

# BU Assessment

Area of Concentration	Expectations ( Description)	Implementation Expectations				Sustainment Expectations			
		25%	50%	75%	100%	1	2	3	
<b>Value Stream Mapping</b>									
1	Product Family Matrix	Products are sorted into families based on similarities of processing steps.	<b>Outline</b> - Draft list of all processes and all products created.	<b>Data Collection</b> - X-Map created by cross-referencing products and processes.	<b>Work Content</b> - Accurate Work Content times added to product family matrix.	<b>Product Families</b> - Product families created based on similar processes & work content.	Work contents and product flow kept up-to-date. New products added as necessary.	All work content times validated.	Product family matrix used to make tactical decisions to improve flow in the factory.
2	Value Stream Mapping	Current & Future State maps & Implementation Plan posted and up to date.	<b>Current State</b> - Current State map drawn. All processes & lead time ladder included.	<b>Future State</b> - Future State map drawn. Lead time ladder & kaizen bursts included.	<b>Implementation Plan</b> - High level Implementation Plan created and posted.	<b>Detailed 2-Week Plan</b> - Detailed action item list for next 2 weeks created and posted.	The maps and implementation plan are posted.	The maps are revised as changes are made, and a detailed 2-week action plan is posted.	Status of implementation action items is posted and up to date.
<b>Takt Time</b>									
3	Takt Time Calculation	Takt time calculated for average annual demand rate.	<b>Data Collection</b> - 12-month history of actual demand collected.	<b>Average Takt</b> - Takt calculated using average annual demand.	<b>Mode Analysis</b> - Takt calculated for several modes of production.	<b>Updated Takt</b> - Takt calculations kept up to date and shown on Future State map.	Takt Time posted on Future State map.	Takt calculations kept up to date.	Takt calculations (including effective working time) recorded, posted and up to date.
<b>Interval</b>									
4	Interval Analysis	Interval analysis used to determine machine capabilities.	<b>Data Collection</b> - cycle times, changeover times, uptime, etc. added to spreadsheet.	<b>Single Interval</b> - Interval Analysis completed for a single machine.	<b>Value Stream Interval</b> - Analysis completed for all applicable value stream machines.	<b>Action Plan</b> - Interval Analysis used to create an action plan to reduce interval.	Step by step action plan created to reduce interval.	Interval reduced, spreadsheet updated and new action plan created.	Interval spreadsheet kept up-to-date. Repeatedly used to analyse capability.
5	Quick Changeover	Changeover times are reduced to accommodate a shorter interval.	<b>Data Collection</b> - changeover work elements listed (with times collected).	<b>Paper Kaizen</b> - Eliminate/Combine/Reduce analysis completed and action plan created.	<b>Implementation</b> - Action plan executed and interval reduced.	<b>Standard Work</b> - Standard Work for new changeover process created and posted.	Standard Work for new changeover process created and posted.	Changeovers always completed within time allotted. Standard Work kept up to date.	Changeovers audited on a regular schedule to ensure Standard Work is followed.
<b>Single Piece Flow</b>									
6a	Operator Balancing	Work Elements collected for initial single piece flow cell.	<b>Data Collection</b> - Work elements identified & timed, 10 samples - select lowest repeatable.	<b>Paper Kaizen</b> - Eliminate walking, waiting and out-of-cycle tasks.	<b>Workload Balancing</b> - Operators balanced to planned Cycle Time (92-95% of Takt).	<b>Documentation</b> - Operator Balance Charts created for each mode, posted & up to date.	Operator Balance charts posted for average takt time calculation.	Operator Balance charts posted for all modes.	Balance charts kept up to date. Work elements re-timed as improvements made.
7a	Layout Implementation	Single piece flow implemented, monitored and adjusted.	<b>Mock Up</b> - Mock cell created to test layout design. New location ready (e.g. wiring, etc.).	<b>Implementation</b> - New cell design implemented and building product.	<b>Monitor</b> - Actively monitor cell performance for 1-2 weeks & action plan created.	<b>Debug</b> - Action items from process monitoring completed.	Single Piece Flow cell debugged and list of action items created.	Continuous improvement efforts continue to reduce process time.	Standard Work always followed.
8a	Standard Work (Level 1)	Standard Work for the build process created and posted. Use balance charts as base.	<b>Draft Level</b> - List work elements and operator break points.	<b>Format</b> - Document created identifying picture locations. Descriptions for each step.	<b>Mock Up</b> - Pictures & time added. Key points highlighted. Posted and visible to operators.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
<b>FIFO</b>									
9a	FIFO Lanes	FIFO lane implemented to control inventory between two processes.	<b>FIFO Size</b> - FIFO lane size calculated to minimize inventory while allowing for variation.	<b>Temporary FIFO</b> - Temporary FIFO lane (e.g. tape on floor) functioning as designed.	<b>Improved FIFO</b> - FIFO lane finalized, made semi-permanent, and audited.	<b>Action Plan</b> - Plan created for when the FIFO lane is full and another for when it is empty.	FIFO lane used correctly - never more than maximum, and always first in, first out.	FIFO lane audited to ensure it is correctly sized.	Standard Work in place to react to FIFO conditions (i.e. almost full or almost empty).
10	FIFO Standard Work (Level 2)	Standard Work created and posted. Includes actions for full and empty conditions.	<b>Draft Level</b> - Basic instructions for use of the FIFO lane created.	<b>Format</b> - Document created identifying picture locations. Descriptions for each step.	<b>Mock Up</b> - Pictures added. Key points highlighted. Posted and visible to operators.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
<b>Finished Goods Strategy</b>									
11	Finished Goods Strategy	Finished goods strategy validated, implemented and in use.	<b>Validation</b> - Selected FG strategy validated using 12 months of demand variation.	<b>Design</b> - FIFO/Supermarket size & location determined. Scheduling plan considered.	<b>Implementation</b> - FG strategy implemented. Value stream scheduled to this strategy.	<b>Audit</b> - FG strategy reviewed (at least quarterly) and calculations kept up to date.	FG Strategy implemented and used to schedule the value stream.	FG Strategy validated regularly to ensure it meets current demand and lead time.	Continuous improvements constantly reduce FG inventory (e.g. more frequent delivery).
<b>Pull</b>									
12	Pacemaker Supermarket	Component parts used at the pacemaker process are replenished using Pull.	<b>Supermarket Size</b> - Inventory required at the pacemaker calculated.	<b>Visual Control</b> - Inventory replenishment system implemented to restock components.	<b>Visual Control</b> - Part numbers posted. Bins color-coded (by product, or value stream, etc.).	<b>Audit</b> - Supermarket size audited to determine if further reductions are possible.	Supermarket system in place and functioning.	Supermarket system so visual that anyone can understand how it works.	Supermarket size audited regularly to ensure the quantities match current demand.
13	Waterspider	Material delivery route to deliver product (and take away from) the pacemaker process.	<b>Waterspider Route</b> - Efficient walking path identified. Plan created for every part.	<b>Implementation</b> - Plan for commonly used parts implemented. Cart designed.	<b>Visual Control</b> - Walking path drawn on floor. Cart implemented. Labeled drop-off points.	<b>Debug</b> - Plan for every part implemented. Improvements reduce time to deliver material.	Waterspider route followed on a repetitive basis.	Visual Controls in place.	Standard Work that anyone can follow is in place and always followed.
14	Waterspider Standard Work (Level 2)	Material replenishment Standard Work created and posted.	<b>Draft Level</b> - Basic instructions detailing the route, and order of part picking.	<b>Format</b> - Document created identifying picture locations. Descriptions for each step.	<b>Mock Up</b> - Pictures & time added. Key points highlighted. Posted & visible to waterspider.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
15	Process Family Matrix	Upstream processes are grouped into families. Shared resources are dedicated to create flow.	<b>Outline</b> - Draft list of all upstream processes and all upstream sub-components created.	<b>Data Collection</b> - X-Map created by cross-referencing products and processes.	<b>Flow</b> - Upstream processes grouped into areas of flow.	<b>Process Flow</b> - Process families are grouped to reduce number of flow pathways.	Work contents and product flow kept up-to-date.	New sub-components added to process family matrix as necessary.	Process family matrix used to make tactical decisions to improve flow in the factory.
16	Value Stream Supermarkets	All value stream component parts are replenished using Pull.	25% - 25% of all value stream processes replenished using Pull with visual controls.	50% - 50% of all value stream processes replenished using Pull with visual controls.	75% - 75% of all value stream processes replenished using Pull with visual controls.	100% - All value stream processes replenished using Pull with visual controls.	All parts for all processes are supplied using a supermarket pull system.	All supermarket pull systems are so visual that anyone can understand how they work.	All supermarket sizes audited regularly to ensure the quantities match current demand.
17	Initial Raw Stock Supermarkets	10 raw stock part numbers ordered from suppliers using a Pull system (e.g. kanban).	<b>System Design</b> - Style of pull system identified for all 10 raw stock part numbers.	<b>Maximum Size</b> - Maximum size calculated using Cycle, Buffer & Safety stocks.	<b>Re-Order</b> - Re-order points & quantities calculated based on supplier capabilities.	<b>Implementation</b> - 10 raw stock part numbers replenished using simple signals.	10 raw stock part numbers only ordered if triggered via visual re-order points.	Cycle, Buffer and Safety stocks reduced through continuous improvement.	Simplified system that minimizes inventory, but never runs out of parts.
18	Value Stream Raw Stock Supermarkets	All raw stock part numbers ordered from suppliers using a Pull system (e.g. kanban).	<b>"A" Items</b> - All high value raw stock part numbers ordered using simple Pull system.	<b>"B" Items</b> - All medium value raw stock part numbers ordered using simple Pull system.	<b>"C" Items</b> - All low value raw stock part numbers ordered using simple Pull system.	<b>Improvement</b> - System simplified (possibly automated). Inventory requirements reduced.	All raw stock part numbers only ordered if triggered via visual re-order points.	Cycle, Buffer and Safety stocks reduced through continuous improvement.	Simplified system that minimizes inventory, but never runs out of parts.
<b>Scheduling</b>									
19	Single Point Scheduling	Value stream scheduled at a single point in pitch increments.	<b>Single Point</b> - Schedule delivered to only 1 process. All others scheduled via flow or pull.	<b>Pitch</b> - Schedule segregated into pitch increments. Only schedule buildable product.	<b>Visual Schedule</b> - The scheduling system visually shows the status of the day's orders.	<b>Continuous Improvement</b> - Scheduling process improved to reduce time required.	Single schedule delivered to one process is used to schedule the entire value stream.	Schedule followed. No expediting. No parts scheduled that cannot be built.	Continuous improvements made to reduce effort to schedule (e.g. automated).
20	Scheduling Standard Work (Level 2)	Scheduling standard Work created and posted.	<b>Draft Level</b> - Basic instructions detailing how to schedule, and how to use the schedule.	<b>Format</b> - Document created identifying picture locations. Descriptions for each step.	<b>Mock Up</b> - Pictures added. Highlight key points visible to scheduler & pacemaker.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
<b>Pitch</b>									
21	Pitch	Value stream monitored at regular pitch increments to ensure customer demand met.	<b>Implement</b> - Pitch system implemented. Visual, Anticipated, Physical & Binary.	<b>Corrective Actions</b> - Standard work created for missed pitch occurrences.	<b>Audit</b> - Pitch system audited on a regular schedule to ensure it is used correctly.	<b>Continuous Improvement</b> - Root causes for missing pitch are permanently eliminated.	Pitch is tracked every increment. Missed pitch occurrences recorded with reasons.	Short-term corrective actions are always followed to get value stream back on pace.	Long-term corrective actions are implemented to eliminate root causes of problems.
22	Metrics	5-8 key metrics posted on cell, value stream, and site boards.	<b>Identification</b> - 5-8 key metrics identified for site, value stream and cell.	<b>Site &amp; Value Stream</b> - Metrics posted on site and value stream boards.	<b>Cell Metrics</b> - Metrics posted at each process.	<b>Continuous Improvement</b> - Corrective actions posted for poor performance.	Site, Value Stream & Cell metrics posted on site and value stream boards.	Action plan created to improve each metric.	Metrics reviewed on a regular basis to continuously improve results.
23	Pitch Standard Work (Level 2)	Standard Work created and posted for how to track pitch.	<b>Draft Level</b> - Basic instructions detailing how to track pitch and identify root causes.	<b>Format</b> - Document created identifying picture locations. Descriptions for each step.	<b>Mock Up</b> - Pictures & time added. Highlight key points. Visible to operators.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
24	Missed Pitch Standard Work (Level 3)	Standard Work created and posted to get value stream on pace after missing pitch.	<b>Draft Level</b> - Basic instructions detailing options for short-term corrective actions.	<b>Format</b> - Flowchart format created. Actions, questions & calculations visually different.	<b>Mock Up</b> - Flowchart created to drive team lead to corrective action.	<b>Final Draft</b> - Clear, concise wording. Clear format. Understandable to non-employees.	Standard Work verified occasionally to ensure correctness and compliance.	Standard Work updated as necessary to reflect improvements.	Regular audit schedule followed. Update procedure in place for improvements.
<b>Perfection</b>									
25	Value Stream Mapping	Next iteration Current & Future State maps & Implementation Plan posted and up to date.	<b>Current State</b> - Current State map drawn. All processes & lead time ladder included.	<b>Future State</b> - Future State map drawn. Lead time ladder & kaizen bursts included.	<b>Implementation Plan</b> - High level Implementation Plan created and posted.	<b>Detailed 2-Week Plan</b> - Detailed action item list for next 2 weeks created and posted.	The maps and implementation plan are posted.	The maps are revised as changes are made, and a detailed 2-week action plan is posted.	Status of implementation action items is posted and up to date.
26	5S / 6S	5S implemented to further reduce waste within the value stream.	<b>Sort</b> - No unnecessary parts, tools, or equipment stored at the workstation.	<b>Set in Order &amp; Shine</b> - A place for every part and every part in its place.	<b>Standardize</b> - Continuous improvement efforts made to constantly improve level of 5S.	<b>Sustain</b> - Regular audit schedule followed to ensure 5S is always improving.	Time allocated to sustaining & improving level of 5S within the value stream.	Regular audit process followed to identify further areas for improvement.	5S score continuously improving. Results posted throughout value stream.
27	Visual Flow	Product flow is visible throughout the facility to the untrained eye.	<b>Andon</b> - Lights (or other signal) indicate when conditions are normal or abnormal.	<b>Basic Visual Flow</b> - Product flow is visual throughout the facility and can be followed.	<b>Allocated Storage</b> - Inventory is stored only in allocated locations that are clearly visible.	<b>Visual Flow</b> - Non-employee can walk value stream alone & report status of all processes.	Andon lights in place and used properly. Value streams color-coded.	Standard work posted for andon lights. Product flow permanently indicated on floor.	Non-employees walk the value stream alone & report status of all processes.
28	Value Stream Focus	Support functions (sales, engineering, etc.) are assigned to value streams.	<b>Team Integration</b> - Support functions meet with the value stream team regularly.	<b>Value Stream Focus</b> - Support functions aligned by value streams.	<b>Value Stream Structure</b> - Reporting structure changed to value stream focus.	<b>Lean Organization</b> - All support functions applying Lean Principles to their processes.	Aligned support functions made aware of value stream transformation initiatives.	Aligned support functions participate in value stream transformation initiatives.	Aligned support functions transform their own value streams to better support value stream.

## Production Assessment Standard Work

### PITCH

Complete the value stream assessment monthly at a minimum (preferably every 2 weeks).

### IMPLEMENTATION

Each section is to be completed sequentially (e.g. Value Stream Mapping, Takt Time, Interval, etc.).

However, not all line items within each section need to be completed before progressing to the next section. For example, Interval is calculated before determining where single piece flow is possible. However, unless it is necessary to reduce the interval to accommodate Single Piece Flow, Operator Balancing (6a) should occur before Quick Changeover (5).

Also note that not all line items will be required for each organization. Those items not required should be "greyed out" (see *Color Coding*).

### SCORING

An area of concentration must meet ALL of the requirements to achieve a given score.

If a facility accomplishes all of the tasks required to achieve a score of 25%, and 75%, but have not completed all of the tasks required for 50%, then the score is shown as 25%.

Some value streams will need to utilize given tools multiple times. These tools have an "a" after their number (e.g. 6a). These tasks should be copied and inserted into the value stream assessment for each time required.

*Example - A value stream requiring the creation of 2 single piece flow cells:*

Single Piece Flow			Implementation				Sustainment		
			25%	50%	75%	100%	1	2	3
6a	Operator Balancing	Work Elements collected for initial single piece flow cell							
7a	Layout Implementation	Single piece flow implemented, monitored and debugged.							
8a	Standard Work (Level 1)	Standard Work for the build process created and posted. Use balance charts as base.							
6b	Operator Balancing	Work Elements collected for initial single piece flow cell							
7b	Layout Implementation	Single piece flow implemented, monitored and debugged.							
8b	Standard Work (Level 1)	Standard Work for the build process created and posted. Use balance charts as base.							

If a third single piece flow cell were identified on the value stream, then there would be a 6c, 7c, and 8c listed.

All steps with the same letter within the same section should be completed before progressing to the next letter. Thus, the expectation is to complete Operator Balancing, Layout Implementation and Standard Work (Level 1) on the first single piece flow cell before progressing to the next single piece flow cell.

However, the tasks within a section should typically be completed before progressing to the next section. Thus, the value stream should implement single piece flow everywhere possible before working on FIFO lanes.

**COLOR CODING**

No Expectation	The value stream is not yet expected to be at this level of implementation.
Expectations Achieved	Once all expectations are met, the appropriate box is colored green.
Expected Score	Yellow can be used to indicate where the facility should be.
Previous Score	If a value stream regresses, then the previous score is colored red.
Not Applicable	If a category does not apply to the value stream, the boxes are colored grey.