DTE Energy & Appvion’s Lean Journey

Lean Transformation of a Company
August 7, 2014
DTE Energy has a rich and deep history, and has evolved into an Integrated Energy Company

**Strong, Stable and Growing Utilities**

**DTE Electric**
- Electric generation and distribution
- 2.1 million customers
- Fully regulated by Michigan Public Service Commission

**DTE Gas**
- Natural gas distribution
- 1.2 million customers
- Fully regulated by Michigan Public Service Commission

**Complementary Non-Utility Businesses**

**Gas Storage & Pipelines (GSP)**
Transport and store natural gas

**Power & Industrial Projects (P&I)**
Own and operate energy related assets

**Energy Trading**
Generate economic value and provide strategic benefits

DTE Energy businesses currently operate in 22 states.
### Improvement Focus

<table>
<thead>
<tr>
<th>Value Stream</th>
<th>Lean Learning Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value stream mapping and implementation</td>
<td>Toyota Way Fieldbook p.419</td>
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<tr>
<td>Process improvement tools</td>
<td>Employee involvement</td>
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<td>Technical tools – short-term results</td>
<td>People development focus</td>
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### Management Approaches to Improvement

#### Toyota Way Fieldbook p.419
The DTE Lean Sigma Journey

- Kaizen (1998)
- More tools (2000)
- Created OS (2002)
- Demo Projects (2002)
Kaizen Approach – 1998

Strengths

 Bias for action
 High interest/support
 Can make radical changes quickly
 Converts skeptics
 Can support value stream approach

Weaknesses

 Lack of CI vision/strategy
 No system to support lasting change
 Can lack ownership if driven by staff only
 Can become the “lean program”
 Sometimes perceived as head-cutting tool
More Tools – 2000

**Strengths**
- Creates common language
- Standard approach to tool
- Quick implementation of chosen tool
- Little resistance

**Weaknesses**
- Tools force fit where it shouldn't be priority
- Lop-sided effort, overall system not balanced
- Less buy-in (they are making me do this)
- May never build operating system (OS)
Create Operating System (OS) – 2002

Strengths
- Easier to get buy-in
- Consistent message across organization
- Common language and vision
- Standard practices
- “Lean” metrics promote right behavior

Weaknesses
- Very slow progress
- Expensive
- Feels overwhelming, leads to stalls
- Bias toward PowerPoint presentations instead of action
Demo Projects – 2002

**Strengths**
- High interest/support
- Bias for action
- Willingness to make radical changes quickly
- Convinces skeptics
- Solves top management problems – gets support for more projects

**Weaknesses**
- No overall vision/strategy
- Can’t support lasting change
- Risk of back-sliding
- Lacks ownership if driven by staff function
- Lean becomes firefighting tool
Six Sigma – 2004

**Strengths**
- Uses very vigorous statistical analysis
- High interest/support
- Can solve top management problem and get support for further projects

**Weaknesses**
- Can lead to analysis paralysis
- BB can do too much on their own – misses chance for employee engagement
- May never build connected flow or a system
DTE Energy’s journey had not tapped the lean learning organization approach and had focused CI efforts towards value streams.

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<th>Improvement Focus</th>
<th>Value Stream</th>
<th>Management Orientation</th>
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<td>2006</td>
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Adapted from Liker – Toyota Way Fieldbook

2012 DTE Energy Company all right reserved.
The DTE Lean Sigma Journey


What’s next????
Poker
Toyota’s approach focuses on people development and value streams and is described in the High Velocity Edge

C1-C4
4 Capabilities of the Operational Outstanding

- C1 – Design work to see problems as they occur
- C2 – Countermeasure problems rapidly as the point of activity
- C3 – Share new local knowledge across the enterprise
- C4 – Leaders develop engaged employees through teaching, coaching and mentoring
2008 Financial Crisis

- $250 million challenge
- No lay-offs
- 80% sustainability
- 8 weeks!
IQPC Best Business Process Improvement Program
2009 & 2013
DTE made progress towards lean learning organization

Management Approaches to Improvement

- Value stream mapping and implementation
  - 2004
  - 2006

- Process improvement tools
  - Technical tools – short-term results
  - 2002
  - 2004

- Lean learning organization
  - 1998
  - 2000
  - 2002
  - 2009

Management Orientation

- Employee involvement
  - People development focus

- Toyota

Adapted from Liker – Toyota Way Fieldbook
Our Operating System has also evolved with Continuous Improvement (CI) a core Value

The best-operated energy company in North America and a force for growth and prosperity in the communities where we live and serve

We put the health and safety of people first
...and know this responsibility rests with each of us.

We act with integrity and show respect
...and understand this defines our company’s character.

We see our work through the eyes of those we serve
...and know that our work is a powerful means to serve others.

We bring our best energy and focus to our work
...and are fully engaged and accountable for results.

We believe that improvement is our daily responsibility
...and know those we serve have the right to expect that from us.

We play to win as a team
...and put the needs of our enterprise first.

We are passionate about the success of our company
...and know that its health and growth generate prosperity.

We serve with our energy,
the lifeblood of communities and the engine of progress
To make our value of CI real, our System of Priorities includes creation of a Distinctive CI Capability

DTE Energy Management Model shows how our six corporate priorities interact and influence one another as a well-connected and reinforcing system. We use this system and set of priorities to drive toward our long-term aspiration.

PRIORITY COMMITTEE
12 Top Executives meet bi-weekly
And our approach to developing this Distinctive CI Capability is systematic.

**INSPECTION**
CI Maturity Assessments

**FEED**
CI Training and Practice to build Capability

**PULL**
Annual Planning Cycle that gives direction to what we Improve

**FOUNDATION**
Continuous Improvement Capabilities Methodology
Employment Security
(CI will not lead to job losses)
The FOUNDATION of our methodology includes four CI Capabilities

- **Process Design**: Design work to see problems
  - Define how the work should be done and make deviations from it visible

- **Problem Solving**: Solve problems systematically
  - Swarm problem once surfaced to find root cause, experiment and countermeasure

- **Knowledge Sharing**: Share improvement across enterprise
  - Share knowledge from experiments (good or bad) to leverage learning

- **Coaching**: Expect leaders to teach and develop teams
  - Leaders develop their employees through practice, repetition and training
As a FEED we provide CI Training at every level of the organization to create a fundamental understanding.

Deepening CI Skills over time as Responsibility Increases
We monitor and improve our own CI Maturity through measurement and **INSPECTION**

DTE Energy Overall CI Maturity Score

<table>
<thead>
<tr>
<th>Year</th>
<th>Score</th>
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<tbody>
<tr>
<td>2011</td>
<td>1.5</td>
</tr>
<tr>
<td>2012</td>
<td>1.9</td>
</tr>
<tr>
<td>2013</td>
<td>2.0</td>
</tr>
<tr>
<td>2014</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Our CI Maturity Model process is helping to drive our implementation of our CI Approach across the enterprise

**CI Maturity Assessment Process**

- **Organizational Self-Assessment**
  - Plan & Organize Organizational Self-Assessment Team
  - Conduct CI Maturity Survey
  - Define Data & Artifacts
  - Conduct Direct Observations and Interviews
  - Effect on Findings and Generate Ratings

- **CIMM Team Assessment**
  - CIMM team conducts a detailed audit of the Organization's Self-Assessment Team
  - CIMM team conducts direct observations and interviews
  - CIMM team generates summary of findings and recommended final ratings

- **QA Board Review**
  - QA Board reviews the Organization's Self-Assessment Report
  - QA Board reviews the CIMM team findings, summary, and recommendations
  - QA Board ensures the quality of the CIMM team approach

- **CI Assessment Results Review**
  - CIMM team provides final summary results and ratings to the area leader
  - CIMM team facilitates a dialogue with the area leader to discuss strengths and opportunities for each CI capability

- **CI Action Planning**
  - Area leader reviews results of CIMM assessment to determine next steps and action plans to further the development of higher area's CI skills
  - Area leader contacts the business unit CI resources for deployment support
And most importantly we align our Focus and Energy to apply CI **PULLED** by our Annual Planning Cycle

Alignment of our CI efforts is a critical step in our Approach

1. Understand Business Goals
2. Develop Priority Plans
3. Develop Scorecards
4. Update Metrics & Use CI
5. Conduct Review Meetings
The PROCESS FRAMEWORK supports the maturity of our PROCESSES toward True North, featuring a progression through three distinct stages:

- Process Definition
- Process Management
- Process Innovation

developing our PEOPLE in each stage:
DTE Energy started the implementation of the **PROCESS FRAMEWORK** in 2008 with the introduction of **Process Design**.

Design starts by documenting a process by establishing:

- **Pre-specifications:**
  - Defining how we want the process to perform and the outputs to be achieved
- **Embedded Tests:**
  - Signals that tell us when we have a problem to each pre-specification
- **Escalations:**
  - Clearly defines who will respond to each embedded test
With Process Management, the GOAL is to **reduce variation** so that the **Actual Condition** is equal to the **Pre-Specificified Condition** and the daily targets are achieved consistently.

“HUDDLES” and Problem Solving

Daily Process Management is required for process stability to meet current customer expectations and to make small, incremental process improvements.

A way to think about this is:

- **Process Variation Reduction**
- **Type 1 Problems**
Leaders and Team Members practicing CI Behaviors on a daily basis

**Execute the Process**

1. Conduct Huddle
2. Ask Key Questions
3. Perform Go and See
4. Use Problem Solving
5. Improve Process Design

**Continuous Improvement Behaviors**

*Engaged Employees*

- Review Performance
- Engage the Team
- Go and See the Facts
- Experiment
- Incorporate Improvements
With Process Innovation, the GOAL is to **shift the process mean** by removing obstacles to reach a new target condition.

A way to think about this is:
- **Shifting the Process Mean**
- **Type 2 Problems**

Process Innovation (PI) is focused on achievement of a Business Challenge through attainment of successive Target Conditions.
Practicing with feedback is the most important part of effective skills training. The roles of Learner and Coach mirror a reporting relationship.

**Process Innovation Core Roles**

**Coaching is the Key Component**

1. **1st Coach (Learner’s Leader)**
   - Leader responsible for the Process

2. **2nd Coach (Coach’s Leader)**
   - Supervisor & Team (Front Line Leader who leads Huddles)

**Learner**

**Team Huddle Board Example**

- **Huddle Agenda**
- **Coaching Log**
- **Coaching Calendar**
DTE made progress towards lean learning organization

Management Approaches to Improvement

Value stream mapping and implementation

Lean learning organization

Isolated processes

Process improvement tools

Technical tools – short-term results

Employee involvement

People development focus

Improvement Focus

2012 DTE Energy Company all right reserved. Adapted from Liker – Toyota Way Fieldbook
What is Appvion?

- $850MM revenue coating company
- Appvion makes thermal paper, carbonless & specialty paper, and encapsulation microcapsules
- Four owned, low-cost manufacturing locations in the U.S. augmented by seven leased and three third-party logistics distribution facilities in North America and Europe
  » State-of-the-art microencapsulation manufacturing plant with substantial scale to support large-volume customers
  » World-class direct thermal coater in West Carrollton enabling rapid growth in high-value, mission critical tag, label and entertainment segments
  » Low-cost, integrated specialty paper mill with significant flexibility and on-machine coating capabilities

**Strategic Operating Platform**

**Appleton, WI**
- Carbonless, thermal, security and coating
- 9 off-machine coaters – ~231,000 tons/year
- Converting and finishing

**Roaring Spring, PA**
- Carbonless, security and other specialty grades
- 3 paper machines with on-machine coating – ~137,000 tons/year
- Bleached kraft pulp mill hardwood – ~91,000 tons/year

**Portage, WI**
- Encapsys® facility
- ~60,000 wet metric tons of microcapsules/year

**West Carrollton, OH**
- World-class thermal coater
- ~110,000 tons/year

**Utrecht, Netherlands**
- Birmingham, England
How Does Direct Thermal Paper Work?

- Thermal paper is produced by applying a thermal sensitive coating as one of several layers of coatings to paper (or film) base stock
  - Direct thermal printing technology is a system of applying heat to the surface of the thermal paper in order to create a chemical reaction within the paper’s coating thus creating an image – requires no ink or toner
- Direct thermal printing technology competes against several other prominent technologies – most notably thermal transfer – and has been consistently gaining market share as Appvion develops more robust coatings
  - Thermal transfer printing produces an image by melting a coating of carbon-based ribbon onto a substrate as it passes over the print head
  - Direct thermal has increasingly become the favored technology – 15% to 30% lower cost of ownership due to less maintenance, fewer consumables and elimination of ribbon disposal, enhanced print quality, improved manufacturing efficiencies and printer up-time
Thermal Paper Examples

**TLE**

- **Label**
- **Gaming**
- **Entertainment**
- **Tag**

**POS**
Carbonless Paper is Highly Technical with Extensive Coating Expertise Required

- The carbonless paper system consists of liquid dye and oil-filled microcapsules dispersed within a solid coating
  » In a typical three-part business form, three sheets of carbonless paper work together as a system to transfer images – Appvion can produce product with up to six layers
- The carbonless market is commonly divided between two types of products
  » Rolls are lower value products sold to printers, who sell finished products to high volume end users
  » Sheets are higher margin products sold to distributors who sell to smaller printers
- Appvion’s flagship NCR PAPER* is the premiere worldwide carbonless paper brand
  » Appvion can produce all varieties and grades of carbonless papers across a comprehensive color spectrum: canary, pink, blue, green, etc.
- Appvion is unique in that it can produce carbonless paper at both its Roaring Spring mill and its coating facility in Appleton
  » Innovative in-line machine coating processes increase production efficiency and reduce costs
  » Sources base stock internally from Roaring Spring and from outside sources

End Use Applications

<table>
<thead>
<tr>
<th>Bills of lading</th>
<th>Receipts</th>
<th>Medical Claim Forms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invoices</td>
<td>Applications Forms</td>
<td>Daily Reports</td>
</tr>
<tr>
<td>Pick Tickets</td>
<td>Quality Control Forms</td>
<td>Packing Slips</td>
</tr>
<tr>
<td>Purchase Orders</td>
<td>Patient Record Forms</td>
<td>Debit Memos</td>
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* NCR PAPER is a registered trademark licensed to Appvion, Inc.
Microencapsulation coating is the process of putting a wall around a core material to create nano-sized capsules

- Improves the efficacy and efficiency of the core material
- Many proven applications including fragrance, flavor masking, phase change material, nutraceuticals, biocides and herbicides
- $4 billion market that is growing 10% annually
- Two broad types of encapsulation are chemical and physical with chemical exhibiting the most attractive rate of growth

Advances in chemical microencapsulation coating technology are opening up new markets

- Development of new cell wall materials and release mechanisms
- Reduction in microencapsulation manufacturing costs
- Transition to chemical from physical in certain applications

Encapsys® is the technology leader with over 60 years of experience

- Leveraged technical know-how from carbonless to commercialize technology
- Strong IP and patent portfolio, which is referenced in over 400 3rd party patents
- Staff of over 30 scientists, technicians and industry experts

Globally recognized as the market leader in microencapsulation coating

- Broadest portfolio of wall technologies and release mechanisms
- Innovative, state-of-the-art, lowest-cost and scalable manufacturing capabilities
- “Gold standard” in fragrance microencapsulation coating
- “Big” company friendly with best-in-class operating controls

Strategic partnership with P&G in select segments

- Launched in 2007 as joint development partnership for Liquid Downy®
- Expanded into other laundry brands and geographies
- Evolve technology to provide P&G with new product solutions and savings
- Ongoing expansion into new product areas, geographies and applications

Business growth strategy realigned to focus on opportunities in core markets where Encapsys® is best positioned to win
Overview of Microencapsulation Coating Technology

- Microencapsulation coating is the process of putting a microscopic wall around a core substance to create nano-sized capsules
  - Wall material or encapsulate consists of a shell made of synthetic or naturally derived polymers and materials using either:
    - Chemical wall through a polymerization process
    - Physical wall through spray drying, fluid-bed or pan coating
  - Core materials may be a liquid, a solid, a vapor or a combination

- Key benefits of microencapsulation coating:
  - Ability to control the release of core material when the capsule wall is ruptured
    - Wall can be designed to rupture utilizing mechanical pressure, friction, degradation, chemical or numerous other methods
  - Provides a partition for incompatible components
  - Enhances performance attributes of core materials and products
  - Improves stability (protection of core materials from oxidation or deactivation because of environmental factors)
  - Mask the odor, taste and activity of core materials

- Encapsys® technology differentiation
  - Largest offering of wall structures and core release mechanisms
  - Experience and know-how to quickly formulate capsule walls and regulate core release for customer applications and processes
  - Highest core-to-wall ratio allowing Encapsys® to maximize the capsule load by tightly controlling the capsule diameter, ranging from sub-micron to over 100 microns
    - Encapsys® cores typically account for 80% to 95% of the capsule whereas other microencapsulators deliver a typical payload of around 50%
Management Approaches to Improvement

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**Management Orientation**

Toyota Way Fieldbook p.419
The Appvion Lean Sigma Journey

More tools (1986-1999)
Even more tools (2000)
Six Sigma introduced (2003)
Create strategic platforms (OS) (2005)
Kaizen events on speed (2006)
Value stream mapping - HPWT (2009)
And more tools (2011)
And demo projects (2003)
And more tools lean office (2005)
More tools & even more tools (1986-2000)

- Crosby process
- Customer focused quality
- Productivity efforts
- “Formal lean introduction”
  - SMED
  - TPM
  - Standard work
Six Sigma introduced & demo projects (2003)

- Introduced Six Sigma
- Utilize DFSS for product development (still used today)
- First “pull” pilot project to demonstrate value of lean
- Started High Performance Work Teams (HPWT)
Create strategic platforms (OS) & more tools (2005)

- New CEO
- Drove Strategic platforms with CI as key lever in operating system
- Lean office tools introduced
Kaizen events on speed (2006)

- Utilization of kaizen workshop
  - Ideal state
  - Current state

- Became the “lean program”
  - 120 plus workshops/year (2006-2013)
  - “Kaizened” out
Value stream map alignment (2009)

**Strengths**
- Efforts are well-integrated within a larger view
- Multiple benefits to value stream are common
- Results well-quantified and tangible
- Experience with lean as a system
- Organization aligned to value stream
- Split Appleton plant into three value streams

**Weaknesses**
- Can be time consuming
- Fluff – if no follow-up
- Requires large involvement to be effective
- Wide variability in execution
- Others outside of model line are not involved
- Hard to define value stream is some contexts
And even more tools (2011)

- Hoshin planning
- Lean accounting
- War rooms for visualization
Appvion’s Journey

Management Approaches to Improvement

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<td>???</td>
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Improvement Focus

- Value Stream Isolated processes
- Technical tools – short-term results
- Process improvement tools
- Employee involvement

Management Orientation
What’s next????

More tools (1986-1999)

Even more tools (2000)

Six Sigma introduced (2003)

Create strategic platforms (OS) (2005)

Kaizen events on speed (2006)

Value stream mapping - HPWT (2009)

And more tools (2011)

And demo projects (2003)

And more tools lean office (2005)
The offer

Poker part 2:

- CEO wants to build CI into culture
- Interested in learning/adapting
- Engaging all people in improvement
Daily CI: C1-C4

C1: Design work to see problems as they occur
- Pre-specify work
- Built-in tests

C2: Counter-measure problems rapidly at the point of activity to prevent recurrence
- The problem is a crime scene
- Swarm it!

C3: Share local knowledge throughout Appvion
- Learn once
- Save time

C4: Leaders develop engaged employees through coaching, mentoring & teaching
- Leaders are skilled in C1, C2 and C3
- Patience as a coach
VISION
We accelerate applied innovation to add value to products and processes for our customers.

VALUES
- Safety
- Integrity
- Accountability
- Diversity
- Teamwork

RESULTS
- Continuous Improvement
- Growth
- Financial Performance

TRUE NORTH
- Safe
  - No unsafe acts
  - Believe in zero
- Defect Free
- No Waste, Lowest Cost
- On Demand
- Morale

THE APPVION WAY
Align organization to corporate priorities through Hoshin Kanri

### X-matrix

**Continuous Improvement Strategy Deployment 2014**

<table>
<thead>
<tr>
<th>Strategies/Actions</th>
<th>Target to Improve</th>
<th>Cl Annual Objectives 2014</th>
<th>Cl Breakthrough Objectives 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define and develop CI M assessment process, deploy and create CI M baseline</td>
<td></td>
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<tr>
<td>Deploy CI c4 capability broadly</td>
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</tr>
<tr>
<td>Implement CI c5-c6 deeply into SOP and safety</td>
<td></td>
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</tr>
<tr>
<td>Value streams and CI own accurate 18 month rolling forecast and business targets</td>
<td></td>
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<td></td>
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<tr>
<td>Deep CI c4 pilots (data, TPS, others)</td>
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<tr>
<td>Develop and improve leader training (CI and general)</td>
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<td></td>
<td></td>
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<tr>
<td>Roll out TPM effort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll out HPWT effort</td>
<td></td>
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<tr>
<td>Develop and standardize &quot;wave&quot; methodology</td>
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### Scorecard

**Scorecard - Cl 2014**

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<th>Strategy/Measure of Success</th>
<th>Responsibility</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety OIR of zero with safety plan; support corporate effort of 1.6</td>
<td>Maureen Ware</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Top Decile engagement of CI team 77%; support corporate effort 68%</td>
<td>Maureen Ware</td>
<td>✔</td>
<td>✔</td>
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<td>✔</td>
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<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Engage 85% of employee daily CI c1-c4</td>
<td>Maureen Ware</td>
<td>✔</td>
<td>✔</td>
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**Notable Achievements**

- Safety OIR of zero with safety plan; support corporate effort of 1.6
- Top Decile engagement of CI team 77%; support corporate effort 68%
- Engage 85% of employee daily CI c1-c4
- CI Annual Objectives 2014
- Cl Breakthrough Objectives 2017
<table>
<thead>
<tr>
<th>Develop and Deploy Strategic Plan</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
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<td>CONFIRM OUR ASPIRATIONS AND PRIORITIES</td>
<td>CONFIRM OUR ASPIRATIONS AND PRIORITIES</td>
<td>COMPLETE 5-YEAR PLAN</td>
<td>DEVELOP 1-YR APPVION X-MATRIX</td>
<td>DEVELOP 1-YR BUSINESS UNITS, SUPPORT GROUP, X-MATRIX, ROLLING FORECAST &amp; CONFIRM (S2)</td>
<td>ALIGN INDIVIDUAL PERFORMANCE OBJECTIVES TO APPVION TARGETS</td>
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<td>Key Dates</td>
<td>April 15</td>
<td>April 15 - June 10-12</td>
<td>July 14-16</td>
<td>Sept 4</td>
<td>Sept 11 - Oct 7-9</td>
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<td>Other Key Dates</td>
<td>March 11-12 Board Meeting</td>
<td>May 6-7 Board Meeting</td>
<td>Stout Risius Ross May 28 (approx.)</td>
<td>August 5-6 Board Meeting</td>
<td>November 4-5 Board Meeting</td>
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</tbody>
</table>

**C1-C2 Gap Closure (PDCA)**

- **Make System Output Problems Visible**
- **Develop A3’s & Countermeasures**
- **Execute Improvement (7Q)**
- **Close Performance Gaps**

**Stout Risius Ross**

- May 6-7 Board Meeting
- May 28 (approx.)
- November 24 (approx.)

**Annual Strategic Planning Cycle**

**Key Dates**

- April 15
- May 6-7
- August 5-6
- November 4-5
- November 24 (approx.)

**Other Key Dates**

- March 11-12 Board Meeting
- June 10-12
- July 14-16
- Sept 4
- Oct 7-9
- Nov-Dec
- Dec-Jan

**Built-in Test on X-Matrix**

- Pulse ➔ Pulse ➔ Deep Dive
- Pulse ➔ Pulse ➔ Deep Dive
- Pulse ➔ Pulse ➔ Deep Dive
- Pulse ➔ Pulse ➔ Deep Dive
Broad deployment of Daily CI

- Introduced October 2013
- Top 51 leaders trained in 5-day workshop starting with CEO and staff
- All leaders to be taught in 8-hour course by December 31
  - 58% completed by July 31
- On-boarding of new executives includes 5 days of CI training
- Approaches/language/rolled-out by Senior Leadership Team
- Key to approach is an assessment process on trainers
  - Assessor evaluates trainer (C4) to give specific feedback on training
  - Monitor spread of training and quality of training
    - Better and more effective roll-out of content

**Daily CI: C1-C4**
### Trainer Assessment and Feedback

**2014 5-Hour Daily CI Training for Managers**

<table>
<thead>
<tr>
<th>Name of Trainer:</th>
<th>Date of Training:</th>
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<tbody>
<tr>
<td>Traine Group Name:</td>
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**PROFICIENCY KEY:**
1. Demonstrated understanding of the concept: the trainer using introduced to the concept for the first time, and therefore needs to improve.
2. Demonstrated understanding of the concept: the trainer has made good progress on his/her “first take” of subject material, and needs to continue to build on his/her already established understanding.
3. Demonstrated understanding of the concept: the trainer is proficient to teach without assistance, and could still improve in further understanding, but is able to effectively transfer knowledge to learners.
4. Demonstrated understanding of the concept: is a strong trainer, although the trainer could still improve. His/her proficiency is such that he/she is able to readily shift the training content from prepared classroom materials to other settings, examples.
5. Demonstrated understanding of the concept: is a strong trainer, although he/she could still improve. His/her proficiency is such that he/she is able to readily shift the training content from prepared classroom materials to other settings, examples.

**Assessor Comments:**

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<td><strong>CI exists because we need to close gap</strong></td>
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<td>States such that learners understandapplican has already made strong progress, can answer questions</td>
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### C1-C4 Sections Trainers Presented

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Problem Solving (C2) takes place in several ways:

<table>
<thead>
<tr>
<th>Type of Problem:</th>
<th>Suggested Tools/Templates:</th>
<th>Estimated Timing to Countermeasure:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boulders</strong></td>
<td>Projects DFSS DMAIC Project Charter Project Summary</td>
<td>Greater than 1 month</td>
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<tr>
<td><strong>Rocks</strong></td>
<td>Kaizen events with CI process changes 8 Step Problem Solving Flow Chart</td>
<td>1 day to 1 month</td>
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<tr>
<td><strong>Pebbles</strong></td>
<td>Countermeasure worksheet Improvement routine</td>
<td>Every day</td>
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EBITDA, Safety, Engagement, Customer

Gap Land

Type of Problem:

Projects DFSS DMAIC Project Charter Project Summary

Estimated Timing to Countermeasure:

Greater than 1 month

1 day to 1 month

Every day
Developed a process & methodology for gap closure activities

- Set targets that tie to corporate performance
- Use abnormality to target to pull countermeasuring of problems (P1)
- When target is consistently hit, raise the target (P2)
- Weekly review of activity to tie activity to gap closure by month
  » Use lean accounting 18 month forecast to show rate and trends
Deep Deployment of Daily CI to learn how to apply at a system level

- Safety process design (C1) and abnormality countermeasuring (C2)
- Solution development process (SDP)
- Toyota pilot

<table>
<thead>
<tr>
<th>Define the Problem</th>
<th>Determine Probable Root Cause</th>
<th>Propose the Countermeasure</th>
<th>Predict the Expected Outcome</th>
<th>Record Actual Outcome</th>
<th>Document Learning</th>
</tr>
</thead>
</table>

**Go & See the Problem**

**Conduct Experiment**

**Daily CI: C1-C4**

- C1: Design work to stop problems as they occur
- C2: Countermeasure problems rapidly at the point of activity to prevent recurrence
- C3: Share local knowledge throughout Appvion
- C4: Leaders develop engaged employees through coaching, mentoring & teaching

- Leaders are skilled in C1, C2 and C3
- Patience as a coach
- The problem is a crime scene
- Swarm it!
- Pre-specify work
- Built-in tests
- Learn once
- Save time

**Engaged Employees**
Applying Daily CI to safety is showing benefits

- C2 rapid response to incidents
- Increase reporting of unsafe acts and conditions
- Process design and communication of safety systems
C2 countermeasuring example #1: Spring Mill front loader

- Performed “Go and See” on the actual problem
- Focused on a rapid, low cost mentality – what can be done today (C2)?
- New shield fabricated and installed in one day
Solution Development Process (SDP) is key to applying innovation at Appvion

- Apply improved process design into SDP process
- Improve process design in portfolio management process
- Apply lean product development methods to improve cycle time and clarity
Toyota is helping us think through how to apply Daily CI with our core assets

- Working with Toyota Production System Support Center (TSSC) monthly to execute strategy on our coaters and rewinders
  - Strengthen “rock” problem countermeasuring
  - Stabilize coaters and rewinders
  - Make abnormalities of performance visible
  - Understand span of control ratio for effective problem countermeasuring
Appvion is laying the foundation for accelerated Daily CI application

- Similar to DTE, process definition, process management, process innovation

  » C1-C4 framework builds the foundation of defining processes and working abnormalities (P0+P1)

  » 2014 work sets up challenges for 2015 in strategic planning that enables kata implementation (P2)
    - Key kata pilots launching in 2014 on product development and operations
    - Kata becomes the C2 and C4 work in Daily CI that works on P2 problems
What’s Different in Deployment
Appvion vs. DTE

- **Push vs. pull**
  - Pull is easier and key to deployment
  - Leaders need to model the behavior
  - Leaders need to mentor and coach
  - Appvion is pulling, DTE was a push in the beginning

- **Selection of leaders based on capability and culture**
  - CI embedded into expectations of leaders
  - Screen top talent before joining company
  - Appvion more nimble to this approach

- **Size of company affects speed of diffusion**
  - Organizational awareness within a year
  - Experiments can be rapidly shared and deployed (C3)

- **C1 process design is to make problems visible**
  - Much more focus on metric targets and built-in tests to trigger countermeasuring at Appvion

- **The Packers are better than the Lions (94-66-7)**
  - One data point does not make a trend (Lions won last year)
Summary

- Building capability of people can work in more than one context
- Lean learning organizations are hard to build and most companies evolve to this management approach
- Each step in deployment iterates – broader and deeper application over time