



# DEFENSE LOGISTICS AGENCY

AMERICA'S COMBAT LOGISTICS SUPPORT AGENCY



## 2016 Personnel Parachute Related Components Supply Chain Analysis

Status Update to Parachute Industry Association  
(Unclassified)  
*August 18, 2016*

Prime Contractor: SHEPRA, Inc.  
GSA Contract Number: GS-10F-0011X  
BPA Number: SP4705-14-A-0130  
Task Order Number: 0012  
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# Bottom Line Up Front

- Key objective of study was to identify opportunities to reduce production lead time (PLT)
  - Could the Warstopper Program invest in industry to mitigate root causes of extended production lead times?
- Noticeable differences between this study and others
  - Absence of Service-identified wartime additive demand
  - No current “normal” supply chain constraints that impact ability of industrial base to meet production requirements
    - Availability of, or long lead times for raw materials, aging production equipment, additional production lines needed, etc.

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- No opportunities to reduce PLT with Warstopper funding
- Cost and lead time to purchase additional inventory negates improvements in material availability (MA)



# Bottom Line Up Front- Findings

Industrial base is adequate to meet near- and long-term demand, but at risk because:

- Air Force Testing Requirements Driving High Production Lead Times
  - Extended PLT impacts supplier production planning, delivery scores/ratings, increases overtime and drives up costs
  - At same time improvement noted in Army and Navy ESA turnaround times for completing tests, resolving issues and submitting reports
- Tech Data Package issues can also contribute to extended PLT
  - Every supplier visited related some problems with tech data packages
  - Suppliers must identify problems in tech data package prior to award; if identified after award it will impact PLT
- Pricing pressure from DLA is high and not aligned with risks
  - Delays in getting government inspections completed and requests for variance processed impacts cash flow
  - Raw material pricing is often good for only 30 days
- Other issues require increased management attention--forecasting, DLA organization, and provisioning of new parachute systems



# Key Supplier Risks

- Government production lot testing caused lead times to be significantly extended (last 4-5 years)
  - Air Force process is longest (up to 1yr) and not aligned with other Services for nearly identical systems
  - Significant inventory awaiting approval, not priced into the original contract
- Highly competitive industrial base making "build to print" systems
  - Limited component and material suppliers
  - Buffer solutions are limited; textile material shelf life <3.5 years



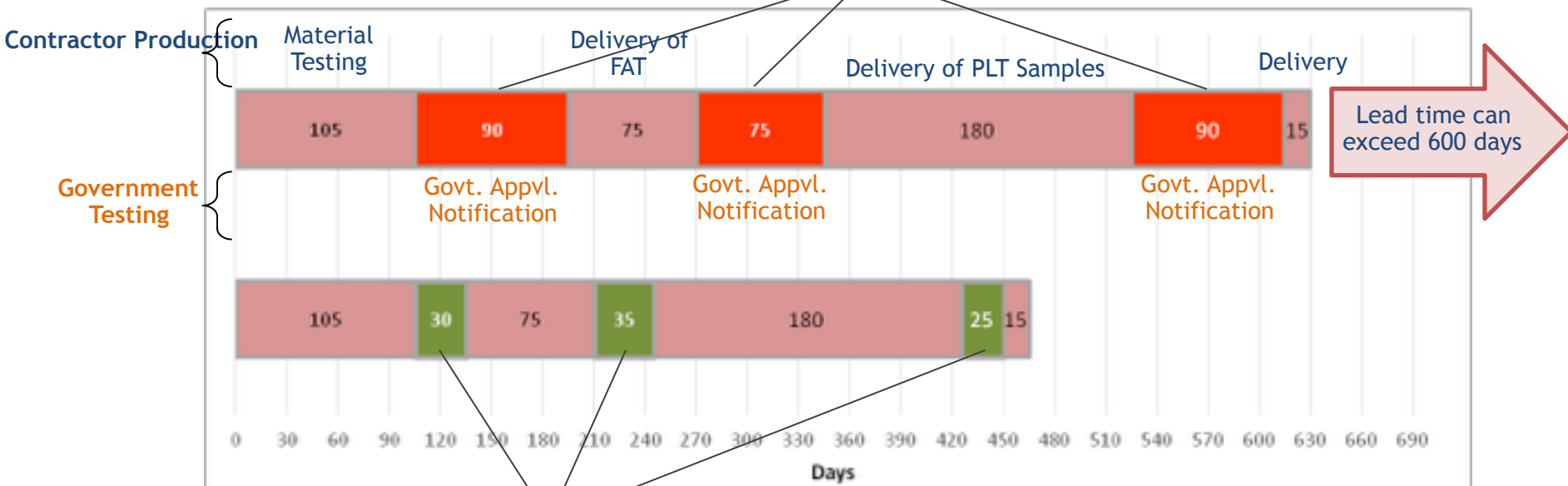
950 chutes awaiting release





# Production Lead Time & Testing Discussion

Air force product spends ~40% of lead time in *testing*: AVG ~255 days



Army & Navy ~19% of lead time in *testing*: AVG ~90 days

- Representative of contract
- Much improved in last few years



# Recommendations in Work

- DLA take lead on an inspection resolution action team
  - Air Force ESA, Air Force Lab, DCMA, DLA, industry, and others
  - Resolve inspection-related issues that have \$5.5M of finished product sitting “on the dock” at three suppliers
- Air Force review workload and staffing requirements needed to meet contract milestones for inspections and resolve issues
- DLA take lead on lean kaizen event to review inspection requirements, 339 administrative procedures, related issues
  - Standardize or simplify testing requirements, streamline processes
- Update technical data packages
  - Senior management attention needed to make it a priority
  - Long term, methodical effort between government and industry
- Improve staff knowledge and understanding of industrial base
  - Better understand supplier risks in current and future environments
- Continued DLA management attention on reorg of parachute supply chain, forecasting issues, provisioning new systems



# Bottom Line Up Front Summary

- Our findings align with results from previous studies by DOC and Clemson University in 2005
- Many of same problems exist, and current suppliers also impacted by time it takes AF to complete testing and resolve inspection-related issues
- Industrial base is smaller, and still plagued by long term issues that haven't been fixed



# Overview

- Background
- Purpose, Scope, and Approach
- Study Tasks
- Long-term Requirements (Task 1)
- Current Materiel Availability Rates (Task 2)
- Industrial Base Analysis Summary (Task 3,4)
- Reducing Production Lead Times (Task 5)
- Inventory Needed to Meet 85% or 95% MA ( Task 7)
- Preliminary Findings/Recommendations (Task 6)





# Background

- Department of Commerce, Bureau of Industrial Security, 2004
  - Army Soldier Biological and Chemical Command concerned about industry's ability to meet future needs
  - Comprehensive look at industrial base data from the Big Five companies from 1996 to 2000; recommended improvements in:
    - Demand forecasting, tech data packages, pricing of contracts, managerial and staff knowledge of industry, funding of manufacturing technology
- Clemson University follow up business case analysis
  - Requested by Parachute Industry Association (PIA) as an update to Dept of Commerce study
  - Collect and expand analysis with data from 2001 to 2004
  - Big Five lost one major producer, data represented new Big 4
  - Validated findings from earlier DOC study



# Background, cont

- Army-DCMA: PEO Soldier Personnel Parachute Fragility and Criticality (FaC) Assessment (7/15)
  - Narrow focus on hardware components (e.g., Safety Ring; Connector & Parachute Links; Harness Adjusters; etc.
- DLA Managed Parachute Consumables Review (11/15)
  - Consolidate DLA management
  - Stock investment in a limited number of critical parachute parts
  - **Warstopper Program risk assessment and business case**
- DLA DORRA: Parachutes--Personnel & Delivery (12/15)
  - Parachutes identified as significant readiness item due to low materiel availability, cancelled PRs, delinquent contracts, etc.
  - Shared study data with team so we could leverage that work



# Purpose, Scope, and Approach

- Purpose: Determine health of industry and opportunities to reduce production lead times, and develop best logistics support strategy for DLA-managed personnel parachute components.
- Scope: Limited to a supply chain assessment for DLA managed Aviation, Land and Maritime, and Clothing and Textile personnel parachute components.
- Approach - Data collection and analysis:
  - Identify the NSN population of items in scope
  - Analyze item data to identify at-risk suppliers using JICAP risk analysis database
  - Develop targeted questionnaires to collect supplier data
  - Conduct site visits with key manufacturers
  - Develop potential solutions based on key pain points



# Study Tasks

1. Determine the long-term requirements for Personnel Parachute related components during normal operations and during surge and sustainment. ●
2. Identify current materiel availability rates of the NSNs given current demand, inventory levels, and status quo operations. ●
3. Identify any factors that could jeopardize the long-term health of the industry, such as, financial, technology; and loss of sub-tier capability or capacity. ●
4. Develop a supply chain map and identify as-is supply chain risk against the long-term requirements, to include: ●
  - a. Assess current industrial base production capacity;
  - b. Identify production bottlenecks/excess capacities;
  - c. Identify impacts of risks illustrated under task 3.
5. Identify process improvements that could reduce production lead times. ●
6. Based on task 4 and 5, provide recommendations for maintaining a healthy supply chain and improvements to include potential Warstopper investment opportunities for surge and sustainment requirement. ●
7. Identify inventory levels for each NSN to meet an 85% and 95% materiel availability assuming as-is and to-be conditions with supporting analysis and documentation. ●



# Long-term Requirements

- Significant effort in identification of parachute systems, components, and repair parts
  - Worked extensively with Services to identify current personnel parachute and aircrew systems, drogue chutes, related items
    - Ten systems in use; long-term needs for MC-6, T-11 and RA-1
  - Data provided by Services, DLA IPT, and DORRA
  - Data scrub showed DORRA list contained total population
- Analysts identified list of 1,296 unique NSNs in scope
- Pulled 13 years of requisition data on items to flag trends
  - Filtered data to remove NSNs no longer procured, items with no demand in past three years, and all others but WSIC F, G, and H
  - Substantial number of common use items not related to study--enamels, solutions, cargo tie downs, etc.
  - Final list of critical, DLA-managed items was 704



# Long-term Requirements, cont.

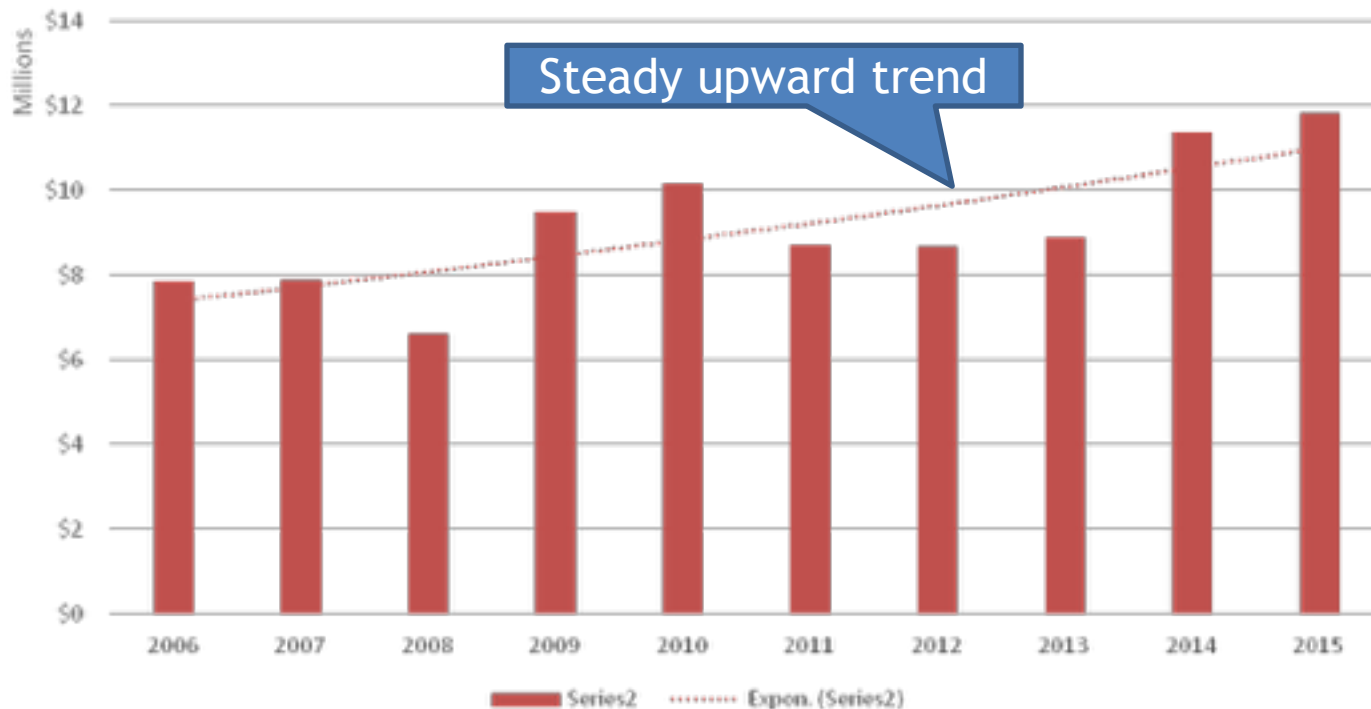
- Next step was to ID items with wartime additive demand
  - 89 items in 2015 surge data base with planned requirements
  - Of these 89 NSNs, 41 with 100% materiel availability
- JICAP analysis revealed several peak demand periods created by 9XX project coded requisitions in past 13 yrs
  - 140 critical NSNs with surge risk in next six months if demand surges to levels of peak periods
  - 68 items with demand on average 300 times higher than SSPR
- Service wartime and DLA peacetime forecasting models do not address unique life cycle of parachutes
- Used 10-year requisition history to graph trend in total demand on next slide





# Demand History

Requisition history annualized for study population sourced from Mills, Airborne, BRS, Aerostar, FXC, Pioneer





# Forecasting Problems

- DLA's five-year demand history not a good indicator of long-term needs because of 13 year parachute life cycle
- Identified as issue in previous studies and analysis
- No automated system in place in any Service to track serial numbers, shelf/service life, maintenance, repair
  - Spreadsheets in use to track items at shop level, but no capability to readily consolidate data for reporting, forecasting

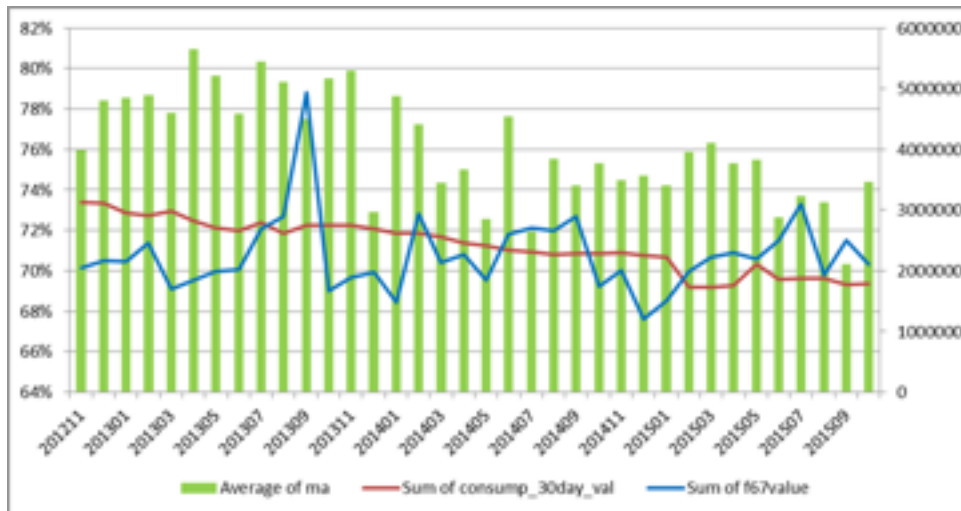
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- Need accurate service forecasts far in advance of need and close collaboration with DLA as forecast is updated
- Absolutely need automated system to replace stubby pencil log books, provide current readiness reporting, and improve forecasting accuracy



# Current Materiel Availability (MA)

- MA is the percentage of time that inventory is available to fulfill requisitions from DLA customers
- Updated Dec 2015 DORRA Analysis showed downward trend for past 3 years
  - Forecasts declining (red line below left)
  - Large spike in demand back in Sep 2013 (Army/Air Force)
  - AF items contribute most to declining MA (red line below right)





# Industrial Base Analysis Summary

Conducted detailed supplier risk analysis in JICAP on initial pop. of 1,296 NIINs...

- Focused on 704 unique critical items<sup>1</sup>:
  - All items critical had surge risk, would stock-out, most w/ delivery risk
  - >70% PLT exceeded 365 days
  - ~50% w/ IPG-1 fill rate below 75% and/or on backorder
  - All SSPR significantly understated
  - Common Item Notes (paraphrased):
    - FAT and/ or PLT often waived - indicates testing creating more backorders
    - Demand exceeds production; significant non-forecasted demand
    - Material approval issues
    - First time buy for Aviation
    - ~30% *Crown Jewel* items

<sup>1</sup> Critical items with Weapon System Indicator Code (WSIC) F, G, or H



# Industrial Base Questionnaire

- **Wave 1: 16 Suppliers (~100 NIINs)**  
Greatest focus, target max participation
  - Suppliers with DLA parachute annual spend >\$500K
  - Input from PLA govt. committee, John Oswald
  - Visited Mills, Pioneer, Guardian, and Airborne
- **Wave 2: Eight (8) Suppliers - Prime and components (sub-tier suppliers)**
  - Suppliers with DLA parachute spend \$100K - \$500K or known issue
  - Key component/ raw material suppliers, identified through Wave 1 site visits

Defense Logistics Agency (DLA) - Industrial Base Questionnaire Program  
Version 1.0 (10/15/2015)

### Defense Logistics Agency (DLA) - Personnel Parachutes Supply Chain Analysis

DLA is conducting an analysis of the personnel parachute supply chain to ensure a viable industrial base. The purpose of this questionnaire is to gain increased insight into the industrial base that may be impacting or could impact parachute production and to explore mitigation strategies in order to ensure a viable industrial base for future parachute production.

Any discussion of risk associated with personnel parachute production does not imply that your company is the "root cause" of the risk. The questionnaire is not a review of current contract performance, industrial base risk exists or if there are ongoing risks, such capacity constraints, that could be mitigated through collaboration.

Completing this questionnaire is entirely voluntary. It is dependent upon your company's participation. All data and individual responses will not be distributed beyond DLA, assurance as to the security of the data collected and the need to protect the information that your company supplies. Issues that are affecting the industrial base and possibly the supply chain.

Should your company choose to participate, DLA would appreciate the response. The response may be provided in coordination with your company's primary manufacturing facilities.

If you have questions or concerns about the validity, purpose, and/or potential outcomes of the DLA study, please contact:

John Cragghead  
Chief, Industrial Capabilities  
DLA location  
8001 Jefferson Davis Hwy  
Columbia, TN 37615  
(615) 462-1807  
john.cragghead@dlm.mil

If you have questions or concerns about the validity, purpose, and/or potential outcomes of the DLA study, please contact:

Greg Woodard  
DLA Industrial Capabilities  
DLA location  
8001 Jefferson Davis Hwy  
Columbia, TN 37615  
(615) 462-1807  
greg.woodard@dlm.mil

### Supplier Information

Please verify the following information for your company:

Supplier Name	Airborne Systems of North America
CALE	0224
Address	2721 W. Walker Ave., Santa Ana, CA 92704
DIC/Phone #	(714) 462-1807

Note: Please feel free to add space under each section, attach additional sheets, or add additional lines to any of the responses provided in the attached spreadsheet in the appendix.

### Item Information

Our data shows that your company is currently supplying the item(s) in the table below to DLA. Preliminary analysis indicates that there may be risk associated with some of these items. If so, describe the associated risk in the space below.

NIIN	Description	Risk Overview (if applicable)
04150310	HARNESSES, T-11	
04150310	PILOT CHUTE	
04150310	EXPLOSIVE SLEEVE	
04150310	SLIDER PADS, T11 M6	
04150310	RESERVE AIRCRAFT ASSY	
04150310	PILOT T-11 M6	
04150310	RESERVE AIRCRAFT ASSY	
04150310	PILOT T-11 M6	
04150310	RESERVE AIRCRAFT ASSY	

### Questions

1. Please provide a breakdown of the factors contributing to the lead time for items produced by your firm. Indicate the total lead time in days and then provide a contribution by item, equally the total lead time. If not any items with significant raw material lead times, please indicate by item in the space below the raw materials that significant contribution to lead time, the length of the individual material lead time, and any comments that may explain concerns in that material's supply chain. If there are comments regarding the factors contributing to lead time for the parachute items supplied by your firm.

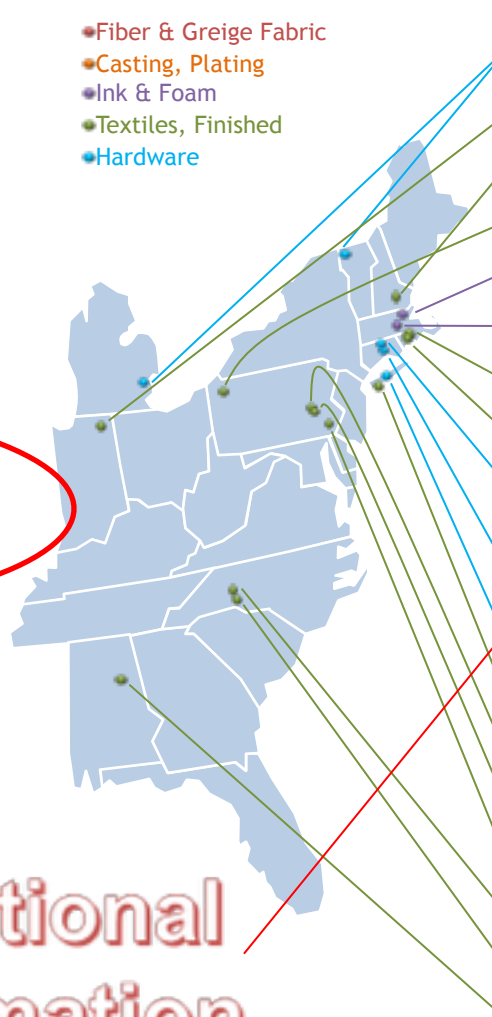
Item	Total of days	Scheduling of	Raw Material	Internal Processing	External Processing	Other	Comments
04150310							
04150310							
04150310							
04150310							
04150310							
04150310							
04150310							
04150310							
04150310							
04150310							



# Parachute Supply Chain (T-11)

- Fiber & Greige Fabric
- Casting, Plating
- Ink & Foam
- Textiles, Finished
- Hardware

Bourdon Forge (XXXX)	<ul style="list-style-type: none"><li>• Material</li><li>• XX weeks</li></ul>
HLC (XXXX)	<ul style="list-style-type: none"><li>• Material</li><li>• XX weeks</li></ul>
Capewell (XXXX)	<ul style="list-style-type: none"><li>• Material</li><li>• XX weeks</li></ul>
XXXX (XXXX)	<ul style="list-style-type: none"><li>• Material</li><li>• XX weeks</li></ul>



Wichard (Fairfax, VT) & ND Industries (Clawson, MI - No Lock)	<ul style="list-style-type: none"><li>• Hardware, Connector Link</li><li>• Self Lock 6-8 weeks</li><li>• No Lock 4-6 weeks</li></ul>
Breyden Products (Columbia City, IN)	<ul style="list-style-type: none"><li>• Tape, Lacing, Nylon</li><li>• 4-6 weeks</li></ul>
Velcro USA (Manchester, NH)	<ul style="list-style-type: none"><li>• Tape, Hook and Pile (Loop)</li><li>• 4-6 weeks</li></ul>
Horn Textiles (Titusville, PA)	<ul style="list-style-type: none"><li>• Tape, Cotton</li><li>• 6-8 weeks</li></ul>
Greene Rubber (Woburn, MA)	<ul style="list-style-type: none"><li>• Foam</li><li>• 4-6 weeks</li></ul>
Frost Manufacturing (Worcester, MA)	<ul style="list-style-type: none"><li>• Ink, Black &amp; Blue</li><li>• 4-6 weeks</li></ul>
K & W (Central Falls, RI)	<ul style="list-style-type: none"><li>• Elastic, Cotton</li><li>• 6-8 weeks</li></ul>
Hope Global (Cumberland, RI)	<ul style="list-style-type: none"><li>• Cord, Polyester</li><li>• 6-8 weeks</li></ul>
Capewell (South Windsor, CT)	<ul style="list-style-type: none"><li>• CAD, Male &amp; Female</li><li>• 12-14 weeks</li></ul>
Bourdon Forge and Lord & Hodge (Middletown, CT)	<ul style="list-style-type: none"><li>• Hardware, Rings/ Links/ Buckles</li><li>• 8-10 weeks</li></ul>
Die-Matic (Plainview, NY)	<ul style="list-style-type: none"><li>• Hardware, Socket / Button / Stud</li><li>• 4-6 weeks</li></ul>
Apex Mills (Inwood, NY)	<ul style="list-style-type: none"><li>• Pin &amp; Stiffener</li><li>• 6-8 weeks &amp; 4-6 weeks</li></ul>
Bally Ribbon (Bally, PA)	<ul style="list-style-type: none"><li>• Netting, Nylon</li><li>• 6-8 weeks</li></ul>
C.S.R. (Sellersville, PA)	<ul style="list-style-type: none"><li>• Tape, Nylon</li><li>• 6-8 weeks</li></ul>
HLC Industries (Bala Cynwyd, PA)	<ul style="list-style-type: none"><li>• Cord, Spectra</li><li>• 6-8 weeks</li></ul>
Car-Mel (Moorestville, NC)	<ul style="list-style-type: none"><li>• Cloth, Nylon &amp; Cotton</li><li>• 6-8 weeks</li></ul>
American & Efrid (Mt. Holly, NC)	<ul style="list-style-type: none"><li>• Label</li><li>• 4-6 weeks</li></ul>
TapeCraft (Oxford, AL)	<ul style="list-style-type: none"><li>• Thread, Nylon</li><li>• 5-6 weeks</li></ul>
	<ul style="list-style-type: none"><li>• Webbing &amp; Tape, Nylon &amp; Cotton</li><li>• 6-8 weeks</li></ul>

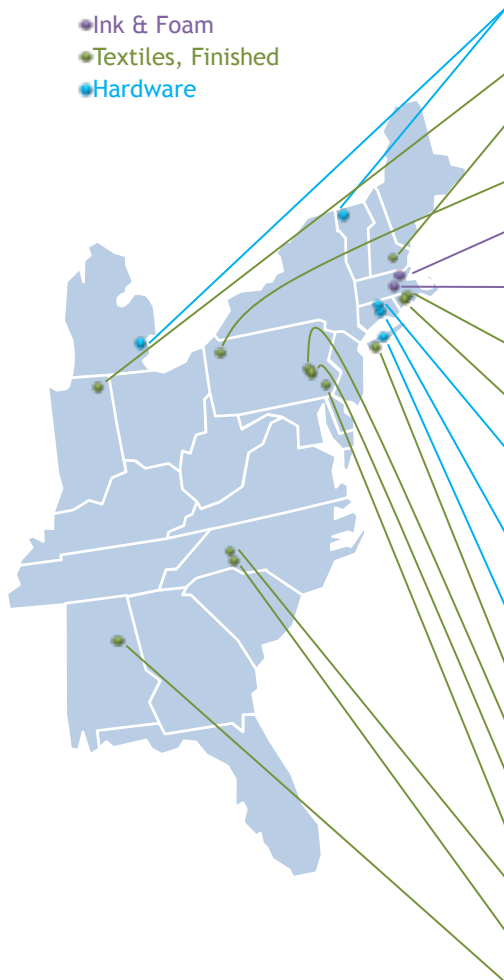
Awaiting additional supplier information





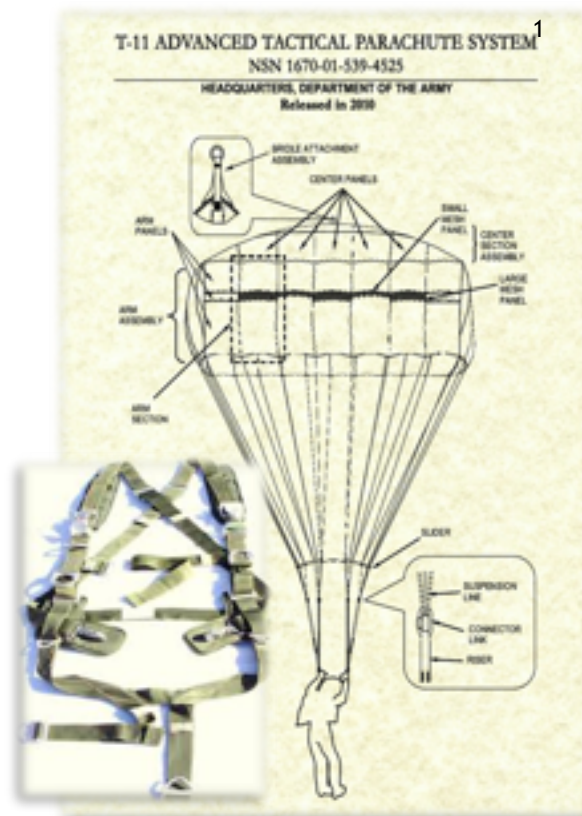
# Parachute Supply Chain (T-11)

- Ink & Foam
- Textiles, Finished
- Hardware



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- New basic T10
- T11R Variant



<sup>1</sup> <http://www.bluemoonpatentprints.com/listing/275100866/t-11-parachute-drawing-us-military-armed>



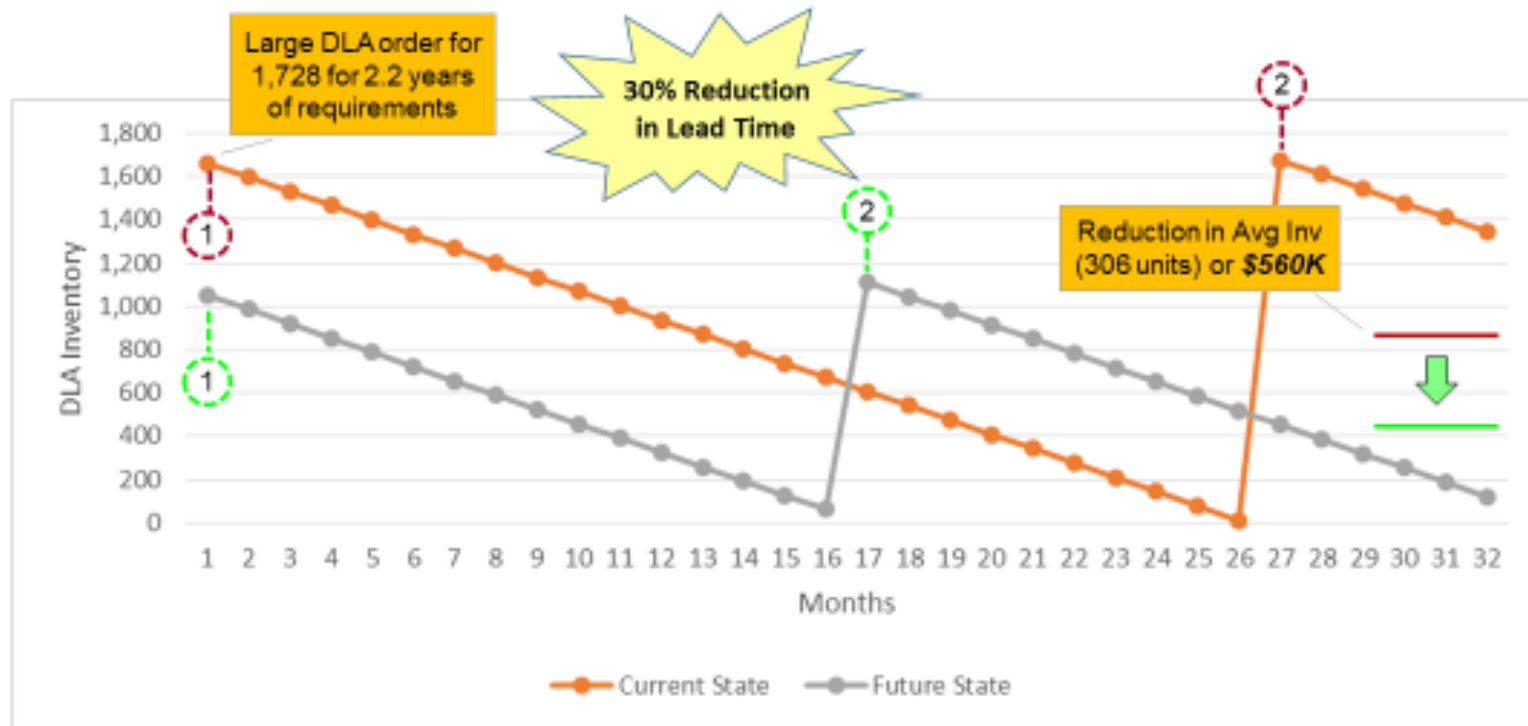
# Additional Supplier Risks

- Erratic government orders last 15 years
  - Cyclical demand caused by aircraft maintenance programs and shelf life
- CA state min. wage increase will further reduce margins



# Reducing Production Lead Times

## 012505468 PARACHUTE ASSEMBLY



Reduces inventory costs at DLA and Suppliers, and increases flexibility to respond more quickly to unplanned requirements.

Note: TBD



# Next Steps

- Complete final report and outbrief
- Get concurrence with stakeholders on recommendations before final brief
- Submit final draft to stakeholders for review
- Review and adjudicate comments/edits
- Publish final report
- Brief DLA Aviation on study results





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WARFIGHTER FIRST - PEOPLE & CULTURE - STRATEGIC ENGAGEMENT - FINANCIAL STEWARDSHIP - PROCESS EXCELLENCE