Strategies and Tactics for Establishing A Culture of Quality and Continuous Improvement for A 'Greenfield' Factory
Don A. Blake

• Graduated Iowa State University in 1976 with B.A. in Pol. Sci./PreLaw. M.B.A. from Wichita State University in 2004; Summa Cum Laude, Beta Gamma Sigma. Began aerospace career with Boeing Military Airplane Co. in 1980. Held various positions; Methods Engineer, Programmer Analyst, TQM Facilitator, MIS Manager, Internal Auditor, Lean Manufacturing Implementation Manager, Director of Quality Inspection/Lean Manufacturing.

• In 2005, Boeing Co. Wichita Division was sold to ONEX, one of 50+ named executives chartered with the deal. While with Spirit was Director of Industrial Cooperation, Director of Strategic Initiatives, Director of Tulsa 737,747,777 Production, Inventory Management and Lean Enterprise. Retired 2014 as Director of Business Management and Sites Services for Spirit AeroSystems at Kinston, NC facility.

• Special training and experience include APICS CPIM, ASQ CQIA, TQM, TPS, Six Sigma. In 1996, one of only 3 people in Boeing company selected in 1996 to received Boeing Production System Specialist training from former Toyota managers and staff. Major achievements include successful implementation of MRPII, implementation of Lean Production at multiple sites, search/negotiation/closing of multi-million dollar incentives for 'Greenfield' factory startups.
This presentation and discussion will cover the strategies, approaches, and curriculum developed and used at the Spirit AeroSystems Kinston North Carolina manufacturing facility during my tenure as the:

- Operational Efficiency/Productivity Director (2009-2011) for the Spirit AeroSystems Wing Segment
- Spirit AeroSystems Kinston site, Director of Quality and Site Services from 2011 thru my recent retirement in June 2014.

Although the site is still relatively new, there are several significant results already which will later manifest in high productivity, lower overhead, and fast cycle times.
• Site History and Overview

- Search and negotiation (2006 - 2008)
- Spirit NC Overview (Triangle BABNC Econ. Dev. Forum May 22, 2013)

• Strategy, Tactics and Results

- NCBU Master Plan (2010 - 2012)
  - Four Facets
  - Building A Solid Foundation for Excellence

- Implementation (2010-2012)
  - Phase I – Awareness
  - Phase II – Leadership
  - Phase III – Enhancing Capabilities / Methods, Techniques, & Tools

- Results (Mid 2012 Status)
  - Education and Training
  - Assessments
The Idea..
The Process..
The Deal..
The Result

Triangle BABNC Economic Development Forum
May 22, 2013
May 14
Spirit and Airbus announce agreement for Spirit to produce S15 of the A350 XWB.
Simultaneously, Spirit and NC GTP announce agreement to construct manufacturing facilities to produce A350 fuselage panels.

July 17
Spirit and Airbus announce agreement for Spirit to produce FLE and Fwd Spar of the A350.

July 1
Grand opening and official start of production for A350 fuselage panels and Leading Edge Spars

September 15
Groundbreaking for Spirit’s first building designed to produce Airbus A350 fuselage panels and A350 Lead Edge Spars

April 15
Partial Building Occupancy

October 24
First A350 Section 15 Shipment

Q1 2011
NC Engineering Established

Q2 2012
First A350 Section 15 Delivery

Q4 2012
First G280 Flap Delivery

Q2 2013
A350 First Flight

Q1 2013
400+ Direct Employees in Kinston
10th A350 Wing Spars Shipped
10th Section 15 Panels Shipped
Site History

May 2008

July 2010

Lease and Upfit for Gulfstream

Future Expansion

2011-2012
North Carolina Business Unit
Work Packages

Gulfstream
G280

Airbus
A350XWB
“And even more important than the facility and tools, we are pleased with the quality of students...It is obvious to us that LCC has a ‘better’ selection process than other schools. The students actually have a desire to learn, have great attitudes, treat the facility and personnel with respect, have excellent attendance, and maintain high grades.”

“The AMR Instructor Guides and Learner Guides that are being developed are superior to all of the materials we have used in the past.”

“Tooling is another area that sets LCC apart from most other training facilities. Most schools use an oven for curing composites; however, LCC invested in an autoclave. We realize this is an extremely expensive piece of machinery to use for training; however, LCC’s goal of ‘properly’ preparing people for the aerospace industry mandated this purchase.”
Questions and comments?
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North Carolina Business Unit

Lean Production and Continuous Improvement Master Plan

2010 – 2012

(Status Date: 6/22/2012)
North Carolina Business Unit master plan for Lean Production and Continuous Improvement has four facets:

- **Policy** – Renewed management commitment and a long term strategy for value stream efficiency and productivity.

- **People** – Awareness about company objectives and plans, leadership in deploying Lean concepts and techniques, and enhancing capabilities in using the methods and tools.


- **Partnerships** – More emphasis and activities designed to engage and collaborate with employees, customers and suppliers to improve overall value chain lead times, product quality, and quality of work-life.

*Building A Solid Foundation For Excellence*
• Four Facets of NCBU Implementation

☑ Policy
✓ Cost, Cycle Time and Quality (CCQ)
✓ Linkage to Business Planning
✓ Incorporated into Performance Reporting

☑ People
✓ Awareness
✓ Leadership In Lean
✓ Methods, Tools, and Techniques

☑ Processes
✓ Metrics
✓ Standard Work
✓ Best Practices

☑ Partnerships
✓ Lean Engagements and Collaboration

A multi-pronged approach for culture and immediate harvesting of opportunities in Quality, Cost, and Delivery.
The Spirit Production System (SPS) is focused on Continuous Improvement through the elimination of waste to shorten lead times, improve quality, reduce costs and ensure customer satisfaction.
Building A Solid Foundation For Excellence
(Steps to Achieving the Goals)

Lean Maturity depends on a foundation of capable people and capable processes.

Quality & Performance Focused
Team Based Culture

Predictability & Reliability
(6S / Flow / Point of Use / Kitting)

Leveled Production
(Leveling / Balancing)

Withdrawal & Replenishment
(Kanban / Pull)

Strategically Placed Inventory
(Buffers / WIP)

Visual Control
(Andon / MBWA)

Flexible Labor
(Multi-skilled / Multi-process)

Work Place Organization

Standard Work/Operations
(TAKT / Sequence / SWIP / Rules)

Defect Prevention
(MVP / Mistake-Proofing / FPY)

Rapid Response/Resolution
(RCCA / DMAIC)

Awareness/Education
(SPS Basics / Lean Academies)

Team Based Problem Solving
(AIW / 3P / Blitzes / Moonshine)

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Specially prepared by Don A. Blake For APICS Chapter 71, September 9, 2014
• **Four Facets of NCBU Implementation**

  - **Policy**
    - ✓ Cost, Cycle Time and Quality (CCQ)
    - ✓ Linkage to Business Planning
    - ✓ Incorporated into Performance Reporting

  - **People**
    - ✓ Awareness
    - ✓ Leadership In Lean
    - ✓ Methods, Tools, and Techniques

  - **Processes**
    - ✓ Metrics
    - ✓ Standard Work
    - ✓ Best Practices

  - **Partnerships**
    - ✓ Lean Engagements and Collaboration

*A multi-pronged approach for culture and immediate harvesting of opportunities in Quality, Cost, and Delivery.*
Policy – Renewed management commitment and a long term strategy for value stream efficiency and productivity.

• In conjunction with company goals and objectives NCBU uses Cost, Cycle Time and Quality (CCQ) as its primary metric set for achieving Functional Excellence.

• The CCQ approach establishes the baselines and the target conditions for each of the product lines.

• A tactical road map for improvement for each product line is developed and aligned with internal and external goals.

• CCQ is intended to be used in all processes and products as they transition from development to production.
Four Facets of NCBU Implementation

- **Policy**
  - Cost, Cycle Time and Quality (CCQ)
  - Linkage to Business Planning
  - Incorporated into Performance Reporting

- **People**
  - Awareness
  - Leadership In Lean
  - Methods, Tools, and Techniques

- **Processes**
  - Metrics
  - Standard Work
  - Best Practices

- **Partnerships**
  - Lean Engagements and Collaboration

A multi-pronged approach for culture and immediate harvesting of opportunities in Quality, Cost, and Delivery.
People – Awareness about company objectives and plans, leadership in deploying Lean concepts and techniques, and enhancing capabilities in using the methods and tools.

- All employees need to be aware of our business objectives and that “Lean” principles, behaviors, and methods are our approach for meeting those objectives.

- Leadership in “Lean” in management and non management ranks.

- Lean Principles, methods, tools and techniques will be formally and informally deployed via classroom, seminar and workshops.

  - Expanding expertise in Lean Principles is beneficial to the employee by creating development opportunities and exposure to various aspects of the organization.
• Four Facets of NCBU Implementation

- **Policy**
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  - ✓ Incorporated into Performance Reporting

- **People**
  - ✓ Awareness
  - ✓ Leadership In Lean
  - ✓ Methods, Tools, and Techniques

- **Processes**
  - ✓ Metrics
  - ✓ Standard Work
  - ✓ Best Practices

- **Partnerships**
  - ✓ Lean Engagements and Collaboration

- Efficiency and productivity is most often measured by direct costs, on time delivery and cost of quality.

- All processes in production shops and in supporting functions will be measured and monitored via cost, cycle time and quality metrics localized and augmented to the specific area of focus and nature of work.

- Robust, predictable, stable production and business support processes are critical
  - Change Management
  - Logistical Support / Control of Material
  - Other processes as identified by stakeholders and leaders

- As Standard Work is established, best practices will be documented and implemented across the business.

<table>
<thead>
<tr>
<th>Total Unit Costs</th>
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<tbody>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Labor</td>
</tr>
<tr>
<td>Overhead</td>
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<table>
<thead>
<tr>
<th>Cycle Time</th>
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<tbody>
<tr>
<td>Lead Time</td>
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<tr>
<td>Queue Time</td>
</tr>
<tr>
<td>Changeover</td>
</tr>
<tr>
<td>Run Time</td>
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<tr>
<td>Transport</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of Quality</th>
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</thead>
<tbody>
<tr>
<td>First Pass Yield</td>
</tr>
<tr>
<td>Scrap</td>
</tr>
<tr>
<td>Rework</td>
</tr>
<tr>
<td>Repair</td>
</tr>
<tr>
<td>Escapes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Material (Stock, standards, and consumables)</td>
</tr>
<tr>
<td>Work In Process (Semi-finished)</td>
</tr>
<tr>
<td>Finished Goods</td>
</tr>
</tbody>
</table>
• **Four Facets of NCBU Implementation**

  - **Policy**
    - ✓ Cost, Cycle Time and Quality (CCQ)
    - ✓ Linkage to Business Planning
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  - **People**
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  - **Processes**
    - ✓ Metrics
    - ✓ Standard Work
    - ✓ Best Practices

  - **Partnerships**
    - ✓ Lean Engagements and Collaboration

_A multi-pronged approach for culture and immediate harvesting of opportunities in Quality, Cost, and Delivery._
Partnerships – More emphasis and activities designed to engage and collaborate with employees, customers and suppliers to improve overall value chain lead times, product quality, and quality of work-life.

- Extending the techniques and harvesting the benefits across the entire value stream are the end goals.
- Made possible by engaging and collaborating with all stakeholders
- First within our own four walls, second with our customers and third, back into the supply chain.
  - Associates and contractors
  - Customers
  - Strategic Partner Suppliers
  - Other Suppliers
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- Results (Mid 2012 Status)
  - Education and Training
  - Assessments
### Phase I – Awareness
Communicate vision and intent. Educate and train all employees in the philosophy, methods, tools, and techniques which establish and maintain Lean Production behaviors and practices.

### Education and Training – Wave I

<table>
<thead>
<tr>
<th>Course</th>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Lean Manufacturing/Production</td>
<td>4 hours</td>
<td>4 hour overview of concepts, methods, tools and techniques. Intent is to have all employees participate as a way of level setting everyone’s knowledge and vocabulary.</td>
</tr>
<tr>
<td>Work Place Organization through 5S/6S</td>
<td>1 hour</td>
<td>1 hour Learn-Do and mini workshop. Intent is to introduce and kickoff Spirit approach to 5S and NCBU incorporation of Safety as the sixth ‘S’ of daily management.</td>
</tr>
<tr>
<td>Value Stream Mapping &amp; Analysis</td>
<td>2 hours</td>
<td>2 hour Learn-Do and mini workshop(s). Intent is provide knowledge and tools for documenting the Macro level value streams which becoming road maps for improvement.</td>
</tr>
<tr>
<td>Root Cause Corrective Action</td>
<td>8 hours</td>
<td>8 hour course provides proven method to improve root cause analysis. Interactive class provides a systematic approach to effectively identify cause chains allowing students to eliminate the sources of nonconformance and implement effective preventive actions.</td>
</tr>
</tbody>
</table>
**Phase II – Leadership In Lean**
Educate and train all employees in the philosophy, methods, tools, and techniques which establish and maintain Lean Production behaviors and practices. **Leadership in deploying Lean concepts and techniques, and enhancing capabilities in using the methods and tools.**

### Education and Training – Wave II

| Spirit Production System Basics | 8 hour overview of concepts of Lean Mfg practices and Principles. | Overarching principles, SPS Basic Foundation, Waste Elimination, Quality, Flow, Basic fundamentals, Mfg practices and Techniques, Bias for Quality-Personal Warranty, Mistake Proofing |
| Process Improvement Event Repository (PIER) | 2 hour overview of methods & information needed to enter an event into the repository. Who should enter events in PIER. When to enter events in PIER. | Registering and tracking quality improvement efforts. How to request a consultant. How to store and view files in pier. How to edit events in pier. How to store savings in PIER. How to close and cancel events in PIER. Roles and responsibilities. |
| Lean Coach/Master Coach Certification | 6-12 month training and self study curriculum. | Intent is to first recognize credentials for coaching and consulting which already are in the team. To also identify and develop embedded coaches within functions and processes whereby Lean/CI experts exist at every level in all organizations. |
Phase III – Enhancing Capabilities / Methods, Techniques, and Tools

Lean Principles, methods, tools and techniques will be formally and informally deployed via classroom, seminar and workshops. Baselines / targets developed at value chain and function. Scheduling and conducting events for chronic problems and low-hanging fruit.

<table>
<thead>
<tr>
<th>Assess and Target – Wave I</th>
<th>Action Plan</th>
<th>Deliverable(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capture current conditions at value stream and functional levels</td>
<td>Train and conduct VSM workshops using 2-3 half days</td>
<td>Macro VSMs for A350 Spar, A350 Sec 15, G280, and G650</td>
</tr>
<tr>
<td>• Develop baseline VSMs for each end item</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Record baselines for Lean Maturity</td>
<td>Conduct baseline assessments using Lean Assessment tool</td>
<td>Baselines for A350 Spar, A350 Sec 15, G280, and G650</td>
</tr>
<tr>
<td>Identify gaps and create Target Conditions and Timelines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Value Stream SQCDT metrics</td>
<td>Conduct VSM targeting workshops using 1-2 half days</td>
<td>Target Conditions for A350 Spar, A350 Sec 15, G280, and G650</td>
</tr>
<tr>
<td>• Lean Maturity</td>
<td>Conduct targeting workshops using</td>
<td>Baselines for A350 Spar, A350 Sec 15, G280, and G650</td>
</tr>
<tr>
<td>Plan and Schedule Lean/Process Management Events</td>
<td>Functions develop event targets and plans.</td>
<td>Combination of IPT projects, improvement workshops, and one blitzes</td>
</tr>
</tbody>
</table>
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Phase I – Awareness / Phase II – Leadership In Lean
Communicate vision and intent. Educate and train all employees in the philosophy, methods, tools, and techniques which establish and maintain Lean Production behaviors and practices.
## CI/Lean Maturity Event Planner

<table>
<thead>
<tr>
<th>ID</th>
<th>Value Chain / Function / Process</th>
<th>Event</th>
<th>Team Leader</th>
<th>Start</th>
<th>End</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ATK QN Reduction Workshop</td>
<td>One Day</td>
<td>QA Sr. Manager</td>
<td>2/21/12</td>
<td>2/12/12</td>
<td>Complete</td>
</tr>
<tr>
<td>2</td>
<td>A350 Concession Process</td>
<td>Multi-Day AIW</td>
<td>Engineering Mgr.</td>
<td>2/27/12</td>
<td>3/1/12</td>
<td>Proposed</td>
</tr>
<tr>
<td>3</td>
<td>Production Preparation Process (3P) for the G280 work transfer</td>
<td>Multi-Day AIW</td>
<td>Ops. Sr. Manager</td>
<td>2/27/12</td>
<td>3/2/12</td>
<td>Committed</td>
</tr>
<tr>
<td>4</td>
<td>Cycle Time Reduction – Dimensional Measurement</td>
<td>Multi-Day AIW</td>
<td>Dim. Mmt. Mgr.</td>
<td>2/27/12</td>
<td>3/1/12</td>
<td>Pre-Event Planning</td>
</tr>
<tr>
<td>5</td>
<td>Material Handling (See ID 17, 18 &amp; 19)</td>
<td>Multi-Day AIW</td>
<td>Tooling &amp; Ops. Mgrs.</td>
<td>3/5/12</td>
<td>3/9/12</td>
<td>In-Process</td>
</tr>
<tr>
<td>6</td>
<td>QA Metrics Data/Format</td>
<td>Multi-Day AIW</td>
<td>QA Manager</td>
<td>Mar</td>
<td>Mar</td>
<td>Complete</td>
</tr>
<tr>
<td>7</td>
<td>Receiving Insp. Cycle Time</td>
<td>Multi-Day AIW</td>
<td>QA Lead</td>
<td>Mar</td>
<td>Mar</td>
<td>Complete</td>
</tr>
<tr>
<td>8</td>
<td>QN-eConc.-Dispo. (1-3day)</td>
<td>Multi-Day AIW</td>
<td>QA Lead &amp; QA Manager</td>
<td>April</td>
<td>April</td>
<td>Complete</td>
</tr>
</tbody>
</table>
Lean Coach/Master Coach Development

- Former BPS Promotion Office Members with Master Coach training/experience
  - Tom Greenwood (also completed Six Sigma Greenbelt training under Carolyn Van Der Veen)
  - Dennis Watson
  - Curtis Welch

- Candidates with training/certifications brought with them from other companies/schools
  - Richard (Stacey) Hale
  - Harry Kagel
  - Kim Morse
  - Curtis Rupke

- Candidates identified to pursue Lean Coach certification
  - Carol Bell
  - Christopher Carr
  - Monica Edwards
  - Rebecca Gorman
  - Jack Happel
  - Harry Kagel
  - Daniel Kittrell
  - David Lee
  - Yesenia Morales-Perez
  - Kim Morse
  - Connie Owens
  - Rick Palmer
  - Regina Parnell
  - Curtis Rupke
  - Taylor Sayonh
  - Andrew Smith
  - Alecia Wenner
Building A Solid Foundation For Excellence
(Steps to Achieving the Goals)

Lean Maturity depends on a foundation of capable people and capable processes.

Quality & Performance Focused Team Based Culture

- Predictability & Reliability (SPC / TPM)
- Leveled Production (Leveling / Balancing)
- Withdrawal & Replenishment (Kanban / Pull)
- Strategically Placed Inventory (Buffers / WIP)
- Visual Control (Andon / MBWA)
- Flexible Labor (Multi-skilled / Multi-process)
- Standard Work/Operations (TAKT / Sequence / SWIP / Rules)
- Defect Prevention (MVP / Mistake-Proofing / FPY)
- Awareness/Education (SPS Basics / Lean Academies)
- Team Based Problem Solving (AIWs / 3P / Blitzes / Moonshine)
- Rapid Response/Resolution (RCCA / DMAIC)

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Building A Solid Foundation For Excellence
(Steps to Achieving the Goals)

### Lean Maturity Assessment Tool & Workbook

#### Version 03b - January 3, 2012

**Assessment Information Master**

<table>
<thead>
<tr>
<th>Site/Area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Area Manager(s):</td>
</tr>
<tr>
<td>252</td>
</tr>
</tbody>
</table>

#### A. Awareness & Education

1.1.1.2 The organization’s capability to make awareness and knowledge of continuous improvement concepts, methods, tools, and techniques.

<table>
<thead>
<tr>
<th>Score</th>
<th>Max Score</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>40</td>
</tr>
</tbody>
</table>

#### B. Team Based Problem Solving

1.1.1.2 The design of the production system and its ability to detect, analyze and correct the abnormalities in their processes. Problems need to be quickly recognized and the mitigation and preventive solutions initiated.

<table>
<thead>
<tr>
<th>Score</th>
<th>Max Score</th>
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<tbody>
<tr>
<td>6</td>
<td>10</td>
<td>60</td>
</tr>
</tbody>
</table>

#### C. Rapid Response & Resolution

1.1.1.2 The design of the production system and its ability to communicate normal and abnormal conditions to employees and managements. The idea is for the system to continuously provide feedback and status of the production lines and support systems.

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<tr>
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<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>40</td>
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#### D. Workplace Organization

1.1.1.2 The organization’s level of maturity in implementing and maintaining a safe, orderly, and harmonious work environment.

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<thead>
<tr>
<th>Score</th>
<th>Max Score</th>
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<tbody>
<tr>
<td>7</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

#### E. Standard Work/Operations

1.1.1.2 The level of maturity and sophistication of direct and indirect policies or 'Work Methods'. The not only includes the proper way but also how they have been designed and ordered to meet achievement of high flow.

<table>
<thead>
<tr>
<th>Score</th>
<th>Max Score</th>
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<tbody>
<tr>
<td>5</td>
<td>10</td>
<td>50</td>
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</table>

#### F. Defect Prevention

1.1.1.2 The organization’s capability to prevent defects and ability to prevent defective products from being produced. If and when defects do occur a highly mature system immediately engages a robust root cause analysis and containment process in rapid fashion.

<table>
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<th>%</th>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>40</td>
</tr>
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</table>

#### G. Strategically Placed Inventory

1.1.1.2 The design of the production system and its ability to effectively distribute the employees and managers are practicing in order to defend against lead time variation, quality issues, and other types of disruptions which can destroy flow and create delays.

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<tbody>
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<td>10</td>
<td>60</td>
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</table>

#### H. Visual Control

1.1.1.2 The design of the production system and its ability to effectively distribute the employees and managers are practicing in order to defend against lead time variation, quality issues, and other types of disruptions which can destroy flow and create delays.

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>4</td>
<td>10</td>
<td>40</td>
</tr>
</tbody>
</table>

#### I. Flexible Labor

1.1.1.2 The organization’s ability to maintain workforce and employees.

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<thead>
<tr>
<th>Score</th>
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<th>%</th>
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</thead>
<tbody>
<tr>
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</table>

#### J. Predictability & Reliability

1.1.1.2 The organization’s use of scientific methods and basic techniques for achieving maximum availability and optimal for critical processes, equipment, and machines.

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<tr>
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</table>

#### K. Leveled Production

1.1.1.2 The production system’s policies, design, and practices for achieving one of the key enablers for Flow Production. Leading the demand and balancing the work context are essential elements of work design that are needed to achieve and maintain flow.

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</tbody>
</table>

#### L. Withdrawal & Replenishment

1.1.1.2 The organization’s capability to get materials and information in workers when they need them, in the quantities they need them, while minimizing waste from excess materials, non-value added movement/transport, and redundant activities.

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### Strategies and Tactics for Establishing A Culture of Quality and Continuous Improvement for A 'Greenfield' Factory

Specially prepared by Don A. Blake For APICS Chapter 71, September 9, 2014

35
• Site History and Overview

  □ Search and negotiation (2006 -2008)
  □ Spirit NC Overview (Triangle BABNC Econ. Dev. Forum May 22, 2013)

• Strategy, Tactics and Results

  □ NCBU Master Plan (2010 -2012)
    ✓ Four Facets
    ✓ Building A Solid Foundation for Excellence

  □ Implementation (2010-2012)
    ✓ Phase I – Awareness
    ✓ Phase II – Leadership
    ✓ Phase III – Enhancing Capabilities / Methods, Techniques, & Tools

  □ Results (Mid 2012 Status)
    ✓ Education and Training
    ✓ Assessments
Thank you for your attention!

Questions?
<table>
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<tr>
<th>Step</th>
<th>Objectives</th>
<th>Action Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Document and Assess Macro Value Stream Conditions</strong>&lt;br&gt;• For Engineering, Supply Chain Management, and Manufacturing&lt;br&gt;• Establish baselines for Cycle Time, Work-In-Process, and Cost of Quality</td>
<td>Understand and confirm:&lt;br&gt;• the value streams,&lt;br&gt;• where the leverage is, and&lt;br&gt;• where the opportunities are</td>
<td>Start at end of stream:&lt;br&gt;• Create end item views,&lt;br&gt;• Use mini workshops, &amp;&lt;br&gt;• Involve all functions</td>
</tr>
<tr>
<td><strong>Develop Short Range, Mid Range and Long Range Target Conditions</strong>&lt;br&gt;• Short Range (by June 2012)&lt;br&gt;• Mid Range (by December 2012)&lt;br&gt;• Long Range (by December 2013)</td>
<td>A road map with goals that are:&lt;br&gt;• Specific,&lt;br&gt;• Measurable,&lt;br&gt;• Achievable,&lt;br&gt;• Realistic, and&lt;br&gt;• Time-based</td>
<td>Set progressive targets &amp; align to:&lt;br&gt;• Capacity needs,&lt;br&gt;• Cost goals, and&lt;br&gt;• Challenge goals</td>
</tr>
<tr>
<td><strong>Execute Improvement Plans</strong>&lt;br&gt;• Communicate strategic intent and goals to all employees&lt;br&gt;• Identify champions at every level&lt;br&gt;• Utilize rapid improvement methods for low hanging fruit&lt;br&gt;• Incorporate Production Preparation Process (3P) methods into product and process development</td>
<td>Put improvements in play as soon as possible:&lt;br&gt;• Get low hanging fruit,&lt;br&gt;• Build foundation for future improvements, and&lt;br&gt;• Create momentum</td>
<td>Engage and focus resources:&lt;br&gt;• Process owners,&lt;br&gt;• Support organizations,&lt;br&gt;• Suppliers, and&lt;br&gt;• Leadership team</td>
</tr>
<tr>
<td><strong>Incorporate Target Conditions Into Monthly Performance Review</strong>&lt;br&gt;• Measure and report key metrics&lt;br&gt;  • Cycle Times, Work-In-Process, Throughput, First Pass Yield&lt;br&gt;• Communicate progress to all employees on a regular basis (Weekly / Monthly / Quarterly)</td>
<td>Communicate up and down organization the importance of achieving goals.&lt;br&gt;Emphasize and closely track:&lt;br&gt;• Progress,&lt;br&gt;• Issues, and&lt;br&gt;• Successes</td>
<td>Use Current &amp; Target Condition views to:&lt;br&gt;• Show progress and trends,&lt;br&gt;• Areas of focus, and&lt;br&gt;• Overall system impacts</td>
</tr>
<tr>
<td><strong>Review / Refresh Plans &amp; Target Conditions Quarterly and As Goals Are Met</strong></td>
<td>Plans and goals that are:&lt;br&gt;• Flexible, and&lt;br&gt;• Adaptable</td>
<td>Review Plans and Targets:&lt;br&gt;• As goals are met or changed, and&lt;br&gt;• As part of Quarterly review process</td>
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