $E = \frac{(C_f - F_f)}{C_f}$ X = PCQI A = container condition B = date coding C = closure condition D = closure function E = net content C_q = number of closure function reported C_f = number of net content reported C_s = number of samples reported as analyzed other than BIT F_q = number of non-conforming samples in closure function F_o = number of non-conforming samples in closure condition F_c = number of non-conforming samples in container condition F_f = number of non-conforming samples in net content F_l = number of non-conforming samples in date coding
Data Source	Quality Measures Push Reports: QAR 470, 922, 933 For example, QAR 933 report:

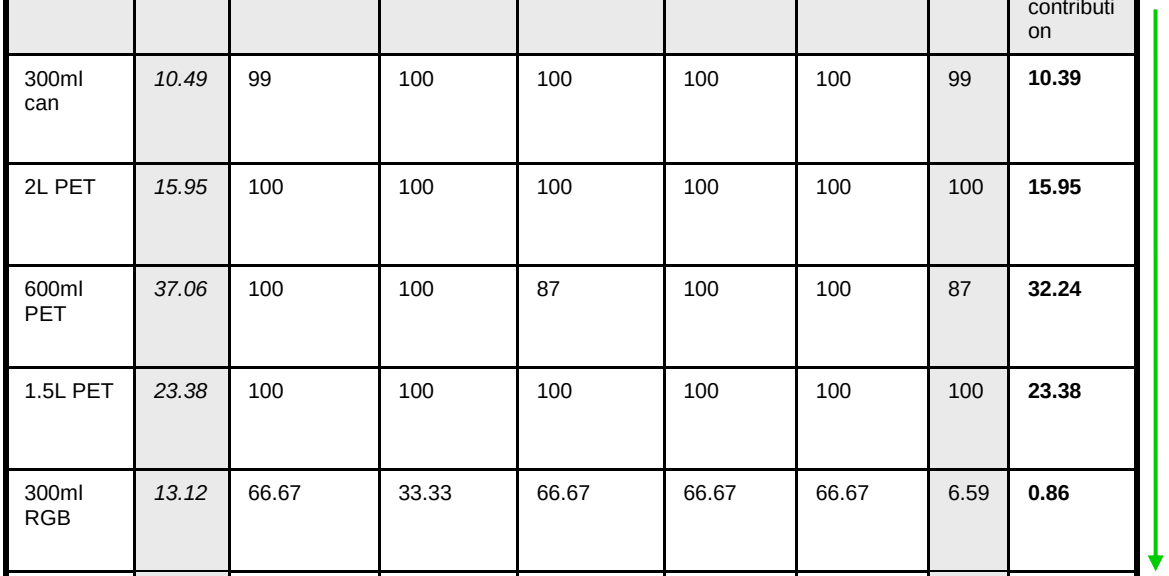
Product	Primary Container	# PC Smpls	PCQI	% Cfrm Clo Cnd	% Cfrm Clo Fnc	% Cfrm Cnt Cnd	% Cfrm Fil Hgt	% Cfrm Net Con	% Cfrm Dte Cd	Age Avg	% Cfrm Tot
1 - Detail											
Coke	NR Plas Btl 1 Ltr Stra	1	100	100	100	100		100	100	51	100
	NR Plas Btl 2 Ltr Stra	87	93	100	93	100		100	100	24	93
	NR Plas Btl 500 Ml Cntr	19	85	100	89	100		100	95	19	89
	REF Glass Btl 1.25 Ltr Stra	104	94	100	95	100	100	99	100	23	95
	REF Glass Btl 350 Ml Stra	1	100	100	100	100	100	100	100	21	
	Total Primary Containers	212	93	100	94	100	100	100	100	23	94
Coke Zero	NR Plas Btl 500 Ml Cntr	4	75	100	75	100		100	100	42	75
	Total Primary Containers	4	75	100	75	100		100	100	42	75
Coke lt	NR Plas Btl 1 Ltr Stra	1	100	100	100	100		100	100	77	100
	NR Plas Btl 2 Ltr Stra	19	100	100	100	100		100	100	34	100
	NR Plas Btl 500 Ml Cntr	5	60	100	60	100		100	100	49	60
	NR Plas Btl 500 Ml Stra	2	100	100	100	100		100	100	22	100
	Total Primary Containers	27	93	100	93	100		100	100	38	93
Fanta Grp	NR Plas Btl 2 Ltr Stra	5	60	100	60	100		100	100	23	60
	NR Plas Btl 500 Ml Stra	19	89	100	89	100		100	100	34	89
	REF Glass Btl 1.25 Ltr Stra	11	91	100	91	100	100	100	100	28	91
	Total Primary Containers	35	86	100	86	100	100	100	100	30	86
Fanta Org	NR Plas Btl 2 Ltr Stra	2	100	100	100	100		100	100	23	100
	NR Plas Btl 500 Ml Stra	16	94	100	94	100		100	100	35	94
	REF Glass Btl 1.25 Ltr Stra	13	92	100	92	100	100	100	100	38	92
	Total Primary Containers	31	94	100	94	100	100	100	100	36	94
Fanta Pine	NR Plas Btl 2 Ltr Stra	5	60	100	60	100		100	100	30	60
	REF Glass Btl 1.25 Ltr Stra	12	58	100	58	100	100	100	100	36	58
	Total Primary Containers	17	59	100	59	100	100	100	100	34	59
Krest Gin Ale	REF Glass Btl 1.25 Ltr Stra	1	0	100	0	100	100	100	100	8	0
	Total Primary Containers	1	0	100	0	100	100	100	100	8	0
Schw Club Soda-KO	NR Plas Btl 2 Ltr Stra	1	100	100	100	100		100	100	8	100
	REF Glass Btl 1.25 Ltr Stra	1	100	100	100	100	100	100	100	121	100

Collection Frequency	Based on analysis conducted on a Monthly basis and reported on a monthly basis
Benchmark	**Industry Average** 91% **Best in Class** 100%
Comments	The Quality measures results are derived from samples taken from the market place and analyzed by TCCC Trade Sample laboratories. There are several ways of viewing samples analyzed namely: • Total Produced View – Sample Weighted View of all samples that were produced by a plant (regardless where they are sold). • Total Sold View – Sample Weighted View of all samples that were sold in a sales territory (regardless where they were produced) • Sales Weighted View – Same as Total Sold View but sales weighted (instead of sample weighted)
Metric Owner	Saratha Packirisamy

Example

Sales Weighted PCQI calculation : for example, all packages for single product, single sales territory

Package	*% sales*	Container Condition	Closure Condition	Date Code Efficiency	Net Content	Closure Function	QI	Sales weighted contribution
300ml can	*10.49*	99	100	100	100	100	99	**10.39**
2L PET	*15.95*	100	100	100	100	100	100	**15.95**
600ml PET	*37.06*	100	100	87	100	100	87	**32.24**
1.5L PET	*23.38*	100	100	100	100	100	100	**23.38**
300ml RGB	*13.12*	66.67	33.33	66.67	66.67	66.67	6.59	**0.86**
	100	**95.52**	**91.25**	**90.81**	**95.63**	**95.63**		82.82



Metric Owner

Saratha Packirisamy

Fixed Asset Utilization

Category	Total Supply Chain
Metric Level	Tier I
Definition	A measure of the amount revenue generated per dollar invested Property, Plant and Equipment.
Objective	Used to highlight how well assets are being utilized in the organization.
Calculation	$\frac{\text{Net Revenue from the previous 12 months}}{\text{(Begining Net PP \& E + Ending Net PP \& E)/2}}$ ***Net Revenue*** is the company gross sales revenue less discounts and sales taxes. **Net PP&E** is Net Property, Plant, and Equipment (Cost less Accumulated Depreciation). This can be obtained from an entity's Balance Sheet.
Data Source	Financial System
Collection Frequency	Monthly – Rolling Annual Calculation
Benchmark	**Industry Average**: 275% **World Class**: TBD
Comments	Note: This is a monthly "rolling" calculation. A more accurate Net PP&E number for the calculation above is to use the average of the month-end Net PP&E for the past 12 months (recommended).
Example	Gross Revenue for the previous 12 months is $5,000,000 and Discounts are $100,000. Net Revenue is $4,900,000. At the Beginning of the 12 month period, Property, Plant, and Equipment Cost is $2,500,000 and Accumulated Depreciation is $900,000. Beginning Net PP&E = $1,600,000. At the End of the 12 month period, Property, Plant, and Equipment Cost is $2,900,000 and Accumulated Depreciation is $1,100,000. Ending Net PP&E = $1,800,000. The Fixed Asset Utilization is: ($5,000,000 - $100,000)/(($1,600,000 + $1,800,000)/2) = $4,900,000/$1,700,000 = 288.2%
Metric Owner	Joseph Motto

COGS as a % of Revenue

Category	Total Supply Chain
Definition	The percentage of revenue absorbed by COGS.
Metric Level	Tier I
Objective	Used to show how efficiently the organization is producing the goods that are being sold.
Calculation	$\frac{\text{Total Cost of Goods Sold (COGS)}}{\text{Net Revenue}}$
Data Source	Financial System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Included both Variable and Fixed COGS. Fixed COGS includes depreciation.
Example	Variable COGS is $100,000 and Fixed COGS is $20,000 in a month. Monthly Gross Revenue is $300,000 and Sales Discounts is $60,000. COGS as a % of Revenue is: ($100,000 + $20,000) / ($300,000 - $60,000) = $120,000/$240,000 = 50%
Metric Owner	Joseph Motto

Lost Time Incident Rate

Category	Total Supply Chain
Metric Level	Tier I
Definition	The number of Lost Time Incidents per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{LTI} \times 200{,}000}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	First Aid Case Rate
Benchmark	**Industry Average**: TBD **World Class**: <0.5%
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). LTIR can be approximated by the LTI per 100 full time workers. **Employee hours to include in Total Hours Worked:** Includes all hourly, salary and temporary employees who are on a facility's payroll, as well as contractors and temporary employees who are not on a facility's payroll, but for whom facility management provides day-to-day supervision of their work and provides the details, means, methods and processes by which the work objective is accomplished. Contractors and temporary employees managed exclusively by an outside firm that provides their own supervision, details, means, methods and processes by which the work objective is accomplished are NOT considered "employees." Employees hours of wholly owned subsidiaries that work on site should include any Lost Time Incidents and the total hours worked in the calculation
Example	A plant records 1 LTI cases in July. Total hours worked during July were: - 6,000 hours worked by production line hourly associates - 4,000 hours worked by temporaries on-line supervised by Bottler associates - 1,000 hours worked by an outside contractor called Mr. Clean Janitorial Company (workers are supervised by a supervisor employed by Mr. Clean)* - 3,000 hours worked by plant Finance, Procurement, and HR associates - 7,000 hours worked by Company logistics associates - 10,000 hours worked by a Logistics Company that is a wholly owned subsidiary of the bottler - 500 hours worked by company that installed warehouse racking* - 2,000 worked by the Plant Manager and salaried supervisors * Don't include these hours in calc Total Hours worked = 32,000 (6,000 + 4,000 + 3,000 + 7,000 + 10,000 + 2,000). The Lost Time Incident Rate is (1 X 200,000)/32,000 = 6.25
Metric Owner	Michael Ferrell

Unconstrained System Line Efficiency

Category	Total Supply Chain
Metric Level	Tier I
Definition	A comparison of the actual number of cases produced during paid time, to the theoretical number of cases that could have been produced without any constraints.
Objective	To measure the actual efficiency based on a line's full potential to highlight issues that may be impeding the capability of the line. For example: • Inefficiencies of line equipment • Inefficiencies within operating processes
Calculation	$\frac{\sum \text{TotalUnitsProduced}}{\sum \text{TheoreticalUnitsProduced@UnconstrainedLineSpeed}} \times 100$ ***Theoretical units @ Unconstrained Line Speed*** is based on the O.E.M. filler line speed or faster times the total time scheduled to run. (Does not include any scheduled downtime) ***Total Units Produced*** is the total number of quality units produced.
Data Source	Production Records
Collection Frequency	Monthly (collection should be done daily, reporting can be done monthly)
Related Supporting Metrics	Constrained Line Efficiency Overall Equipment Effectiveness
Benchmark	**Industry Average** PET 75% REFPET 75% Can 75% NR Glass 70% Returnable Glass 65% Hot-fill TBD Aseptic TBD **World Class** PET 85% REFPET 85% Can 78% NR Glass 78% Returnable Glass 75% Hot-fill TBD Aseptic TBD
Comments	• If entire production crew is scheduled in, no time can be excluded from this calculation. (E.g. if production crew schedule is 2/10 hr shifts per day, 5 days a week the calculation is based on 400 hours for a 4 week month and 500 hours for a 5 week month.) Production scheduled hours must not change from week to week unless there is a downtime due to a major overhaul, there is lack of sales volume, you work more hours than normal (then your hours increase), or there is a holiday. • Skeleton crews can be used to conduct cleaning, syrup prep, etc. and this does not reflect upon the SLE. Skeleton crew must be ≤25% of the normal production crew. • Use the O.E.M. rated speed or actual speed (whichever is faster) in the calculation. • Amount of SKU's and Packages by line will affect benchmarks

Example

Note: The example below is based on 1 package size. When multiple SKUs are rolled up, all measures should be converted to time for an accurate rollup. Please see the Supply Chain XChange for an example of a rollup template.

Plant A schedules 5 day a week production/24 hours a day. Line 1 in January:

- Yielded 12 million units of Quality/Sellable product.
- Approximately 8 hours of PMs were performed on the line both by operators and by the maintenance crew.
- Shut down 9 times during the week for a total of 10 hours for CIPs and changeovers.
- Shut down the line for 2 hours for unscheduled maintenance.
- The filler has an O.E.M. rated speed 800 bpm, but is running at 850 bpm*.

$$\frac{12{,}000{,}000}{850\text{bpm}((24/\text{day}) \times 60\,\text{min/hr} \times 5\,\text{days/wk} \times 4\,\text{wk/mth}))} \times 100 = 49.02\%$$

Note: CIP, Changeovers, Corrective Maintenance, and PMs are NOT subtracted from this calculation. Below is a chart that presents Situations and Line Scenarios and Guidance on when to include the hours in the Scheduled Hours part of the Metric calculation.

Situation / Scenario	Include / Exclude in Scheduled Hours?
1. Planned Labor/Union Meetings or Management Meetings	Include if paid time
2. Planned New Product Development/Trails	Include if line is staffed by more than 25% of the normal production crew
3. Planned CIP (mandatory) and changeovers	Include if line is staffed by more than 25% of the normal production crew
4. Planned start-ups	Include if line is staffed by more than 25% of the normal production crew
5. Planned shutdowns	Do not include assuming line staff is not paid.
6. Planned Training	Do Not Include.
7. Planned maintenance	Include if line is staffed by more than 25% of the normal production crew
8. No electricity or no water are available to the line	Include if more than 25% of the normal production crew continue to get paid

Metric Owner

Tom Sanborn and Terry Sharp

Demand and Supply Chain Planning

Classified - Internal use

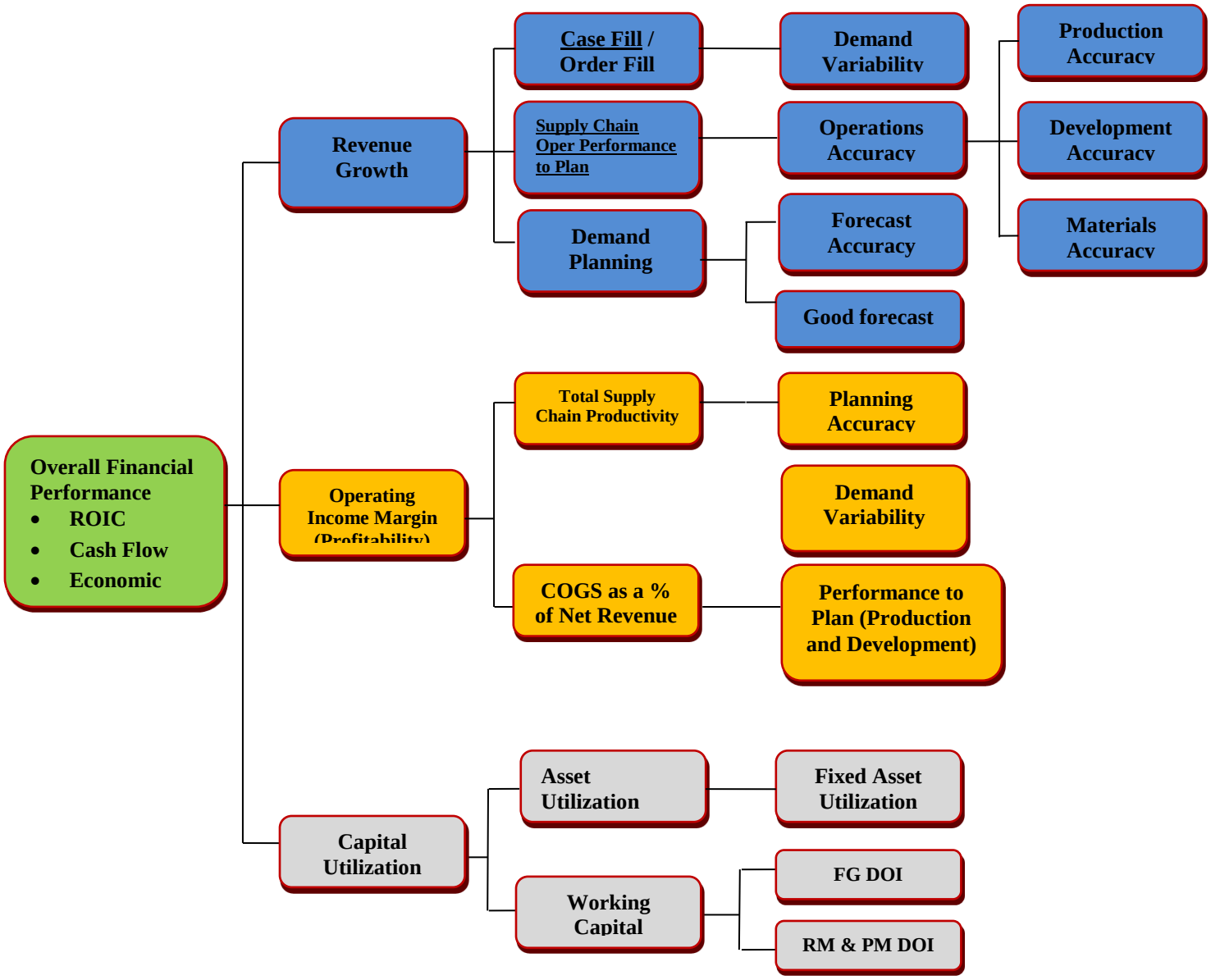
Demand and Supply Chain Planning RACI

Category	KPI	Production Planners	Materials Planners	Transport Planners	Distribution Planners	Toll Fill Product Planners	Inventory Planners	Regional Demand Planners	National Demand Managers	National Supply Planners	National Inventory Planners	Regional Planning Managers	National DOIP Manager	Director of Planning	Production	Procurement	Logistics	Distribution	Sales	Marketing	Finance	COO/CEO/GM
Safety	Medical Treatment	I	I	I		I	I	I	R	I	I	I	R	A								I
Finance	DOI Finished Goods - Actual Sales	R	C	R		R	R	R	C	R	R	C	R	A	I	I	I	I	I	I	I	I
	DOI Raw & Packaging Materials - Actual Sales	C	R	I		C	I	I	I	C	I	C	R	A	I	I	I	I	I	I	I	I
Customer Service (Tier 1)	SC Performance to Plan	C	C	C		C	C	C	R	C	C	C	R	A	R	R	R	R	R	R	I	C
Performance (Tier 2)	Forecast Accuracy	I	I	I		I	C	R	R	I	C	C	C	R	I	I	I	I	A	C	I	I
	Production Accuracy	R	R	I		I	I	I	I	I	I	C	C	R	A	R	I	I	I	I	I	I
	Materials Accuracy	C	R				C			C	C	C	C	R	C	A	I	I	I	I	I	I
	Loading Accuracy			C	C	C	C	I	I	C	C	C	C	R	I	I	A	I	I	I	I	I
	Transport Accuracy			R	I	I	C	I	I	I	C	C	C	R	I	I	A	I	I	I	I	I
	Delivery Accuracy			I	R		I	I	I	I	I	I	I	C			I	A	I	I	I	I
	Toll Fill Accuracy					R	C	C	C	I	C	C	C	A	I	R	I	I	I	I	I	I
	Inventory Planning Accuracy					C	R	C	C	C	R	C	C	A	I	I	I	I	C	C	C	I
Performance (Tier 3)	DOI Finished Goods - Forecast	R	I	I		R	R	I	I	R	R	R	R	A							I	I
	DOI Raw & Packaging Materials - Forecast	I	R	I		I	I	I	I	I	I	R	R	A							I	I

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Demand and Supply Chain Planning Line of Site



Supply Chain Operations Performance to Plan

Process	Total Supply Chain
Metric Level	Tier I
Definition	A combination of the performance of Manufacturing, Logistics (Warehouse & Transport) and Delivery to meet their plans
Objective	A measure of the effectiveness of operations to meet planned requirements both in terms of time and quantity given a 1 week forecast from Sales.
Calculation	**Week 1** = %PP2P x %WP2Px %TDP2P x %DP2P = 90% x 98% x 95% x 97% = 81% PP2P = average weekly Production Performance to Plan WP2P = average weekly Warehouse Performance to Plan TDP2P = average weekly Transportation Deployment Performance to Plan DP2P = average weekly Delivery Performance to Plan Perform calculation against each week performance then sum the weeks and divide by total weeks in period. Week 1 = 81% Week 2 = 99% Week 3 = 94% Week 4 = 88% **Final result = (81%+99%+94%+88%)/4 = 90.5%**
Data Source	Planning Systems
Collection Frequency	Monthly
Related Supporting Metrics	Weekly Forecast Accuracy Production Performance to Plan Warehouse Performance to Plan Transportation Deployment Performance to Plan Delivery Performance to Plan
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Manufacturing, Warehousing, Transport, Delivery accuracies are against final schedule of previous day.
Example	Through S&OP/E processes, a 1-week frozen forecast for each week of the month is produced. Each day planners update schedules for production, loading, transport and delivery. Each week the actual performance against these plans is measured. Sum the results of each week and then divide by total number of weeks in period to get final result.
Metric Owner	Paulo Mendes

Supply Planning Performance to Plan

Process	Total Supply Chain
Metric Level	Tier II
Definition	A combination of the performance of Manufacturing and Logistics to execute the proposed plan
Objective	A measure of the effectiveness of Manufacturing and Logistics to meet planned requirements both in terms of time and quantity given a 1 week forecast from Sales.
Calculation	**Formula: % Production P2P x % Transportation Deployment P2P** **Example:** Week 1 = 90% x 95% = 85% Perform calculation against each week performance, then sum the weeks, and divide by total weeks in the period. Week 1 = 85% Week 2 = 99% Week 3 = 94% Week 4 = 88% **Final result = (85%+99%+94%+88%)/4 = 91.5%**
Data Source	Planning Systems
Collection Frequency	Monthly
Related Supporting Metrics	Production Planning Accuracy Deployment Planning Accuracy Supply Chain Operations Performance to Plan
Benchmark	**Industry Average** TBD **World Class** TBD
Comments	Manufacturing and Transportation P2P should be measured against final schedule of previous day.
Example	Through S&OP/E processes, a 1-week frozen forecast for each week of the month is produced. Each day planners update schedules for production and transportation. Each week the actual performance against these plans is measured. Sum the results of each week and then divide by total number of weeks in period to get final result.
Metric Owner	Paulo Mendes

Weekly Forecast Accuracy

Category	Demand Planning
Metric Level	Tier I
Definition	An absolute measure of how well forecasts project actual demand, regardless of whether the forecast was high or low.
Objective	Used to measure how well the demand planning team brings together information about the business to generate a sales forecast by SKU, Warehouse and Week.
Calculation	$\left(1-\frac{\lvert\text{SKU Forecast}-\text{SKU Net Sales}\rvert}{\text{SKU Net Sales}}\right)$ ***for Single Product*** $\left(1-\frac{\sum\lvert\text{SKU Forecast}-\text{SKU Net Sales}\rvert}{\sum\text{SKUNet Sales}}\right)$ ***for Aggregate Products or Weeks*** If | SKU Forecast – SKU Net (Actual) Sales | > SKU Net (Actual) Sales, % Accuracy = ZERO ***SKU Net Sales*** is actual physical case settled sales for the SKU processed through that facility during the period. ***SKU Forecast*** is forecasted physical case sales used for planning purposes, for the SKU, warehouse facility, and week frozen period. The forecast finalized this week, normally no later than Wednesday, for the following week demand, normally starting on Saturday, is frozen for measurement purposes.
Data Source	Arete Prevail or Marquee
Collection Frequency	Weekly
Related Supporting Metrics	% Good Forecast, Forecast Stability
Benchmark	**Industry Average**: A SKUs > 85 % B SKUs > 80% C SKUs > 75% **World Class**: >90%
Comments	Needs to be reported by A, B, and C SKUs: **A SKUs** = Those SKUs representing > 70% of the volume **B SKUS** = Those SKUs representing the next 20% of the volume **C SKUs** = Those SKUs representing the last 10% of the volume It is recommended that reclassification of SKUs be done quarterly, but must be done at minimum semi-annually.
Example	Calculate the Period % Accuracy by summing all absolute errors by SKU, and then divide by the total physical case sales in the period.

	Week 1	Fcast	Actual	Error	Accuracy
Week 1	SKU A 1	1200	700	500	**29%**
	SKU A 2	600	1000	400	**60%**
	Week 1 Total	**1800**	**1700**	**900**	**47%**
Week 2	SKU A 1	1400	900	500	**44%**
	SKU A 2	900	1400	500	**64%**
	Week 2 Total	**2300**	**2300**	**1000**	**57%**
Week 3	SKU A 1	1500	1400	100	**93%**
	SKU A 2	1000	700	300	**57%**

	Week 3 Total	**2500**	**2100**	**400**	**81%**
Week 4	SKU A 1	1300	500	800	**0%**
	SKU A 2	1400	1700	300	**82%**
	Week 4 Total	**2700**	**2200**	**1100**	**50%**
Period		**9300**	**8300**	**3400**	**59.0%**

Forecast Stability – 13 Weeks Forecast Accuracy

Category	Demand Planning
Metric Level	Tier II
Definition	Measures the evolution of operational forecast accuracy over the 13 weeks forecast horizon.
Objective	Used to measure how stable is the forecast accuracy over the forecast horizon.
Calculation	***Average Forecast Stability:*** $\frac{1}{n} x \sum_{n=1}^{13} \left(Forecast\ Accuracy_n\right)$ ***Standard Deviation of Forecast Stability:*** Std Deviation (Forecast Accuray) over 13 weeks Forecast Accuracy is the forecast accuracy result for each of the 13 weeks under analysis
Data Source	Arete Prevail or Forecast Tracker
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy
Benchmark	**Industry Average** > 75% **World Class** > 85%
Comments	Needs to be reported on a weekly basis using a graphic or table to show the trend of forecast results.
Example	The bottler has forecast accuracy for the last 13 weeks as described below: **Forecast Stability** FA_1 = 80% FA_2 = 75% FA_3 = 77% FA_4 = 75% FA_5 = 73% FA_6 = 80% FA_7 = 78% FA_8 = 68% FA_9 = 80% FA_{10} = 67% FA_{11} = 75% FA_{12} = 80% FA_{13} = 82% Average 76% Standard Dev 5% Average Forecast Stability = 1/13 x (80% + 75% + 77% + 75% + 73% + 80% + 78% + 68% + 80% + 67% + 75% + 80% + 82%) = 76.15%
Metric Owner	Paulo Mendes

Collaborative Sales Forecast Accuracy

Category	Demand Planning
Metric Level	Tier II
Definition	Measures the quality of collaborative forecast from sales team to improve company´s forecast accuracy
Objective	Used to measure how accurate is the adjusted forecast generated by sales team.
Calculation	$\left(1-\frac{\lvert \text{SKU Forecast FROM SALES} - \text{SKU Net Sales} \rvert}{\text{SKU Net Sales}}\right)$ ***for Single Product*** $\left(1-\frac{\sum \lvert \text{SKU Forecast FROM SALES} - \text{SKU Net Sales} \rvert}{\sum \text{SKU Net Sales}}\right)$ ***for Aggregate Products or Weeks*** If | SKU Forecast FROM SALES – SKU Net Sales | > SKU Net Sales, % Accuracy = ZERO ***SKU Net Sales*** is actual physical case settled sales for the SKU processed through that facility during the period of analysis. ***SKU Forecast FROM SALES*** is the forecast in physical cases adjusted by the sales team on a weekly basis to incorporate new market activities, price changes, promotions, etc.
Data Source	Arete Prevail
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy
Benchmark	**Industry Average** — TBD **World Class** — TBD
Comments	Results should be reported on a weekly basis for both overall company and by sales manager involved in the collaborative forecast process.
Example	See table below
Metric Owner	Paulo Mendes

Weeks	SKU	Generated Forecast	Collaborative Forecast from Sales	Live Forecast	Actual Net Sales	Generated FA	Collaborative FA	Live FA
1	201	1.000	1.100	1.050	1.000	100%	90%	95%
	202	800	1.000	900	930	86%	92%	97%
2	201	1.200	1.500	1.400	1.450	83%	97%	97%
	202	750	1.000	1.000	800	94%	75%	75%
3	201	1.800	2.000	1.900	2.200	82%	91%	86%
	202	1.200	1.200	1.200	950	74%	74%	74%
4	201	2.000	2.200	2.200	2.100	95%	95%	95%
	202	1.500	1.300	1.400	1.650	91%	79%	85%

Forecast BIAS

Category	Demand Planning
Metric Level	Tier II
Definition	Measures the percentage BIAS of a weekly forecast
Objective	Used to identify if forecasts tend to be over-forecast (positively biased) or under-forecast (negatively biased).
Calculation	$\left(\frac{\sum(\text{Forecast} - \text{Net Sales})}{\sum \text{Net Sales}}\right)$ ***Net Sales*** is actual physical case settled sales for the SKU processed through that facility during the period. ***Forecast*** is forecasted physical case sales used for planning purposes, for the SKU, warehouse facility, and week frozen period. The forecast finalized this week, normally no later than Wednesday, for the following week demand, normally starting on Saturday, is frozen for measurement purposes.
Data Source	Arete Prevail
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy % Good Forecast
Benchmark	**Industry Average** **World Class** < 5%
Comments	
Example	See table below
Metric Owner	Paulo Mendes

Week	Sales	Forecast 1	Forecast 1 Error	Forecast 2	Forecast 2 Error
200701	400	300	-100	300	-100
200702	400	500	+100	300	-100
200703	400	400	0	400	0
200704	400	300	-100	300	-100
200705	400	500	+100	300	-100
Total	2000	0% biased	0	-20% biased	-400

% Unplanned Promotions

Category	Demand Planning
Metric Level	Tier II
Definition	Measures the percentage of promotions that were communicated to the demand planning team after the frozen period.
Objective	Allows quantifying how Marketing and Commercial are collaborating with demand planning team to share information about special promotions and market activities in accordance with forecast lead times.
Calculation	$\left(\frac{\text{Number of Unplanned Promotions (Communicated after 2 weeks frozen Period)}}{\text{Total Number of Promotions Executed in the Period}}\right)$ ***Number of Unplanned Promotions*** is the sum of the number of promotions (e.g. price discount, special market activities, etc.) that were communicated by Marketing and Commercial to the demand planning team after the agreed frozen period (usually 2 weeks in advance). ***Total Number of Promotions*** is the sum of all promotions executed in the specific week.
Data Source	Internal System
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy % Good Forecast
Benchmark	**Industry Average** < 5% **World Class** < 1%
Comments	
Example	

Week	# of Unplanned Promotions (after lead time of 2 weeks in advance)	Total # of Promotions	% Unplanned Promotions
1	2	5	40%
2	1	10	10%
3	2	2	100%
4	0	5	0%
Total Month	5	22	23%

Metric Owner	Paulo Mendes

% Good Forecast

Category	Demand Planning
Metric Level	Tier II
Definition	The number of SKUs that have a forecast accuracy ≥ 75%.
Objective	Used to allow for focus on those SKUs not meeting benchmark forecast accuracy.
Calculation	$\frac{\sum \text{All SKUs} \geq 75\% \text{ Forecast Accuracy}}{\text{Total \# of SKUs}}$ **All SKUs ≥ 75% Forecast Accuracy** is the sum of the number of SKUs that have forecast accuracy results greater than 75% **Total Number of SKUs** is the total number of SKUs active in the forecast process
Data Source	Arete Prevail or Internal System
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy
Comments	None
Example	See table below
Metric Owner	Paulo Mendes

Week	# SKUs > 75% Accuracy	Total # SKUs	% Good Forecast
1	30	100	30%
2	40	100	40%
3	28	100	28%
4	50	100	50%
Total Month	**148**	**400**	**37%**

Demand Variability

Category	Demand Planning
Metric Level	Tier II
Definition	Measures the variability of actual sales volume in physical cases
Objective	Used to quantify the degree of variability of company sales volume.
Calculation	$\left(\frac{\text{Standard Deviation of Actual Sales Volume)}}{\text{Average of Actual Sales Volume}}\right)$ ***Standard Deviation of Actual Sales Volume*** is the standard deviation of actual sales volume in physical cases during the period of analysis. It should be calculated considering daily sales. ***Average of Actual Sales Volume*** is the average of actual daily sales in physical cases during the period of analysis.
Data Source	Internal System
Collection Frequency	Daily
Related Supporting Metrics	Weekly Forecast Accuracy
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	See below
Metric Owner	Paulo Mendes

Day	Week	Month	Sales Volume in Physical Cases
1/1/2012	Week 1	Jan-12	1.000
2/1/2012	Week 1	Jan-12	1.500
3/1/2012	Week 1	Jan-12	1.200
4/1/2012	Week 1	Jan-12	1.300
5/1/2012	Week 1	Jan-12	1.100
6/1/2012	Week 1	Jan-12	1.200
7/1/2012	Week 1	Jan-12	2.500
8/1/2012	Week 1	Jan-12	3.500
9/1/2012	Week 2	Jan-12	800
10/1/2012	Week 2	Jan-12	1.000
11/1/2012	Week 2	Jan-12	1.100
12/1/2012	Week 2	Jan-12	1.200
13/1/2012	Week 2	Jan-12	1.400
14/1/2012	Week 2	Jan-12	1.300
15/1/2012	Week 2	Jan-12	1.500
16/1/2012	Week 3	Jan-12	1.000
17/1/2012	Week 3	Jan-12	900
18/1/2012	Week 3	Jan-12	1.100
19/1/2012	Week 3	Jan-12	1.300
20/1/2012	Week 3	Jan-12	1.000
21/1/2012	Week 3	Jan-12	950
22/1/2012	Week 3	Jan-12	800
23/1/2012	Week 4	Jan-12	1.000
24/1/2012	Week 4	Jan-12	1.200
25/1/2012	Week 4	Jan-12	2.500
26/1/2012	Week 4	Jan-12	2.900
27/1/2012	Week 4	Jan-12	3.500
28/1/2012	Week 4	Jan-12	3.800
29/1/2012	Week 4	Jan-12	4.500

Demand Variability (Coefficient of Variation)			
By Month	CoV	By Week	CoV
Jan-12	0,6	Week 1	0,5
Feb-12		Week 2	0,2
Mar-12		Week 3	0,2
		Week 4	0,5

% of Demand by Week	
Week	Sales Weight
Week 1	28%
Week 2	17%
Week 3	15%
Week 4	40%

Example Week 1:

Standard Deviation = 879.8 Physical Cases

Average Daily Sales = 1.662.5 Physical Cases

Coefficient of Variation = 879.8 / 1.662.5 = 0.529

Finished Goods Days of Inventory (Actual Performance)

Category	Inventory Planning
Definition	A measure of the actual inventory level against actual sales.
Metric Level	Tier II
Objective	Used to measure how well capital invested in inventory is being utilized. Always backward looking – past performance.
Calculation	$\frac{\text{AverageDailyInventoryPhysicalCase}}{\text{AverageDailySalesPhysicalCase}}$ ***Average Daily Inventory Physical Case*** is the average daily inventory over a month's period. ***Average Daily Sales Physical Case*** is the average daily physical case sales for the same month as physical case inventory average above. Do not include days in which no sales occurred.
Data Source	Warehouse Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: ≤ 5 Days **World Class**: TBD
Comments	Further analysis should be done by reviewing DOI by SKU type (A, B, C) and/or by specific SKU for the entire bottler supply chain (includes all FG inventories at plants, warehouses and any owned inventory at other storage facilities (example: mini-bodega).
Example	The average days inventory in one finance calendar month was 1,000,000 PC and Average daily physical case sales for the same month 100,000 PC Finished Goods Days of Inventory(Actual performance) = $\frac{1{,}000{,}000}{100{,}000} = 10$ days
Metric Owner	Paulo Mendes

Classified - Internal use

Raw Material Inventory Days of Supply

Category	Inventory Planning
Definition	A measure of the amount of inventory, expressed in days of production, for ingredients and packaging materials
Metric Level	Tier II
Objective	Used to measure how well capital invested in inventory is being utilized.
Calculation	$$\frac{\text{Total Raw Material Inventory Value (Month End)}}{\text{Average Value of Raw Material Used Daily (current month)}}$$ ***Raw Material Inventory Value*** is the value at month end raw material inventory.
Data Source	Warehouse Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Use only running days in the average value of Raw Material Used Daily. Though not required, a more accurate calculation is to use the average Total Raw Material Inventory Value for each day of the month instead of the Month End value.
Example	The raw material inventory value at month-end is $2,000,000. Raw Material Usage during the month was $3.5 million, days run was 20 days. The value of the raw material used over that same month on a daily basis is $175,000. $$\frac{\$2,000,000}{\$175,000} = 11.4 \text{ days}$$
Metric Owner	Paulo Mendes

Finished Goods Days of Inventory (Forecasted)

Category	Inventory Planning
Definition	A measure of the inventory level which will be used for future demand.
Metric Level	Tier II
Objective	Used to measure how well the inventory level is positioned to meet the next operational cycle demand.
Calculation	$\frac{\text{Ending Inventory Physical Case (week 0)}}{\text{Average daily forecast for sum of week 1 and week 2}}$
Data Source	Warehouse and Sales Management system
Collection Frequency	Weekly – rolling across all weeks without regard to period end. So, in week 4 of a 4 week period you will use the forecasted demand of week 4 and week 1 of next period.
Benchmark	**Industry Average**: ≤ 5 Days **World Class**: TBD
Comments	Compared with next rolling 2 week's average daily forecast, how long period will be covered.
Example	See table below
Metric Owner	Paulo Mendes

	Ending Inventory	Next 4 week rolling forecast			
Week	Week 0	Week 1	Week 2	Week 3	Week 4
330ml Can Coke phy cases	90,000	50,000	30,000	40,000	10,000
Average Daily Forecast for the next 2 weeks*	$= \frac{90,000}{6,667} = 13.5 \text{ days}$				
DOI	$= \frac{50,000 + 30,000}{2 * 6} = 6,667 \text{ Physical Cases}$				

*Note: 6 Selling Days Per Week

Classified - Internal use

% Revenue and Profit from New Products

Category	Product Lifecycle Management (PLM)
Metric Level	Tier II
Definition	Measures the percentage of revenue (and profit) that comes from products that were launched in the market place less than 1 year.
Objective	Used to understand how new products contribute to company´s revenue and profits
Calculation	$\left(\frac{\text{Revenue (or Profit) from New Products}}{\text{Total Company Revenue (or Profit)}}\right)$ ***Revenue (or Profit) from New Products*** is the sum of revenue (or Profit) from all new products during the period of analysis. (A New Product is defined as the product launched in less than 1 year). ***Total Company Revenue (or Profit)*** is the sum of company´s revenues (or Profit) during the period of analysis. **Important Note**: PLM KPIs should be measured by the Planning department, but they should be managed as cross-functional metrics, as different functional areas like commercial, supply chain, finance, marketing, etc., impact their results.
Data Source	Internal System
Collection Frequency	Monthly
Related Supporting Metrics	% New Product Meeting Objectives
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	
Metric Owner	Paulo Mendes

Month	Total Net Revenue (000)	Total Net Profit (000)	Total Net Revenue from Products Launched less than 1 year (000)	Total Net Profit from Products Launched less than 1 year (000)	% of Revenue from New Products	% of Profit from New Products
Jan	1.000	250	150	38	15%	15%
Feb	900	225	135	34	15%	15%
Mar	850	250	170	50	20%	20%
Apr	700	175	175	44	25%	25%
May	900	225	180	45	20%	20%
June	1.100	275	220	55	20%	20%
July	1.500	375	225	56	15%	15%
YTD	6.950	1.775	1.043	266	15%	15%

% New Products Meeting Objectives

Category	Product Lifecycle Management (PLM)
Metric Level	Tier II
Definition	Measures the percentage of new products that meet objectives in terms of sales volume, market share or profit.
Objective	Quantify the percentage of new products that meet company´s objectives.
Calculation	$\left(\frac{\text{Number of New Products that Meet Objective}}{\text{Total Number of New Products Launched}}\right)$ ***Number of New Products that Meet Objective*** is the sum of the number of new products that meet the objectives in terms of sales volume goal in unit case, and market share and profit. ***Total Number of New Products Launched*** is the sum of the number of New Products launched during the period of analysis. (A New Product is defined as the product launched in less than 1 year). **Important Note**: PLM KPIs should be measured by the Planning department, but they should be managed as cross-functional metrics, as different functional areas like commercial, supply chain, finance, marketing, etc., impact their results.
Data Source	Internal System
Collection Frequency	Monthly
Related Supporting Metrics	% of Revenue and Profit from New Products
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	This metric should be calculated for each criteria separately (volume, share and profit) and also for all 3 criteria considered at the same time, as illustrated in the example below.
Example	
Metric Owner	Paulo Mendes

Month	Total Number of Active SKUs	Number of SKUs Launched	Number of SKUs launched that meet Sales Volume, Profit, AND Market Share Objectives	% of SKUs meeting Objectives
Jan	100	0	0	-
Feb	110	10	2	20%
Mar	120	20	5	25%
Apr	120	20	7	35%
May	140	40	10	25%
June	130	40	12	30%
July	130	40	15	38%

New Products Launched On Time and On Budget

Category	Product Lifecycle Management (PLM)
Metric Level	Tier II
Definition	Measures the percentage of new products that were launched On time and On budget
Objective	Quantify the percentage of new products that were launched as expected in the project plan.
Calculation	$\left(\frac{\text{Number of New Products Launched On Time and On Budget}}{\text{Total Number of New Products Launched}}\right)$ ***Number of New Products Launched On Time and On Budget*** is the sum of the number of new products that were launched On time (as defined in the project launch timeline) and On budget (as defined in company´s budget or business plan) ***Total Number of New Products Launched*** is the sum of the number of New Products launched during the period of analysis. (A New Product is defined as the product launched in less than 1 year). **Important Note**: PLM KPIs should be measured by the Planning department, but they should be managed as cross-functional metrics, as different functional areas like commercial, supply chain, finance, marketing, etc., impact their results.
Data Source	Internal System
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	See table below
Metric Owner	Paulo Mendes

Month	Number of SKUs Launched	Number of SKUs Launched "On Time and On Budget"	% New Products Launched On Time and On Budget
Jan	0	0	-
Feb	10	5	50%
Mar	20	15	75%
Apr	0	0	-
May	10	6	60%
June	0	0	-
July	5	4	80%
YTD	**45**	**30**	**67%**

Weekly Forecast Accuracy for New Products

Category	Demand Planning
Metric Level	Tier II
Definition	An absolute measure of how well forecasts project actual demand for new products
Objective	Used to measure how well the demand planning team generates a sales forecast by SKU, Warehouse and Week for new products (A New Product is defined as the product launched in less than 1 year).
Calculation	$\left(1-\frac{\lvert SKU\,Forecast\,Sales-SKU\,Net\,Sales\rvert}{SKU\,Net\,Sales}\right)$ ***for Single Product*** $\left(1-\frac{\sum\lvert SKU\,Forecast\,Sales-SKU\,Net\,Sales\rvert}{\sum SKU\,Net\,Sales}\right)$ ***for Aggregate Products or Weeks*** If | SKU Forecast Sales – SKU Net Sales | > SKU Net Sales, % Accuracy = ZERO ***SKU Net Sales*** is actual physical case settled sales for the SKU processed through that facility during the period. ***SKU Forecast Sales*** is forecasted physical case sales used for planning purposes, for the SKU, warehouse facility, and week frozen period. The forecast finalized this week, normally no later than Wednesday, for the following week demand, normally starting on Saturday, is frozen for measurement purposes.
Data Source	Arete Prevail or Marquee
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	
Example	Calculate the Period % Accuracy by summing all absolute errors by SKU, and then divide by the total physical case sales in the period.

	Week 1	Forecast	Actual	Error	Accuracy
Week 1	New SKU A 1	1200	700	500	**29%**
	New SKU A 2	600	1000	400	**60%**
	Week 1 Total	**1800**	**1700**	**900**	**47%**
Week 2	New SKU A 1	1400	900	500	**44%**
	New SKU A 2	900	1400	500	**64%**
	Week 2 Total	**2300**	**2300**	**1000**	**57%**
Week 3	New SKU A 1	1500	1400	100	**93%**
	New SKU A 2	1000	700	300	**57%**
	Week 3 Total	**2500**	**2100**	**400**	**81%**
Week 4	New SKU A 1	1300	500	800	**0%**
	New SKU A 2	1400	1700	300	**82%**
	Week 4 Total	**2700**	**2200**	**1100**	**50%**
Period		**9300**	**8300**	**3400**	**59.0%**

Metric Owner	Paulo Mendes

% Write-offs for New Products

Category	Product Lifecycle Management (PLM)
Metric Level	Tier II
Definition	Measures the percentage of write-offs for products launched in less than 1 year
Objective	Quantify the write-off from new products as a percentage of net revenue
Calculation	$\left(\frac{\sum \text{Write - off COGS from New Products}}{\sum \text{Net Revenue from New Products}}\right)$ ***Write-off COGS from New Products*** is the sum of all COGS from new products (products launched in less than 1 year) that were wrote-off during the period of analysis. ***Net Revenue from New Products*** is the sum of total revenue discounted taxes from all new products launched during the period of analysis.
Data Source	Internal System
Collection Frequency	Monthly
Related Supporting Metrics	Weekly Forecast Accuracy for New Products
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	The write-off of new products during last month was $100,000, mainly due to product expired in the warehouse as forecasts were highly above actual sales in the market place. The revenue from new products was $5,000,000 and net revenue (discounted taxes) was $4,000,000. % Write-offs for New Products = $100,000 / $4,000,000 = 2.5%
Metric Owner	Paulo Mendes

Production Planning Accuracy

Category	Operations Planning
Metric Level	Tier II
Definition	Actual final production schedule open by day and by SKU measured against final published production schedule of previous week
Objective	A measure of the ability of Planning Group to create a weekly production schedule that remains in effect and represents the true production demand.
Calculation	$\text{Daily PPA \%} = 1 - \frac{\lvert \text{Final Planned Qty} - \text{Original Planned Qty} \rvert}{\text{Original Planned Qty}} \times 100\%$ $\text{Weekly PPA \%} = 1 - \frac{\text{Aggregated Error}}{\text{Aggregated Original Planned Qty}} \times 100\%$ ***Final Planned Quantity*** is the last production plan volume open by day, by production line and by SKU in physical cases released to Manufacturing area to be produced. ***Original Planned Quantity*** is the first production plan volume in physical cases generated one week prior to the schedule (should also be opened by day, by production line and by SKU). Be sure to use previous week published production schedule (1 week frozen)
Data Source	Production Planning Tool & Manufacturing Execution Systems
Collection Frequency	Weekly and reported monthly
Related Supporting Metrics	Weekly Forecast Accuracy Production Performance to Plan Warehouse Inventory Accuracy
Benchmark	**Industry Average**: > 80% **World Class**: > 95%
Comments	It is important to define a set of standard reason codes to track deviation between the original and the final published production plan.
Example	Example: Line 1 in Week 1

Day	Line	SKU	Original Production Plan	Final Plan to Manufacturing	Production Accuracy
Monday	1	101	1.000	1.200	80%
Tuesday	1	101	900	900	100%
Wednesday	1	202	1.500	1.100	73%
Thursday	1	304	2.000	1.800	90%
Friday	1	1100	800	790	99%
Saturday	1	1100	1.000	1.000	100%
Sunday	1	101	900	1.200	67%

Metric Owner	Paulo Mendes

Deployment Planning Accuracy

Category	Operations Planning
Metric Level	Tier II
Definition	Actual final deployment schedule measured against final published deployment schedule of previous week
Objective	A measure of the ability of Planning Group to create a weekly deployment schedule that remains in effect and represents the true need to fulfil demand.
Calculation	$$\text{Daily PPA \%} = 1 - \frac{\lvert \text{Final Planned Qty} - \text{Original Planned Qty} \rvert}{\text{Original Planned Qty}} \times 100\%$$ $$\text{Weekly PPA \%} = 1 - \frac{\text{Aggregated Error}}{\text{Aggregated Original Planned Qty}} \times 100\%$$ ***Final Planned Quantity*** is the last deployment plan volume in physical cases released to Logistics (transportation) area to be transfer from production center to warehouse facilities. ***Original Planned Quantity*** is the first deployment plan volume in physical cases generated one week prior to the schedule. Be sure to use previous week published deployment schedule (1 week frozen)
Data Source	Deployment Planning Tool
Collection Frequency	Weekly and reported monthly
Related Supporting Metrics	Weekly Forecast Accuracy Production Performance to Plan Deployment Performance to Plan Warehouse Inventory Accuracy
Benchmark	**Industry Average**: > 80% **World Class**: > 95%
Comments	It is important to define a set of standard reason codes to track deviation between the original and the final published deployment plan.
Example	Example: From Plant 1 to Warehouse 1 in Week 1

Day	From	To	SKU	Original Deployment Plan	Final Deployment Plan	Deployment Accuracy
Monday	Plant 1	Warehouse 1	101	2.000	1.500	75%
Monday	Plant 1	Warehouse 1	305	500	450	90%
Tuesday	Plant 1	Warehouse 1	101	2.000	1.900	95%
Tuesday	Plant 1	Warehouse 1	610	1.600	1.400	88%
Wednesday	Plant 1	Warehouse 1	202	2.900	2.600	90%
Wednesday	Plant 1	Warehouse 1	810	3.000	3.500	83%
Thursday	Plant 1	Warehouse 1	304	2.500	2.900	84%
Thursday	Plant 1	Warehouse 1	202	1.500	1.300	87%
Friday	Plant 1	Warehouse 1	1100	500	800	40%
Friday	Plant 1	Warehouse 1	1300	700	700	100%
Saturday	Plant 1	Warehouse 1	1100	1.200	1.000	83%
Saturday	Plant 1	Warehouse 1	101	2.000	1.900	95%
Sunday	Plant 1	Warehouse 1	305	500	900	20%

Metric Owner	Paulo Mendes

Turns for RGB and REFPET Floats (by year and month)

Category	Operations Planning
Metric Level	Tier II
Definition	The number of times RGB float turns. Tracked by bottle size and includes physical inventory (in marketplace, at consumer, warehouse, full goods, plant, etc.).
Objective	A measure of the efficiency of RGB inventory management.
Calculation	$$\frac{\text{Bottles Sold}}{\text{Size of the Float in the Complete Universe}}$$ ***Complete Universe* =** Best accounting estimation of the empties and full goods in current inventory, in the market place, and at the consumer
Data Source	Warehouse Management System or Internal System
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Measure should be for both RGB and REFPET
Example	A bottler has 21,000 bottles in their current inventory in the yard, 10,000 bottles of full goods in their warehouse, 10,000 bottles of full goods at the consumer and 11,667 bottles at the customer. FY (rolling 12 months) there has been 139,117 bottles sold. MTD there has been 8,179 bottles sold. $\frac{139,117}{21,000+10,000+10,000+11,667} = 2.6/\text{FY}$ $\frac{8,179}{21,000+10,000+10,000+11,667} = .16/\text{mth}$
Metric Owner	Paulo Mendes

Fixed Asset Utilization

Category	Infrastructure Planning
Metric Level	Tier I
Definition	Fixed Asset Utilization measures how many dollars of revenue are generated for each dollar invested in net PP&E
Objective	Used to highlight how well assets are being utilized in the organization
Calculation	$$\frac{\text{Net Revenue from Previous 12 months}}{(\text{Begining Net PP \& E} + \text{Ending Net PP \& E})/2}$$ ***Net Revenue*** is the company gross sales revenue less discounts and sales taxes. ***Net PP&E*** is Net Property, Plant, and Equipment (Cost less Accumulated Depreciation). This can be obtained from an entity's Balance Sheet.
Data Source	Financial System
Collection Frequency	Monthly – Rolling Annual Collection
Related Supporting Metrics	None
Benchmark	**Industry Average**: 275% **World Class**: TBD
Comments	Note: This is a monthly "rolling" calculation. A more accurate Net PP&E number for the calculation above is to use the average of the month-end Net PP&E for the past 12 months (recommended).
Example	Gross Revenue for the previous 12 months is $5,000,000 and Discounts are $100,000. Net Revenue is $4,900,000. At the Beginning of the 12 month period, Property, Plant, and Equipment Cost is $2,500,000 and Accumulated Depreciation is $900,000. Beginning Net PP&E = $1,600,000. At the End of the 12 month period, Property, Plant, and Equipment Cost is $2,900,000 and Accumulated Depreciation is $1,100,000. Ending Net PP&E = $1,800,000. **The Fixed Asset Utilization is:** ($5,000,000 - $100,000)/(($1,600,000 + $1,800,000)/2) = $4,900,000/$1,700,000 = 288.2%
Metric Owner	Joe Motto

Transportation Deployment Performance to Plan

Category	Logistics – Transportation
Metric Level	Tier II
Definition	An absolute measure of Transportation Deployment Planned shipments vs. Actual
Objective	A measure of the effectiveness of logistics to meet planned requirements both in terms of time and quantity.
Calculation	**For Single Products:** $1 - \frac{\lvert \text{Transportation Deployment Plan} - \text{Transportation Actual Deployment} \rvert}{\text{Transportation Deployment Plan}}$ **For Aggregated Products or Aggregated Planning Horizons:** $1 - \frac{\sum \lvert \text{Transportation Deployment Plan} - \text{Transportation Actual Deployment} \rvert}{\sum \text{Transportation Deployment Plan}}$ ***Transportation Deployment Plan*** means the cases that were planned to be transported to Sales Center/Distributor. ***Transportation Haulage Actual*** means the cases that were transported to Sales Center / Distributor.
Data Source	DRP system
Collection Frequency	Daily and reported monthly as roll up of daily actual results.
Related Supporting Metrics	Supply Chain Operations Performance to Plan Deployment Planning Accuracy
Benchmark	**Industry Average** ≤ 95% **World Class** 99%
Comments	None

Example

Day	From	To	SKU	Final Deployment Plan	Actual Deployment Executed	Absolute Error	Deployment Accuracy
Monday	Plant 1	Warehouse 1	101	2.000	2.200	200	**90%**
Monday	Plant 1	Warehouse 1	305	500	900	400	**20%**
Tuesday	Plant 1	Warehouse 1	101	2.000	1.900	100	**95%**
Tuesday	Plant 1	Warehouse 1	610	1.600	1.400	200	**88%**
Wednesday	Plant 1	Warehouse 1	202	2.900	2.600	300	**90%**
Wednesday	Plant 1	Warehouse 1	810	3.000	3.500	500	**83%**
Thursday	Plant 1	Warehouse 1	304	2.500	2.900	400	**84%**
Thursday	Plant 1	Warehouse 1	202	1.500	1.300	200	**87%**
Friday	Plant 1	Warehouse 1	1100	500	800	300	**40%**
Friday	Plant 1	Warehouse 1	1300	700	700	0	**100%**
Saturday	Plant 1	Warehouse 1	1100	1.200	1.000	200	**83%**
Saturday	Plant 1	Warehouse 1	101	2.000	1.900	100	**95%**
Sunday	Plant 1	Warehouse 1	305	500	900	400	**20%**

Monday	Plant 1	Warehouse 1	All SKUs	2.500	3.100	600	76%
Tuesday	Plant 1	Warehouse 1	All SKUs	3.600	3.300	300	92%
Wednesday	Plant 1	Warehouse 1	All SKUs	5.900	6.100	800	86%
Thursday	Plant 1	Warehouse 1	All SKUs	4.000	4.200	600	85%
Friday	Plant 1	Warehouse 1	All SKUs	1.200	1.500	300	75%
Saturday	Plant 1	Warehouse 1	All SKUs	3.200	2.900	300	91%
Sunday	Plant 1	Warehouse 1	All SKUs	500	900	400	20%

All Days	Plant 1	Warehouse 1	All SKUs	20.900	22.000	3.300	84%

Metric Owner

Lou Swanson

Delivery Performance to Plan

Category	Logistics – Delivery
Metric Level	Tier II
Definition	An absolute measure of Delivery Planned shipments vs. Actual
Objective	A measure of the effectiveness of Logistics to meet planned requirements both in terms of time and quantity.
Calculation	**For Single Planning Horizon Calculation:** $1 - \frac{\lvert \text{Delivery Plan} - \text{Delivery Actual} \rvert}{\text{Delivery Plan}}$ **For Aggregated Products or Aggregated Planning Horizons:** $1 - \frac{\sum \lvert \text{Delivery Plan} - \text{Delivery Actual} \rvert}{\sum \text{Delivery Plan}}$ ***Delivery Plan*** means the physical cases that were planned to be delivered to the customers. ***Delivery Actual*** means the physical cases that were delivered to the customers
Data Source	
Collection Frequency	Daily and reported monthly as roll up of daily actual results.
Related Supporting Metrics	Supply Chain Operations Performance to Plan Warehouse Performance to Plan
Benchmark	**Industry Average**: ≤ 95% **World Class**: 99%
Comments	None
Example	See Transportation Deployment Performance to Plan example as the same approach is applied for this metric.
Metric Owner	Lou Swanson

Warehouse Performance to Plan

Process	Logistics - Warehouse
Metric Level	Tier II
Definition	A measure of the accuracy of loading the right SKUs to customers, sales centers, depots, wholesalers, distributors, cross-dockings and to MEPs.
Objective	Used to measure quality of the loading operation
Calculation	$1 - \frac{\lvert \text{Warehouse Loading Plan - Warehouse Loading Actual} \rvert}{\text{Warehouse Loading Plan}}$ **For Aggregated Planning Horizons:** $1 - \frac{\sum \lvert \text{Warehouse Loading Plan - Warehouse Loading Actual} \rvert}{\sum \text{Warehouse Loading Plan}}$ **Warehouse Loading Plan and Actual is based on cases.**
Data Source	Warehouse Management System or Internal Controls
Related Supporting Metrics	Supply Chain Operations Performance to Plan
Benchmark	**Industry Average**: TBD **World Class**: TBD
Collection Frequency	Monthly
Comments	None
Example	See Transportation Deployment Performance to Plan example as the same approach is applied for this metric.
Metric Owner	Lou Swanson

Production Performance to Plan

Category	Manufacturing
Metric Level	Tier II
Definition	An absolute measure of Manufacturing Planned Production vs. Actual Production
Objective	A measure of the effectiveness of manufacturing to meet planned requirements both in terms of time and quantity.
Calculation	**For Single Product Calculation:** $1 - \frac{\lvert \text{Production Plan - Production Actual} \rvert}{\text{Production Plan}}$ **For Aggregated Products or Aggregated Planning Horizons:** $1 - \frac{\sum \lvert \text{Production Plan - Production Actual} \rvert}{\sum \text{Production Plan}}$ ***Production Plan*** is the cases planned (published production schedule released 12-24 hours ahead of the actual execution). ***Production Actual*** is the cases produced and accepted off the line***.***
Data Source	Production Management System
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy Transportation Deployment Performance to Plan Production Planning Accuracy Delivery Performance to Plan Supply Chain Operations Performance to Plan
Benchmark	**Industry Average** ≤ 92% **W rld Class** 99%
Comments	Must be against published schedule from planning team, released day prior to actual production – Do not use schedules released same day as production.

Classified - Internal use

Example

Day	Line Number	SKU ID	Production Plan	Actual Production	Absolute Error	Production P2P
Monday	Line 1	101	10.000	8.500	1.500	**85%**
Monday	Line 2	305	9.000	11.500	2.500	**72%**
Tuesday	Line 1	101	20.000	23.000	3.000	**85%**
Tuesday	Line 2	610	11.000	10.500	500	**95%**
Wednesday	Line 1	202	15.000	18.000	3.000	**80%**
Wednesday	Line 2	810	13.000	12.000	1.000	**92%**
Thursday	Line 1	304	18.000	15.000	3.000	**83%**
Thursday	Line 2	202	8.500	11.000	2.500	**71%**
Friday	Line 1	1100	19.500	20.000	500	**97%**
Friday	Line 2	1300	7.000	9.000	2.000	**71%**
Saturday	Line 1	1100	13.000	15.000	2.000	**85%**
Saturday	Line 2	101	8.000	7.000	1.000	**88%**
Sunday	Line 1	305	5.000	4.500	500	**90%**

Monday	All Lines	All SKUs	19.000	20.000	4.000	79%
Tuesday	All Lines	All SKUs	31.000	33.500	3.500	89%
Wednesday	All Lines	All SKUs	28.000	30.000	4.000	86%
Thursday	All Lines	All SKUs	26.500	26.000	5.500	79%
Friday	All Lines	All SKUs	26.500	29.000	2.500	91%
Saturday	All Lines	All SKUs	21.000	22.000	3.000	86%
Sunday	All Lines	All SKUs	5.000	4.500	500	90%

All Days	All Lines	All SKUs	157.000	165.000	23.000	85%

Metric Owner

John Sweeney

Logistics – Transportation

Classified - Internal use

Transportation - RACI

Category	KPI	driver	Transportation supervisor	Warehouse Supervisor/Manager	transportation managers	logistics director	supply chain director	regional P&L leader	COO/CEO/GM
Safety	Vehicle Crash Rates	R	R		A	C	I	I	I
	First Aid Case rate	R	R		A	C	I	I	I
Cost	Transportation Cost per Case		R	R	R	A	C	I	I
	% Transport Routing Compliance		R	R	A	R	C	I	I
	% of Inbound Truck Freight on Board (FoB) Origin		R	R	R	A	C	I	I
	Transportation Cost per KM	R	R	R	A	C	I		
Customer Service	% Transport Schedule Completed	R	R	R	A	C	I		
	Transport Deployment Accuracy	R	R	R	A	C	I		
Productivity	Transportation Turnaround Time	R	R	R	A	C	I		
Utilization	Transportation Asset Utilization		R	R	A	C	I		
	Transportation Deadhead Factor		R	R	A	C	I		

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Classified - Internal use

Transportation – Line of Site

Vehicle Crashes

Category	EOSH
Metric Level	Tier II
Definition	Any incident in which a company vehicle is involved (whether in motion, temporarily stopped, parked or being loaded or unloaded) that results in personal injury and/or property damage, regardless of who was hurt, what property was damaged, the extent of the damage, who was responsible, whether the incident was preventable, or whether the incident was legally required to be reported. Crashes involving company cars are included regardless of whether they occur during business or personal use. Crashes are independent of any associated injury. For example, a single crash resulting in LTI's to two employees will be reported as one crash in the Fleet metrics, and as two LTI's in the Facility OSH metrics.
Objective	Utilized to determine the fleet safety impact of the operation
Calculation	Summarize all crashes of owned and leased (but not 3rd party) delivery and 'all other' vehicles during the reporting period. This includes crashes involving rented or leased vehicles or personal vehicles used on company business.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Vehicle Crash Rate
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	A post trip inspection of a transport trailer showed a broken tail lamp and fender dent. This is reported as a "crash". A company pool car has a defect report turned in for a broken headlamp, reportedly from a stone impact. This is reported as a "crash". While attempting to maneuver around stalled traffic a company-owned motorcycle hits a vehicle and breaks a mirror. This is reported as a "crash". A delivery truck returning from its route is parking in the plant yard and gets too close to a light post, putting a scratch down the length of the truck. This is reported as a crash.
Metric Owner	Michael Ferrell

Transportation Cost per Case

Category	Logistics – Transportation
Metric Level	Tier II
Definition	The cost incurred transporting full goods, raw materials, and returnables between suppliers, plants sales centers, distributors, and cross dock/fast flow. Transportation is the transfer within the Bottler network. Shipments to Central Warehouses of customers are not to be included as Transportation costs (they are Delivery)
Objective	Used to highlight issues with cost of transporting product such as fuel efficiency, routes, etc.
Calculation	$\frac{\text{Vehicle Operating Costs} + \text{Labor}}{\text{Total \# of Physical Cases Sold}}$ ***Vehicle Operating Costs*** include rentals, 3rd party charges, fuel, repairs, and maintenance for product transport vehicles that are transporting product from a production warehouse to a DC. ***Vehicle Fixed Costs*** include depreciation, taxes and insurance ***Labor*** includes wages, salaries, and benefits, of personnel involved in managing, preparing (loading/unloading), receiving, and driving **Note:** Vehicle includes all modes of transportation (boats, motorcycles, etc.)
Data Source	Transportation Management Systems and Financial Systems
Collection Frequency	Monthly
Related Supporting Metrics	Fuel Usage Transportation Cost per km
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	This does not include delivery to customers (measured in delivery cost per case)
Example	In one month: • Vehicle Operating Costs = $300,000 • Fixed costs = $100,000 • Labor = $ 200,000 • Total cases sold in a month = 500,000 physical cases $\frac{\$600{,}000}{500{,}000} = \$1.20 / \text{phys case}$
Metric Owner	Juan M Fernandez M. Fernandez

Transportation C.O. Fleet Asset Utilization

Category	Logistics – Transportation
Metric Level	Tier II
Definition	A measure of the percentage of time that Company Owned Transport fleet is used.
Objective	Used to highlight improvement opportunities by showing how the fleet assets are being utilized.
Calculation	$\frac{\text{Total Actual Hours}}{\text{Total Net Hours Available (7x24)}}$ ***Total Actual Hours*** is the total time that the C.O. tractors are on duty (loading, unloading, on the route) clock hours as recorded on drivers' records for driving, on-duty and off-duty time. On-duty and off-duty time includes time at locations for loading and/or unloading, personal time for meals and refreshments while on route or at a loading/unloading location. Extended rest periods and layovers are excluded. ***Total Net Hours Available*** is 168 hours per week per tractor based on 24 hr x 7 days per week Note: In cases where there are legal limitations for Haulage trucks to operate during certain days (e.g. Sundays) or periods of the day, still this metric should be measured based on 24x7
Data Source	Transportation Management System
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: 75% **World Class**: 90%
Comments	None
Example	A company owned fleet consisting of 5 tractors with 7 trailers has operated 2,500 hours last month performing Transportation duties and 300 hours performing Distribution activities (shipments to Central Warehouses of Customers) $\frac{2{,}500 + 300}{(5 \text{ tractors} \times 24 \text{ hr} \times 7 \text{ days} \times 4 \text{ wk/mth})} = 83.3\%$
Metric Owner	Juan M Fernandez M. Fernandez

Transportation Haulage Performance to Plan

Category	Logistics – Transportation
Metric Level	Tier II
Definition	An absolute measure of Transportation Haulage Planned shipments vs. Actual
Objective	A measure of the effectiveness of logistics to meet planned requirements both in terms of time and quantity.
Calculation	$\left[1-\left\lvert\frac{\text{Transportation Haulage Plan - Transportation Haulage Actual}}{\text{Transportation Haulage Plan}}\right\rvert\right]$ ***Roll up Formula** **Weights = SKU TA x Transportation Haulage Plan** $\frac{\sum \text{Weights}}{\sum \text{Transportation Haulage Plan}}$ ***Transportation Haulage Plan*** means the cases that were planned to be transported to Sales Center/Distributor. ***Transportation Haulage Actual*** means the cases that are transported to Sales Center/Distributor.
Data Source	DRP system
Collection Frequency	Daily and reported monthly as roll up of daily actual results.
Related Supporting Metrics	Supply Chain Operations Performance to Plan
Benchmark	**Industry Average** ≤ 95% **World Class** 99%
Comments	None
Example	**THP2P% = Transportation Haulage Performance to Plan %**

Destination	SKU	Date	Plan	Actual	SKU THP2P%	Weights	Daily THP2P%
Warehouse 1	1000 Coke	11/23/08	1,92	1,800	94%	1,800	80%
	00 Pop	11/23/08	2,880	3,000	96%	2,760	
	Sub total		**4,800**	**4,800**		**4,560**	
Warehouse 2	237 Coke	11/23/08	3,360	2,688	80%	2,688	
	240 Pop	11/23/08	2,016	3,091	47%	941	
	Sub total		**5,376**	**5,779**		**3,629**	
Total		11/23/08	10,176	10,579		8,189	

Metric Owner	Lou Swanson

% Transport Routing Guide Compliance

Category	Logistics – Transportation
Metric Level	Tier II
Definition	The number of truckloads handled by carrier by traffic lane vs. the total number truckloads tendered by the same traffic lane.
Objective	To measure compliance to the routing guide in which transportation suppliers are prioritized by lane based on specific criteria (e.g. cost, quality, truck types, etc.)
Calculation	$\frac{\text{Number of Truckloads handled by Carrier by Traffic Lane}}{\text{Total Number of Truckloads Tendered by Traffic Lane}}$
Data Source	Transportation Management System
Collection Frequency	Weekly; Monthly
Related Supporting Metrics	Transportation Cost per Case
Benchmark	**Industry Average** 85% **World Class** 92%
Comments	None
Example	In one weekly period, there were 400 truckloads transported inbound and outbound from the manufacturing plant. You must track compliance to the routing guide for the top 3 transport companies (carriers) by day by week with a roll up on a monthly basis. Below is an example within one traffic lane that has 15 truckloads for the week. As you can see the first choice carrier handled 67% of the total truckloads tendered. In the troubleshooting guide we would track by reason code.
Metric Owner	Lou Swanson

Week 1	**Traffic Lane 1**			
Traffic Lane	**Actual Weekly Truckloads**	**Routing Book Scheduled**	**Actual Transports Handled**	**Percent Total Truckloads by Carrier**
Shenyang Plant to Zhong Shen	15	1. Berto Express	10	67%
		2. Shuito Transport	2	13%
		3. Benning Transport	3	20%

Classified - Internal use

% Transport Schedule Completed

Category	Logistics – Transportation
Metric Level	Tier II
Definition	The percent of Transports delivered on time and to the schedule. On time performance is generally defined as within a 24 hour period of schedule generation or by a specific time if load is prioritized.
Objective	A measure of the ability of the Transportation department to delivery full goods and raw materials between suppliers, production, sales centers, cross dock and fast flow facilities.
Calculation	$\frac{\text{Transports Delivered On Time}}{\text{Total Transports Scheduled}}$
Data Source	TMS
Collection Frequency	Daily, weekly, monthly, YTD
Related Supporting Metrics	Perfect Order
Benchmark	**Industry Average**: 95% **World Class**: 99%
Comments	Timely execution of priority loads mitigates the risk of out of stocks and avoids congestion and delays at the receiving location.
Example	A transport operation delivered 150 truckloads of materials and full goods on time. For the same day the schedule generated required 155 truckloads. $\frac{150}{155} = 97\%$
Metric Owner	Lou Swanson

Classified - Internal use

Transportation Fuel Usage

Category	Logistics – Transportation
Metric Level	Tier II
Definition	A measure of the energy consumed by transport per volume basis.
Objective	Used to measure the efficiency in which transportation assets are utilized
Calculation	$\frac{\text{Total km Driven}}{\text{Total Fuel Used in Liters}}$
Data Source	Transportation Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Used for shipping and delivery for transportation that is under Supply Chain responsibility.
Example	The total amount of kilometers driven by a fleet in one period is 1,500,000 km. The total liters of fuel used during this time are 200,000 liters. $\frac{1{,}500{,}000}{200{,}000} = 7.5\,\text{km/L}$
Metric Owner	Lou Swanson

Transportation Cost per Kilometer

Category	Logistics – Transportation
Metric Level	Tier II
Definition	A measure of the total cost of moving product from a shipping location to a distributor or customer.
Objective	Used to measure the efficiency of transportation assets and highlights issues with routes, equipment, etc.
Calculation	$\frac{\text{Vehicle Operating Costs} + \textit{VehicleFixedCosts} + \text{Labor}}{\text{km}}$ ***Vehicle Operating Costs*** includes rentals, fuel, repairs, and maintenance ***Vehicle Fixed Costs*** include depreciation, taxes, insurance ***Labor*** includes wages, salaries, and benefits, of personnel involved in managing, preparing (loading/unloading), receiving, and driving.
Data Source	Transportation Management System
Collection Frequency	Monthly
Comments	Used for shipping and delivery for transportation that is under Supply Chain responsibility.
Example	In one month: Vehicle Operating Costs = $300,000 Vehicle Fixed Costs = $100,000 Labor = $200.000 Total kilometers driven (300 trucks, 250 km/day, 5 day/wk, 4-wk month) = 1,500,000 $\frac{\$600,000}{1,500,000\,\text{km}} = \$0.40/\text{km}$
Metric Owner	Lou Swanson

Company Owned (C.O.) Transportation Deadhead Factor %

Category	Logistics – Transportation
Metric Level	Tier II
Definition	The percentage of time that Company Owned tractor trailers are traveling empty (deadhead).
Objective	Used to focus transportation management on running a private fleet effectively, that is to keep the equipment loaded all the time. This KPI is only applicable to C.O. Fleet (in most cases it is not possible to measure deadhead factor for 3rd party carriers)
Calculation	$1 - \frac{\text{ActualKilometers} - \text{Loaded}}{\text{TotalKilometers} - \text{Driven}}$ ***Actual Kilometers – Loaded*** is the number of kilometers that equipment is loaded with raw materials, finished goods, returnables or even contract carriage for other companies. ***Total Kilometers – Driven*** is the number of kilometers driven both empty and full.
Data Source	Fleet Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: 30% **World Class**: 5%
Comments	• An effective inbound transportation program is essential • Contract carriage is an additional avenue for minimizing deadhead kilometers and maximizing revenues
Example	Total kilometers driven for the month 100,000 total kilometers driven loaded were 90,000. $CO\_Transportation\_Deadhead\_factor = 1 - \frac{90{,}000}{100{,}000} = 10\%$
Metric Owner	Juan M Fernandez M. Fernandez

% of Inbound Truck Freight on Board (FoB) Origin

Category	Logistics – Transportation
Metric Level	Tier II
Objective	Used to manage inbound costs by separating freight from the purchase price of all inbound products and managing cost effectively (Ex-works)
Calculation	$\frac{\text{Number of Inbound Deliveries FoB Origin}}{\text{Total Number of Inbound Deliveries}}$
Data Source	Transportation department
Collection Frequency	Weekly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	This needs to involve, Finance, Transportation, DOIP, and Procurement to ensure there is a cost benefit to the entire SC system.
Example	The total number of deliveries for one period was 100. Ten of these deliveries were FOB. $\%\,\text{Inbound FoB Origin} = \frac{10}{100} = 10\%$
Metric Owner	Lou Swanson

Transport Turnaround Time

Category	Logistics – Transportation
Metric Level	Tier II
Definition	A measure of the average time it takes to load or unload all transports at a facility
Objective	Used as an indicator to minimize "waiting time" and keep transports on the road.
Calculation	$\frac{\text{Total Turnaround Time All Transports}}{\text{Number of Transports Loaded or Unloaded}}$ ***Total Turnaround time all transports*** are the total waiting time for all transports when the truck comes through the gate at the scheduled time and the time the truck leaves the gate. In those instances where dock scheduling system is in place and truck arrives earlier than scheduled, you can take scheduled time for registration as arrival time ***Number of Transports loaded or unloaded*** is the total number of transports either loaded and/or unloaded during a 24 hour period.
Data Source	Transportation Management System
Collection Frequency	Daily, Weekly, Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: 60 minutes **World Class**: 20 min
Comments	Calculation reported in minutes
Example	The total-turnaround time for transports for one day = 30 hours The total number of transports for the day = 45 The Transport Turnaround Time =. $\frac{30 \times 60}{45} = 40 \text{ minutes}$
Metric Owner	Juan M Fernandez M. Fernandez

Truck capacity utilization % to Cross-docks (Haulage)

Category	Logistics – Transportation
Metric Level	Tier II
Objective	Used to understand the level of utilization of the trucks in the shipments to Cross-docks
Calculation	$\frac{\text{Total actual weight shipped to Cross-docks}}{\text{Total payload of trucks used in shipments to Cross-docks}}$
Data Source	Transportation department
Collection Frequency	Daily
Benchmark	**Industry Average**: 85% **World Class**: 95%
Comments	Only applicable in a network where we have Cross-docks The general assumption is that shipments to our DC or in between plants we are already maximizing the payload of the trucks (100%)
Example	The total weight shipped to our 2 Cross-docks last month was 2400 ton. Payload of trucks used was 24 tons, and # shipments organized last month was 120 truckloads $\text{Truck capacity utilization to X-docks} = \frac{2400}{24 \times 120} = 83.3\%$
Metric Owner	Juan M Fernandez M. Fernandez

Logistics – Fleet

Fleet RACI

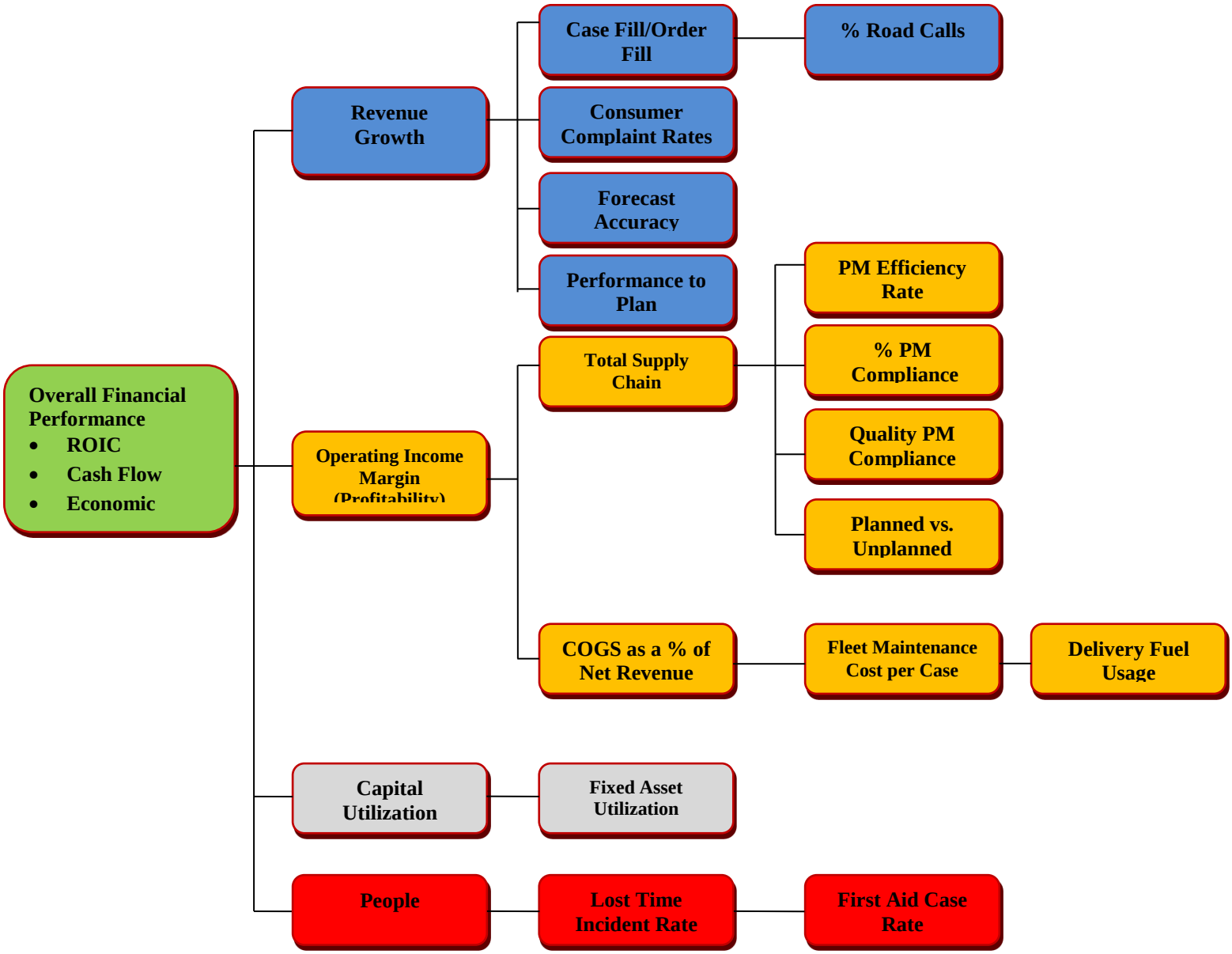
Category	KPI	driver	mechanic	fleet supervisor	fleet manager	distribution manager	logistics director	supply chain director	regional P&L leader	COO/CEO/GM
Safety	First Aid Case Rate		R	R	A	C	C	I	I	I
Cost	Distribution Fuel Usage (KM/L)	R	R	R	R	C	I	I		
	Fleet Maintenace Cost per Case		R	R	A	C	I	I		
Customer Service	% Road Calls	R	R	R	A	R	C	C		
Productivity	% PM Compliance	R	R	R	A	C	I	I		
	Quality PM Compliance		R	R	A	C	I	I		
	PM Efficiency Rate		R	R	A	C	I	I		
	Planned vs Unplanned		R	R	A	I	I	I		

R	Responsible
A	Accountable
C	Consult
I	Inform

	Daily
	Weekly
	Monthly
	Quarterly

Classified - Internal use

Fleet Line of Site



First Aid Case Rate

Category	Logistics - Fleet
Metric Level	Tier II
Definition	The number of First Aid Cases (FAC) per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{FAC} \times 200{,}000}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost Time Incident Rate, First Aid Cases
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). FACR can be approximated by the FAC per 100 full time workers.
Example	A plant records 3 first aid cases in its register. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The First Aid Case Rate is (3 X 200,000)/32,000 = 18.75
Metric Owner	Michael Ferrell

Delivery Fuel Usage

Category	Logistics - Fleet
Metric Level	Tier II
Definition	A measure of the energy consumed by transport per volume basis.
Objective	Used to measure the efficiency in which transportation assets are utilized
Calculation	$\frac{\text{Total km Driven}}{\text{Total Fuel Used in Liters}}$
Data Source	Delivery Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Used for shipping and delivery for transportation that is under Supply Chain responsibility.
Example	The total amount of kilometers driven by a fleet in one calendar month is 1,500,000 km. The total liters of fuel used during this time are 200,000 liters. $\frac{1{,}500{,}000}{200{,}000} = 7.5\,\text{km/L}$
Metric Owner	Lou Swanson

Fleet Cost per Case

Category	Logistics - Fleet
Metric Level	Tier II
Definition	A measure of the maintenance costs per physical case.
Objective	Used to highlight inefficiencies in maintenance processes.
Calculation	$\frac{\text{Total Cost of Maintenance Labor} + \text{Cost of External Vendors (materials and service)} + \text{Materials})}{\text{Total Physical Cases Sold}}$
Data Source	Computerized Maintenance Management System Financial System
Collection Frequency	Monthly
Related Supporting Metrics	% Scheduled Downtime
Benchmark	**Industry Average**: TBD **World Class**: TBD
Roll-Up	Country - Summation of numerator and denominator Global – Summation of numerator and denominator
Comments	Separate calculation results into 3 areas; fleet, production, and cold drink. Include any building and utilities maintenance that affects the plant budget in production maintenance cost per case.
Example	During one period, there is $200,000 dollars spent in maintenance labor and $200,000 spent on parts & supplies. There were 2,000,000 physical cases sold that same month. $\frac{\$200{,}000 + \$200{,}000}{2{,}000{,}000 \text{ cases}} = \$0.20/\text{cs}$
Metric Owner	Lou Swanson

% Road Calls (Fleet)

Category	Logistics - Fleet
Metric Level	Tier II
Definition	A measure of the percentage road calls to vehicles dispatched
Objective	Identify root cause of road calls and eliminate them.
Calculation	$\frac{\text{Number of Road Calls by Root Cause}}{\text{Total Number of Vehicles Dispatched}}$ ***Number of road calls by root cause*** is the actual number of road calls by depot by day by root cause (type). ***Total number of vehicles dispatched***= total number of vehicles dispatched.
Data Source	Fleet Management System or spreadsheet
Collection Frequency	Daily, Weekly , Monthly
Related Supporting Metrics	PM Compliance, PM/CM Ratio
Benchmark	**Industry Average** 1.5% **World Class** 0.5%
Comments	Road calls are expensive, an indication of fleet management issues and a major reason for missed customer deliveries. Failure Codes for Road Calls: • Driver abuse flat tires • All other Flat tires • Vehicle accident • Starter • Dead battery • Out of fuel • Air leak • Brakes • Other
Example	20 road calls were received for the month, 1200 total vehicles dispatched. % Road calls = $\frac{20}{1200} = 1.7\%$
Metric Owner	Lou Swanson

Planned vs. Unplanned

Category	Logistics - Fleet
Metric Level	Tier II
Definition	The ratio of planned maintenance hours as a percentage of total maintenance hours.
Objective	To determine the amount of work that is planned vs. reactive. Each facility should move towards a higher percentage of planned work in order to avoid unexpected equipment breakdowns.
Calculation	$$\frac{\text{Planned Maintenance Hours}}{\text{Planned + Unplanned Maintenance Hours}}$$ ***Planned*** is considered any job that undergoes the 8 phases of planning or are routine inspections that are generated within the CMMS, 72 hours before the job is performed (Review and analyze the work order, visit the job site, determine the basic information, plan the work, determine the availability of the materials, complete the work plan).
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	PM/CM Ratio Schedule Compliance Backlog By Craft
Benchmark	**Industry Average**: 65%-95% **World Class**: > 95%
Comments	None
Example	There are 10 technicians within the facility that work 8 hours a day/6 days a week for a total of 480 hrs/wk. During the week the maintenance hours spent are as follows: • Emergency Corrective Maintenance = 48 hours • Non-Emergency Corrective Maintenance = 288 unplanned hours and **48** planned hours • Preventive Maintenance = **48** hours • Inspections = **48** hours $\frac{48+48+48}{480} = \frac{144}{480} = 30\%$
Metric Owner	Lou Swanson

PM Compliance

Category	Logistics - Fleet
Metric Level	Tier II
Definition	A measure the effectiveness of completing PMs as scheduled.
Objective	To ensure that the PM program is on track and the schedules are maintained.
Calculation	$\frac{\#\text{ of PMs Completed}}{\#\text{ of PMs Scheduled}}$
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	Compliance by Priority
Benchmark	**Industry Average**: TBD **World Class**: >95%
Comments	Calculation is over a given period of time.
Example	There are 35 PMs schedule for the 1st week of August. At the end of the week 20 PMs have been completed. PM Compliance is: $\frac{20}{35} = 57\%$
Metric Owner	Lou Swanson

Quality PM Compliance

Category	Logistics - Fleet
Metric Level	Tier II
Definition	A measure of the effectiveness of completed PMs.
Objective	To ensure that PM's are completed with a high level of quality, fully and completely to the specifications outlined.
Calculation	$\frac{\#\text{ of Quality PMs Completed}}{\text{Total \# of PMs Checked or Audited}}$
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	Compliance by Priority
Benchmark	**Industry Average**: TBD **World Class**: >15% power units (tractors and route trucks) > 5% all others,
Comments	Calculation is over a given period of time.
Example	There are 35 PMs for power units (tractors and route trucks) and 10 quality PMs completed on the same vehicle types for the month of November $\frac{10}{35} = 29\%\ \text{quality PMs performed}$
Metric Owner	Lou Swanson

Classified - Internal use

Logistics – Delivery

Classified - Internal use

Delivery RACI

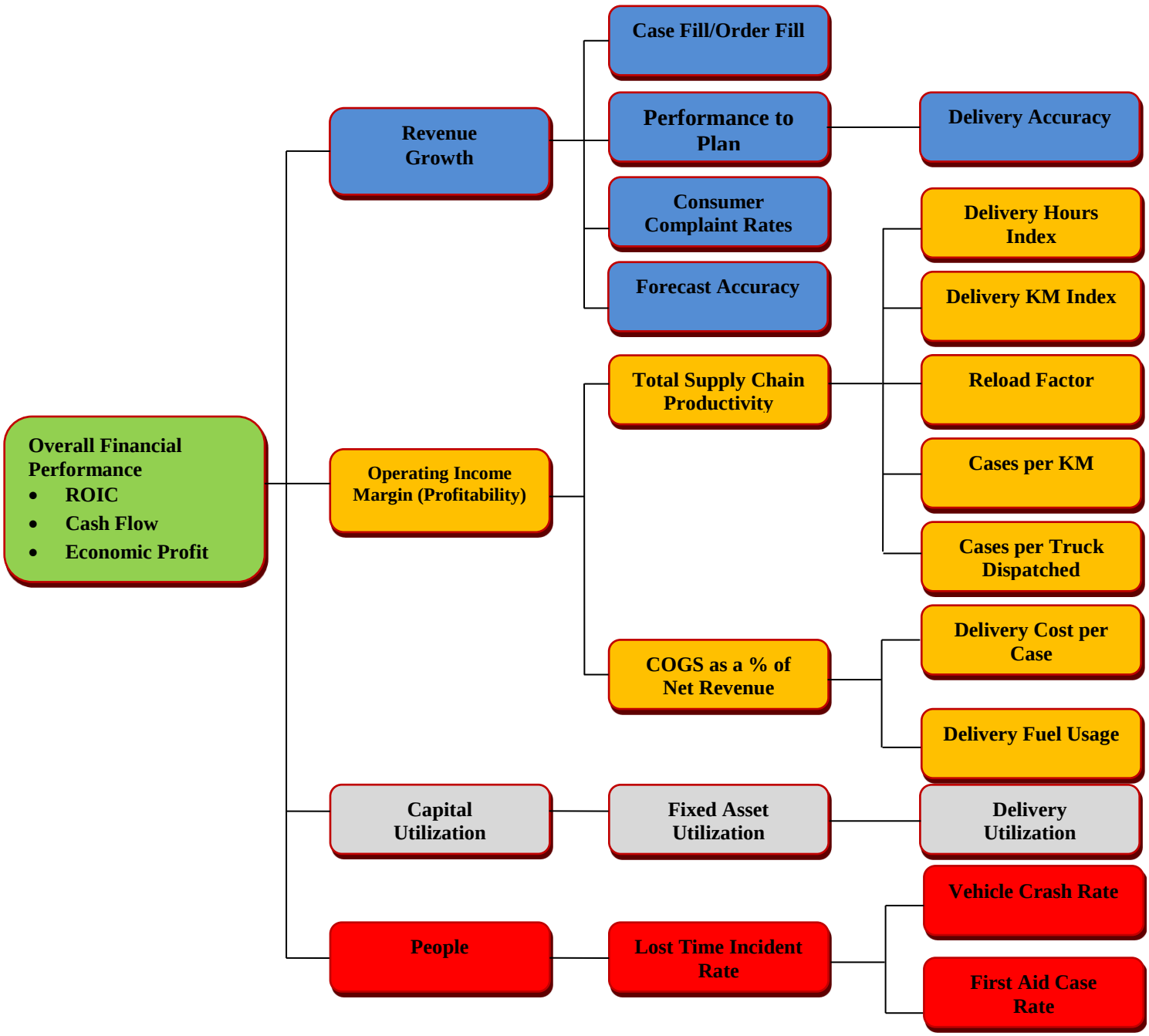
Category	KPI	driver	distribution supervisor	route planners	distribution managers	logistics director	supply chain director	sales /RTM Manager	Sales/RTM Director	regional P&L leader	COO/CEO/GM
Safety	Vehicle Crash Rate	R	R		A	C	I	I	I	I	I
	First Aid Case Rate	R	R		A	C	I	I	I	I	I
Cost	Delivery Cost/case		R	R	R	A	C	I	I	I	I
	Delivery fuel usage	R	A	R	R	I	I				
Customer Service	Case Fill Rate	R	R	R	R	A	R	C	C	C	C
	Order Fill Rate	R	R	R	R	A	R				
	Delivery Accuracy	R	R	R	R	A	R	I	I	I	I
Productivity	Delivery kilometers Index	R	R	R	A	C	I				
	Delivery hours index	R	R	R	A	C	I				
	Reload factor	R	R	R	A	C	I				
	Cases per Km.	R	R	R	A	C	I				
	Cases/truck dispatched	R	R	R	A	C	I				
Asset Utilization	Delivery utilization		R	R	A	C	I				

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Classified - Internal use

Delivery Line of site



Vehicle Crash Rate

Category	Logistics – Delivery
Metric Level	Tier II
Definition	The number of vehicle "Crashes" per million kilometres driven
Objective	Utilized to determine the fleet safety impact of the operation
Calculation	$\frac{\text{Total Vehicle Crashes X 1,000,000}}{\text{Total kilometers Driven}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Vehicle Crashes
Benchmark	**Industry Average**: 5.0 per mm km **World Class**: 1 per mm km
Comments	**Crash**—any incident in which a Company vehicle is involved (whether in motion, temporarily stopped, parked or being loaded or unloaded) that results in personal injury and/or property damage, regardless of who was hurt, what property was damaged, the extent of the damage, who was responsible, whether the incident was preventable or whether the incident was legally required to be reported. Count all crashes of owned and leased (but not 3rd party) distribution and 'all other' vehicles. This includes crashes involving rented or leased vehicles or personal vehicles used on Company business. Crashes involving Company cars are included regardless of whether they occur during business or personal use. **Covered Vehicles**—All motorized over-the-road vehicles including autos (inclusive of Company cars, route sales vehicles, cold drink services, etc.), trucks, trailers, vans, motorcycles, employee transport vans and buses and yard tractors, By definition, does not include lift trucks, personnel lifts or similar equipment. Contract carriers are included in the scope of these requirements if: - The vehicles bear the Company name, images or Trademarks; - The carrier is under long-term contract (> 1 year) to transport Company products; or - The carrier is exclusively carrying Company products.
Example	All vehicles in a Bottler's fleet record a total of 726935 km driven for the month, with 7 crashes. (7 X 1,000,000)/726953 = 9.63 Crash Rate
Metric Owner	Michael Ferrell

Delivery Cost per Case

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of the total cost of delivering product to a customer.
Objective	Used to highlight issues with cost of transporting product such as fuel efficiency, routes, etc.
Calculation	$\frac{\text{Vehicle Operating Costs} + \text{Labor}}{\text{Total \# of Physical Cases Sold}}$ ***Vehicle Operating Costs*** is rentals, 3rd party charges (distributors), depreciation, fuel, taxes, insurance, repairs, and maintenance for product transport vehicles. ***Labor*** is wages, salaries, and benefits, of personnel involved in managing, preparing (loading/unloading), receiving, and driving **Note:** Vehicle includes all modes of transportation (boats, motorcycles, etc.)
Data Source	Transportation Management Systems and Financial Systems
Collection Frequency	Monthly
Related Supporting Metrics	Transportation Cost Per Case
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Excludes haulage costs. These are included in the Transportation Cost Per Case
Example	In one month: • Vehicle Operating Costs + Labor = $300,000 • Total physical cases sold in a month = 500,000 cases $\frac{\$300{,}000}{500{,}000} = \$0.60/cs$
Metric Owner	Lou Swanson

Order Fill (On-Time-In-Full)

Process	Total Supply Chain
Metric Level	Tier I
Definition	The percent completion rate for orders.
Objective	A measurement of how often we are filling customer orders completely, that is on time and full, i.e., we satisfied the original order exactly to the customer's requirements.
Calculation	$\frac{\sum \text{Orders Delivered on Time in Full}}{\sum \text{Total Original Orders}}$
Data Source	Order Management System
Collection Frequency	Daily
Related Supporting Metrics	Perfect Order, Case Fill
Benchmark	**Industry Average**: ≥ 95% **World Class**: 100%

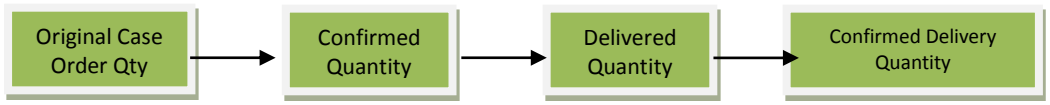
Comments/Scenarios

Order and Case Fill Rate Scenarios

Order Scenarios for 2 SKUs - Total of 100 cases					This Scenario		Cumulative - All Scenarios	
Scen #	Situation	SKU	Orig Order Phys Case Qty	Case Qty Filled	Order Fill Rate	Case Fill Rate	Order Fill Rate	Case Fill Rate
1	Order Filled on Time and In Full	SKU #1	40	40	100%	100%	1/1 = 100%	100/100 = 100%
		SKU #2	60	60				
2	Order Not Filled. Customer did not pass credit check.	SKU #1	40	0	Not Included	Not Included	1/1 = 100%	100/100 = 100%
		SKU #2	60	0				
3	Order Filled In Full but outside appointment time (if applicable)	SKU #1	40	40	0%	100%	1/2 = 50%	200/200 = 100%
		SKU #2	60	60				
4	SKU Order Quantity Unavailable at time of order (Warehouse Plan)	SKU #1	40	0	0%	40%	1/3 = 33%	240/300 = 80%
		SKU #2	60	40				
5	Order received after preseller cut-off time	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
6	Customer did not pick up Order	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
7	Order was cancelled by the Sales Rep	SKU #1	40	0	Not Included	Not Included	1/3 = 33%	240/300 = 80%
		SKU #2	60	0				
8	**All Orders not delivered (examples):** -Truck not dispatched on time -Truck Breakdown -Driver availablity/hours -Vehicle Accident -Delays at Warehouse Plan -Customer Refuses Shipment	SKU #1	40	0	0%	0%	1/4 = 25%	240/400 = 60%
		SKU #2	60	0				

Example	In one day, the total number of orders delivered in a region were as follows:  O 500 C 450 Less 50 Orders that had at least one Out of Stock in Inventory (ATP Check) D 425 Less 25 Orders not loaded on truck A 375 Less 40 Returned Orders (Not Accepted by Customer) and Less 10 Orders not delivered on time or in full $\frac{A}{O} = \frac{375}{500} = 75.0\%$
Metric Owner	Lou Swanson

Case Fill Rate

Category	Total Supply Chain
Metric Level	Tier I
Definition	The percent completion rate for physical case orders.
Objective	A measure of the ability of the existing Supply Chain to meet aggregate demand of the customer base. Fill Rate is a critical measure that quantifies how well we serve our customers, and to that end, should be always measured against the original volume ordered by our customers, before any internal checking and confirmation process.
Calculation	$\frac{\sum \text{SKUy Confirmed Delivered Quantity}}{\sum \text{Total SKUy Original Order Quantity}}$ ***Original Order Quantity*** is the original order quantity from customer or the pre-seller (before Available to Promise check) ***Delivered Quantity*** is the quantity actually accepted by the customer at time of delivery
Data Source	Order Management System
Collection Frequency	Daily
Related Supporting Metrics	Perfect Order, Order Fill Rate
Benchmark	**Industry Average** ≥ 98% **World Class** 99.9%
Comments	This does not include take into account whether the order was delivered on time or not. On time delivery is addressed in the Perfect Order and Order Fill metric. See Order Fill Rate for Scenario Guidance.
Example	 O 1,000 → C 800 → D 700 → A 600 Less (200 Cases) Out of Stock in Inventory (1st ATP Check) Less (100 out of 800) Cases not loaded Less 100 Returned Cases (Not Accepted by Customer) out of 700 shipped $\text{Case FillRate} = \frac{A}{O} = \frac{600}{1000} = 60\%$.
Metric Owner	Lou Swanson

Breakage, Damage, Loss

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of inventory losses throughout the warehousing and delivery process.
Objective	Used to measure the financial impact of losses incurred during the order fulfillment process.
Calculation	$\frac{\sum \text{Physical Cases Lost}}{\text{Net Physial Case Sales}}$
Data Source	Warehouse and Transportation Management Systems
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Losses considered (but not limited to): • Delivery/Warehousing: Warehouse, picking and delivery processes, nonconformance • Market: Expired and damaged products returned from the market • Inventory differences • Theft • Destruction Note: Losses charged to a 3rd party are not included.
Example	The cases lost through delivery and production in a one month period at a plant and affiliated delivery center is 75 cases. There were 25 cases returned from the market due to damage. The net case sales for that same month are 500,000 cases. $\frac{100}{500{,}000} = 0.02\%$
Metric Owner	Lou Swanson

Delivery Performance to Plan

Category	Logistics – Delivery
Metric Level	Tier II
Definition	An absolute measure of Delivery Planned shipments vs. Actual
Objective	A measure of the effectiveness of Logistics to meet planned requirements both in terms of time and quantity.
Calculation	$\left[1 - \left\lvert \frac{\text{Delivery Plan - Delivery Actual}}{\text{Delivery Plan}} \right\rvert\right]$ ***Roll up Formula** **Weights = SKU DP2P x Delivery Plan** $\frac{\sum \text{Weights}}{\sum \text{Delivery Plan}}$ ***Delivery Plan*** means the cases that were planned to be delivered to the customer. ***Delivery Actual*** means the cases that are delivered to the customer
Data Source	
Collection Frequency	Daily and reported monthly as roll up of daily actual results.
Related Supporting Metrics	Supply Chain Operations Performance to Plan
Benchmark	**Industry Average**: ≤ 95% **World Class**: 99%
Comments	None

Example

Destination	SKU	Date	Plan	Actual	SKU DP2P%	Weights	Daily DP2P
Customer 1	1 00 Coke	11/23/08	1,920	1,800	94%	1,800	80.4 %
	800 Pop	11/23/08	2,880	3,000	96%	2,760	
	Sub total		**4,800**	**4,800**		**4,560**	
Customer 2	237 Coke	11/23/08	3,360	2,688	80%	2,688	
	240 Pop	11/23/08	2,016	3,091	47%	941	
	Sub total		**5,376**	**5,779**		**3,629**	
Total		11/23/08	10,176	10,579		8,189	

Metric Owner	Lou Swanson

Delivery Kilometers Index

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of the actual vs. scheduled kilometers driven by delivery vehicles. Requires automated vehicle routing system and on board tracking systems.
Objective	The real measure of productivity is execution of the schedule based on the use of an automated vehicle routing system that minimizes road miles and hours while optimizing the delivery function. This measurement identifies if the vehicle is off route and traveling excess mileage.
Calculation	$\frac{\text{ActualKilometers}}{\text{ScheduledKilometers}}$ ***Actual Kilometers traveled by vehicle*** is the actual kilometers for each vehicle that is tracked, using an on board computer or real time tracking system. ***Scheduled kilometers traveled by vehicle*** is the total number of kilometers scheduled for delivery.
Data Source	Transportation routing system
Collection Frequency	Daily, Weekly, Monthly
Related Supporting Metrics	Delivery hours index
Benchmark	**Industry Average**: TBD **World Class**: 99%
Comments	Key to managing productivity and improving accuracy of the routing tool to create achievable and efficient routes. Sort in descending order and address the largest discrepancies first. An index of 100 +/- 5% is desirable
Example	The total kilometers driven on Monday for vehicle 121 = 180 The total kilometers scheduled for vehicle 121 for Monday = 150 The Delivery Kilometer Index Time = $\frac{180}{150} = 120\%$
Metric Owner	Lou Swanson

Delivery Hours Index

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of the actual vs. scheduled hours driven by delivery vehicles. Requires automated vehicle routing system and on board tracking system
Objective	The real measure of productivity is execution of the schedule based on the use of an automated vehicle routing system that minimizes road miles and hours while optimizing the delivery function. This measurement identifies if the actual number of hours to complete the route is efficient.
Calculation	$\frac{\text{ActualHours}}{\text{ScheduledHours}}$ ***Actual Hours by driver by vehicle*** is the actual hours for each driver and each vehicle is tracked, using an on board computer or real time tracking system. ***Scheduled hours travelled by driver by vehicle*** is the total number of hours each driver is scheduled in order to complete his scheduled deliveries for the day.
Data Source	Transportation routing system
Collection Frequency	Daily, Weekly, Monthly
Related Supporting Metrics	Delivery kilometers index
Benchmark	**Industry Average**: TBD **World Class**: Between 95 -105%
Comments	Key to managing productivity and improving accuracy of the routing tool to create achievable and efficient routes. Sort in descending order and address the largest discrepancies first. An index of 100 +/- 5% is desirable. Must include pre-trip and post-trip in calculation.
Example	The total hours driven by employee 1222 on Monday for vehicle 121 =12 The total hours scheduled to complete the route = 10 The Delivery Hours Index Time = $\frac{12}{10} = 120\%$
Metric Owner	Lou Swanson

Delivery Fuel Usage

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of the energy consumed by transport per volume basis.
Objective	Used to measure the efficiency in which transportation assets are utilized
Calculation	$\frac{\text{Total km Driven}}{\text{Total Fuel Used in Liters}}$
Data Source	Delivery Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Used for shipping and delivery for transportation that is under Supply Chain responsibility.
Example	The total amount of kilometers driven by a fleet in one calendar month is 1,500,000 km. The total liters of fuel used during this time are 200,000 liters. $\frac{1{,}500{,}000}{200{,}000} = 7.5\,\text{km/L}$
Metric Owner	Lou Swanson

Number Cases Sold/ Truck Dispatched

Category	Logistics – Delivery
Definition	A measure of the number of cases sold/truck in DSD environment. This if most often broke out between pallet delivery (bulk) and handpicked side loader delivery
Metric Level	Tier II
Objective	Used to manage driver productivity and establish standards in the absence of an automated vehicle routing and tracking toolset.
Calculation	$\frac{\text{Number of Cases Sold}}{\text{Number of Trucks Dispatched}}$ ***Number of cases sold*** is the actual number of cases sold, this is kept by depot but also maintained by vehicle and driver ***Number of Trucks Dispatched*** is the number of trucks dispatched provides the denominator to calculate depot cases sold/truck dispatched.
Data Source	Delivery /delivery department
Collection Frequency	Daily, Weekly, Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	
Example	Actual cases sold for the month were 1,500,000 , actual trucks dispatched were 400 Average cases sold per truck dispatched = $\frac{1{,}500{,}000}{400} = 375$
Metric Owner	Lou Swanson

Delivery Reload Factor

Category	Logistics – Delivery
Metric Level	Tier II
Objective	Used to manage driver productivity and equipment
Calculation	$\frac{\text{Number of Routes Dispatched}}{\text{Number of Trucks in Use}}$ ***Number of Routes Dispatched*** is the actual number of routes dispatched by day by depot but also maintained by vehicle and driver. ***Number of Trucks in Use*** is the number of trucks used that day provides the denominator to calculate average number of reloads per truck that is used that day.
Data Source	Delivery /delivery department
Collection Frequency	Daily, Weekly, Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	In customer delivery it may indicate an opportunity to go to larger trucks to minimize the number of times drivers have to return to the depot, thus maximizing the time making deliveries and meeting customer demand.
Example	Actual number of routes dispatched for the day was 100 and the number of trucks in use was 75. $\frac{100}{75} = 1.3$
Metric Owner	Lou Swanson

Delivery Utilization

Category	Logistics – Delivery
Metric Level	Tier II
Definition	A measure of the percentage transport and delivery fleet capacity used on a daily basis by type of vehicle.
Objective	Used to highlight improvement opportunities by showing how the fleet assets are being utilized and where excess equipment exists.
Calculation	$\frac{\text{Total Vehicles Dispatched by Depot by Type}}{\text{Total Vehicles Available by Depot by Type}}$ ***Total Vehicles Available by Depot by Type*** is the total vehicles available by depot by type. ***Total Vehicles Dispatched by Depot by Type*** is determined by completing a yard check to ascertain vehicles not dispatched.
Data Source	Spreadsheet
Collection Frequency	Daily, weekly, Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Look for opportunities to balance your daily routes and smooth across the days of the week, huge spikes in equipment usage indicates that routes are not balanced effectively and driving excess overtime and labor costs.
Example	A Sales center has the following transportation equipment: 30, tractors, 40 trailers and 30 route trucks. Daily yard inventory shows 30 tractors dispatched 30 trailers and 20 route trucks for Monday. $\frac{30}{30} = 100\%\ \text{Tractor Usage}$ $\frac{30}{40} = 75\%\ \text{Trailer Usage}$ $\frac{20}{30} = 67\%\ \text{Route Truck Usage}$
Metric Owner	Lou Swanson

Delivery Vehicle Cube Capacity Utilization

Category	Logistics – Delivery
Metric Level	Tier II
Definition	Total cubes delivered compared to the total vehicle capacity in cubes.
Objective	To measure how well we are utilizing our delivery vehicles on a cube basis.
Calculation	$\frac{\text{Total Cubes Delivered}}{\text{Total Vehicle Capacity in Cubes}}$
Data Source	Fleet Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: >85%
Comments	None
Example	In one period of 25 days, there are 10 total trucks with a capacity of 10 pallets (100 cubes per pallet). During this period, 10 trucks were used with 8 pallets per truck loaded. $\text{Delivery Vehicle Cube Capacity Utilization} = \frac{25 \times 100 \times 8 \times 10}{25 \times 100 \times 10 \times 10} = 80\%$
Metric Owner	Lou Swanson

Delivery Cases per Kilometers

Category	Logistics – Delivery
Metric Level	Tier II
Definition	Total cases delivered per total kilometers driven
Objective	A measure of our productivity on a kilometer basis
Calculation	$\frac{\text{Total Cases Delivered}}{\text{Total Kilometers Driven}}$
Data Source	Fleet Management System
Collection Frequency	Monthly
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	In one period of 25 days, there are 1,000,000 cases delivered and the fleet kilometers driven by all delivery vehicles was 125,000 km. $\text{Delivery Cases per KM} = \frac{1{,}000{,}000}{125{,}000} = 8 \text{ cases/km}$
Metric Owner	Lou Swanson

Classified - Internal use

Logistics – Warehouse

Classified - Internal use

Warehouse RACI

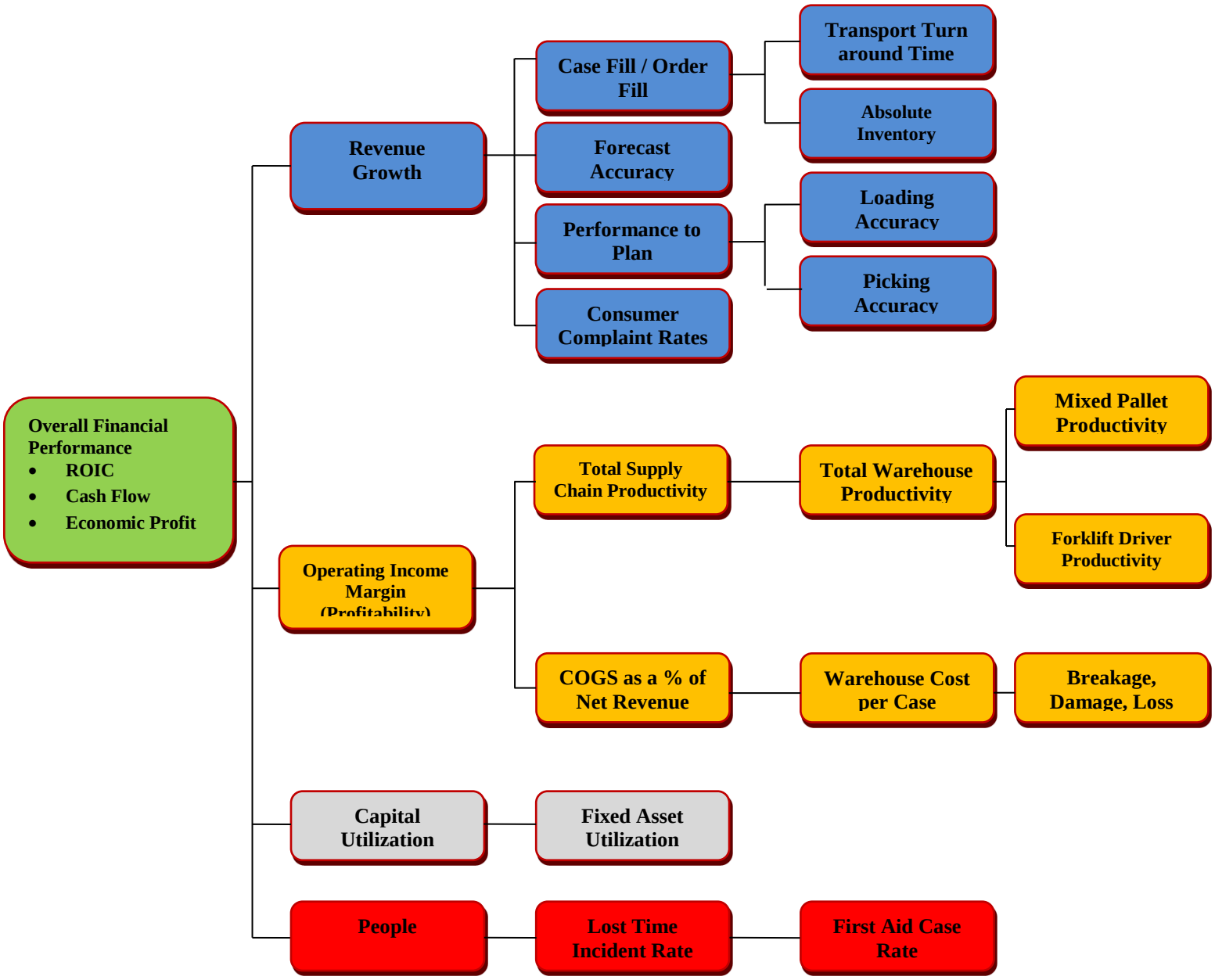
Category	Tool/Name of Report	warehouse operators	warehouse inventory supervisor	warehouse supervisor	warehouse manager	regional/national warehouse manager	Logistics Manager/Regional Product Availability (PA) Manager	Director Logistics/PA Director	Supply Chain Director	regional P&L leader	COO/CEO
Safety	First Aid Case Rate	R	R	R	A	C	I	I	I	I	I
Cost	Warehouse Cost per Case	I	R	R	A	C	I	I	I	I	
	Shrinkage; Breakage, Damage, Loss	R	R	R	A	C	I	I	I		
Customer Service	Case Fill Rate	I	R	R	A	C	I	I	I	I	I
	Picking Accuracy	I	R	R	A	C	I	I	I		
	Transport Loading Accuracy	I	R	R	A	C	I	I	I		
	Transport Turnaround Time	I	R	R	A	C	I	I	I		
	Absolute Inventory Accuracy	I	R	R	A	C	I	I	I		
Productivity	Total Warehouse Productivity	I	R	R	A	C	I	I	I		
	Warehouse Productivity - Forklift Drivers	R	R	A	R	C	I	I	I		
	Mixed Pallet Productivity	R	R	A	R	C	I	I	I		
Utilization	Equipment Utilization	I	R	R	A	C	I	I	I		
	Warehouse Density	I	R	R	A	C	I	I	I		
	Warehouse Utilization	I	R	R	A	C	I	I	I		

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Classified - Internal use

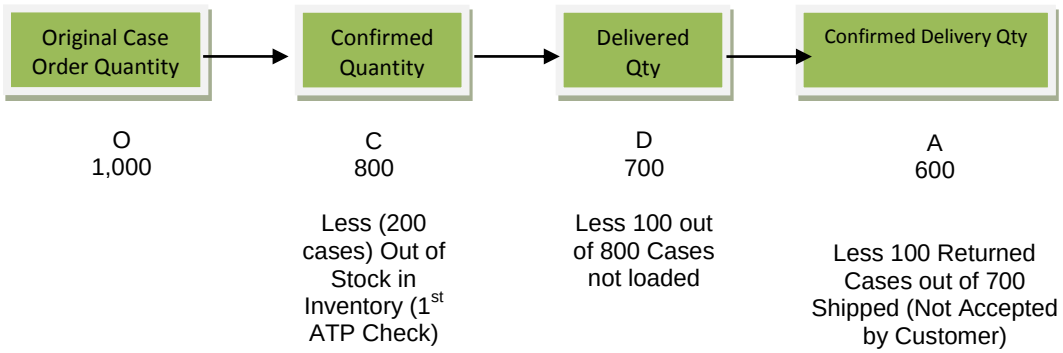
Warehouse Line of Site



First Aid Case Rate

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	The number of First Aid Cases (FAC) per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact into the warehouse operation
Calculation	$\frac{\text{FAC x 200,000}}{\text{Total Hours Worked in the Warehouse}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost Time Incident Rate
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). FACR can be approximated by the FAC per 100 full time workers.
Example	A warehouse records 3 first aid cases in its register. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The First Aid Case Rate is (3 X 200,000)/32,000 = 18.75
Metric Owner	Michael Ferrell

Case Fill Rate

Category	Logistics - Warehouse
Metric Level	Tier I
Definition	The percent completion rate for physical case orders by customers.
Objective	A measure of the ability of the existing Supply Chain to meet aggregate demand of the customer base. Fill Rate is a critical measure that quantifies how well we serve our customers, and to that end, should be always measured against the original volume ordered by our customers, before any internal checking and confirmation process.
Calculation	$\frac{\sum \text{SKUy ConfirmedDeliveredQuantity}}{\sum \text{TotalSKUy OriginalOrder Quantity}}$ ***Original Order Quantity*** is the original order quantity from customer or the pre-seller (before Available to Promise check) ***Delivered Quantity*** is the quantity actually accepted by the customer at time of delivery
Data Source	Order Management System
Collection Frequency	Daily
Related Supporting Metrics	Perfect Order
Benchmark	**Industry Average** ≥ 98% **World Class** 99.9%
Comments	This does not take into account whether the order was delivered on time or not. On time delivery is addressed in the Perfect Order metric.
Example	 $\text{Case FillRate} = \frac{A}{O} = \frac{600}{1000} = 60\%$.
Metric Owner	Lou Swanson

Warehouse Utilization

Category	Logistics – Warehouse
Metric Level	Tier I
Definition	A measure of the amount of warehouse space that is utilized at manufacturing plants and sales centers. Assumption must be made that the pallets can be stacked at minimum 2.5 high.
Objective	Quantify how well warehouse capacity is used in terms of storage space. Based on this number, we can identify need to expand warehouse capacity to cope with growth market demand and / or opportunities to reduce number of current warehouses.
Calculation	$\frac{\sum \text{Pallets in Warehouse}}{\sum \text{Total Potential Pallet Positions}}$ ***Pallets in Warehouse*** is the average finished goods pallets kept in the warehouse (e.g. average of daily pallet positions kept during the month). ***Total Potential Pallet Positions =*** Racked Positions + (Floor Position* 2.5) using available storage space.
Data Source	Warehouse Management System or Internal Control
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: 75% **World Class**: Between 90-96%
Comments	None
Example	The floor positions in the warehouse are 400. The racking is 6 pallets high for a total of 180 pallet positions. There are 500 pallets with products the inventory floor area and 50 pallets on the racks. $180 \text{ racked positions} + (400 \times 2.5) \text{ floor positions} = 1180 \text{ potential positions}$ 500 pallets on the floor + 50 pallets in the racks = 550 pallets total $\frac{550}{1180} = 46.6\%$
Metric Owner	Lou Swanson

Warehouse Equipment Utilization

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the percentage material handling equipment capacity used on a daily basis by type of equipment.
Objective	Used to highlight improvement opportunities by showing how the warehouse equipment assets are being utilized and where excess equipment exists by shift. Adequate equipment utilization considers not only the number of equipments, but also the type of equipment for each warehouse function.
Calculation	$\frac{\text{Total Warehouse Equipment by Shift by Type}}{\text{Total Warehouse Equipment Available by Shift by Type}}$ **Total Warehouse Equipment by Shift by Type** is the number of a specific equipment type used in one specific shift. **Total Warehouse Equipment Available by Shift by Type** is the total number of a specific equipment type available to be used by warehouse personnel in one specific shift.
Data Source	Spreadsheet
Collection Frequency	Semi-Annual
Related Supporting Metrics	None
Benchmark	**Industry Average** 70% **World Class** 92%
Comments	Look for opportunities to balance your warehouse equipment across shifts (or specific hours during the shift), by warehouse functions, by scheduling inbound and outbound deliveries and smoothing across the days of the week.
Example	30 forklifts assigned to the production warehouse: 5 pallet jacks and 25 dual forklifts. During first shift, 2 pallet jacks and 20 forklifts were in use. $\frac{2}{5} x = 40\% \text{ Pallet Jack Usage}$ $\frac{20}{25} = 80\% \text{ Forklift Usage}$
Metric Owner	Lou Swanson

Classified - Internal use

Total Warehouse Productivity

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the total productivity of warehouse operations.
Objective	Used to measure the overall efficiency of warehouse operations.
Calculation	$\frac{\text{Total Physical Cases Sold}}{\text{Total Warehouse Labor Hours Worked}}$ ***Total Warehouse Labor Hours Worked*** includes contract, temporary, direct labor including supervisor and managers.
Data Source	Warehouse Management System or Internal Control
Collection Frequency	Monthly
Comments	All relevant raw material and finished goods supply chain warehouses. **Should include only actual hours worked, i.e., vacation hours must not be included**.
Example	The warehouse has a 5 days per week operation: • Sold 100,000 cases in one month to customers or distributors • Had 40 employees working 8 hours a day in a 4 week month and 5 employees were on vacation for a month $\frac{100{,}000}{35 \text{ x } 40 \text{ x } 4} = 17.85 \text{ cases sold per man hour}$
Metric Owner	Lou Swanson

Warehouse Absolute Inventory Accuracy

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	The inventory accuracy on a SKU level basis when comparing actual physical count with system count.
Objective	To determine inventory precision.
Calculation	$\frac{\sum \text{System Inventory} - \sum \lvert \text{Actual SKUy Inventory} - \text{System SKUy Inventory} \rvert}{\sum \text{System Inventory}}$
Data Source	Warehouse Management System or Internal Control
Collection Frequency	Daily
Related Supporting Metrics	Warehouse Net Inventory Accuracy
Benchmark	**Industry Average**: 97% **World Class**: Greater than 99,9%
Comments	Inventory accuracy is a critical element to become an efficient supply chain operation and achieve high customer service level cost effectively.
Example	See table below
Metric Owner	Lou Swanson

SKU	Actual Inventory	System Inventory	Variance
1	100	90	10
2	110	120	10
3	120	110	10
4	90	100	10
Totals	**420**	**420**	**40**

$$\text{Absolute Inventory Accuracy} = \frac{420 - 40}{420} = 90.48\%$$

Warehouse Net Inventory Accuracy

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	The inventory accuracy on a total inventory basis when comparing actual physical count with system count.
Objective	A financial measure
Calculation	$\frac{\sum \text{ActualInventory}}{\sum \text{SystemInventory}}$
Data Source	Warehouse Management System or Internal Control
Collection Frequency	Daily
Related Supporting Metrics	Warehouse Absolute Inventory Accuracy
Comments	Inventory accuracy is a critical element to become an efficient supply chain operation and achieve high customer service level cost effectively. It is common to also measure net inventory accuracy in dollar unit to take product value into consideration.
Example	
Metric Owner	Lou Swanson

SKU	Actual Inventory	System Inventory	Variance
1	100	90	10
2	110	120	10
3	120	110	10
4	90	100	10
Totals	**420**	**420**	**40**

$$\text{Absolute Inventory Accuracy} = \frac{420}{420} = 100\%$$

Breakage, Damage, Loss

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of inventory losses throughout the warehousing and delivery process.
Objective	Used to measure the financial impact of product losses incurred during the order fulfillment process.
Calculation	$\frac{\sum \text{Cases Lost}}{\text{Net Sales}}$ **Cases Lost** is the total number of physical cases damaged or lost (see comments below for more information). **Net Sales** is the total number of physical cases effectively sold to customers.
Data Source	Warehouse and Delivery Internal Controls
Collection Frequency	Weekly and Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Losses considered (but not limited to): • Delivery/Warehousing: Warehouse, picking & delivery processes, nonconformance • Market: Expired and damaged products returned from the market • Inventory differences • Theft • Destruction Note: Losses charged to a 3rd party are not included
Example	The cases lost through delivery and production in a one month period at a production warehouse and affiliated delivery center is 75 cases. There were 25 cases returned from the market due to damage. The net case sales for that same month are 500,000 cases. $\frac{100}{500{,}000} = 0.02\%$
Metric Owner	Lou Swanson

Warehouse Productivity – Forklift Drivers

Category	Logistics
Metric Level	Tier III
Definition	A measure of the productivity of forklift operations inside the warehouse.
Objective	Used to measure efficiency of forklift drivers inside the warehouse. Labor and equipment costs are two primary drivers of warehouse total cost, and therefore, it is necessary to guarantee that we have the right number of forklift equipments and drivers for each warehouse function in each shift.
Calculation	$\frac{\sum \text{Pallets pulled or putaway (to/from receiving, production, distributor, customer)}}{\text{Total Labor Hours Worked for Forklift Drivers}}$
Data Source	Warehouse Management System or Internal Controls
Collection Frequency	Monthly
Comments	Should only include actual hours worked, i.e., vacation hours must not be included.
Example	The Shipping & Receiving area works 1-8 hr shift/5 day per week operation: • Received 5,000 pallets in one month for redelivery • Shipped 10,000 pallets in one month to distributor or customer • Had 4 employees working 8 hours a day in a 4 week month, 2 employees on vacation for a month $\frac{15{,}000}{4 \times 40 \times 4} = 23.4 \text{ pallets/hr}$
Metric Owner	Lou Swanson

Manual Mixed Pallet Productivity

Category	Logistics
Metric Level	Tier II
Definition	A measure of the output of labor dedicated to staging and assembling cases ordered in less than full pallet quantities (Layers and individual cases)
Objective	Used to measure the efficiency of warehouse operations in relation to mixed pallet make-up area.
Calculation	$\frac{\text{Physical Cases Assembled}}{\text{Mixed Pallet Hours Worked}}$ **Physical Cases Assembled** is the total number of cases used to assemble mixed pallets during the picking operation **Mixed Pallet Hours Worked** is the total hours worked by pickers during the picking operation.
Data Source	Warehouse Management System or Internal Warehouse Controls
Collection Frequency	Daily, Weekly, Monthly
Comments	Can also be measured on a per pallet basis if it is manually driven (Formula becomes: **Number of Pallets Assembled / Mixed Pallet Hours Worked**). If it is system driven (e.g. using a picking planning tool), then this should be measured on a per physical case basis.
Example	There are 72,000 physical cases assembled for mixed pallets over a calendar month. The total hours worked for assembling these pallets in that same month included, 2 employees worked 10 hours to stage product, 4 employees worked 40 hours on pallet makeup, 1 employee worked 10 hours to stage the pallets, and 2 employees worked 10 hours verifying the pallet mix. (Example has no layer picking operation). $\frac{72{,}000}{210} = 342 \text{ cs/hr}$
Metric Owner	Lou Swanson

Warehouse Capacity (Density)

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the finished goods warehouse density by dividing the total case inventory by the number of square meters under roof.
Objective	Used to highlight improvement opportunities by showing underutilized assets (facilities) and avoiding incremental rental or capital expenses
Calculation	$$\frac{\text{Total Cases in Inventory (Finished Goods; and Returnable Bottles)}}{\text{Total Square Meters Under Roof (Finished Goods and Returnable Bottles)}}$$ ***Total cases in inventory*** is the full goods daily inventory on hand AND any REFPET and RGB in storage during cold seasons (Daily Average Inventory when reporting monthly) ***Total square Meters under roof*** is the actual square meters allocated toward finished goods, REFPET and RGB, put away, storage, retrieval, picking, loading and other support areas.
Data Source	Warehouse Management System or Internal Controls
Collection Frequency	Monthly
Related Supporting Metrics	Warehouse Utilization
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	1,000,000 finished good cases inventories with a 15,000 square meters of dedicated space to finished goods activities Warehouse Density **=** $\frac{1{,}000{,}000}{15{,}000} = 66.7 \text{cs/m}^2$
Metric Owner	Lou Swanson

% of Picking Errors

Process	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the operational accuracy of the mixed pallet process
Objective	Picking operation is a labor intense process and it is critical to measure the quality of the manual work performed by pickers because of the negative impact of poor accuracy in both customer service and warehouse cost per case.
Calculation	$\frac{\text{Number of Picking Errors}}{\text{Number of Customer Orders Picked}}$
Data Source	Warehouse Management System or Picking Tool
Related Supporting Metrics	Manual Mixed Pallet Productivity
Benchmark	**Industry Average**: TBD **World Class**: TBD
Collection Frequency	Daily, Weekly and Monthly
Comments	Combination of mis-picks of what the checker finds in the warehouse and the driver finds while en route.
Example	Last month, there were 200,000 customers orders received in the warehouse under analysis, and 2,000 picking errors in the mixed pallet operation. $\frac{2{,}000}{200{,}000} = 1.0\%\ \text{Picking}\ errors$
Metric Owner	Lou Swanson

Warehouse Performance to Plan

Process	Logistics - Warehouse
Metric Level	Tier II
Definition	A measure of the accuracy of loading the right SKUs to customers, sales centers, depots, wholesalers, distributors and to MEPs.
Objective	Used to measure quality of the loading operation
Calculation	$\left[1 - \left\lvert \frac{\text{Warehouse Loading Plan - Warehouse Loading Actual}}{\text{Warehouse Loading Plan}} \right\rvert\right]$ **Warehouse Loading Plan and Actual is based on cases.**
Data Source	Warehouse Management System or Internal Controls
Related Supporting Metrics	Supply Chain Operations Performance to Plan
Benchmark	**Industry Average**: TBD **World Class**: TBD
Collection Frequency	Monthly
Comments	None
Example	See table below
Metric Owner	Lou Swanson

Destination	SKU	Date	Plan	Actual	SKU WP2P%	Weights	Daily WP2P%
Customer 1	1000 Coke	11/23/08	1,920	1,800	94%	1,800	
	800 Pop	11/23/08	2,880	3,000	96%	2,760	
	Sub total		**4,800**	**4,800**		**4,560**	
Warehouse 2	237 Coke	11/23/08	3,360	2,688	80%	2,688	80%
	240 Pop	11/23/08	2,016	3,091	47%	941	
	Sub total		**5,376**	**5,779**		**3,629**	
Total		11/23/08	10,176	10,579		8,189	

Transport Turnaround Time

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the average time it takes to load or unload all transports at a facility
Objective	Used as an indicator to minimize "waiting time" and keep transports on the road.
Calculation	$\frac{\text{Total Turnaround Time All Transports}}{\text{Number of Transports Loaded or Unloaded}}$ ***Total Turnaround time all transports*** are the total waiting time for all transports when the truck comes through the gate at the scheduled time (or the actual time if it is later than schedule time) and the time the truck leaves the gate. ***Number of Transports loaded or unloaded*** is the total number of transports either loaded or unloaded during a 24 hour period.
Data Source	Transportation Management System
Collection Frequency	Daily, Weekly, Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: 30 minutes **World Class**: TBD
Comments	Calculation reported in minutes
Example	The total turnaround time for all transports for one day = 30 hours The total number of transports for the day = 45 The Transport Turnaround Time =. $\frac{30 \times 60}{55} = 33 \text{ minutes}$
Metric Owner	Lou Swanson

Warehouse Cost per Case

Category	Logistics – Warehouse
Metric Level	Tier II
Definition	A measure of the total cost of running warehouse operation (receiving, picking, loading, staging, and unloading) per physical case sold.
Objective	Used to highlight issues with cost of warehouse labor, overhead and processes.
Calculation	$\frac{\text{Total Warehouse Cost}}{\text{Total \# of Physical Cases Sold}}$
Data Source	WMS and Financial ERP
Collection Frequency	Monthly
Related Supporting Metrics	TDC as a % of Net Revenue Cost to Serve
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	
Example	In one period: • Labor costs in the warehouse cost center = $300,000 • Overhead costs = $50,000 • Equipment maintenance and service costs = $50,000 • Other miscellaneous warehouse costs = $25,000 • Total cases sold in this period = 1,000,000 cases $\frac{\$425{,}000}{1{,}000{,}000} = \$0.425 \text{ per physical cases sold}$
Metric Owner	Lou Swanson

Manufacturing

Classified - Internal use

Manufacturing RACI

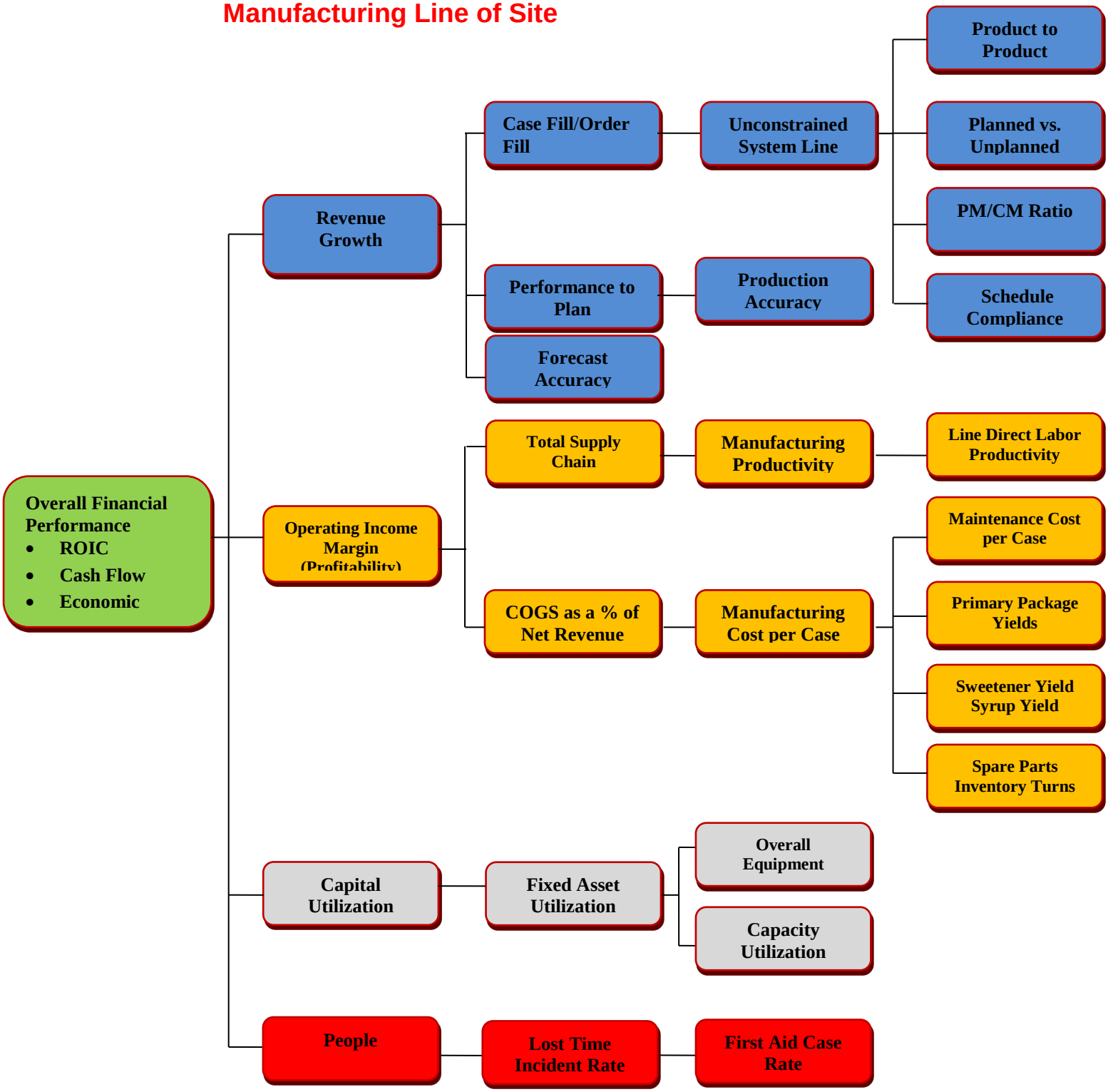
Category	Tool/Name of Report	Operator / Technician	EOSH Coordinator	Quality supervisor	Maintenance Supervisor	Production Supervisor	Spare Parts Inventory / Maint. Planner	EOSH / HR Manager	Quality Assurance Manager	Maintenance Manager	Production Manager	Plant Manager	Manager of Planning (DOIP)	National Director of EOSH	National Director of Quality	National Director of Manufacturing	National Director of Engineering	National Procurement Director	National Direcor of Logistics	National Supply Chain director	Regional P&L Leader	COO/CFO
Safety	First Aid Case Rate	I	I	I	I	R	I	I	I	I	R	A								I		
Cost	Manufacturing Cost per Case	I	I	I	I	R	I	I	I	R	R	A	C	I	I	C	C	I		I	I	I
	Maintenance Cost per Case	I	I	I	R	I	R	I	I	A	R	C					C			I		
	Maintenance Labor Cost Per Case	I			R	R	R			A	C	C				I	I			I		
	Product-to-Product	R		R	R	R	R		C	C	A	C	C		I	C	C			I	I	I
	Primary Package Yield	R		R	R	R	R		C	C	A	C	C		I	C	C			I		
	Final Syrup Yield	R		R	R	R	R		C	C	A	C	C		I	C	C			I		
	Concentrate Yield	R		R	R	R	R		C	C	A	C	C		I	C	C			I		
	Sweetener Yield	R		R	R	R	R		C	C	A	C	C		I	C	C			I		
	Spare Parts Inventory Turns				R		A			C	C	C				I	C			I		
Customer Service	Product-to-Product	R		R	R	R	R		C	C	A	C	C		I	C	C			I	I	I
	Unconstrained System Line Efficiency	R		R	R	R	R		C	C	A	C	C		I	C	C			I	I	I
	Production Accuracy	I				I			I	I	A	C	C			C						
	Planned vs Unplanned	R			R	R	R			A	C	C				I	I			I		
	PM Compliance	R			R	R	R			A	C	C				I	I			I		
	Maintenance Labor Cost Per Case	I			R	R	R			A	C	C				I	I			I		
	PM/CM Ratio	R			R	R	R			A	C	C				I	I			I		
	Maintenance Schedule Compliance	R			R	R	A			C	C	I				I	I			I		
Asset Utilization	Overall Equipment Effectiveness	I		R	R	R	R		C	C	C	A	C		I	C	C			I		
	Annual & Peak Season Capacity Utilization											I	A			C	C		C	C	I	I
Productivity	Manufacturing Productivity	I	I	R	R	R	I	R	R	R	C	A	I	I	I	C	I		I	I	I	I
	Line Direct Labor Productivity	I	I	I	R	R	I	I	R	R	A	C	I	I	I	I	I		I	I		

R	Responsible
A	Accountable
C	Consult
I	Inform

	Daily
	Weekly
	Monthly
	Quarterly

Classified - Internal use

Manufacturing Line of Site



First Aid Case Rate

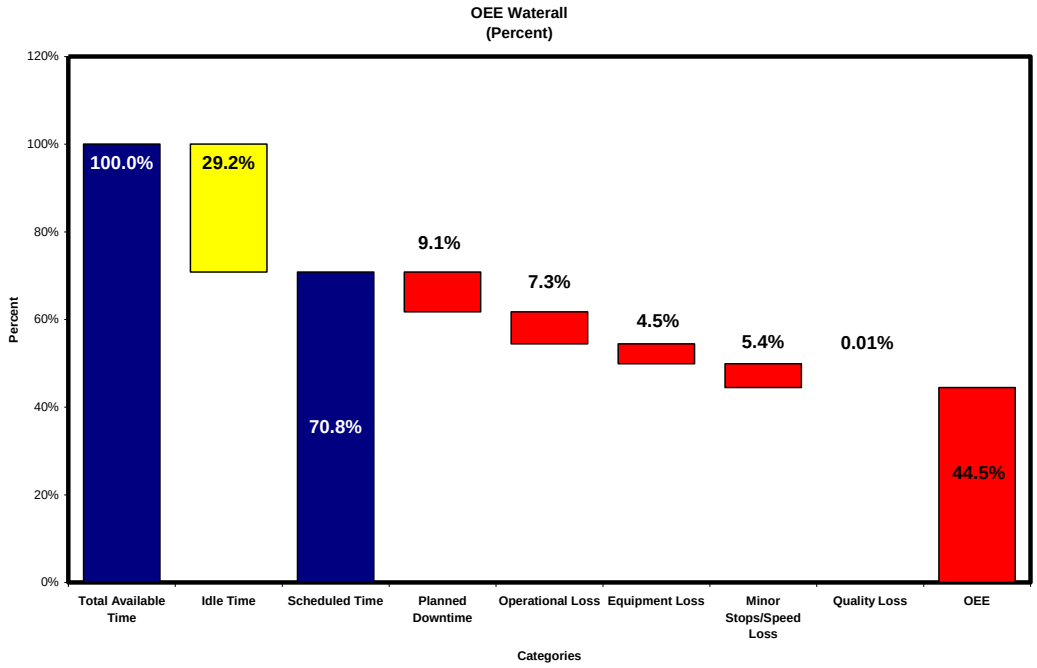
Category	Manufacturing
Metric Level	Tier II
Definition	The number of First Aid Cases (FAC) per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{FAC x 200,000}}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost Time Incident Rate, First Aid Cases
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). FACR can be approximated by the FAC per 100 full time workers.
Example	A plant records 3 first aid cases in its register. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The First Aid Case Rate is (3 X 200,000)/32,000 = 18.75
Metric Owner	Michael Ferrell

Classified - Internal use

Overall Equipment Effectiveness

Category	Manufacturing
Definition	A measure to evaluate the productivity of an equipment or a production line
Metric Level	Tier II
Objective	Provide a true view of capacity availability.
Calculation	$OEE = Availability\ Rate\ X\ Performance\ Rate\ X\ Quality\ Rate$ $Availability\ Rate = \frac{Running\ Time}{Total\ Available\ Time\ (Always\ 24x7)}$ $Performance\ Rate = \frac{Actuall\ Output}{Rated\ Output}$ $Quality\ Rate = \frac{\#\ of\ Good\ Units}{Actual\ Output}$ ***OR*** $\frac{\left(\frac{Actual\ Good\ Units\ Produced}{Filler\ Rated\ Speed}\right)}{Total\ Available\ Time\ (Always\ 24\ hours)}$
Data Source	Downtime Recording System
Collection Frequency	Shiftly by hour
Benchmark	**Industry Average** N/A **World Class** N/A Note: This measure is not meant for benchmarking.
Comments	See the OEE and SLE Roll-up template on Supply Chain XChange to view how these numbers are rolled up on a line/SKU/plant/country level. In order to take action on the OEE results, you must have waterfall charts in place such as the example below. Additionally, you should be able to drill down as needed to determine the root cause for not achieving the set goal. The OEE waterfall chart needs to reflect the downtime or speed loss that affects the output at the end of the line, i.e., the palletizer unless you are hand stacking. Equipment failures (e.g., labeler downtime) only impact the OEE when it affects the output at the palletizer, but should still be monitored and recorded in your downtime logs.

Example Waterfall Chart



Categories for each of the losses are defined as follows:

Idle Time	Planned Downtime	Operational Loss	Equipment Loss	Minor Stops/Speed Loss	Quality Loss
• Planned Lights Out – No Demand • Planned Maintenance – No production	• Start Up/Shut Down/CIPs /Changeovers • Planned Maintenance – During Production • Training/Meetings • Cleaning • Breaks/Lunches	• Operator Error • Set-ups or Adjustments • External Support Failures (Syrup, Warehouse, Raw Material, People, Utilities) • QA Checks (line down due to waiting for results)	• Equipment Breakdowns – Mechanical Pneumatic, Utilities • Equipment Breakdown due to Packaging Material	• Unrecorded stops or Minor Stops • Speed Losses (slowing down filler or other equipment constraints)	• Product Waste • QA Sample Check (product lost) • Rework

Example

The following example shows data for 1 day. To rollup data for a week, month or year, please use the template on Supply Chain XChange.

Plant A runs two shifts 8 hours per day 5 days per week
Line 1 contains the following data for 1 day:

- SKU A (0.6L) scheduled to run 10 hours

- SKU B (2 L) scheduled to run 6 hours
- OEM filler rated speed 0.6L = 36,000 bph
- OEM filler rated speed 2.0L = 20,000 bph

Losses for the day were as follows:

SKU	Availability Losses	Performance Losses	Quality Losses
General	Planned Lights Out **8 hours**		
SKU A	Equipment Breakdowns **1.6 hours**	Speed Loss & Unrecorded **1.4 hours**	1000 bottles
SKU B	Equipment Breakdowns **0.5 hours** Changeover **0.5 hours** Break **0.5 hours**	Speed Loss & Unrecorded **1 hours**	0 bottles
Total	**11.1 hours**	**2.4 hours**	**0.05 hours**

Calculate the Availability Rate:

$$SKU\,A\,Running\,Time = Total\,Available\,Time - Availability\,losses = 18\,hours - 9.6\,(from\,Table\,1)$$

$$SKU\,B\,Running\,Time = Total\,Available\,Time - Availability\,losses = 6\,hours - 1.5\,(from\,Table\,1)$$

Total Running Time = 24-11.1=12.9

$$Availability\,Rate = \frac{Running\,Time}{Total\,Available\,Time} \quad \frac{12.9\ hrs}{24\ hrs} = .538$$

Calculate the Performance Rate:

$$Theoretical\,Production\,SKU\,A = Running\,Time \times OEM\,Rated\,Speed\,(or\,faster) = 8.4 \times 36{,}000 = 302{,}400$$

$$Theoretical\,Production\,SKU\,B = Running\,Time \times OEM\,Rated\,Speed\,(or\,faster) = 4.5 \times 20{,}000 = 90{,}000$$

Total Theoretical Production = 392,400

- SKU A actual production = 252,000 bottles
- SKU B actual production = 70,000 bottles

Total Actual Production = 322,000

$$Performance\,Rate = \frac{Actual\,Production}{Theoretical\,Production} = \frac{322{,}000}{392{,}400} = 0.821$$

Calculate the Quality Rate:

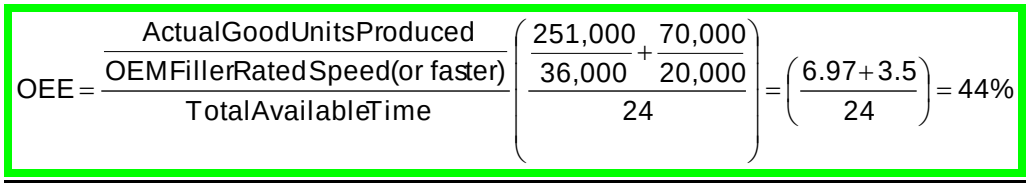
$$\#\,of\,Good\,Units\,Produced = 322{,}000 - (1000) = 321{,}000$$

$$Quality\,Rate = \frac{321{,}000}{322{,}000} = 0.997$$

Calculate the OEE

$$Availability\ X\ Performance\ X\ Quality\,Rate$$

$$OEE = (0.538 \times 0.821 \times 0.997)\,X\,100 = 44\%$$

	OR  $OEE = \frac{\frac{ActualGoodUnitsProduced}{OEMFillerRatedSpeed(or\ faster)}}{TotalAvailableTime}\left(\frac{\frac{251,000}{36,000}+\frac{70,000}{20,000}}{24}\right)=\left(\frac{6.97+3.5}{24}\right)=44\%$
Metric Owner	Tom Sanborn and Terry Sharp

Unconstrained System Line Efficiency

Category	Manufacturing
Metric Level	Tier I
Definition	A comparison of the actual number of cases produced during paid time, to the theoretical number of cases that could have been produced without any constraints.
Objective	To measure the actual efficiency based on a line's full potential to highlight issues that may be impeding the capability of the line. For example: • Inefficiencies of line equipment • Inefficiencies within operating processes
Calculation	$\frac{\sum \text{TotalUnitsProduced}}{\sum \text{TheoreticalUnitsProduced@UnconstrainedLineSpeed}} \times 100$ ***Theoretical units @ Unconstrained Line Speed*** is based on the O.E.M. filler line speed or faster times the total time scheduled to run. (Does not include any scheduled downtime) ***Total Units Produced*** is the total number of quality units produced.
Data Source	Production Records
Collection Frequency	Monthly (collection should be done daily, reporting can be done monthly)
Related Supporting Metrics	Constrained Line Efficiency Overall Equipment Effectiveness
Benchmark	**Industry Average** PET 75% REFPET 75% Can 75% NR Glass 70% Returnable Glass 65% Hotfill TBD Aseptic TBD **World Class** PET 85% REFPET 85% Can 78% NR Glass 78% Returnable Glass 75% Hot fill TBD Aseptic TBD
Comments	• If entire production crew is scheduled in, no time can be excluded from this calculation. (E.g. if production crew schedule is 2/10 hr shifts per day, 5 days a week the calculation is based on 400 hours for a 4 week month and 500 hours for a 5 week month.) Production scheduled hours must not change from week to week unless there is a downtime due to a major overhaul, there is lack of sales volume, you work more hours than normal (then your hours increase), or there is a holiday. • Skeleton crews can be used to conduct cleaning, syrup prep, etc. and this does not reflect upon the SLE. Skeleton crew must be ≤25% of the normal production crew. • Use the O.E.M. rated speed or actual speed (whichever is faster) in the calculation. • Amount of SKU's and Packages by line will affect benchmarks • If the line is stopped because of inclement weather, any (paid) downtime hours resulting from the weather should be included in scheduled hours.

Example

Note: The example below is based on 1 package size. When multiple SKUs are rolled up, all measures should be converted to time for an accurate rollup. Please see the Supply Chain XChange for an example of a rollup template.

Plant A schedules 5 day a week production/24 hours a day. Line 1 in January:

- Yielded 12 million units of Quality/Sellable product.
- Approximately 8 hours of PMs were performed on the line both by operators and by the maintenance crew.
- Shut down 9 times during the week for a total of 10 hours for CIPs and changeovers.
- Shut down the line for 2 hours for unscheduled maintenance.
- The filler has an O.E.M. rated speed 800 bpm, but is running at 850 bpm*.

$$\frac{12{,}000{,}000}{850\text{bpm}((24/\text{day}) \times 60\,\text{min/hr} \times 5\,\text{days/wk} \times 4\,\text{wk/mth}))} \times 100 = 49.02\%$$

Note: CIP, Changeovers, Corrective Maintenance, and PMs are NOT subtracted from this calculation. Below is a chart that presents Situations and Line Scenarios and Guidance on when to include the hours in the Scheduled Hours part of the Metric calculation.

Situation / Scenario	Include / Exclude in Scheduled Hours?
1. Planned Labor/Union Meetings or Management Meetings	Include if paid time
2. Planned New Product Development/Trails	Include if line is staffed by more than 25% of the normal production crew
3. Planned CIP (mandatory) and changeovers	Include if line is staffed by more than 25% of the normal production crew
4. Planned start-ups	Include if line is staffed by more than 25% of the normal production crew
5. Planned shutdowns	Do not include assuming line staff is not paid.
6. Planned Training	Do Not Include.
7. Planned maintenance	Include if line is staffed by more than 25% of the normal production crew
8. No electricity or no water are available to the line	Include if more than 25% of the normal production crew continue to get paid

Metric Owner

Tom Sanborn and Terry Sharp

Facility Productivity

Process	Manufacturing
Metric Level	Tier II
Definition	A measure of the utilization of total personnel within the production operation.
Objective	Used to measure the efficiency in which production personnel are utilized.
Calculation	$\left(\frac{\text{Produced Physical Cases of Finished Product}}{\text{Total Plant People Hours}}\right)$ ***People*** includes direct labor, management/supervision, all services, maintenance, cleaning and sanitation crews (Permanent, temporary, seasonal and/or contract), and 3rd party related to core manufacturing activity. ***Plant People Hour*** includes everything within the four walls of the plant: • Manufacturing and Maintenance personnel (PET preform and bottle manufacturing, cogeneration, plant QA/QC, staff, line personnel, etc.) • Plant warehousing personnel (Forklift Operators, handling, mixed pallet makeup, pallet rebuild, loading, etc.). Excludes sales, transportation and delivery, or finance personnel.
Data Source	Production Records Payroll Records
Collection Frequency	Monthly (collection should be done daily, reporting can be done monthly)
Related Supporting Metrics	Manufacturing Productivity Warehousing Productivity Manual Mixed Pallet Productivity
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	This includes plant warehousing and production.
Example	A total of 1,500,000 physical cases were produced in one calendar month. The manufacturing hours worked included, 1600 hours for temporary employees, 4800 hours for hourly employees, 1280 hours for management, 160 hours for custodial. The warehousing hours worked included 320 hours for temporary employees, 1600 hours for hourly employees, 480 hours for management, and two employees each took 40 hours of vacation a piece during this month. $\frac{1{,}500{,}000}{(1600+4800+1280+160+320+1600+480)} = 146.5 \text{cs/hr}$ **Note:** Vacation hours are not included in the calculation
Metric Owner	Tom Sanborn and Terry Sharp

Primary Package Yield

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the percentage of the quantity of primary packages required compared to the quantity used.
Objective	Used to determine the amount of usage in operations.
Calculation	$\left(\frac{\text{Theoretical \# of Packages needed for Net Production Run}}{\text{Actual \# of Packages Used for the Run}}\right)$
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: Crowns 99.5%; Closures 99.5%; PET Bottle 99.5%; Preform 99.8%; Cans 99.95%; NR Glass 99.5%; All other 99.5% **World Class**: Crowns 99.8%; Closures 99.8%; PET Bottle 99.8%; Preform 99.9%; Resin 99.9%; Cans (Body/End) 99.9%; NR Glass 99.8%; All other 99.8%
Comments	Must be measured by item for all primary packaging (e.g. crowns, closures, PET bottles, etc.). Global roll-up (multiple countries) must be weighted based on volume. This measure does not include losses from transportation or handling outside of manufacturing.
Example	The number of theoretical bottles that were to be used in a calendar month was 6,000,000 bottles to produce 250,000 (24-bottle) cases. The actual number of bottles used that month was 6,100,000. $\frac{6{,}000{,}000}{6{,}100{,}000} = 98.4\%$
Metric Owner	Tom Sanborn and Terry Sharp

Final Syrup Yield

Process	Manufacturing
Metric Level	Tier II
Definition	A measure of the percentage of the number of cases of blended syrup vs. the actual cases produced on the line.
Objective	Used to determine the amount of usage in operations.
Calculation	$\left(\frac{\text{Actual \# of Physical Cases Produced}}{\text{Theoretical \# of Phyiscal Cases Blended for Production Run}}\right)$ **Final Syrup contains both sweetener and Concentrate**
Data Source	Production Records
Collection Frequency	Monthly (collection should be done daily, reporting can be monthly)
Related Supporting Metrics	None
Benchmark	**Industry Average**: > 99.8% **World Class**: 99.9%
Comments	Global roll-up (multiple countries) must be weighted based on volume.
Example	The amount of final syrup blended to meet the planned SKU for 1 run was 35,000 cases. The actual number of cases produced in this run was 34,750 cases. $\frac{34{,}750}{35{,}000} = 99.3\%$
Metric Owner	Tom Sanborn and Terry Sharp

Sweetener Yield

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the percentage of sweetener theoretically required vs. the actual amount used based on the volume mix.
Objective	Used to determine the amount of usage in operations.
Calculation	$\left(\frac{\text{Theoretical Amount of Sweetener Needed for Net Production Run}}{\text{Actual Amount of Sweetener Used for the Run}}\right)$
Data Source	Production Records
Collection Frequency	Monthly(collection should be done daily, reporting can be done monthly)
Related Supporting Metrics	None
Benchmark	**Industry Average**: > 99.8% **World Class**: 99.9%
Comments	This is only used for sweetener that is a raw material at the plant not for sweetener that is already contained within the Concentrate. It includes raw granulated sugar, liquid sucrose, HFCS (or HFSS). Global roll-up (multiple countries) must be weighted based on volume.
Example	The theoretical amount of sweetener used for the month based on the required scheduled calendar month was 5000 L. The actual amount of sweetener used to meet the required schedule that month was 5050 L. (Note: Unit of measure is subject to country) $\frac{5000}{5050} = 99.01\%$
Metric Owner	Tom Sanborn and Terry Sharp

Manufacturing Cost per Case

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the value of inputs used in the conversion of raw materials to saleable goods.
Objective	Used to highlight inefficiencies within the manufacturing process such as capital management, labor inefficiencies, etc.
Calculation	$\frac{\text{All Fixed and Variable Costs (Includes Depreciation)}}{\text{Total Physical Cases Produced for the Month}}$
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Includes Cash and Non-Cash as well as glass, REFPET, crates depreciation costs. Utilities for support functions such as finance and sales are excluded. Packaging and ingredients that are part of the BOM are NOT included in this cost.
Example	In one month, a plant had the following fixed and variable costs: • Wages, salaries, and benefits of hourly employees = $840,000 • Wages, salaries, and benefits of supporting functions (management, clerical, admin, etc.) = $630,000 • Total cost of depreciation, rentals, utilities, maintenance supplies and parts, building services, consumable supplies, etc.)=$450,000 • Total physical cases produced in one month = 1,000,000 $\frac{\$840,000 + \$630,000 + \$450,000}{1,000,000} = \$1.92/cs$
Metric Owner	Tom Sanborn and Terry Sharp

Manufacturing Productivity

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the utilization of total personnel within the manufacturing operation.
Objective	Used to measure the efficiency in which manufacturing personnel are utilized.
Calculation	$\left(\frac{\text{Produced Physical Cases of Finished Product}}{\text{Total Core Manufacturing People Hours}}\right)$ ***People*** includes direct labor, management/supervision, all services, maintenance, cleaning and sanitation crews (permanent, temporary, seasonal and/or contract), and 3rd party related to core manufacturing activity. ***Core Manufacturing*** includes packaging (e.g., preform, shrink film, caps, etc.) manufacturing and cogeneration and/or CO2 production, and plant QA/QC staff, but excludes items such as sales and finance staff.
Data Source	Production Records
Collection Frequency	Monthly
Comments	Involves only that labor which is involved with the manufacturing process.
Example	A total of 1,500,000 cases were produced in one calendar month. The production hours worked included, 480 hours of temporary employees, 3680 hours of hourly employees, 800 hours of management, 160 hours for custodial. Two employees each took 40 hours of vacation a piece during this month. $\frac{1{,}500{,}000}{(480+3680+800+160)} = 293 \text{ cs/hr}$ **Note:** Vacation hours are not included in this calculation.
Metric Owner	Tom Sanborn and Terry Sharp

Production Performance to Plan

Category	Manufacturing
Metric Level	Tier II
Definition	An absolute measure of Manufacturing Planned Production vs. Actual Production
Objective	A measure of the effectiveness of manufacturing to meet planned requirements both in terms of time and quantity.
Calculation	$\left[1-\left\lvert\frac{\text{Production Plan - Production Actual}}{\text{Production Plan}}\right\rvert\right]$ **Roll up Formula:** **Weights = Production Accuracy x Production Plan** $\frac{\sum \text{Weights}}{\sum \text{Production Plan}}$ ***Production Plan*** is the cases planned (published production schedule released 12-24 hours ahead of the actual execution). ***Production Actual*** is the cases produced and accepted off the line**.**
Data Source	Production Management System
Collection Frequency	Weekly
Related Supporting Metrics	Weekly Forecast Accuracy Transportation Haulage Performance to Plan Production Planning Accuracy Delivery Performance to Plan Supply Chain Operations Performance to Plan
Benchmark	**Industry Average** ≤ 92% **World Class** 99%
Comments	Must be against published schedule from planning team, released day prior to actual production – Do not use schedules released same day as production.

Example

Line	SKU	Date	Plan	Actual	SKU Prod Accuracy %	Weights	Line MA%	Daily MA%
L1	1000ml Coke	02/01/08	25,000	23,456	94%	23,456	94%	94%
	500ml Zero	02/01/08	19,200	20,111	95%	18,289		
Sub Total			44,200	43,567		41,745		
L2	237 Coke	02/01/08	13,500	12,160	90%	12,160	93%	
	240Zero	02/01/08	10,000	10,290	97%	9,710		
Sub Total			23,500	22,450		21,870		
Total		02/01/08	67,700	66,017		63,615		

Metric Owner	Tom Sanborn and Terry Sharp

Carbon Dioxide Yield

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the percentage of carbon dioxide theoretically required vs. the actual amount purchased for the runs.
Objective	Used to determine the amount of usage in operations.
Calculation	$\left(\frac{\text{Theoretical Weight of } CO_2 \text{ Required for Net Production}}{\text{Actual Weight of } CO_2 \text{ Purchased (for the runs)}}\right)$ ***Theoretical Weight of CO2 (of the various products/packages) is*** $\left(\frac{\text{CO2 Volumes x Container Size (ml) x1.98}}{\text{1 Million}}\right)$ ***Actual Weight of CO2 purchased for the runs is*** $\text{Opening Tank Inventory} - (\text{Closing Tank Inventory} + \text{Delivery Receipts})$
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: Bottles – 80% Cans – 70% **World Class**: TBD
Comments	Global roll-up (multiple countries) must be weighted based on volume.
Example	None
Metric Owner	Tom Sanborn and Terry Sharp

Annual & Peak Season Capacity Utilization

Category	Manufacturing
Metric Level	Tier II
Definition	A measure of the capacity of the plant based on current efficiencies.
Objective	Used for planning and infrastructure modeling purposes
Calculation	$\frac{\#\text{ of hours to produce required Sales}}{\text{Hours Available in Period}}$ ***# of hours to produce required sales*** is based on the current system line efficiency. ***Hours Available In Period*** is 20 hours a day x 6 days a week x 52 weeks for annual calculations unless local labor law dictates that some time/days can never be considered for working. The number of weeks for peak season period is obviously dependent on market sales trends, but typically is a 1 to 3 month period during which time you plan to utilize the line / plant fully.
Data Source	Production Records
Collection Frequency	As required for modeling , Quarterly, Annually
Related Supporting Metrics	None
Benchmark	**Industry Average** **World Class** >80%
Comments	
Example	See table below

Line 1	Annual Case Sales	Peak Season Sales (cases)	Rated Speed	Production Rate (rated speed x SLE)	# hours it will take to produce annual sales	# hours it will take to produce peak season sales
SKU 1	750,000	262,500	3000 cases per hour	1950 cs/hr	385	135
SKU 2	1,000,000	350,000	2200 cases per hour	1430 cs/hr	699	245
SKU 3	2,000,000	700,000	2500 cases per hour	1625 cs/hr	1231	431
Total	**3,750,000**	**1,312,500**			**2315**	**811**

In this example:

- SLE for the line is 65%
- Peak Season Sales are 35% of the annual sales volume
- Peak season lasts 12 weeks

Total Annual Available Time = 52 weeks x 20 hours/day x 6 days/ week = 6,240 hours

Annual Capacity Utilization= $\frac{2315\text{hours}}{6240\text{hours}} = 37.1\%$

Total Peak Season Available Time = 12 weeks x 20 hours/day x 6 days/week =1,440

Peak Season Capacity Utilization = $\frac{811\text{hours}}{1{,}440\text{hours}} = 56.3\%$

Metric Owner	Tom Sanborn and Terry Sharp

Line Direct Labor Productivity

Category	Manufacturing
Metric Level	Tier III
Definition	Utilization of direct personnel assigned to the line including operators, relief operators, visual inspectors, and forklift drivers used in production to put away.
Objective	Used to see how well line labor is being utilized.
Calculation	$\frac{\text{Net Production (physical cases)}}{\text{Direct Labor Hours}}$ ***Direct Labor Hours*** is the sum of all hours worked including overtime by direct labor on the line regardless of employment status.
Data Source	Payroll and ERP
Collection Frequency	Monthly
Related Supporting Metrics	Manufacturing Productivity
Benchmark	**Industry Average** | **World Class** | Refillable: 75 cases/hr N/R Bottles: 200 cases/hr Canning: 600 cases/hr
Comments	Benchmarks will vary based on rate line speeds. Forklift driver could be an issue as it varies by location.
Example	In a 4 week period, there were 200,000 physical cases produced on a line. The labor hours worked were as follows: 15 Visual Inspectors @ 40 hours each 2 Forklift Drivers @ 40 hours each 3 Relief Operators @ 40 hours each 7 Operators @ 40 hour each 6 Temporary or Contract @ 40 hours each Two of the operators put in 10 hours of overtime each during the 4 week period. Total labor hours = $(15 \times 40)+(2 \times 40)+(3 \times 40)+(7 \times 40)+(6 \times 40)+(2 \times 10)=1340$ Line Direct Labor Productivity = $\frac{200{,}000}{1340}=149$ cases/hr
Metric Owner	Tom Sanborn and Terry Sharp

Chemical Usage

Category	Manufacturing
Metric Level	Tier III
Definition	Measurement of chemical usage for refillable bottles.
Objective	Utilized to determine if there is overuse of chemicals in the bottle washing process.
Calculation	$\frac{\text{Actual Amount of Chemicals Used}}{\text{Net Liters of Refillable Package Beverage Produced}}$ ***Actual Amount of Chemical Used*** is the amount in grams used in the bottle washing process. This should be converted if volume measurement is used to dose the machine.
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average** | **World Class** | <1.4 g/L
Comments	None
Example	There is 117,000 L of beverage is produced at a plant. Chemical usage for that period of production is 235,008 grams. Chemical Usage = $\frac{235{,}008}{117{,}000} = 2.0 \text{ grams/L}$
Metric Owner	Tom Sanborn and Terry Sharp

Product-to-Product

Category	Manufacturing
Metric Level	Tier III
Definition	Measurement of efficiency of a changeover.
Objective	Utilized to determine changeovers are being performed as efficiently as possible.
Calculation	$\frac{\text{ActualChangeoverTime}}{\text{NormalChangeoverTime}}$ ***Actual changeover*** is the time from the last bottle produced on the filler in one flavor, to the first good bottle produced in the next flavor. ***Normal changeover*** is the estimated standard time from the last bottle produced on the filler in one flavor, to the first good bottle produced in the next flavor. ***First good bottle*** is the first bottle produced from the filler after quality checks are approved. ***Estimated standard time*** is the time that is benchmarked and approved by production management as the minimum best time the changeover can be performed.
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	For further analysis, the changeover time can be divided into different steps, and each step can be analyzed separately. For example 4 steps: Finish, CIP, Start-up, QC, etc. Changeover time in minutes should be tracked for all changeovers and continuous improvement should drive changeover goal and target
Example	The normal changeover for a Hot-CIP is 90 minutes. The line crew is performing the actual changeover in 97 minutes. P2P = 97 / 90 = 108 % Product-to-Product = $\frac{97}{90} = 108\%$
Metric Owner	Tom Sanborn and Terry Sharp

Right First Time

Category	Manufacturing
Metric Level	Tier III
Definition	Measurement of the quality of product at startup of the line.
Objective	Utilized to determine changeovers are being performed as efficiently as possible.
Calculation	$\frac{\#\text{ of good startups}}{\#\text{ of total startups}}$ **# *of good startups*** is the total number of all startups after changeover where quality checks have been approved. **# *of total startups*** is total number of all startups after changeover.
Data Source	Production Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average** — TBD **World Class** — TBD
Comments	None
Example	During one month a line has had 40 startups after changeover. After one of these startups there was a quality issue, where the line had to adjust the filler before continuing. Right First Time = $\frac{39}{40} = 97.5\%$
Metric Owner	Tom Sanborn and Terry Sharp

Classified - Internal use

Manufacturing Maintenance

Planned vs. Unplanned - Maintenance

Category	Manufacturing – Maintenance
Metric Level	Tier II
Definition	The ratio of planned maintenance hours as a percentage of total maintenance hours.
Objective	To determine the amount of work that is planned vs. reactive. Each facility should move towards a higher percentage of planned work in order to avoid unexpected equipment breakdowns.
Calculation	$$\frac{\text{Planned Maintenance Hours}}{\text{Planned + Unplanned Maintenance Hours}}$$ ***Planned*** is considered any job that undergoes the 8 phases of planning or are routine inspections that are generated within the CMMS, 72 hours before the job is performed (Review and analyze the work order, visit the job site, determine the basic information, plan the work, determine the availability of the materials, complete the work plan).
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	PM/CM Ratio Schedule Compliance Backlog By Craft
Benchmark	**Industry Average**: 65%-95% **World Class**: > 95%
Comments	Hours are used instead of the number of work orders because the number of work orders does not indicate the severity of the issue, or how much of your valuable manhours are not being scheduled.
Example	There are 10 maintenance technicians within the facility that work 8 hours a day/6 days a week for a total of 480 hrs/wk. During the week the maintenance hours spent are as follows: • Emergency Corrective Maintenance = **24** hours • Non-Emergency Corrective Maintenance = **312** unplanned hours and **40** planned hours • Preventive Maintenance = **56** hours • Inspections = **48** hours $\frac{48+40+56}{480} = \frac{144}{480} = 30\%$
Metric Owner	Tom Sanborn and Terry Sharp

PM Compliance

Category	Manufacturing – Maintenance
Metric Level	Tier II
Definition	A measure the effectiveness of completing PMs as scheduled.
Objective	To ensure that the PM program is on track and the schedules are maintained.
Calculation	$\frac{\#\text{ of PMs Completed}}{\#\text{ of PMs Scheduled}}$
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	Compliance by Priority
Benchmark	**Industry Average**: TBD **World Class**: >95%
Comments	Calculation is over a given period of time.
Example	There are 35 PMs schedule for the 1st week of August. At the end of the week 20 PMs have been completed. PM Compliance is: $\frac{20}{35} = 57\%$
Metric Owner	Tom Sanborn and Terry Sharp

Quality PM Compliance

Category	Manufacturing – Maintenance
Metric Level	Tier II
Definition	A measure of the effectiveness of completed PMs.
Objective	To ensure that PM's are completed with a high level of quality, fully and completely to the specifications outlined.
Calculation	$\frac{\text{Number of PMs Audited with Zero Defects}}{\text{Total \# of PMs Audited}}$
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	Compliance by Priority
Benchmark	**Industry Average**: TBD **World Class**: >85%
Comments	Calculation is over a given period of time.
Example	There are 35 PMs for overhauls that are audited and 10 PMs are found with zero defects. $\frac{10}{35} = 29\%\ \text{quality PM's performed}$
Metric Owner	Tom Sanborn and Terry Sharp

Spare Parts Inventory Turns

Category	Manufacturing – Maintenance
Metric Level	Tier II
Definition	A summation of the last 12 months (rolling) of spare parts used in USD over the average actual spare parts inventory in USD for the last 12 months.
Objective	To measure how well working capital in stores is being turned over and is not idle.
Calculation	$\frac{12\text{ month rolling value of parts consumed}}{12\text{ month rolling average \$ inventory value}}$
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	Inventory Turns – Obsolete Parts Inventory Turns – Emergency(high value)/Redundant part Inventory Turns – Highly consumed parts
Benchmark	**Industry Average**: 1.0 **World Class**: 1.4
Comments	All Spare Parts must be charged into inventory before consumed.
Example	From June 2006 to May 2007 (12 months), there was $3,800,000 in spare parts used at Plant XYZ. The average monthly inventory value from June 2006 to June 2007 was $3,000,000. The inventory turn rate is: $\frac{3,800,000}{3,000,000} = 1.27\text{ turns}$
Metric Owner	Tom Sanborn and Terry Sharp

Overtime vs. Straight time

Category	Manufacturing – Maintenance
Metric Level	Tier II
Definition	The amount of overtime hours worked vs. the amount of straight time hours worked.
Objective	To convey the overtime load and staffing needs.
Calculation	$\frac{\text{Total Maintenance People Hours Worked Overtime}}{\text{Total Maintenance People Hours Worked Straight Time}}$
Data Source	CMMS or Payroll Software
Collection Frequency	Monthly
Related Supporting Metrics	Estimated vs. Actual
Benchmark	**Industry Average** 9.5% **World Class** 9.0%
Comments	None
Example	There are 10 technicians scheduled to work 40 hours a week in a four week month. In addition to the 40 hours/wk, the following overtime was put in: Week 1: 5 technicians 4 hours/each Week 2: 2 technicians 4 hours/each Week 3: 2 technicians 3 hours/each Week 4: 3 technician 6 hours/each Total overtime hours = $(5X4)+(2X4)+(2X3)+(3X6)=52$ Overtime vs. Straight Time = $\frac{52}{40X10}=13\%$
Metric Owner	Tom Sanborn and Terry Sharp

Maintenance Labor Cost Per Case

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	The cost of labor for maintenance per physical case produced.
Objective	To surface any issues with current staffing, organization structure, or process issues.
Calculation	$\frac{\text{Total Maintenance Labor Costs}}{\text{Total \# of Physical Cases Produced}}$ ***Labor Costs*** include Full Time Equivalents, temporary employees, or contract workers. Include all technical workers involved in maintaining support /utility equipment.
Data Source	CMMS/Payroll Software and Production Software
Collection Frequency	Monthly
Related Supporting Metrics	
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Engineering and auxiliary services departments' hours worked (who are under the maintenance management) should be considered in the calculation. You should include all 3rd party work that is being done as well as engineering costs.
Example	Two contract workers are paid a total of $5,000 in the month of June. There are ten FTEs who were paid a total of $32,000 in the month of June. There were 1,000,000 physical cases were produced in the month of June. Labor Cost Per Case = $\frac{5{,}000 + 32{,}000}{1{,}000{,}000} = \$0.037/\text{case}$
Metric Owner	Tom Sanborn and Terry Sharp

Compliance to Maintenance Budget

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	The variance from budget.
Objective	To surface issues with spend or the budget planning process.
Calculation	$\frac{\text{Actual Maintenance Expenditures}}{\text{Budgeted Maintenance Expenditures}}$ ***Maintenance Expenditures*** include labor, temporary, contract, vendors, spare parts, consumables, etc. Labor must include support / utility technical workers.
Data Source	CMMS, Payroll Software, Purchasing Software
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Should be looked at from a monthly, year to date, and a Rolling Estimate perspective.
Example	In the month of June, there was \$32,000 of labor costs for FTEs, \$5,000 for temporary labor. A 3rd party contractor performed calibrations for \$8,000 and \$500,000 worth of spare parts were consumed. The budget was \$750,000 for the month. Compliance to Budget = $\frac{32{,}000+5{,}000+8{,}000+500{,}000}{750{,}000} = 72.6\%$
Metric Owner	Tom Sanborn and Terry Sharp

PM/CM Ratio

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the PMs or Inspections hours spent vs. the total hours spent on Corrective and Preventive Maintenance and Inspections.
Objective	To measure the effectiveness of the planning/scheduling and PM programs and its influence on corrective maintenance.
Calculation	$$\frac{\text{Preventive Maintenance People Hours} + \text{Inspection People Hours}}{\text{Preventive Maintenance People Hours} + \text{Inspection People Hours} + \text{Corrective Maintenance People Hours}}$$
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: 75% **World Class**: 95%
Comments	None
Example	In the month of June, there is 222 hours spent on inspections and preventive maintenance. There were 120 hours spent performing planned jobs that stemmed from a corrective maintenance work order. There was 182 hours spent on emergency work orders (breakdowns). The PM/CM ratio is: PM/CM Ratio = $\frac{222}{120+182+222} = 42.36\%$
Metric Owner	Tom Sanborn and Terry Sharp

Schedule Compliance

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the tasks that are completed as scheduled without interruption from emergencies, unplanned, or unscheduled work.
Objective	To measure the ability to complete tasks on time when they are scheduled during a given period.
Calculation	$\frac{\text{Maintenance People Hours Completed as Scheduled}}{\text{Total Maintenance People Hours Scheduled}}$ ***Maintenance People Hours Completed as Scheduled*** is the actual people hours spent performing scheduled maintenance. ***Maintenance People Hours Scheduled*** is the total maintenance people hours scheduled for the week (**NOT** total maintenance people hours available).
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: >80%
Comments	None
Example	There were 320 hours scheduled (it is marked on the calendar for completion) for maintenance for the first week of June. During the first week of June, it is found that 225 actual hours were logged performing scheduled maintenance. The % Schedule Compliance is: Schedule Compliance = $\frac{225}{320} = 70.3\%$
Metric Owner	Tom Sanborn and Terry Sharp

Backlog by Craft

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the backlog vs. the resources available.
Objective	To show the extent of the backlog and surface any issues with resources or effectiveness of the PM program.
Calculation	$\frac{\text{Backlog in People Hours for Mechanical Craftsman}}{(\text{\# of Mechanical Craftsmen Available x \# hours work/per week}) - \text{Demand}}$ $\frac{\text{Backlog in People Hours for Electrical Craftsman}}{(\text{\# of Electrical Craftsmen Available x \# hours work/per week}) - \text{Demand}}$ ***Backlog*** is all work that has been identified and is in the weekly queue less the demand work. ***Demand*** is all hours worked for emergency/unplanned work
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: 5
Comments	None
Example	In the 1st week of June there are 75 jobs in the 7 day backlog queue. Of these, there are 480 hours of work that require mechanical skills. There are 5 mechanical technicians available that work 40 hours/wk. During the first week of June, 130 hours of emergency work is performed by the mechanical technicians. The backlog for the mechanical craftsman is: Backlog for Mechanics = $\frac{480}{(5X40)-130} = 6.4$
Metric Owner	Tom Sanborn and Terry Sharp

Compliance by Priority

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the backlog by priority vs. the resources available.
Objective	To ensure high priority jobs are not consistently left in the backlog.
Calculation	$\frac{\#\text{ of Priority1 Work Orders Complete}}{\#\text{ of Priority1 Work Orders Scheduled}}$ $\frac{\#\text{ of Priority2 Work Orders Complete}}{\#\text{ of Priority2 Work Orders Scheduled}}$ $\frac{\#\text{ of Priority3 Work Orders Complete}}{\#\text{ of Priority3 Work Orders Scheduled}}$ ***Priority*** is the categorization of the work to be performed based on one's priority matrix (safety issue, production issue, etc.)
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	For the 1st week of June, there were 15 Priority 1 work orders scheduled. There were 12 Priority 1 work orders completed. Compliance for Priority1 = $\frac{12}{15} = 80\%$
Metric Owner	Tom Sanborn and Terry Sharp

Spare Parts Inventory Turns by Type

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	An average of the last 12 months of spare parts by type used over the average over the last 12 months of actual spare parts by type inventory .
Objective	To measure how well working capital in stores is being turned over and is not idle and how much of those that are idle are from obsolete parts, emergency/redundancy parts, or highly consumed parts.
Calculation	$\frac{12\text{-monthrollingvalueof obsoleteparts}}{12\text{-monthrollingaverage\$ obsoleteinventoryvalue}}$ $\frac{12\text{-monthrollingvalueof emergencyor redundantparts}}{12\text{-monthrollingaverage\$ emergencyor redundant inventoryvalue}}$ $\frac{12\text{-monthrollingvalueof highlyconsumedparts parts}}{12\text{-monthrollingaverage\$ highlyconsumedinventoryvalue}}$ ***Obsolete parts*** are those parts that are still in inventory, but the equipment for which they are utilized is no longer active. ***Emergency or Redundant Parts*** are those parts that held in the facility because of the large lead time and that they are critical spares which if not readily available, could cause an all-stop in production or a safety related incident. ***Highly Consumed Parts*** are those parts that are consumed on a regular basis and have a high turn rate, i.e., >1 times/yr.
Data Source	CMMS or Inventory System
Collection Frequency	Monthly/Quarterly/ Annually
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	
Example	From June 2006 to June 2007, there was $3,800,000 in spare parts used at Plant XYZ. Of these parts, there was $0.00 of obsolete parts used, $1,200,000 of emergency or redundant parts used, and $2,600,000 of highly consumed parts used. The average inventory value from June 2006 to June 2007 for each of these spare type parts are as follows: $1,000,000 in Obsolete Spares, $1,500,000 in emergency or redundant parts, $750,000 in highly consumed parts $\frac{\$0}{\$1,000,000} = 0\,TurnsObsoleteParts$ $\frac{\$1,200,000}{\$1,500,000} = 0.8\,TurnsEmergencyParts$ $\frac{\$2,600,000}{\$750,000} = 3.5\,TurnsHighlyConsumedParts$

Metric Owner	Tom Sanborn and Terry Sharp

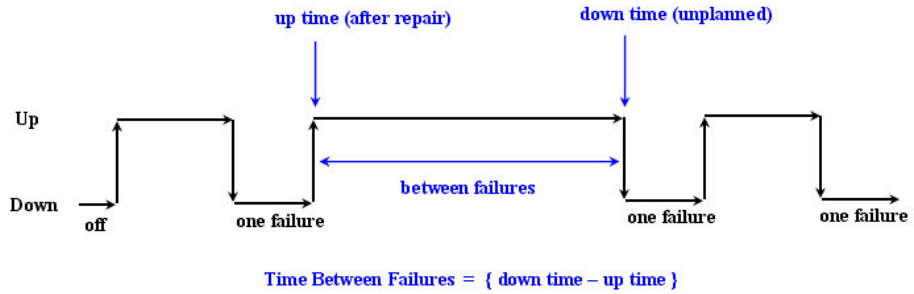
Estimated Time vs. Actual Time

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the hours that were estimated as necessary for job completion vs. the actual hours that it took to complete the jobs.
Objective	If estimated accurately, used to measure labor efficiency. Also can be used to tighten up the planning and scheduling process.
Calculation	$\frac{\text{Estimated Time (in Hours) Work Orders}}{\text{Actual Time (in Hours) for Work Orders}}$
Data Source	CMMS
Collection Frequency	Weekly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	For the 1st week of June, there were 40 planned jobs with a total estimated time of 385 hours. The actual hours that were logged for the jobs were 420 hours. $\frac{385}{420} = 91.6\%$
Metric Owner	Tom Sanborn and Terry Sharp

Maintenance Cost as a % of Estimated Replacement Value

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	A ratio of the current maintenance costs as compared to the estimated replacement value.
Objective	Used to determine if maintenance activities are value added or if the cost to replace outweighs the cost to maintain.
Calculation	$\frac{\text{Total Annual Maintenance Costs}}{\text{Estimated Replacement Value}}$ ***Total Annual Maintenance Costs*** is the total annual expenditure on all maintenance activities to include spare parts, labor (direct, indirect and contractual) and consumables, but does not include any capital expenditures. ***Estimated Replacement Value*** is the estimated, current day, replacement cost of all equipment maintained.
Data Source	CMMS, Finance System
Collection Frequency	Weekly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: 2.3%
Comments	None
Example	Operating Expenses for the Maintenance budget for the year including permanent labor, supplier repairs, temporary labor, lubricants, spare parts usage was $1.1MM. The estimated cost to replace the 3 lines, blending, and auxiliary equipment is $23MM. Maintenance cost as a % of ERV = $\frac{\$1.1}{\$23} = 4.8\%$
Metric Owner	Tom Sanborn and Terry Sharp

Mean Time Between Failures (MTBF)

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	The mean (average) time between failures of a piece of equipment.
Objective	Used to determine the life cycle of equipment as well as scheduling for predictive maintenance.
Calculation	$\frac{\sum(\text{downtime of the equipment} - \text{uptime for the equipment})}{\text{number of failures}}$ 
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The measure can be looked at as a complete line as well, but for reliability purposes and predictive maintenance, it should be reviewed by asset. This should be based on running hours of the equipment (no lights off).
Example	See table below.
Metric Owner	Tom Sanborn and Terry Sharp

Line	Equipment	Date/Time Equipment Repaired	Date/Time Equipment Failed	Time Between Failures	# of Failures
Line 1	Labeler	8/3/08 1:10 PM	8/8/08 2:00 AM	108:50:00	1
Line 1	Labeler	8/5/08 3:00 PM	8/9/08 1:00 PM	94:00:00	1
Line 1	Labeler	8/6/08 12:00 AM	8/10/08 9:00 AM	105:00:00	1
Total				307:50:00	3

$$MTBF = \frac{307:50:00}{3} = 102 \text{ hours } 36 \text{ minutes}$$

Mean Time to Repair (MTTR)

Category	Manufacturing – Maintenance
Metric Level	Tier III
Definition	The total amount of time spent performing all corrective maintenance repairs divided by the total number of those repairs.
Objective	Used to help identify potential down time and maintainability problems; repair/replace analysis; planning necessary resources (personnel, tools, test equipment, etc.).
Calculation	$\frac{\sum \text{Actual Time Spent on WOs for Asset}}{\text{Total Number of Work Orders}}$
Data Source	CMMS
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	See table below
Metric Owner	Tom Sanborn and Terry Sharp

Line	Equipment	Corrective Maintenance Work Order Time	Total Corrective Maintenance Work Orders
Line 1	Labeler	0:32	1
Line 1	Labeler	1:23	1
Line 1	Labeler	3:12	1
Total		5:07	3

$$MTTR = \frac{5:07}{3} = 1 \text{hour } 42 \text{ minutes}$$

Environmental, Occupational Health & Safety (EOSH)

Based on TCCC EOSH Performance Measurement Requirements

EOSH RACI

KPI	Mode of Communication	Comments	Operator / Technician	EOSH Coordinator	Quality supervisor	Maintenance Supervisor	Production Supervisor	EOSH / HR Manager	Quality Assurance Manager	Maintenance Manager	Production Manager	Plant Manager	National Director of EOSH	National Director of Quality	National Director of Manufacturing	National Director of Engineering	National Supply Chain director	Regional P&L Leader	COO/CEO
Lost Time Incident Rate	Informed through meetings/emails/ reports		I	R	R	R	R	A	R	R	R	I	I	I	I	I	I	I	I
First Aid Case Rate	On Visual board		I	R	R	R	R	A	R	R	R	I	I	I	I	I	I	I	I
Water Use Ratio	On Visual board		R	R	R	R	R	A	R	R	R	I	I	I	I	I	I	I	I
Total Energy Use	On Visual board		R	R	R	R	R	A	R	R	R	I	I	I	I	I	i	I	I

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Total Water Use

Category	EOSH
Metric Level	Tier III
Definition	Summation of all water entering the plant, from all sources, including municipal supplies, wells, surface water intake, and collected rain water. Does not include non-branded bulk water donated to the community.
Objective	Utilized to determine environmental impact from water consumption
Calculation	• Summation of all water entering the plant, from all sources
Data Source	Internal Records, water bills
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: Varies volume and processes **World Class**: Varies volume and processes
Comments	Report in kiloliters, 1 m^3 = 1000 kl
Example	A plant receives 287,632 kl of water from a city source, 54,331 kl from an onsite well and 32117 kl from recovered rainwater. A total of 13,123 kl was provided to the local community through a metered tap just outside the main gate. Total Water Use is (287,632 + 54,331 + 31,117) – 13,123 or 360,857 kl
Metric Owner	Michael Ferrell

Classified - Internal use

Water Use Ratio

Category	EOSH
Metric Level	Tier II
Definition	Measurement of the liters of water used to produce a liter of product
Objective	Utilized to determine environmental impact from water consumption
Calculation	$\frac{\text{Total Water Used (liters)}}{\text{Total Product Volume Produced (liters)}}$
Data Source	Production Records, Internal Records, water bills
Collection Frequency	Monthly
Related Supporting Metrics	Total Water Use, Production Volume
Benchmark	**Industry Average**: Varies by product and package **World Class**: Varies by product and package
Comments	
Example	During one month a plant produced 600,000 liters of finished beverage. Total water used for the plant during this period was 2,400,000 liters Water Use Ratio = $\frac{2{,}400{,}000}{600{,}000} = 4.0$
Metric Owner	Michael Ferrell

Total Wastewater Discharged

Category	EOSH
Metric Level	Tier III
Definition	Total of all process wastewater discharged off site
Objective	Utilized to determine environmental impact from water consumption
Calculation	Measure in m^3. Total volume of wastewater discharged from on-site wastewater treatment (including sprayfields, etc.), off-site wastewater treatment, or directly to natural bodies of water. Include *stormwater and sanitary* wastewater for toilets, sinks, and canteens **only** if you combine it with *process* wastewater on site and discharge as process wastewater.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Total Water Use, Total Production Volume
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Report in kl (1 m^3 = 1000 kl). Do not include stormwater collected from rainfall into separate, dedicated stormwater drains. Do not include any wastewater re-used or recycled prior to discharge (separate metric). Can be *estimated* by subtracting the total production volume from the total water used.
Example	A plant operates a wastewater treatment plant with a metered outfall. It measures 513,498 kl of wastewater flow for the month. The total wastewater discharged is 513,498 kl.
Metric Owner	Michael Ferrell

Total Wastewater Recycled or Recovered

Category	EOSH
Metric Level	Tier III
Definition	Total of all process wastewater re-used or recycled
Objective	Utilized to determine environmental impact from water consumption
Calculation	Total volume of *treated* wastewater re-used or recycled and not discharged..
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Total Water Use, Total Wastewater Discharged, Total Production Volume
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	Report in kl (1 m^3 = 1000 kl). Any quantity included as re-used or recycled would not be included in the volume of total wastewater discharged. An example of re-use would be for on-site irrigation or used to flush toilets. Total wastewater recovered/recycled can be estimated by subtracting total production volume and total wastewater discharged from the total water use.
Example	A site uses treated wastewater to irrigate the landscaping. A metered pump pulls water from the disinfection tank before the effluent enters the discharge pipe. A total of 200 kl were recorded for the month. The total wastewater recovered/recycled would be 200 kl.
Metric Owner	Michael Ferrell

Total Energy Use

Category	EOSH
Metric Level	Tier III
Definition	Total of all energy consumed, with the exception of fuels used for fleet operations. Includes fuels used to run generators but not the electricity produced by the generators. Includes fuels used to produce CO_2.
Objective	Utilized to determine environmental impact from energy consumption
Calculation	Summation of all types of energy consumed for the site: • Electricity (Include all electricity purchased from grid or non-grid supplies or generated on site from non-fueled sources like solar or wind) • Gas - Natural Gas, Petroleum gases (LPG, Propane), Biogas, landfill gas, wastewater treatment process gas • Ethanol • Light Fuel Oil (diesel, biodiesel, kerosene, #2 FO, LSD, HSD, etc.) • Heavy Fuel Oil (Bunker C, #6 FO) • Coal, peat, lignin • Biomass (wood, wood chips, agricultural waste) • Purchased steam, hot water • Other
Data Source	Internal Records, Energy bills
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	Calculate in mega joules by energy type. Conversion of each fuel type to MJ may be done automatically through the EOSHPM data collection system. The EOSHPM Guidelines also contain conversion factors for manual calculation, as well as suggestions for obtaining the data.
Example	None
Metric Owner	Michael Ferrell

Energy Use Ratio

Category	EOSH
Metric Level	Tier II
Definition	Measurement of the total mega joules of energy used to produce a liter of product
Objective	Utilized to determine environmental impact from energy consumption
Calculation	$\frac{\text{Total Energy Used (megajoules)}}{\text{Total Product Volume Produced (liters)}}$
Data Source	Production Records, Internal Records, Energy bills
Collection Frequency	Monthly
Related Supporting Metrics	Total Energy Use, Production Volume
Benchmark	**Industry Average**: varies by climate, volume, processes **World Class**: varies by climate, volume, processes
Comments	None
Example	During one month a plant used 600,000 mj of energy. Total production volume during this period was 2,400,000 liters $\frac{600{,}000}{2{,}400{,}000} = 0.25 \text{mj/L}$
Metric Owner	Michael Ferrell

CO_2 Loss Emissions

Category	EOSH
Metric Level	Tier III
Definition	CO_2 emissions accountable to the site from indirect and direct loss of CO_2.
Objective	Utilized to determine environmental impact
Calculation	Summation of the loss of CO_2, calculated from the CO_2 yield: (100 – CO_2 yield) X CO_2 purchased during the reporting period (metric tons)
Data Source	Internal Records, CO_2 invoices
Collection Frequency	Monthly
Related Supporting Metrics	CO_2 yield
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	
Example	Plant CO_2 yield for July was calculated as 65%. Purchases for the month totaled 100 tons. CO_2 loss emissions would be (100 – 65) X 100 tons = 35 tons
Metric Owner	John Sweeney

Total Greenhouse Gas Emissions

Category	EOSH
Metric Level	Tier II
Definition	Total of all greenhouse gas emissions accountable to the site from indirect and direct energy consumption. Fuels used for fleet operations will be accounted for separately.
Objective	Utilized to determine environmental impact from energy consumption
Calculation	Summation of the GHG emissions from 1) all types of energy consumed for the site: • Electricity (Include all electricity purchased) • Natural Gas • Petroleum gases (LPG, Propane) • Biogas • Light Fuel Oil (diesel, kerosene, #2 FO, LSD, HSD, etc.) • Heavy Fuel Oil (Bunker C, #6 FO) • Coal, peat, lignin • Biomass (wood, wood chips, agricultural waste) • Purchased steam, hot water • Other and 2) the CO_2 Loss Emissions
Data Source	Internal Records, Energy bills
Collection Frequency	Monthly
Related Supporting Metrics	Total Energy Use, CO_2 Loss Emissions
Benchmark	**Industry Average**: varies by climate, volume, processes **World Class**: varies by climate, volume, processes
Comments	The GHG emissions (in tons) can be calculated from emissions factors for each energy source; may be done automatically through the EOSHPM data collection system
Example	The plant energy sources included electricity, natural gas (boilers, space heaters) and light fuel oil (boiler back up). Entering in the kilowatt hours, therms and liters of oil used into the EOSHPM tool, the plant GHG emissions for the period were calculated as 2450 tons. The CO_2 Loss Emissions were calculated to be 10 tons. The total GHG emissions for the reporting period would be 2450 + 10 = 2460 tons.
Metric Owner	Michael Ferrell

Total Fleet Emissions

Category	EOSH
Metric Level	Tier III
Definition	Total of all greenhouse gas emissions accountable to fleet operations from fuel consumption.
Objective	Utilized to determine environmental impact from energy consumption
Calculation	Summation of the Total Fuel use by fuel type, converted to Equivalent Diesel (liters) X (average emission factor for diesel)
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Fleet Fuel Consumption
Benchmark	**Industry Average**: Varies by fuel type and distance driven **World Class**: Varies by fuel type and distance driven
Comments	Fleet emissions may be calculated automatically through the EOSHPM data collection system, or manually using emissions factors available from the Environment and Water Resources department.
Example	None
Metric Owner	Michael Ferrell

Classified - Internal use

Fleet Fuel Consumption

Category	EOSH
Metric Level	Tier II
Definition	Total quantity of all fuel types consumed by all owned, leased, and 3rd party delivery vehicles in the fleet during the reporting period, converted to the diesel equivalent fuel consumption.
Objective	Utilized to determine environmental impact from energy consumption
Calculation	Summation of the total fuel use by the fleet in diesel equivalents: • Gasoline, regular unleaded • Gasoline, RFG (10% MBTE) • Diesel • Liquid Natural Gas • Compressed Natural Gas • Propane/LPG • Methanol (M-100) • Methanol (M-85) • Ethanol (E-100) • Ethanol (E-85) • Biodiesel (B-20) The diesel equivalent can be calculated automatically through the EOSHPM data collection system or from factors for each fuel type
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: Varies by fuel type and distance driven **World Class**: Varies by fuel type and distance driven
Comments	None
Example	None
Metric Owner	Lou Swanson

Total Waste Generated

Category	EOSH
Metric Level	Tier III
Definition	Total of all waste generated at the site due to production, construction, food service or any other activities
Objective	Utilized to determine environmental impact from waste generation
Calculation	Summation of the mass of all waste generated at the site. Do not include liquid wastes disposed of through the wastewater system as these wastes are accounted for in wastewater discharge volume and wastewater sludge.
Data Source	Internal Records, Disposal bills
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: Varies by process **World Class**: Varies by process
Comments	Calculate in metric tons
Example	Examples: paper, plastic, corrugated cardboard, metal, glass, sludge from your water, wastewater and sugar treatment processes, waste oils, fleet wastes (tires, batteries, coolants, oils, etc.), damaged ingredients or products, any liquid wastes disposed off-site, plus all hazardous wastes such as solvents, inks and lab wastes.
Metric Owner	Michael Ferrell

Waste Generation Ratio

Category	EOSH
Metric Level	Tier III
Definition	Measurement of the total grams of waste generated to produce a liter of product
Objective	Utilized to determine environmental impact from waste generation
Calculation	$\frac{\text{Total Waste Generated*} (1{,}000{,}000 \text{gm/MT})}{\text{Total Product Volume Produced (Liters)}}$
Data Source	Production Records, Internal Records, Energy bills
Collection Frequency	Monthly
Related Supporting Metrics	Total Waste Generation, Production Volume
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	None
Metric Owner	Michael Ferrell

Total Waste Recovered or Recycled

Category	EOSH
Metric Level	Tier III
Definition	Total of all waste recovered through *recycling*, burning with energy recovery, composting, or land application.
Objective	Utilized to determine environmental impact from waste generation
Calculation	Direct: Summation of the mass of all waste recovered at the site Indirect: Total Waste Generated – Total Waste disposed to landfill.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Total Waste Generated;
Benchmark	**Industry Average**: Varies by local waste management practices and recovery opportunities **World Class**: 100% recovered/recycled
Comments	Calculate in metric tons
Example	None
Metric Owner	Michael Ferrell

Classified - Internal use

Recovery Ratio

Category	EOSH
Metric Level	Tier III
Definition	Percentage of the total waste generated that is recovered through *recycling*, burning with energy recovery, composting, or land application.
Objective	Utilized to determine environmental impact from waste consumption
Calculation	$\frac{\text{Total Waste Recovered (MT)}}{\text{Total Waste Generated (MT)}}$
Data Source	Internal Records,
Collection Frequency	Monthly
Related Supporting Metrics	Total waste generated, Total waste recovered
Benchmark	**Industry Average**: Varies by local waste management practices and recovery opportunities **World Class**: 100%
Comments	None
Example	During one month a plant produced 600 tons of waste. Of this, 200 tons were recycled. Recovery Ratio = $\frac{200}{600} = 33\%$
Metric Owner	Michael Ferrell

Total Ozone Depleting Substance Emissions

Category	EOSH
Metric Level	Tier III
Definition	Total **Ozone Depleting Substance (ODS) emissions** generated at the site, typically from maintenance of refrigeration equipment
Objective	Utilized to determine environmental impact from waste generation
Calculation	Summation of the mass of all ODS emissions attributed to the site. • Chlorofluorocarbons (CFC's) • Hydrochlorofluorocarbons (HCFC's) • Halons If these emissions are not 'measured' then they may be approximated as: (total amount of charge replaced)-(amount recaptured).
Data Source	Internal Records
Collection Frequency	Annually
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: Zero
Comments	Calculate in kilograms
Example	A cold drink Service Center maintains an inventory of the quantity and type of refrigerant gases used in the equipment it maintains and new refrigerant for servicing equipment. • The inventory records showed that 120 kg of CFC 134a was purchased during the year and added to existing inventory of 57 kg. • A total of 53 compressors were disposed, netting 116.6 kg of recovered refrigerant. Of this only 50 kg was recoverable and the rest sent to a certified disposal site. • Service records show a total of 157 kg were used. • Year-end inventory of CFC gas was 55kg. Total CFC added to the inventory (57 + 120 +50) or 227 kg Year-end inventory: 55 kg Net use from inventory during the year: 172 kg Service use: 157kg Emission loss for the year (172 – 157) = 15 kg
Metric Owner	Michael Ferrell

Total Fatalities

Category	EOSH
Metric Level	Tier II
Definition	1. A loss of life occurring to an employee, as defined above, as the result of a work-related incident 2. A loss of life occurring to a contractor as the result of a work-related incident while performing work exclusively for the Company; OR a loss of life occurring to a 3rd party (such as a vendor or site visitor) as the result of a work-related incident that occurs while on Company property. 3. A loss of life occurring to a member of the general public (not affiliated with Coca-Cola) as a result of interaction with Company property or work-related interaction with Company employees or contractors
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the employee, contractor and public fatalities attributed to the site from its operations.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: 0
Comments	None
Example	A company truck with a contractor driver and helper has a road accident with a car carrying a family of 4. The helper and two occupants of the car are killed. The TCCC entity (depot, warehouse, plant, sales center, etc.) dispatching the vehicle would record 1 contractor and 2 public fatalities (total of 3) in its monthly report.
Metric Owner	Michael Ferrell

Classified - Internal use

First Aid Cases

Category	EOSH
Metric Level	Tier II
Definition	A work-related incident which required some level of basic first aid. First aid- The immediate actions taken when a work related accident or acute illness occur to maintain important functions in the body or to prevent further injuries. This includes, but is not limited to, such things as cleansing and disinfecting wounds, applying bandages or sterile gauze wraps, applying first aid creams, salves or ointments, removing splinters and metal slivers, icing bruises or blisters, applying hot packs, flushing contaminants from the eyes, and tending to insect stings and bites. Observations performed subsequent to a work related injury to ascertain fitness to return to work are considered first aid cases. For example, having a worker lie down after a fall or chemical exposure to check for other symptoms or dizziness would be considered first aid. The use of eyewashes and safety showers in order to prevent further injuries from hazardous materials is considered a first aid case.
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the incidents during the reporting period which required some sort of basic first aid.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	None
Metric Owner	Michael Ferrell

Classified - Internal use

First Aid Case Rate

Category	EOSH
Metric Level	Tier II
Definition	The number of First Aid Cases (FAC) per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{FAC} \times 200{,}000}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	First Aid Cases; Total Hours Worked
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks).
Example	A plant records 3 first aid cases in its register. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The First Aid Case Rate is (3 X 200,000)/32,000 = 18.75
Metric Owner	Michael Ferrell

Lost Time Incidents

Category	EOSH
Metric Level	Tier III
Definition	A work-related incident, including fatality, which results in one or more Lost Days.
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the lost time incidents (LTI) attributed to the site during the reporting period.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost Time Incident Rate, First Aid Case Rate
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	A single event which results in Lost Days for two or more employees is counted as two or more LTI's. A LTI is counted as a First Aid case and a Medical Treatment case.
Example	A worker falls and hits his head, knocking him out. He is taken to the supervisor's office for evaluation. The supervisor decides to take the injured worker to the local clinic for evaluation by a medical doctor. The doctor determines the worker has a suffered a concussion and recommends that he take a couple of days bed rest and see his personal doctor for follow up. The worker does not report back to work for 3 days. The site would record this as a LTI with 3 lost days and a first aid case.
Metric Owner	Michael Ferrell

Lost Time Incident Rate

Category	EOSH
Metric Level	Tier II
Definition	The number of Lost Time Incidents per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{LTI \times 200{,}000}{Total Hours\ Worked}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost time incidents; Total Hours Worked, First Aid Case Rate
Benchmark	**Industry Average**: 1.5 **World Class**: <0.5
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). LTIR can be approximated by the LTI per 100 full time workers.
Example	A plant records 1 LTI cases in July. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The Lost Time Incident Rate is (1 X 200,000)/32,000 = 6.25
Metric Owner	Michael Ferrell

Lost Time Days

Category	EOSH
Metric Level	Tier III
Definition	The total number of Lost Days associated with LTI's which occurred during the reporting period. A Lost Day occurs when, in the opinion of the physician of record, the employee cannot work, or requires restrictions which prevent the employee from performing routine job functions, or requires a job transfer.
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the lost days attributed to the site during the reporting period. Lost Days are counted as calendar days where counting begins the first day following the injury and ends when the person returns to full duty, receives a permanent job transfer, leaves employment, or reaches 180 Lost Days. The first Lost Day is the first day following the injury, regardless of whether it was a scheduled workday, if the criteria for 'Lost Day' are met. Lost days are associated with the LTI which caused them, and do not transfer across reporting periods--i.e, lost days associated with a Lost Time Injury in a prior reporting period are not counted in the current reporting period. If an employee is still out at the end of a reporting period, enter the estimated total number of Lost Days. If the actual number of Lost Days turns out to be different than the estimate, then update the record for the reporting period in question. In the event of a fatality, record 1 Lost Day.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	A worker falls and hits his head, knocking him out. He is taken to the supervisor's office for evaluation. The supervisor decides to take the injured worker to the local clinic for evaluation by a medical doctor. The doctor determines the worker has a suffered a concussion and recommends that he take a couple of days bed rest and see his personal doctor for follow up. The worker does not report back to work for 3 days. The site would record this as a LTI with 3 lost days.
Metric Owner	Michael Ferrell

Lost Time Incident Severity Rate

Category	EOSH
Metric Level	Tier II
Definition	The number of Lost Time Days per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{Total Lost Work Days X 200,000}}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost Time Days; Total Hours Worked
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). LTISR approximates the days of lost work per LTI
Example	A plant records 1 LTI cases in July with a total of 6 lost days. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The LTISR would be (6 X 200,000)/32,000 = 37.5 days
Metric Owner	Michael Ferrell

Lost Time Incident Opportunity Costs (Productivity Losses)

Category	EOSH
Metric Level	Tier III
Definition	Costs (direct and indirect) associated with a lost time incident. Costs incurred by the Company, include • **Direct costs** (lost wages, medical claims and treatment (including long-term therapy and treatment), third party liability costs, claims handling and legal fees, and property damage costs); and • **Indirect costs** (increases in workers compensation and insurance premium payments, replacement worker wages and training costs, fines, penalties and other accruals).
Objective	Utilized to determine the safety impact of the operation
Calculation	Sum all direct and indirect costs attributable to all LTIs per a reporting period, (converted to US$)
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Lost time incidents
Benchmark	**Industry Average**: NA **World Class**: NA
Comments	None
Example	A delivery driver is injured in a crash which totals the delivery truck and its contents. A 3rd party car was also damaged and its occupant injured. The driver was determined to be at fault. Insurance paid the claim for the damaged vehicles, the lost goods, legal bills and the medical bills, a total payout of $525,500. The company paid a $5000 deductible on the claim. The insurance premiums went up $500 for the next period. The driver incurred 34 lost days for which he was paid his normal salary of $200/day. Overtime (1.5 normal time) was used to cover his route in his absence. Cost of the accident: $5000 + $500 + (34 X $200) + (34 X $100 <- The overtime premium) or $15,700.
Metric Owner	Michael Ferrell

Medical Treatment Case

Category	EOSH
Metric Level	Tier III
Definition	A work related injury or illness that requires medical treatment beyond standard first aid. Classification is based on the treatment required in the opinion of the physician of record, regardless of who provides it or even if it is actually provided.
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the medical treatment cases attributed to the site during the reporting period.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The number of medical treatment cases will always be greater than or equal to the number of Lost Time Incidents (LTIs), since every LTI is counted as a medical treatment case. Every medical treatment case is also counted as a first aid case.
Example	A worker falls and hits his head, knocking him out. He is taken to the supervisor's office for evaluation. The supervisor decides to take the injured worker to the local clinic for evaluation by a medical doctor. The site would record one medical treatment case and one first aid case.
Metric Owner	Michael Ferrell

Classified - Internal use

Total Incident Rate

Category	EOSH
Metric Level	Tier II
Definition	The number of Medical Treatment cases per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{Total Medical Treatment Cases X 200,000}}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Medical Treatment Cases; Total Hours Worked
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). TIR can be approximated by the medical treatment cases per 100 full time workers.
Example	A plant records 1 medical treatment case in July. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The Total Incident Rate is (1 X 200,000)/32,000 = 6.25
Metric Owner	Michael Ferrell

Absent Days

Category	EOSH
Metric Level	Tier III
Definition	A day when an employee is absent from work because of incapacity of any kind, not just as the result of work-related injury or disease. Work related or non-work related injuries and illnesses are included, in addition to any other non-permitted leave absences.
Objective	Utilized to determine the safety impact of the operation
Calculation	Summation of the total absence days attributed to the site during the reporting period.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average** TBD **World Class** TBD
Comments	Permitted leave absences such as holidays, study, maternity/paternity and compassionate leave are excluded.
Example	None
Metric Owner	Michael Ferrell

Absence Days Rate

Category	EOSH
Metric Level	Tier II
Definition	The total number of Absence days per standard work period (200,000 hours)
Objective	Utilized to determine the safety impact of the operation
Calculation	$\frac{\text{Total Absence Days X 200,000}}{\text{Total Hours Worked}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Total Absence days; Total Hours Worked
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	The calculation is based on 200,000 hours (100 full-time equivalent employees (FTE) working 40 hours per week for 50 weeks). ADR can be approximated by the absence days per 100 full time workers.
Example	A plant records 30 Absence days. Total hours worked during the reporting period were 32,000 (200 workers X 40 hr/week X 4 weeks) The Absence Days Rate is (30 X 200,000)/32,000 = 187.5
Metric Owner	Michael Ferrell

Vehicle Crashes

Category	EOSH
Metric Level	Tier II
Definition	Any incident in which a company vehicle is involved (whether in motion, temporarily stopped, parked or being loaded or unloaded) that results in personal injury and/or property damage, regardless of who was hurt, what property was damaged, the extent of the damage, who was responsible, whether the incident was preventable, or whether the incident was legally required to be reported. Crashes involving company cars are included regardless of whether they occur during business or personal use. Crashes are independent of any associated injury. For example, a single crash resulting in LTI's to two employees will be reported as one crash in the Fleet metrics, and as two LTI's in the Facility OSH metrics.
Objective	Utilized to determine the fleet safety impact of the operation
Calculation	Summarize all crashes of owned and leased (but not 3rd party) delivery and 'all other' vehicles during the reporting period. This includes crashes involving rented or leased vehicles or personal vehicles used on company business.
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Vehicle Crash Rate
Benchmark	**Industry Average**: N/A **World Class**: N/A
Comments	
Example	A post trip inspection of a transport trailer showed a broken tail lamp and fender dent. This is reported as a "crash". A company pool car has a defect report turned in for a broken headlamp, reportedly from a stone impact. This is reported as a "crash". While attempting to maneuver around stalled traffic, a company-owned motorcycle hits a vehicle and breaks a mirror. This is reported as a "crash". A delivery truck returning from its route is parking in the plant yard and gets too close to a light post, putting a scratch down the length of the truck. This is reported as a crash.
Metric Owner	Michael Ferrell

Vehicle Crash Rate

Category	EOSH
Metric Level	Tier II
Definition	The number of vehicle “Crashes” per million kilometres driven
Objective	Utilized to determine the fleet safety impact of the operation
Calculation	$\frac{\text{Total Vehicle Crashes X 1,000,000}}{\text{Total kilometers Driven}}$
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Vehicle Crashes,
Benchmark	**Industry Average**: 5.0 per mm km **World Class**: 1 per mm km
Comments	**Crash**—any incident in which a Company vehicle is involved (whether in motion, temporarily stopped, parked or being loaded or unloaded) that results in personal injury and/or property damage, regardless of who was hurt, what property was damaged, the extent of the damage, who was responsible, whether the incident was preventable or whether the incident was legally required to be reported. Count all crashes of owned and leased (but not 3rd party) distribution and ‘all other’ vehicles. This includes crashes involving rented or leased vehicles or personal vehicles used on Company business. Crashes involving Company cars are included regardless of whether they occur during business or personal use. **Covered Vehicles**—All motorized over-the-road vehicles including autos (inclusive of Company cars, route sales vehicles, cold drink services, etc.), trucks, trailers, vans, motorcycles, employee transport vans and buses and yard tractors, By definition, does not include lift trucks, personnel lifts or similar equipment. Contract carriers are included in the scope of these requirements if: - The vehicles bear the Company name, images or Trademarks; - The carrier is under long-term contract (> 1 year) to transport Company products; or - The carrier is exclusively carrying Company products.
Example	All vehicles in a Bottler’s fleet record a total of 726,935 km driven for the month, with 7 crashes. (7 X 1,000,000)/726,953 = 9.63 Crash Rate
Metric Owner	Michael Ferrell

Vehicle Crash Costs

Category	EOSH
Metric Level	Tier II
Definition	The sum of all incurred costs from vehicle accidents in the reporting period. The cost total does not include insurance premium payments and broker fees, but does include property damage direct costs, third party liability costs, claims handling and legal fees, third party medical injury cost, repair or replacement costs of vehicles or other property, fees, penalties and other accruals.
Objective	Utilized to determine the safety impact of the operation
Calculation	Sum all direct and indirect costs attributable to all vehicle crashes per a reporting period
Data Source	Internal Records
Collection Frequency	Monthly
Related Supporting Metrics	Vehicle crashes
Benchmark	**Industry Average**: TBD **World Class**: TBD
Comments	None
Example	None
Metric Owner	Michael Ferrell

Classified - Internal use

Quality

Classified - Internal use

Quality RACI

Mode of Communication	Comments	Operator/ Technician	Consumer Coordinator	Quality Supervisor	Maintenance Supervisor	Production Supervisor	Quality Assurance Manager	Maintenance Manager	Production Manager	Plant Manager	Manager of Planning (DOIP)	National Quality Director	National Manufacturing Manager	National Engineering Director	National Logistics Director	National Marketing/ Sales Director	National Supply Chain Director	COO/COE
Visual Management and Monthly reports		I	I	R	R	R	A	C	C	C	I	C	C	I	C	C	C	I
Visual Management and Monthly reports		I	I	R	R	R	A	C	C	C	I	C	C	I	C	C	C	I
Management Reviews and Monthly reports	May be on Visual Boards per line	I	R	R	R	R	A	C	C	C	I	C	C	I	C	C	C	I

	Daily
	Weekly
	Monthly
	Quarterly

R	Responsible
A	Accountable
C	Consult
I	Inform

Product Quality Index

Category	Quality
Definition	This is the Beverage Product Quality Indicator (BPQI) which includes the following parameters: - Appearance - Taste - Brix - Carbonation - Microbiological - Acid/ Special Assay - Salts - Still Beverage Parameters
Metric Level	Tier I
Objective	To indicate the Beverage Product Quality (as per specifications) of product sampled in the Market Place using a sampling plan as per sales volume
Calculation	As per TCCC Quality Measures database. Example of calculation used in Quality Measures: Beverage Product Quality Indicator: $X = A \times B \times (C \text{ or } I) \times (D \text{ or } G \text{ or } H) \times E \times 100$ $A = \frac{(C_s - F_a)}{C_s}$ $B = \frac{(C_s - F_t)}{C_s}$ $C = \frac{(C_v - F_v)}{C_v}$ $D = \frac{(C_b - F_b)}{C_b}$ $E = \frac{(C_y - F_y)}{C_y}$ $G = \frac{(C_p - F_p)}{C_p}$ $H = \frac{(C_x - F_x)}{C_x}$ $I = \frac{(C_k - F_k)}{C_k}$ X = BPQI A = appearance parameter B = taste parameter C = carbonation parameter D = beverage °Brix parameter E = micro parameter G = acid parameter H = salt parameter I = vacuum parameter C_b = number of beverage °Brix data C_s = number of samples reported C_v = number of carbonation data C_y = number of micro data C_p = number of acid data C_x = number of salt data C_k = number of vacuum data F_a = number of non-conforming samples in appearance F_b = number of non-conforming samples in beverage °Brix F_t = number of non-conforming samples in taste F_v = number of non-conforming samples in carbonation F_y = number of non-conforming samples in micro F_p = number of non-conforming samples in acid F_x = number of non-conforming samples in salt F_k = number of non-conforming samples in vacuum

<table>
<tr><td>Data Source</td><td>Global Quality Measures database</td></tr>
<tr><td>Collection Frequency</td><td>Based on analysis conducted on a Monthly basis and reported on a monthly basis</td></tr>
<tr><td>Benchmark</td><td><table>
<tr><td>Industry Average</td><td>95%</td></tr>
<tr><td>Best in Class</td><td>100%</td></tr>
<tr><td>World Class</td><td>99%</td></tr>
</table></td></tr>
<tr><td>Comments</td><td>The Quality measures results are derived from samples taken from the market place and analyzed by TCCC Trade Sample laboratories.
There are several ways of viewing samples analyzed namely:
• Total Produced View – Sample Weighted View of all samples that were produced by a plant (regardless where they are sold).
• Total Sold View – Sample Weighted View of all samples that were sold in a sales territory (regardless where they were produced)
• Sales Weighted View – Same as Total Sold View but sales weighted (instead of sample weighted)</td></tr>
</table>

Example

Sales Weighted BPQI calculation : for example, all packages for single product, single sales territory

Package	% sales	Taste	App	Brix	CO_2	Micro	QI	Sales weighted contribution
300ml can	*10.49*	99	100	100	100	100	99	**10.39**
2L PET	*15.95*	100	100	100	100	100	100	**15.95**
600ml PET	*37.06*	100	100	87	100	100	87	**32.24**
1.5L PET	*23.38*	100	100	100	100	100	100	**23.38**
300ml RGB	*13.12*	66.67	33.33	66.67	66.67	66.67	6.59	**0.86**
	100	**95.52**	**91.25**	**90.81**	**95.63**	**95.63**		82.82

Sales weighted attribute

Sales Weighted BPQI

Metric Owner

Saratha Packirisamy

Package Quality Index

Category	Quality
Metric Level	Tier I
Definition	This is the Primary Container Quality Indicator (PCQI) which includes the following parameters: - Net Content - Container Condition (which includes labeling condition) - Closure condition - Closure Function and application (includes can tabs, Crowns and closures) - Date code efficiency (on primary packaging)
Objective	To indicate the Primary Container Quality (as per specifications) on product sampled in the Market Place
Calculation	As per TCCC Quality Measures database. Example of calculation used in Quality Measures: Primary Container Quality Indicator: $X = A \times B \times C \times D \times E \times 100$ $A = \frac{(C_s - F_c)}{C_s}$ $B = \frac{(C_s - F_l)}{C_s}$ $C = \frac{(C_s - F_o)}{C_s}$ $D = \frac{(C_q - F_q)}{C_q}$ $E = \frac{(C_f - F_f)}{C_f}$ X = PCQI A = container condition B = date coding C = closure condition D = closure function E = net content C_q = number of closure function reported C_f = number of net content reported C_s = number of samples reported as analyzed other than BIT F_q = number of non-conforming samples in closure function F_o = number of non-conforming samples in closure condition F_c = number of non-conforming samples in container condition F_f = number of non-conforming samples in net content F_l = number of non-conforming samples in date coding
Data Source	Global Quality Measures database

Product	Primary Container	# PC Smpls	PCQI	% Cfrm Clo Cnd	% Cfrm Clo Fnc	% Cfrm Cnt Cnd	% Cfrm Fil Hgt	% Cfrm Net Con	% Cfrm Dte Cd	Age Avg	% Cfrm Tot
1 - Detail											
Coke	NR Plas Btl 1 Ltr Stra	1	100	100	100	100		100	100	51	100
	NR Plas Btl 2 Ltr Stra	87	93	100	93	100		100	100	24	93
	NR Plas Btl 500 Ml Cntr	19	85	100	89	100		100	95	19	89
	REF Glass Btl 1.25 Ltr Stra	104	94	100	95	100	100	99	100	23	95
	REF Glass Btl 350 Ml Stra	1	100	100	100	100	100	100	100	21	
	Total Primary Containers	212	93	100	94	100	100	100	100	23	94
Coke Zero	NR Plas Btl 500 Ml Cntr	4	75	100	75	100		100	100	42	75
	Total Primary Containers	4	75	100	75	100		100	100	42	75
Coke lt	NR Plas Btl 1 Ltr Stra	1	100	100	100	100		100	100	77	100
	NR Plas Btl 2 Ltr Stra	19	100	100	100	100		100	100	34	100
	NR Plas Btl 500 Ml Cntr	5	60	100	60	100		100	100	49	60
	NR Plas Btl 500 Ml Stra	2	100	100	100	100		100	100	22	100
	Total Primary Containers	27	93	100	93	100		100	100	38	93
Fanta Grp	NR Plas Btl 2 Ltr Stra	5	60	100	60	100		100	100	23	60
	NR Plas Btl 500 Ml Stra	19	89	100	89	100		100	100	34	89
	REF Glass Btl 1.25 Ltr Stra	11	91	100	91	100	100	100	100	28	91
	Total Primary Containers	35	86	100	86	100	100	100	100	30	86
Fanta Org	NR Plas Btl 2 Ltr Stra	2	100	100	100	100		100	100	23	100
	NR Plas Btl 500 Ml Stra	16	94	100	94	100		100	100	35	94
	REF Glass Btl 1.25 Ltr Stra	13	92	100	92	100	100	100	100	38	92
	Total Primary Containers	31	94	100	94	100	100	100	100	36	94
Fanta Pine	NR Plas Btl 2 Ltr Stra	5	60	100	60	100		100	100	30	60
	REF Glass Btl 1.25 Ltr Stra	12	58	100	58	100	100	100	100	36	58
	Total Primary Containers	17	59	100	59	100	100	100	100	34	59
Krest Gin Ale	REF Glass Btl 1.25 Ltr Stra	1	0	100	0	100	100	100	100	8	0
	Total Primary Containers	1	0	100	0	100	100	100	100	8	0
Schw Club Soda-KO	NR Plas Btl 2 Ltr Stra	1	100	100	100	100		100	100	8	100
	REF Glass Btl 1.25 Ltr Stra	1	100	100	100	100	100	100	100	121	100

Collection Frequency

Based on analysis conducted on a Monthly basis and reported on a monthly basis

Benchmark

Industry Average	90%
Best in Class	100%
World Class	99%

Comments

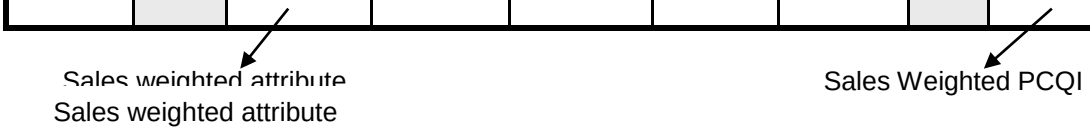
The Quality measures results are derived from samples taken from the market place and analyzed by TCCC Trade Sample laboratories.
There are several ways of viewing samples analyzed namely:

- Total Produced View – Sample Weighted View of all samples that were produced by a plant (regardless where they are sold).
- Total Sold View – Sample Weighted View of all samples that were sold in a sales territory (regardless where they were produced)
- Sales Weighted View – Same as Total Sold View but sales weighted (instead of sample weighted)

Example

Sales Weighted PCQI calculation : for example, all packages for single product, single sales territory

Package	% sales	Container Condition	Closure Condition	Date Code Efficiency	Net Content	Closure Function	QI	Sales weighted contribution
300ml can	*10.49*	99	100	100	100	100	99	**10.39**
2L PET	*15.95*	100	100	100	100	100	100	**15.95**
600ml PET	*37.06*	100	100	87	100	100	87	**32.24**
1.5L PET	*23.38*	100	100	100	100	100	100	**23.38**
300ml RGB	*13.12*	66.67	33.33	66.67	66.67	66.67	6.59	**0.86**
	100	**95.52**	**91.25**	**90.81**	**95.63**	**95.63**		82.82



Owner

Saratha Packirisamy

Consumer Complaint Rate

Category	Quality
Metric Level	Tier I
Definition	The total number of Product Integrity and Package Integrity related Consumer Complaints verified per million physical individual containers sold. Verification of a complaint includes: • Receiving the sample and conducting evaluation/analysis • Have information regarding consumer complaint from consumer perspective • Have identification information for product and/or package • Investigation and analysis of root cause • Feedback to consumer • Corrective and preventive actions to close out
Objective	4. To measure the trend of consumer complaints (YTD) in order to reduce the rate of current year against previous year. 5. To identify trends of specific Complaint types, for example: • Off Tastes in can product • Foreign Material in Refillable containers • Leakers 6. To identify multiple complaints within the specified criteria for investigation and corrective action planning.
Calculation	$\frac{\text{Total Number of Complaints}}{\text{1,000,000 containers sold}} = \text{Consumer Complaint Rate (CCR)}$ • Use of formatted spreadsheet for input and for calculation • Review trend analysis per complaint type on a year to date basis
Data Source	• Complaints received through the following sources: By letter, email or in person at the manufacturing plant or distribution/sales center, through the internet on the Company website, through the local or global call center, from Consumer board, through Bureau of Standards • In Plant Consumer Response Program database (daily input) which updates into the Monthly Consumer report
Collection Frequency	Collected daily with input into in-plant database. Monthly report out.
Related Supporting Metrics	No direct related metrics. Quality measures do have an indirect relation to trends of multiple complaints
Benchmark	**Industry Average**: 0.2 per million container sold **Best in Class**: 0 per million containers sold **World Class**: <0.4%
Comments	This can be split up into Package types and/or Complaint types (such as foreign materials, off tastes, gushing)
Example	Input Spreadsheet (refer below)
Metric Owner	Saratha Packirisamy

Number of Packages sold 39002378	Under Fills	Foreign Material	Peaked Cans	Leakers	Off Taste/ Off odor	Appearance	Micro Contam.	Low Carbonation	Glass Fragment	Chipped Necks	Other	Total
Refillable Glass (excl. Packaged Water, Juice Products with > 6% juice and other Still products)		3								4		7
REFPET (excl. Packaged Water, Juice Products with > 6% juice and other Still products)												
Non-Refillable PET (excl. Packaged Water, Juice Products with > 6% juice and other Still products)								2				2
Cans (excl. Packaged Water, Juice Products with > 6% juice and other Still products)	1		2	2				2				7
TetraPak, etc. (excl. Packaged Water, Juice Products with > 6% juice and other Still products)												0
Packaged Water - all package types (Natural, Spring, with added Minerals, etc.) - all package types												0
Juice Products - all package types (with > 6% juice)							1					1
All other Still Beverages - all package types (Nestea, Powerade, Tea, Coffee, etc.)												0
Fountain (Cold Drink)											1	1
Total	1	3	2	2	0	0	1	4	0	4	1	18
CCR	0.5											

Fountain Quality Index

Category	Quality
Metric Level	Tier II
Definition	This quality index is the overall quality rating of the beverage at the point of dispensing. The quality rating includes the following parameters: • Taste • Appearance • Ratio • Carbonation • Temperature • Syrup Age • Microbiological Measured against specifications for each of the above parameters.
Objective	To evaluate the quality of the beverage at the point of dispensing. Includes Bag in Box, Post-mix, pre-mix.
Calculation	PER OUTLET: Quality Index = { (B÷A) x (D÷C) x (F÷E) x (H÷G) x (J÷I) x (L÷K) x (N÷M) } x 100 A = Total Number of samples analyzed for taste B = Total number of samples in specification for taste C = Total Number of samples analyzed for appearance D = Total number of samples in specification for appearance E = Total Number of samples analyzed for ratio F = Total number of samples in specification for ratio G = Total Number of samples analyzed for carbonation H = Total number of samples in specification for carbonation I = Total Number of samples analyzed for temperature J = Total number of samples in specification for temperature K = Total Number of samples analyzed for syrup age L = Total number of samples in specification for syrup age M = Total Number of samples analyzed for micro N = Total number of samples in specification for micro Manual calculation or formatted spreadsheet/tool can be used.
Data Source	From analysis, assessment and measurement of each parameter at outlet
Collection Frequency	When Survey is conducted per outlet; Monthly report generated
Benchmark	**Industry Average** 80% **Best in Class** 95%
Comments	The fountain index is calculated from analysis data conducted by TCCC or an externally contracted vendor. However, this index can be monitored as an internal control metric.

	Number of Out Lets	TASTE		APPEARANCE		RATIO		CARBONATION		TEMPERATURE		SYRUP AGE		MICRO		WATER		QUALITY INDEX
All Plants: Sep Monthly Summary	11	46	46	46	46	45	30	13	11	46	45	97	93	64	62	11	11	**51.3%**
All Plants: Oct Monthly Summary	24	98	98	98	98	91	57	26	20	95	73	109	98	142	108	24	24	**25.3%**
All Plants : Dec Monthly Summary	2	8	8	8	8	8	7	2	2	8	8	7	7	12	10	2	2	**72.9%**
XYZ Plant Summary	8	35	35	35	35	32	25	9	6	35	15	39	38	48	29	8	8	**13.1%**
ABC Plant Summary	5	23	23	23	23	22	14	6	6	23	23	47	46	28	26	5	5	**57.8%**
BDN Plant Summary	6	23	23	23	23	23	16	7	5	23	22	50	47	36	36	6	6	**44.7%**
NMN Plant Summary	9	35	35	35	35	33	13	10	7	34	34	31	27	52	46	9	9	**21.2%**

Example	Input Spreadsheet
Metric Owner	Saratha Packirisamy

TYW Plant Summary	5	20	20	20	20	18	11	5	5	18	16	31	27	30	24	5	5	**37.8%**
VWD Plant Summary	4	16	16	16	16	16	15	4	4	16	16	15	13	24	19	4	4	**64.3%**
	37	152	152	152	152	144	94	41	33	149	126	213	198	218	180	37	37	**34.1%**
		100%		100%		**65%**		**80%**		**85%**		**93%**		**83%**		100%		

IMCR Incident Rates

Category	Quality
Metric Level	Tier II
Definition	The total number of serious and general IMCR categorized Incidents which resulted in one or more of the following: • Product recall or withdrawal • Media Alerts • Legal actions against the Company The Serious incidents include any incidents or situations which would negatively affect the consumer, Company assets, and/or trademark.
Objective	To track trends in IMCR Incidents and close out of these incidents
Calculation	**Monthly:** $\text{IMCR Rate} = \frac{\text{Total Number of Incidents}}{\text{Sales volume per month}}$ **Annual:** IMCR Close out = Number of Incidents closed out / Total number of IMCR incidents
Data Source	Internal monitoring database and IMCR Global Tool(input by local BU)
Collection Frequency	Monthly – reported during Management Reviews
Benchmark	**Industry Average**: 2 serious incidents per year **Best in Class**: 0 Incidents
Comments	Trends can be tracked as per each type of incident: • Product Withdrawal/ Product recall • Media alert due to negative issues • Consumer injury • Governmental agencies
Metric Owner	Saratha Packirisamy

Production Index

Category	Quality
Metric Level	Tier II
Definition	Production Quality Indicator (PDQI) is a sample weighted indicator that indicates the beverage quality when shipped from the manufacturing operation.
Objective	Production Index will confirm production facilities are ensuring beverage quality is 100% with respect to compliance to specifications, at the point of shipping to the market.
Calculation	Production Index (PI) = Assay x Appearance (where not related to degradation) x Brix x Date Code Efficiency x Net Content (low failures) x Taste (non degrading) x Micro (yeast) x CO2 (can/glass only)
Data Source	Global Quality Measures database
Collection Frequency	Monthly
Benchmark	**Industry Average**: 96% **Best in Class**: 100%
Comments	Production Index is reflective of the manufacturing process
Example	Production Index (PI) = Assay x Appearance (where not related to degradation) x Brix x Date Code x Net Content (low failures) x Taste (non-degrading) x Micro (yeast) x CO2 (can/glass only)
Metric Owner	Saratha Packirisamy

Delivery-Marketplace Quality Indicator

Category	Quality
Metric Level	Tier II
Definition	The Delivery-Marketplace Quality Indicator (DMQI) is an indicator (sample and sales-weighted) that focuses on delivery-related aspects of trade sample quality and excludes aspects of quality affected by production plant issues. The following seven attributes are used to calculate the DMQI: • Age (Sample age compared to primary age. For some countries, primary age equals shelf life) • Beverage Appearance (Characteristics not included in PDQI) • Aspartame • Closure Condition • Carbonation (PET only) • Container Condition • Beverage Taste (Characteristics not included in PDQI)
Objective	To evaluate the Quality (product and package) in the market place based on parameters impacted by the distribution cycle.
Calculation	The seven DMQI attributes are multiplied to produce the DMQI, exactly as the BPQI and PCQI are calculated from their five respective quality parameters.
Data Source	Global Quality Measures database
Collection Frequency	Monthly
Benchmark	**Industry Average** 95% **Best in Class** 97%
Comments	The following seven trade sample attributes are used to calculate the DMQI, using percent conformance for each: 1. Age – Two age tolerances will be used – primary age and shelf-life. The percent conformance used for the delivery indicator will be sample age compared to primary age. 2. Beverage Appearance – Non-conformance for the following defects only: Loss of Cloud, Sediment, Neck Ring, Turbid, Off-Color, Yeast, Pulp 3. Aspartame 4. Closure Condition - Non-conformance for the following defects only: Cut-Through, Rusty/Corroded, Damaged, Scratched/Scuffed, Damaged Band 5. Carbonation – Plastic Bottles Only 6. Container Condition - Non-conformance for the following defects only: Damaged Container, Rusty/Corroded, Damaged Finish, Scratched, Dirty, Scuffed, Faded Label, Scuffed/Scratched, Missing Label, Torn Label, Rusty Neck 7. Beverage Taste - Non-conformance for the following defects only: Metallic, Oxidized Age is an important attribute of the metric.

Example	The seven DMQI attributes are multiplied to produce the DMQI, exactly as the BPQI and PCQI are calculated from their five respective quality parameters:
Metric Owner	Saratha Packirisamy

Package	*% sales*	Beverage Taste	Beverage Appearance	Product Age	Container Condition	Closure Condition	Carbonation (PET)	Aspartame	DMQI	Sales weighted contribution
300ml can	*10.49*	99	100	100	100	100	100	100	99	**10.39**
2L PET	*15.95*	100	100	100	100	100	100	100	100	**15.95**
600ml PET	*37.06*	100	100	100	100	87	100	100	87	**32.24**
1.5L PET	*23.38*	100	100	100	100	100	100	100	100	**23.38**
300ml RGB	*13.12*	66.67	100	100	33.33	66.67	66.67	66.67	6.59	**0.86**
	100	**95.52**	**100**	**100**	**91.25**	**90.81**	**95.63**	**95.63**		82.82

Classified - Internal use

Process Capability Index

Category	Quality
Metric Level	Tier II
Definition	Process capability analyzes the capability of the process to produce within specifications. *Capability* is defined as the likelihood a product will meet its designed specifications. *Capability Analysis* is a set of statistical calculations performed on a set of data in order to determine the capability of the system. A system is said to be "capable" if it meets 100% of its specifications. However, to be 3-sigma it only needs to meet 99.73% of specifications. Specifications are also referred to as requirements, goals, objectives, or standards. Formulas used to calculate capability are: Cpu = (USL – mean)/ 3 * standard deviation Cpl = (mean – LSL)/ 3 * standard deviation CpK = min {Cpu, Cpl}
Objective	• Used to compare the range, or *natural tolerance* (NT), of an in-control or consistent process to the specifications. • The CpK is the most commonly used index for calculating capability, however some have found that the PpK index is actually better. The CpK is used to gauge the potential capability of a system, or in other words, a system's aptitude to perform. The PpK (and relative pp and Pr) actually measure the performance of the system. To determine which of the indexes to use, determine whether you want to analyze the actual performance (PpK) or the potential capability of the system (CpK). CpK is calculated with sigma equal to 3, which is an estimated sigma. Calculating PpK uses a calculated sigma from the individual data. The indexes help to determine the system's ability to meet specifications. The problem found in using the CpK, is that it does not account for the average.
Calculation	Cp and CpK – calculated with formatted tool and /or SPC Program CpK > 1.33 Cp > 1.33
Data Source	Internal - measured on all Processes : for example - Proportioning/ blending, Net content, Carbonation, PET Bottle Blow molding, etc.
Collection Frequency	PpK : Measured daily per line CpK : measured per annual process capability study
Benchmark	**Industry Average**: CpK > 1.33 **Best in Class**: CpK > 1.33 for all parameters
Comments	Process capability compares the range, or *natural tolerance* (NT), of an in-control or consistent process to the specifications. The natural tolerance can be described by thinking of the bell–shaped delivery.

The natural tolerance would be the ± 3σ range that includes 99.73% of the data. If the *natural tolerance* is less than the specification range, or *engineering tolerance* (ET), then the process is said to be capable of meeting requirements. The engineering tolerance is simply the upper specification limit minus the lower specification limit. A process can either be capable or not.

Because process capability calculates the standard deviation from a control chart, the natural variability of the process can be estimated even if the process is changing through time.

σ	Estimate of the process standard deviation from a control chart
s	Mathematical calculation for standard deviation
C_p	Potential capability index
C_{pK}	Actual capability index

Potential:

$$Cp = \frac{USL - LSL}{6\sigma}$$

Actual: Min of Upper and Lower:

$$CpK\ U = \frac{USL - x}{3\sigma}$$

$$CpK\ L = \frac{LSL - x}{3\sigma}$$

A capability analysis will determine if it is likely that product not measured and future product will meet specifications. Process control is critical before this can be evaluated. If the process is not in-control, the process average and variability are constantly changing and are not predictable. If process variability and average are not predictable then process output and conformance to specifications cannot be predicted.

NOTE:

- A Cp of less than 1.33 indicates that there is too much variability in the process to meet specifications. Action must be taken to reduce the variability.
- A good Cp but low CpK (<1.33) indicates a process that is capable of meeting requirements, but is not properly centered within the specifications. Action should be taken to re-center the process.
- A good Cp and CpK indicate a process that is capable of and meeting requirements. The goal in this situation would be to continue the use of control charts to monitor the process. Monitoring the process with control charts ensures that the process will maintain it's current capability level. In effect, each time a point is plotted on the chart, we are validating the capability of the process.

The goal would be to keep reducing process variability and to strive for continuous improvement.

The following processes must have a CpK greater than 1.33 based on Finished Product Specification

- Proportioning - Brix/Ratio/Assay
- Carbonation
- Capping/Closing – Torque
- Filling – Net Content

Laboratory equipment measurement variability must be less than 25% of attribute tolerance

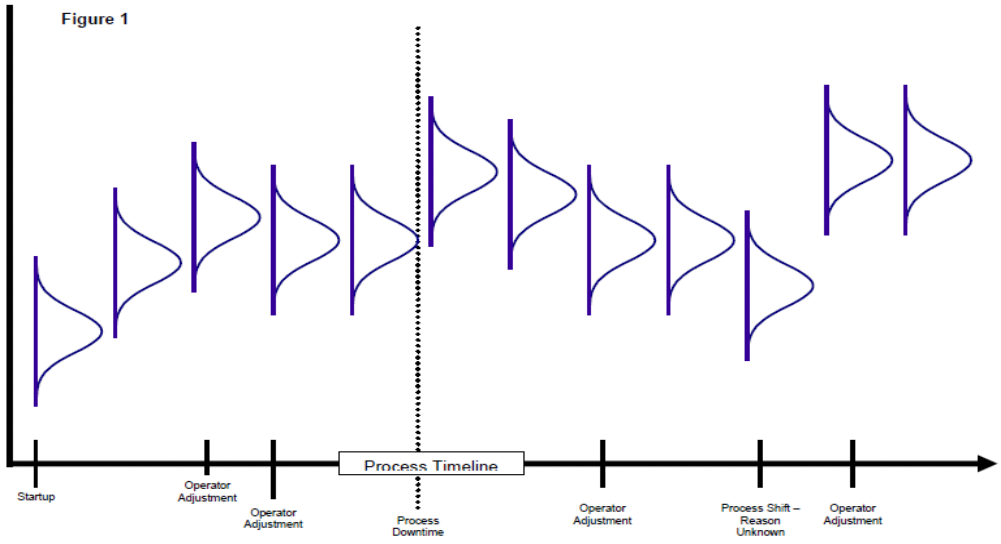
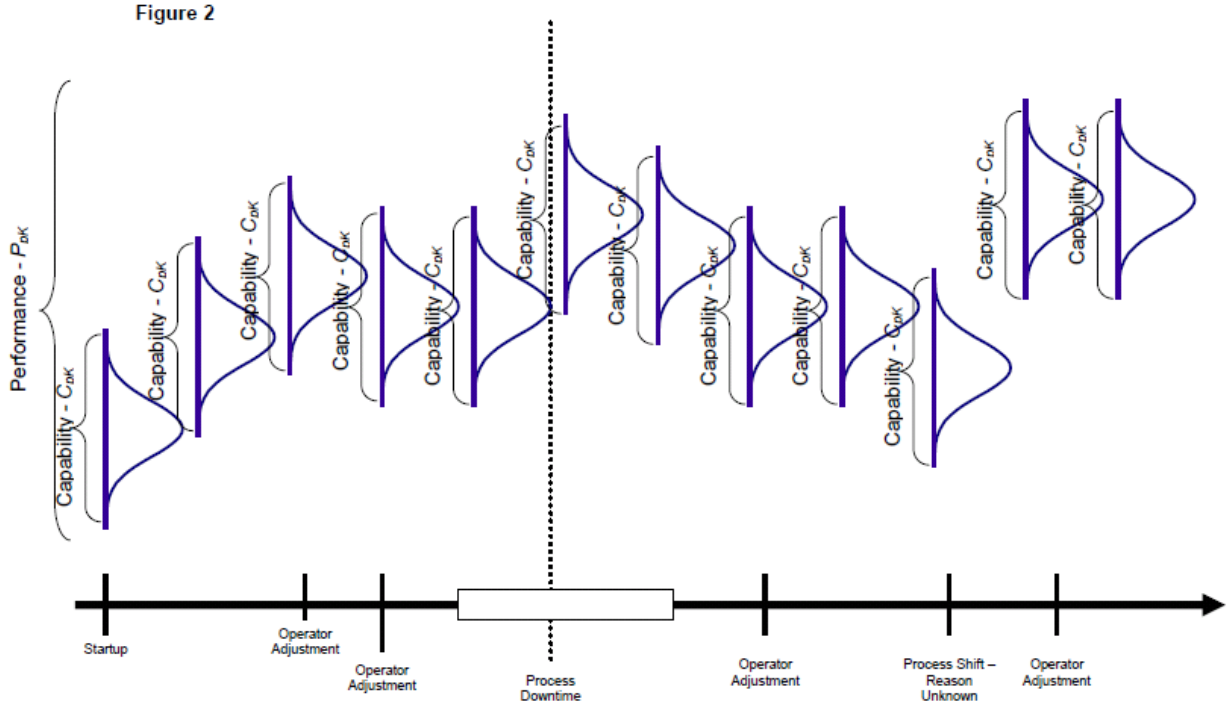
Example	Because process capability calculates the standard deviation from a control chart, the natural variability of the process can be estimated even if the process is changing through time. The example that follows illustrates this: • The output of a process is shown in figure 1 on the following page. The normal distributions represent the output of the process at certain intervals where routine QA data is collected. It is evident that the process is changing throughout time. This is occurring for several reasons that are given at the bottom of the graph. Some of the reasons include: startup, operator adjustment, and downtime. Figure 1  • The data collected from this process will be just as erratic as the process itself. If all the data were grouped together, the standard deviation based on all the results would be very high. This is how process performance is calculated and the results would not look very good. However, if the variability is estimated from a control chart, the results look very different. Control charts only look at the variability within each subgroup. **So even if the process is changing drastically, the natural variability of the process can be estimated**. • Figure 2 shows the difference between capability and performance of the process. Performance would be grouping all the normal distributions into one large group and would measure the range of all the output of the process. Capability only looks at the natural variability of the process within each group, when no changes to the process are taking place.

Figure 2



C_{pk} is another widely used index. The C_{pk} index differs from the C_p index by incorporating the process average into a modified formula of C_p:(Note: USL = upper specification limit; LSL = lower specification limit.) Because the process average is part of the calculation, some believe this formula incorporates process centering. This is an erroneous assumption because you do not know how far the process average is from nominal. The formula uses half the process spread (3s) and the distance between the mean (not specification nominal) and tolerance limit. To use this formula, you must calculate both equations and use only the one that yields the smallest number.

Example 2:
The Cpk index evaluates half the process spread with respect to where the process is actually located (some point in space). The average is calculated from a specific sample size and is a dynamic entity that changes with the addition of each consecutive part produced. For example, the average of 10 measurements—0.501, 0.498, 0.497, 0.499, 0.503, 0.496, 0.503, 0.501, 0.502 and 0.498—is 0.4998. If you add one more data point of 0.497, the average becomes 0.4995 and shifts by 0.0003. Because the average changes with each part produced, you may want to establish an acceptable range within which Cpk may vary by calculating a confidence interval for the Cpk value. If the process is perfectly centered in the specification, both Cpk formulas will yield the same number, but this condition rarely occurs. The Cpk of the earlier example is 1.57. If you shift the average by 0.0003, the Cpk becomes 0.98.4 Now the Cpk has moved from acceptable (1.57) to unacceptable (0.98) with the addition of one more data point. That's why some believe Cpk should be considered only with a range. Table 1 puts sample size and Cpk range into perspective.

Table 1. Sample Size (n) and Cpk Range
95% confidence interval (Actual Cpk range)

n	1.00	1.33	1.67
10	0.548 - 1.454	0.729 - 1.934	0.915 - 2.428
15	0.634 - 1.366	0.843 - 1.817	1.059 - 2.281
25	0.719 - 1.281	0.956 - 1.703	1.200 - 2.139
50	0.802 - 1.197	1.067 - 1.592	1.340 - 1.999
70	0.833 - 1.166	1.108 - 1.551	1.392 - 1.948
100	0.861 - 1.139	1.145 - 1.515	1.438 - 1.902
250	0.912 - 1.088	1.213 - 1.447	1.523 - 1.816

Table 1 also shows how, for a given sample size, the actual Cpk falls into the range calculated by the confidence interval. Like the Cp index, the larger the Cpk number the better. Cpk is tied to the movement of the average and can be viewed as the distance the average is from the center of the specification.

Table 2 illustrates this movement with specifications set at 2.83 to 2.84 and a s of 0.001168. Cp is added to demonstrate it does not change as the process average moves. You can see the Cpk value changes as the average moves, while the Cp value remains constant. Negative values of Cpk are caused when the average is positioned outside the tolerance.

Table 2. Cpk Moves With the Average

Average	C_{pk}	C_p
2.82	-2.85	1.43
2.825	-1.43	1.43
2.831	0.29	1.43
2.835	1.43	1.43
2.837	0.86	1.43
2.839	0.29	1.43
2.845	-1.43	1.43
2.85	-2.85	1.43
2.86	-5.71	1.43

Both Cp and Cpk have the following identical interpretations:

- A Cp or Cpk value of 1 is achieved when the tolerance spread and process spreads are equal and the process is perfectly centered for Cpk.
- A value of 1.33 means the process spread is 75% of the tolerance spread.
- As the index numbers increase, the percentage of tolerance spread being consumed by the process spread decreases.

Cpk numbers will vary wildly as the process average migrates away from the center of the tolerance.

Metric Owner	Saratha Packirisamy

Product Carbonation Index – Non Refillable PET

Category	Quality
Metric Level	Tier III
Definition	This index includes the carbonation for all non-refillable PET packaged product only. The index evaluated is the Sales weighted or sold view since it is measured on product sampled from the market place.
Objective	To indicate the Product Carbonation index (as per specifications) on product packaged in Non-refillable PET bottles. The product is sampled in the Market Place for analysis.
Calculation	NR PET Carbonation Index = $\frac{A - B}{A} \times 100$ Where: A = Total number of NR PET samples analyzed for carbonation B = Number of Non-conforming samples in Carbonation
Data Source	Global Quality Measures database
Collection Frequency	Monthly
Benchmark	**Industry Average**: 90% **Best in Class**: >95%
Owner	Saratha Packirisamy

Classified - Internal use

Quality Index – In Plant

Category	Quality
Metric Level	Tier III
Definition	Measurement of the Quality index of product and packaging on line. This can be conducted using SPC software and/or manual systems
Objective	To determine the quality index per parameters or set of parameters on a daily basis.
Calculation	**Per Parameter:** Parameter result = $\frac{\text{Total number of analysis results – Total number of out of spec}}{\text{Total number of analysis results}}$ Parameter Index = Parameter result x 100 **More than one Parameter:** Quality Index = [Parameter 1 result x Parameter 2 result x Parameter 3 Result] x 100
Data Source	Internal Quality Control analysis- manual or use of on line monitoring programs
Collection Frequency	Per Batch, per shift or Daily
Benchmark	**Industry Average**: 100% **Best in Class**: 100%
Comments	• Note that the specification referred to above is the in plant specification with in plant Upper and lower control limits. • The Quality Index can be calculated as a total Quality Index or Product Index and Package Index. • All parameters can be considered based on the test methods and internal data collection.
Owner	Saratha Packirisamy

Classified - Internal use

Inspection Acceptance Rate

Category	Quality
Metric Level	Tier III
Definition	The number of batches/deliveries of a specific ingredient, packaging material or raw material that had passed the inspection testing quality specifications on receipt from supplier, versus the number of total batches/deliveries received over calendar month.
Objective	To track raw material, ingredient and packaging materials received that are within quality specifications on receipt.
Calculation	Inspection Acceptance rate = Total number of in specification batches/deliveries / Total number of batches/deliveries Alternatively, can calculate: Total number of out of specification batches/deliveries / Total number of batches/deliveries
Data Source	In plant Inspection testing; Analysis on Certificate of Analysis and certificate of conformance
Collection Frequency	Collection on each inspection testing; Management Report - Monthly
Benchmark	**Industry Average** **Best in Class**
Comments	Separate inspection testing for: • Carbon Dioxide • Sweeteners • Packaging materials • Ingredients /raw materials Also defined as per the BIG requirement for Defect materials reporting.
Owner	Saratha Packirisamy

Cost of Quality

Category	Quality
Metric Level	Tier III
Definition	Quality costs also include loss as a result of poor quality, waste, and inefficiency. Quality costs represent the difference between the actual cost of a product or service and what the reduced cost would be if there were no possibility of substandard service, failure of products, or defects in their manufacture or delivery. Typically, quality costs are grouped into four categories: • Prevention • Appraisal • Internal Failure • External failure
Objective	The Cost of Quality provides a way to identify, and track poor quality and its related costs in your operation. To provide visibility into related cost areas. Relationship of the cost of quality to sales determines the impact to the bottom line
Calculation	Use of Quality Cost tool with formatted calculations
Data Source	Plant information
Collection Frequency	Weekly and reported Monthly
Related Supporting Metrics	Consumer Complaints, Quality Control results, IMCR incidents, Supplier Quality issues
Benchmark	**Industry Average**: 20-30% of Sales (USA) **Best in Class**: < 10% of cost of Sales
Comments	Like every other aspect of the business, quality has a cost. However, the most obvious costs such as those for inspections and laboratory tests are not always the most significant. Quality costs also include the money - and customers - lost as a result of poor quality, waste, and inefficiency.
Example	Quality costs include the following: 1. **Prevention** : These costs prevent errors from being made -- a cost avoidance investment such as - Quality related Education and Training - Supplier Certification and Review and vendor surveys - Internal and market surveys - Qualification Testing –products and services - Field trials - Quality Management and administration costs - Management System implementation and maintenance - Developing the quality process control plan - Equipment/process capability - Product evaluations - Packaging qualifications 2. **Appraisal**: These costs help detect errors. They are costs associated with evaluating product, and auditing a process to measure conformance to specifications and procedures, such as - Inspection Testing - Measurement Equipment - Routine Inspection and testing - Equipment calibration and verification - Audits - External lab support

	- Source Inspection programs - Field performance tests - External Certifications 3. **Internal Failure** : These costs are incurred as a result of errors detected before receipt by the customer, such as - Re-inspection and retest costs - In-process scrap and rework - Down time due to product and/or package issues - Purchased product reject disposition costs - Uncontrolled material costs - Corrective action costs - Troubleshooting and repairing - Engineering changes - Re-inspection & testing after defects are detected - Downgrading - release of substandard product - Missed schedules 4. External failure : These costs are incurred because the external customer or consumer receives an unacceptable product or service - Customer and Consumer Complaint Costs including complaint handling - Recall/withdrawal of products - Warranty Claims - Liability Costs - Penalty costs - Customer goodwill - Lost sales due to product / package issues Analysis of product returns
Owner	Saratha Packirisamy

Procurement

Classified - Internal use

Supplier Service Defect Rate (SSDR)

Process	Procurement
Metric Level	Tier II
Definition	The number of deliveries from a supplier that had issues regarding, service, cost, or quality versus the number of total deliveries made over calendar month. **Supplier**: The one to whom we place and who manages the order, e.g., it can be an actual supplier or a distributor such as, Harris & Ford, or a company location supplying another plant. **Delivery**: Each purchase order Schedule line item or Scheduling Agreement Schedule Line Item is counted as a delivery and is considered "included" if it has a Due date in the period, regardless of delivery status, i.e., Whether it is Actually Delivered or Not. Currently, in the case of Bulk Items, a Single Schedule line item in the Scheduling Agreement to which multiple tankers are related is counted as one delivery for SSDR Metric Purpose. (Note: 1 open issue Bulk items. If multiple tankers are related to a single line item, we want to count as multiple deliveries but no truck id available.)
Objective	Used to track the service and delivery issues of suppliers.
Calculation	$\frac{\text{Total\# of Defects}}{\text{Total\# of Deliveries}}$
Data Source	Supplier Incident Report System
Collection Frequency	Monthly
Related Supporting Metrics	None
Benchmark	**Industry Average**: < 0.02 **World Class**: 0.2%
Comments	At minimum this measure must be reported out for strategic suppliers. The list of defects can be categorized, but is not limited to one of the following: Over/Under Weight, Out of Spec, Caking, Off-appearance, Off-odor, Off-taste, Contamination, Foreign material, Expired Ingredient, Ingredient close to expiration date, Early, Late, Leaking, Dirty, Burst Bags, Damaged, Non-Supplier Identifiable, Broken/Damaged, Missing, Wrong Loose, Pallets - Exposed Nails, Pallets - Broken / Damaged, Labels – Missing, Labels – Mismatched, Labels – Torn, Labels – Wrong, Information/Design, Improper Shrink Wrap, Responsiveness, Missing Incomplete, Wrong, Shifted load, Tamper evident seal, Missing/Wrong Placards, Load weight, Container conditions, Incorrect Transport, Temperature, Incorrect Ingredient Shipped, Incorrect Quantity Shipped Note: There can be more than one defect per delivery.
Example	The number of supplier deliveries that had issues regarding, service, cost, or quality versus the number of total deliveries made over calendar month is five. The total number of supplier deliveries for that month was 500. $\frac{5}{500} = 1.0\%$
Metric Owner	Tom Sanborn and Terry Sharp