ToC Tapped to Accelerate Gulf of Mexico Cleanup
June, 2010 – Stage 1

- Rapidly Improve Supply Chain performance
- Marathon across the US and Europe
- Doubling, Tripling (decupling?) output of key suppliers
  - Boom
  - Skimmers
  - Absorbents
- Never starved the effort
August, 2010 – Stage 2

- 14,000 Vessels on the payroll
- Daily spend exceeding $35M
- No facilities
- Grew a Fortune 500 company then shrank it in 4 months
- Saved $700M
Stage I
Holy Cow, we don’t have enough!

- BP cornered the world market inside 30 days
  - Boom
  - Skimmers
  - Tyvec suits
- Still not enough for projected demand
- How to get more?
Absorbent Products

- **Absorbent Boom**
  - 5” dia x 10-20 ft long
  - “Poly” net casing
  - Hydrophobic, hydraphilic filler
  - One Houston supplier increased production from one truck a day to 10 per day

- **Absorbent “pom-pom” Boom**
  - Polypropylene fibers spun around 50 ft line
  - New Orleans supplier went from 2,000 to 80,000 ft per day by expansion
  - **Increased to 120,000 ft/day by implementing TOC focused Lean**
Boom

Containment Boom
• Used in contain oil near shore
• 18” high x 100 ft long
• Manufacturers takt time ranged from 30 minutes to 6 minutes

Fire Boom
• Used to contain oil while burning in open water
• Above Water: Inconel/Ceramic woven fabric
• High temp foam floats protected by stainless steel shells
High Tech Absorbents

High Tech Absorbent Pad
- High loft polypropylene blend absorbs 50 times its weight in oil
- Fabric manufactured on high volume mattress pad lines
- Each line can produce 2,500,000 ft² weekly

High Tech Absorbent Mops
- Proprietary foam absorbs very high ratio of oil while rejecting all water
- Can be cut into mops, booms or wipes
- Production capacity 115 miles per week
- Highly durable on shoreline
Skimmers

• Drums, Discs, or Brushes rotate through oily water, oil is combed off and pumped away
• Diesel Power Packs provide hydraulic pressure to rotate drum and pump oil
Vessels and Storage

Storage Bladders
- Used to temporarily store oil after skimming
- 10m3 to 25m3 Capacity
- Having problems emptying thick oil from bladders, want more barges

Specialty Vessels
- Skimmers and barges
- One supplier was at 1 vessel per week, now at 1 per day
Our Mission

- Assess high level quality and plant safety
- Determine if supplier can do what they have already committed to do
- Identify opportunities to increase production

Increase production at least 3 to 5 times current output in the next 30 days.
Suppliers Visited – usually 1 day

18 Suppliers in one Month
Methodology

• Define the system

• ToC Focus
  – Identify the constraint
  – Exploit the constraint
  – Subordinate non-constraints to support the constraint
  – Elevate Constraint
  – Restudy

• Rapid lean tool implementation
  – Rapid reduction of key wastes at the constraint

• Time frame = NOW (30 day max)

• BP - “Don’t let money hold you back, but don’t waste our money”
Defined the system

- Quick walk to get overall flow – flow diagram of each supplier
Identify the Constraint

- Internal or External - Not the market!
- Policies
- Capacity
  - Manpower
  - Methods/Processes
  - Time
  - Machines
  - Facilities
- No data collection other than what we did on initial visit – Relied on our experience and asked the right questions to the right people
Policies: a few examples of many

• BP Payment Terms
  − Contracted weekly invoicing/payments

• Eliminate Over-Processing
  − Stop epoxy painting aluminum skimmers and boats
  − “We need 10 Chevrolets instead of 1 Cadillac”

• Off-loading work
  − Kvichak subcontracted to Trinity Yachts who had skill set and capacity to fabricate and assemble
  − Aqua-Guard/Rainer – Divest containment boom business to focus bottleneck recourses on towable bladders
Sorbent Examples

- External supply constraint of polypropylene scrap
  - Facilitated approval for alternate cellulose material
- 20’ lengths vs standard 10’ lengths
  - Eliminated 1.5’ overlap every 10’, 15% more linear boom
Skimmer Example

- Get all less than 6 min cycle time to achieve 6 min takt
### Supply Chain Results

- **Weekly Production and Improvement Factors**

<table>
<thead>
<tr>
<th>Product</th>
<th>BP Production</th>
<th>Total Production</th>
<th>Additional Prod &lt;30 days</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorbent Boom (ft)</td>
<td>150,000</td>
<td>150,000</td>
<td>500,000</td>
<td>3.3 times</td>
</tr>
<tr>
<td>Absorbent Pads (ft)</td>
<td>0</td>
<td>80,000</td>
<td>160,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Absorbent Pom-Poms (ft)</td>
<td>80,000</td>
<td>80,000</td>
<td>180,000</td>
<td>2.0</td>
</tr>
<tr>
<td>Absorbent Blocks (ft)</td>
<td>30,000</td>
<td>126,000</td>
<td>604,800</td>
<td>4.8</td>
</tr>
<tr>
<td>Containment Boom (ft)</td>
<td>128,400</td>
<td>208,400</td>
<td>416,850</td>
<td>2.0</td>
</tr>
<tr>
<td>Fire Boom</td>
<td>1,980</td>
<td>1,980</td>
<td>2,400</td>
<td>1.2</td>
</tr>
<tr>
<td>Skimmers (units)</td>
<td>35</td>
<td>47</td>
<td>96</td>
<td>2.0</td>
</tr>
<tr>
<td>Skimmer Vessels (units)</td>
<td>2</td>
<td>2.5</td>
<td>7.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Bladders</td>
<td>0</td>
<td>3</td>
<td>20</td>
<td>6.7</td>
</tr>
</tbody>
</table>
Part 2 – “We have a fleet and don’t need it.”

- Decontamination - “Clean-up of the clean-up”
- Over 14,000 vessels plus major pieces of equipment
  - All MC-252 product had to be removed and properly disposed
  - USCG – “Vessels must not cause sheen”
- Daily spend >$25M
- No facilities, no people, no process
Our Mission

Remove vessels from the payroll as quickly as possible

• Build the process
• Measure progress
• Integrate the supplier
• Coordinate the work
• Stay out of the way!
How We Did It

• Created structured process for the entire Demobilization process design
  – Designed in the drum
  – Performance criteria
• Established Site Performance Management processes to support ongoing improvement at Decon & Dry Dock sites
• Created standard work
  – At the sites for decon
  – At the UAC for demobilization
• Provide ongoing support to drive best practices and consistency in execution
• Contractor Management / Supplier Performance Management effort to apply standard practices
Part 2 – Grow Pinnacle Strategies in 30 days

- Pinnacle Strategies team sized to expanded roles:
  - From 5 to 30 consultants in a month
  - On-boarding, integration, training
  - Geographically dispersed
  - Spread best practices
Sites to be Managed - 20
Our Roles

- **Command center support**
  - Develop standard work – goal to safely demob as quickly as reasonable – rapid continuous improvement
  - Create & maintain decon metrics
  - Share learnings among sites
  - Rapid communications among business functions and sites
  - Maintain system focus

- **Decon on-site support**
  - Early site life: Aim to safely and rapidly increase decon/demob throughput to full rate
  - Mid site life: Sustain gains and lead continuous improvement efforts for safety and throughput
  - Late site life sustain safety and throughput metrics while rapidly ramping down to demob status
Boom Decon – Theodore, AL

All that boom we made earlier was used and now had to be decontaminated

Mostly biological growth
Boom Decon – CI

- Semi-automatic boom cleaner – 10x throughput with same size crew – idea sparked by Pinnacle Strategies on Friday, built by Monday, and running on Tuesday
Ship Decon
Ship Decon - Exploitation

https://dl.dropboxusercontent.com/u/78737571/Video/Pascagula%20Decon.m4v
Demob/Decon Process Mapping

- Process maps created to identify opportunity for system improvement and to illustrate individual roles and responsibility
Developed Decon Standard Work

Standard Process for decontaminating wooden deck boards

Deck and Board Cleaning Process: Boards Removed From Vessel

- Boards enter physical inspection bay in groups corresponding to deck position
- Boards placed on decon rack
- Soak boards in 10% Accell Solution
- Pressure wash boards over soak bin
- Rinse boards in rinse bin (look for sheen)
- Contamination inspection
- Clean Board Storage (ready for installation)
- Physical inspection

Workflow:
- Sill 4
- Sill 3
- Sill 2
- Sill 1

By: Scott Schipske
10-13-2010

© 2011 TOCICO. All rights reserved.
KPI Categories

- Dock Utilization
- Throughput – Vessel Feet Processed
- First Time Quality
- Total Recordable Safety Incidents (near misses, too)
- Productivity – Lost Time
Decon Site Weekly KPIs – w/e 11/5

Throughput: Total Vessel Feet Processed

First Time Quality

Dock Utilization & Throughput Ratio

Total Recordable Incidents Rate
Developed & Maintained Metrics

- Each site monitored and reported on safety and throughput metrics

### Daily Vessel feet processed (last 16 days) Lake Charles

- **Date**: 11/25, 11/26, 11/27, 11/28, 11/29, 11/30, 12/1, 12/2, 12/3, 12/4, 12/5, 12/6, 12/7, 12/8, 12/9, 12/10
- **Values**: 0.0, 140.7, 178.0, 70.0, 280.0, 143.7, 84.4, 69.6, 89.4, 223.5, 153.0, 260.6, 411.3

### Cumulative Planned vs. Unplanned

- **Lost Time**: 23.3%
- **Vessel Decon**: 69.0%
- **Insp**: 6.5%
- **Equip Decon / Inspection**: 1.8%

### Cumulative Lost Time

- **Vessel Idle**: 25%
- **Unload/load Crane**: 3%
- **Pump truck**: 4%
- **Repair/Replacement**: 9%
- **Safety**: 20%
- **Uncontrol**: 1%
- **Vessel Traffic**: 1%
- **Dock Assessment**: 4%
- **Marine Chemist**: 6%
- **Confined Space Permit**: 2%
- **Confined Crews**: 2%
- **Materials**: 22%
Dry Dock CI

Blocking time reduced from 72 hour average to 8-24 hours
- Added Block Building Resources to night shift
- Synchronized (Staggered) schedule to avoid resource contention
- Scheduled vessel sequence according to hull geometry - reduced NVA blocking time by reuse of existing blocks
Lessons Learned

• Drivers of Success:
  - Identify and communicate key success factors
    - Focus of operations and organization to support those objectives
  - Identify relevant productivity metrics for key activities, measure and act on the information, e.g. Non-productive time, identify improvement opportunities and share learning through short interval reports and changes in practices

• Battle Rhythm
  - Daily operations with fact based review of work schedule and status against plan; operational issues raised and resolved transparently; decisions taken
  - Daily leadership meetings to challenge activities, reinforce policy; facilitate timely decisions based on facts and input from leadership team
  - Objective weekly performance reporting laterally and upward to highlight areas of focus
  - Communication upward in weekly report to stakeholders (UAC and GC IMT)
Part I – Make More Now

Absorbent Boom – Houston, New Orleans, New York, North Carolina, Mexico


Skimmer Vessels – Seattle & Gulfport

INCREASED 2 TO 10 TIMES
Part II – Decon/Demob Quickly

Tripled Rate of Decon/Demob
Saved $700,000,000

- Receiving Boom - Biloxi
- Decon Pool – C-Port
- Dry Dock - Fourchon
- Graving Dry Dock - Tampa
- Vessel Decon - Biloxi
- Equipment - Pascagoula
ToC Tapped to Accelerate Gulf of Mexico Cleanup

www.pinnacle-strategies.com