TOCICO CONFERENCE 2008

TOC IMPLEMENTATION -- 6 Years Later

Presented By:

Col Daniel Gillan
LtCol Don Humpert
Mr. Steve Foreman
Mr. Bert Black

Date: 3 November 2008
TOC IMPLEMENTATION -- 6 Years Later

Logistics Solutions for the Warfighter
<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vision / Mission</td>
<td>Col Daniel Gillan</td>
</tr>
<tr>
<td>The Way We Were</td>
<td>LtCol Don Humpert</td>
</tr>
<tr>
<td>Change...Change...Change</td>
<td>Mr. Steve Foreman</td>
</tr>
<tr>
<td>It Doesn't Stop</td>
<td>Col Daniel Gillan</td>
</tr>
</tbody>
</table>
Logistics Command’s ★★★ VISION

Marine Corps’ Operational Logistics Solution provider for fielded weapons systems, support services and supplies.

- Operational logistics solutions to satisfy the Warfighter’s tactical logistics requirements.
- Sustain weapon systems and equipment with supporting products and services.

*With a Warfighter focus, we provide competitive, comprehensive and integrated solutions by being “the best” or sourcing from The best commercial, organic and DOD providers.*

- Fulfill the Operating Forces’ logistics requirements ……………with innovative, efficient and effective solutions.
- Best-value logistics support provider for strategic functions ……….. resource from best-value support providers for all other functions.

*Enhance the Marine Corps’ ability to execute and sustain its warfighting competency.*

- Logistics broker connecting strategic logistics resources to tactical logistics requirements.
- Take logistics burden off of the Warfighters’ shoulders ……… allowing them to focus more on their core competency of warfighting.

Logistics Solutions for the Warfighter
Current on Board: 1,759
Contractor: 621
Temp/Term: 330
Permanent: 799
Marines: 9

It’s All About The People!
Versatility and Capability
Multi-Commodity / 493 Lines
69 Trade Skills - Laborers to Engineers

ANNUAL REVENUE

National Guard Bureau
Marine Corps
Air Force
Private Industry
FBI
Foreign Military Assistance
Army
Homeland Security
Navy
THE WAY WE WERE
LtCol Humpert

- Past Performance
- Nine Better Business Practices
- What next?
- LOGCOM HQ Support
- TOC Implementation Strategy
Stove-Piped Organization
Outdated Processes
Reactive vs Proactive
Ad Hoc Solutions
Cost Overruns
Schedule Slippage
Long Repair Cycle Times
Growing and “Out of Control” WIP
9 BETTER BUSINESS PRACTICES

- Activity Based Costing
- Budget Process Improvement
- DCAA (cost accounting standards compliance)
- Earned Value Management
- ISO 9000
- Business Process Improvement
- MRP-II
- Process Standards
- Supply Chain Management
What to Change?
- Top level focus on efficiencies
- Scheduling
- Production

What to Change to?
- Focus on the GOAL: readiness
- Critical chain for each primary end item
- SDBR production system in backshops

How to Cause the Change?
- “Pilot” vehicle on Critical Chain to prove concept
- Supporting back shops on SDBR
- Leadership and education to create a culture of throughput
The Right Questions:

- What to Change?
- What to Change to?
- How to Cause the Change?

Resource Support

- Funding
- Staff Support

Genuine Understanding

Transformational Leadership
Change...Change...Change
(Steve Foreman)

Desperate Situations
Demand
Visionary Leadership
“Radical” Approach
- Managers work for employees
- Supervisors exist to help employees create value
- Managers ensure employees have everything they need to do their jobs
- Manage by walking the floor, answers are not in an office or in meetings
- Managers get engaged with creating value for the customer
- Managers drive change with personal action

Talk the Talk, WALK the WALK
Change...Change...Change
(Steve Foreman)

MK-48 & LAV-25 Stories
Institutionalizing the Process
Continuous Communication
Univ of Tenn Article
Control of WIP/Inductions
Material Management
Critical Chain
Drum-Buffer-Rope
Improved Metrics
Variation Analysis
Throughput Focus
Financial Results
TOC Reports/Software Upgrades
Lessons Learned/Challenges

Desperate Situations
Demand
Visionary Leadership
MK-48
Turnaround Story

- FY00 - 38 page brief to PM full of excuses
- Missing cost and schedule significantly
- First line implemented under TOC
  (Assisted by Vector Strategies)
- Reduced WIP from 55 to 16
- Increased production from 5 to 16 per month
- Additional 30 MK48s without add'l funds
- RCT from 167 to 53 days

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**Repair Cycle Time (Days)**

<table>
<thead>
<tr>
<th>FY00</th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
<th>FY04</th>
<th>FY05</th>
<th>FY06</th>
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</thead>
<tbody>
<tr>
<td>98</td>
<td>53</td>
<td>64</td>
<td>54</td>
<td>56</td>
<td>51</td>
<td></td>
</tr>
</tbody>
</table>

**Labor Rate/Hr**

<table>
<thead>
<tr>
<th>FY00</th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
</tr>
</thead>
<tbody>
<tr>
<td>152</td>
<td>85</td>
<td>80</td>
<td>79</td>
</tr>
</tbody>
</table>

**COST**

<table>
<thead>
<tr>
<th>FY00</th>
<th>FY01</th>
<th>FY02</th>
<th>FY03</th>
</tr>
</thead>
<tbody>
<tr>
<td>127</td>
<td>127</td>
<td>79</td>
<td>72</td>
</tr>
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</table>

$125K - TOC vehicles

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Logistics Solutions for the Warfighter
PM very dissatisfied with cost & schedule
PM looking for alternative sources of repair
MCA requested time to implement TOC
LAV was second line under TOC
RCT reduced from 231 to 116 days

Logistics Solutions for the Warfighter
ACCOMPLISHMENTS

Improved Readiness

Marine Corps  *(used savings to fund additional workload)*
- Added 30 MK48’s to FY-02 line
- Added 10 MK15 Trailers
- Added 4 LAV-25’s and 2 POP (SLEP) vehicles
- Added 4 MK17 Trailers
- Completed 17 SEE Tractors (Prior Yr jobs)

Other Services
- 8 M88’s (Georgia Army National Guard)
- 6 M-977 HEMTT’s (Army)
- 20 HMMWV’s (Florida Army Reserves)
- Corrosion Control Program (Georgia Army National Guard)

- Ahead of or on schedule for all TOC production lines
- Reduced Repair Cycle Time by at least 50%
- Reduced Quantity of Assets in Maintenance by up to 50%

No Charge to Customers
INSTITUTIONALIZING THE PROCESS

Spread the message of Success
- Obtained initial Employee Buy-In
- Groups of 30 *(Explained Situation and Process)*
- Listen! It’s their processes

Union Representative on Implementation Team

Implemented across all production lines
- Additional Line every two weeks
- Cemented Employee Buy-In through demonstrated success

Incorporated TOC methodology
- Policies
- Procedures
- Work Instructions

Daily Production Meetings – Continues Today
APPLYING THEORY OF CONSTRAINTS PRINCIPLES AND LEAN THINKING

Theory of Constraints principles can be used in conjunction with Lean thinking to leverage even more benefits for the enterprise.

Theory of Constraints & Lean enables growth strategy.
TOC primarily focuses on the bottleneck.
Lean is focused on reducing waste at all levels.
Lean uncovers additional capacity for further growth.
Lean thinking corporate implementation plan developed.
Set up Lean Team.
Lean 6-S efforts results:
- Reengineered supply warehouse,
- Significant increase in available shop floor space,
- Streamlined process flows,
- Cleaner workplace, less cluttered, and safer.

“The Center has become extremely flexible and better positioned to meet its responsibilities for regeneration and reconstitution of critical supplies.”
CONTROL OF WIP / INDUCTIONS

- One Piece Flow
- Pull System
- Critical Chain
- Simplified Drum-Buffer-Rope
Ensure Parts Availability
- Aggressively worked with DLA, OEMs and other vendors
- “It’s NOT a parts problem!”

Maximized Line-Side Stock
- High volume materials within arms reach of the artisan
- Automated the reorder process - Reduced from 5 to 1 day

Make/Buy Decisions
- Determine uneconomical repair processes
- Less inventory OH + less labor to complete + increased throughput = Reduced cost

- Increased Kitting
  - Develop kits to support/optimize production throughput
  - Purchase kits ready to use vs. making in house

Logistics Solutions for the Warfighter
Change...Change...Change
Modified Drum-Buffer-Rope

Controlled Induction

End Item

Disassembly Process

Components

Staging Area

CRITICAL CHAIN

Hull / Frame

Process Hull Frame

Assy₁ → Assyₙ

Component / Support Shops

Queue (1 Day)

1 Release Day Queues

2

3

4

5

Disposition of Components

Controlled Release

Time Phased Release (Lead Time)
Throughput ➺
Employee Morale ➺
Customer Satisfaction ➺
Direct Labor Hours ➺
Repair Cycle Time ➺
Total Repair Cost ➺
WIP ➺
## RCT VARIATION REDUCTION

<table>
<thead>
<tr>
<th>Weapon System</th>
<th>FY-04 (RCT Variation)</th>
<th>FY-07 (RCT Variation)</th>
<th>Reduction (Days) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK-48</td>
<td>100 (138-38)</td>
<td>38 (68-30)</td>
<td>62 (62%)</td>
</tr>
<tr>
<td>MK-15 Trailer</td>
<td>71 (133-62)</td>
<td>5 (41-36)</td>
<td>66 (93%)</td>
</tr>
<tr>
<td>MK-17 Trailer</td>
<td>53 (105-52)</td>
<td>10 (47-37)</td>
<td>43 (81%)</td>
</tr>
<tr>
<td>M970 Refueler</td>
<td>86 (136-50)</td>
<td>4 (73-69)</td>
<td>82 (95%)</td>
</tr>
<tr>
<td>M149A2 Water Trailer</td>
<td>49 (65-16)</td>
<td>19 (38-19)</td>
<td>30 (62%)</td>
</tr>
<tr>
<td>M88 Tank Retriever</td>
<td>89 (235-146)</td>
<td>31 (129-98)</td>
<td>58 (65%)</td>
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*Note: MK-48 had a reduction of 192 days in FY-01.*
Increase throughput and make schedule without increasing operating expenses or sacrificing quality.

1. Identify the constraint
2. Exploit the constraint
3. Subordinate everything else to the constraint
4. Elevate the constraint
5. Go back to step one (avoid inertia)
FINANCIAL RESULTS

- Work in Process $$ ↓
- Direct Labor Costs ↓
- Overhead Costs ↓
Daily Production Meeting
- Buffer Management Reports

MRP-II / TOC Marriage
- Modified MRP Business Rules

New Scheduling Software
- Runs TOC Reports
- Performs Production Scheduling Tasks
- Identifies Buffer Penetration
- Resource Planning
LESSONS LEARNED

Communication

Business Rule Changes
- No Batching
- Leadtimes
- Add Buffers
- One piece flow – Pull
- No working ahead
- No Queue-Time
- Changed from Forward to Backward Scheduling

Training / Education

Gray Matter

Changing the culture
- Reduced WIP
- Job Security

Contractor Support
- With defined exit plan

Challenge: When to say NO!
It Doesn't Stop
(Col Daniel Gillan)

- Organizational Review
- Offsites
- Benchmarking
- Relationships w/ Industry
- Delta Air Lines TOC Success Story
- Sustainment
- Market Share Expansion

Logistics Solutions for the Warfighter
ORGANIZATIONAL REVIEW

Maintenance Center, Albany Organizational Chart

COMMANDER
Colonel Dan Gillan

DEPUTY COMMANDER
Trent Bislock

Voluntary Protection Program (VPP) Office
W. Chauncey

ISO Management Representative
J. Barthlein

Production Mgt Dept.
D. Jones

Business Mgt Dept.
John Reed

TMDE Department
J. Powell

Engineering Department
D. Jenson

Trades Department
D. Jones

Risk Mgt Dept.
L. Petties

Program Management Branch
H. Eldson

Financial Branch
A. Hambric

Metrology Branch
P. Dembowski

HM PEI Branch
N. Wilson

Coatings Branch
S. Allen

Environmental Branch
M. Kencilja

Production Control Branch
E. Carter

Quality Branch
J. Barthlein

Engineering & Development Branch
R. Pavlik

SDR Branch
C. Hood

Engineering Equipment Branch
H. Cross

Human Resources Branch
S. Robinson

Systems Branch
M. Martin

Product Support Branch
(OPEN)

Metals Branch
K. Shaw

Electronics Branch
L. Olson

Night Shift
B. Barbre

Fabrication Branch
R. Kinson

Relevancy & Proper Structure
STRATEGIC RELATIONSHIPS

Delta Airlines
GDLS
3M
Toyota
BAE Systems
Franklin Covey
John Deere

Booz Allen Hamilton
DRS Technologies
Other DoD Depots ...
Joe Gibbs Racing
BAE Foreign Military Sales (Taiwan)
Lockheed Martin
Force Protection
Oshkosh
W.W. Williams
International Military Group

(Logistics Solutions for the Warfighter)
(Both)
(Benchmarked)
Delta’s new execution management system
… built on 7 simple principles:

1. Use the system constraint to set the drumbeat.
2. Manage backshop queues.
3. Avoid multitasking.
4. Synchronize execution priorities.
5. Anticipate and rectify the potential for delays.
6. Use flexibility to respond to variation.
7. Adopt and adhere to a doctrine of accountability.

<table>
<thead>
<tr>
<th>Repair &amp; Support</th>
<th>Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnaround</td>
<td>40%</td>
</tr>
<tr>
<td>Throughput</td>
<td>18%</td>
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</tbody>
</table>

**External Customer Orders:** ↑ 33%

**Exceeded recovery goal by $42 million**

**Emerged as a leader in airline MRO**
SUSTAINMENT

- In-Depth Expert Training
  - Critical Chain
  - DBR
- Upgraded TOC Software
- Continue to Maintain Critical Chain
- Review and Update Current Critical Chains
  - HMMWV: 6 Critical Chains to 1 (72 to 36 Days)
  - M113A3: (53 to 67 Days)
MARKET SHARE EXPANSION

Increasing Beyond Traditional Customer Base

MARSOC  NAVAIR  Seabees
...??  Private Industry  Homeland Security
National Guard Bureau  Air Force

Logistics Solutions for the Warfighter
What you do is **IMPORTANT!** Everyday a Marine’s Life depends on it!
Logistics Solutions for the Warfighter

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Everyday a Marine's Life depends on it!
TOC IMPLEMENTATION
-- 6 Years Later

Questions?

Logistics Solutions for the Warfighter