Logistics Analytics and Optimization
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SAS Federal, United States
My logisticians are a humorless lot. They know if my campaign fails, they are the first ones I will slay.

Alexander the Great
Current Logistics Efforts

- **ANALYSIS AND REPORTING**—US Army Iraq Withdrawal
- **OPTIMIZATION**—US Navy Attack Helicopter Maintenance Program
- **STRATEGIC PLANNING**—Global Operational Logistics Decision Support System (GOLDSS)
- **FLEXIBILITY**—US Coast Guard Air Logistics Center Supply Optimization
Talking Points

- Focus for seven years, the military focus has been on Iraq and Afghanistan
- Changing from a “forward deployed” to “expeditionary” model
- Long standing systems, procedures and methodologies can hamper innovative thinking
- Pending budgetary constraints
“How do I get out of Iraq?”
US Army RESPONSIBLE RESET Analysis

- 110,000 troops, over 200 operating bases, 65,000 combat and support vehicles, over 200,000 supply containers and on and on
- Six possible dispositions for equipment
- Five different systems for each set or piece of equipment—no one would share

“I need to know how I’m doing.” MG Kevin Leonard
ARFORGEN COP

Assimilates Data From Multiple Tools/Systems to Provide a Common Operating Picture of Equipment Asset Visibility and Maintenance Status for Every Unit/Task Force
### Iraq SSAs

<table>
<thead>
<tr>
<th>QTY</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>2,339,659 (+22,341)</td>
</tr>
<tr>
<td>ASL / NSL Lines</td>
<td>152,765 (-7,914)</td>
</tr>
<tr>
<td>STONs</td>
<td>4,624 (+383)</td>
</tr>
</tbody>
</table>

### Kuwait SSAs

<table>
<thead>
<tr>
<th>QTY</th>
<th>QTY</th>
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</thead>
<tbody>
<tr>
<td>Items</td>
<td>11,387,274 (+42,644)</td>
</tr>
<tr>
<td>ASL / NSL Lines</td>
<td>132,823 (+1,688)</td>
</tr>
<tr>
<td>STONs</td>
<td>5,727 (-19)</td>
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</tbody>
</table>

### Iraq DRMO

<table>
<thead>
<tr>
<th># LINs</th>
<th># Items</th>
<th>Containers</th>
<th>Scrap (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>151 (-3)</td>
<td>3,033 (-204)</td>
<td>5 (+1)</td>
<td>45 (+5)</td>
</tr>
</tbody>
</table>

### Kuwait DRMO

<table>
<thead>
<tr>
<th># LINs</th>
<th># Items</th>
<th>Containers</th>
<th>Scrap (Tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>335 (-25)</td>
<td>11,165 (-1,765)</td>
<td>11 (0)</td>
<td>117 (+2)</td>
</tr>
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</table>

### SSA Volume

- **Notional Data**
  - Source: LIW
  - As of: 03/29/2010

### Turn in to SSA

- Actual: 15/6

### Trans & Collection Point Receipt

- Actual: 54/41

### Iraq DRMO

- STD: 20/30

### Kuwait DRMO

- STD: 30/30

### SSA – Totals

- In Iraq: 2,339,659 (+22,341)
- In Kuwait: 11,387,274 (+42,644)
- Rec’d at SOR (since 1 OCT 09): 651,419 (+143,214)

### Time Period *

- 3/14/2010 - 3/27/2010

### Delivered & Receipt

- Actual: 296/610

### POD Hold

- Actual: 16/6

### To POD

- Actual: 4/153

### POE Hold

- Actual: 2/0

### Received at SOR & ICP

<table>
<thead>
<tr>
<th>QTY</th>
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<tbody>
<tr>
<td>Sierra</td>
<td>1,681 (-994)</td>
</tr>
<tr>
<td>Tobyhanna</td>
<td>1,246 (+340)</td>
</tr>
<tr>
<td>Red River</td>
<td>2,527 (+50)</td>
</tr>
<tr>
<td>Anniston</td>
<td>148 (+122)</td>
</tr>
<tr>
<td>Letterkenny</td>
<td>31 (-61)</td>
</tr>
<tr>
<td>Corpus Christi</td>
<td>642 (-472)</td>
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<tr>
<td>Other</td>
<td>96,507 (-2,647)</td>
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</tbody>
</table>

### Kuwait DRMO

<table>
<thead>
<tr>
<th>QTY</th>
<th>QTY</th>
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</thead>
<tbody>
<tr>
<td>Kuwait Int’l</td>
<td>258 (0)</td>
</tr>
<tr>
<td>Al Sahra</td>
<td>1 (0)</td>
</tr>
<tr>
<td>Al Asad</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Ash Shuaybah (Mil)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Ash Shuwaik (Comm)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Kuwait Naval Base</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Other</td>
<td>37,300 (0)</td>
</tr>
</tbody>
</table>

### As of: 03/29/2010

- Source: LIW

- * = Time Period applies to transportation metrics.
The command was unable to calculate key metrics impacting operational readiness.

Previous system had data fidelity challenges, complicated formulae, non-standardized definitions—complicated and difficult to use.

Needed faster interpretation of analytical output with high degree of confidence in the results.
US Navy AH-1W RESET Program

- Integrated raw, separately held data for use in analysis of the attack helicopter maintenance, repair and rebuild program
- Analyzed data to determine the significant factors affecting operational readiness
- Created an interactive, multi-level dashboard with drill down to supporting data
- Forecast system wide maintenance requirements based on significant historical data
US Navy AH-1W RESET Program

Created interactive dashboards with drill down to detailed data on each individual metric.
## US Navy AH-1W RESET Program

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<tbody>
<tr>
<td>Downtime</td>
<td>784.53</td>
<td>439.06</td>
<td>161.55</td>
<td>998.13</td>
<td>4977.05</td>
<td>413.90</td>
<td>1733.53</td>
<td>136.05</td>
<td>1555.32</td>
<td>1733.53</td>
<td>915.02</td>
<td>12982.37</td>
<td>12954.72</td>
<td>12876.05</td>
<td>703.03</td>
<td>1712.1</td>
<td></td>
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<tr>
<td>Total Flight Time</td>
<td>3.30</td>
<td>22.20</td>
<td>0.00</td>
<td>0.00</td>
<td>4.30</td>
<td>0.00</td>
<td>9.50</td>
<td>12.00</td>
<td>10.10</td>
<td>9.50</td>
<td>57.00</td>
<td>202.70</td>
<td>246.00</td>
<td>236.40</td>
<td>191.40</td>
<td>201.00</td>
<td>191.00</td>
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<tr>
<td>DT/FH1</td>
<td>239.74</td>
<td>15.95</td>
<td>2359.44</td>
<td>112.49</td>
<td>1157.59</td>
<td>517.37</td>
<td>182.48</td>
<td>15.80</td>
<td>154.25</td>
<td>162.48</td>
<td>10.75</td>
<td>45.38</td>
<td>52.11</td>
<td>12.35</td>
<td>20.92</td>
<td>1.80</td>
<td>8.03</td>
</tr>
</tbody>
</table>

### DT/FH1

- **HMLA-381**: Some data points are highlighted.
- **HMLA-167**: A spike is observed.
- **HMLA-269**: Data is sparse.
- **HMLA-367**: A significant increase is noted.
- **HMLA-369**: Data is relatively consistent.
- **HMLA-773**: A notable decrease.
- **HMLA-775**: Data points are distributed.
- **HMLA-1303**: Data is scattered.
- **HMLA-163**: A minor peak.
- **HMM-265**: Data is sparse.
- **HMT-303**: A significant peak is observed.
- **HMLA-167**: Data is consistent.
- **HMLA-169**: Data is scattered.
- **HMLA-267**: Data is sparse.
- **HMLA-269**: A minor peak.
- **HMLA-367**: Data is consistent.
- **HMLA-369**: Data is scattered.
- **HMLA-777**: Data is sparse.
Global Operational Logistics Decision Support System

- Meet delivery dates while minimizing transportation costs and observing throughput constraints
- Calculate daily movement through each node each day by what mode of transportation
- Determine where shortages and delays will occur and where inter-service supply is needed
- Project future inventory levels at each supply node
Global Operational Logistics Decision Support System

- Generalized supply chain optimization model designed to support logistics planning
- Integrates data from disparate sources of record to create Courses of Action for planners
- Enable “what-if” and adaptive planning
- Optimizes the sourcing of requirements from global inventory and the transportation to points of need
- Creates view of logistics system “future state”
- Initial model generated logistics planning Courses of Action in 1 hour with 7 million decision variables and 1 million constraints
- Generated planner-defined revisions in as little as 15 minutes
Demonstrated the flexibility of SAS solutions

Analytics on spares to optimize procurement and storage at maintenance facilities

Applied the methodology to 123’ cutters

Reduced the amount of maintenance equipment and spares on board by 70 tons
Leveraging the Power of Analytics

- Decision optimization
- Fraud and improper payment detection
- Cyber defense and operations
- Government openness
Thank You

Don Ducey, Director, Strategic Initiatives, United States

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