



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND – GROUND VEHICLE SYSTEMS CENTER

Using Big Data and the GVSC “SERA” Tool in
Acquisition (Parts Selection) and Sustainment (DMSMS)

Steve Olevnik
DMSMS, Obsolescence Lead
AFC CCDC GVSC

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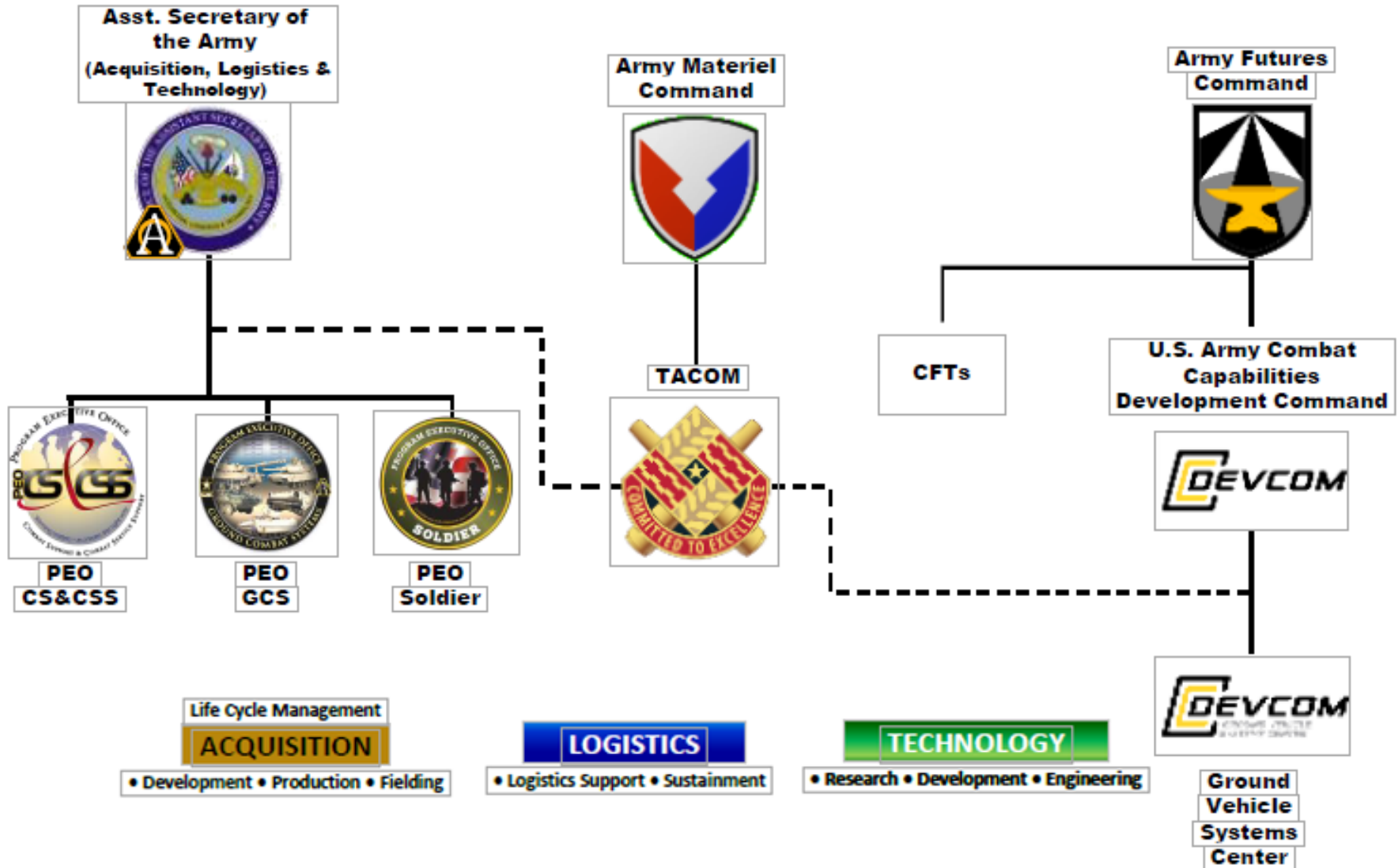


*“The Army has Data.....
.....like the Desert has Sand.”*

**Sifting the sands to make data-driven
decisions in Acquisition and Sustainment**



WHO WE ARE





SUPPLY CHAIN DATA ANALYSIS



Escalating support challenges...

- Increasing O&S requirements (65-80% of Life Cycle Cost)
- Equipment condition due to deployments (Degradation)
- Obsolescence of Army systems due to age (25-40 yrs)
- Loss/change of manufacturing sector for COTS (Support Strategy Risk)
- Inconsistent lifecycle sustainment policy & planning (Organic vs. CLS vs. TDPs?)
- Inconsistent engineering/design influence for sustainment (Poor Lifecycle Planning)
- Stove-piped industrial base issue investigation & resolution (ILSC & PM/LCMC/DLA)
- Negative economic trends impacting commercial industrial base (Industrial Base Risk)
- Environmental and safety impacts (e.g., cadmium, asbestos, Pb-free electronics)

....drive a need for

modern comprehensive data analytics

....that lead to predictive outcomes.



PARTS & OBSOLESCENCE MANAGEMENT



(enabled by the combined logistics/engineering data in SERA)

DESIGN

PRODUCTION

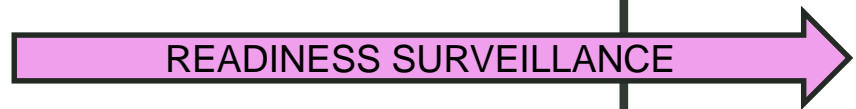
NO MORE PRODUCTION



LCSP



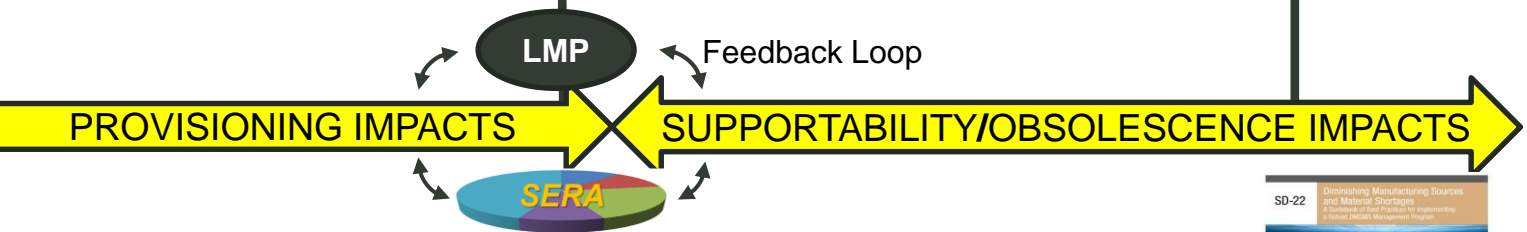
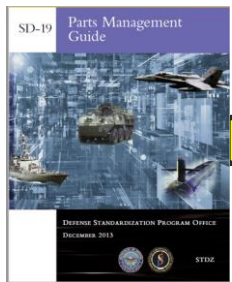
CONTRACT LANGUAGE



Input – OEM’s, Vendors, Part Nos.
What are the NSN Characteristics?

Earlier participation/analysis smooths the transition from Production to Sustainment

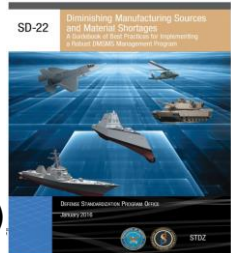
INSIGHT TO SUPPLY BASE (Material Trends, Tech Roadmaps)



(Parts Management Guide)

SD-19 & MIL-STD-3018

SD-22 (DMSMS Guidebook)





TWO CHALLENGES AT TACOM



500,000

(number of support vehicles in Army; trucks, jeeps, etc.)

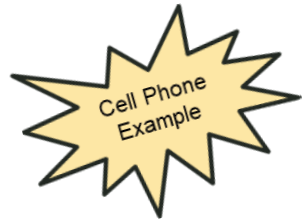
LOTS OF MICROELECTRONICS

NOT SO MUCH

10:1

50,000

(number of combat vehicles in Army; tanks, fighting vehicles, etc.)



Focus on Mechanical/Electrical parts as well as Electronics

Electrical Cables



MMPV Type II Exhaust



**US ARMY
TACOM LCMC**

Request to GVSC for Obs. Eng. Support

Year	Non-Electronics	Electronics/Micro-Elect
2019	7839 (93%)	582 (7%)
2018	9884 (92%)	817 (8%)
2017	7173 (94%)	490 (6%)
2016	5656 (93%)	421 (7%)
2015	5768 (93%)	456 (7%)
Totals	36320 (93%)	2766 (7%)



Big Vehicle Systems, Mostly Big Metal, Electrical, some Electronics



Radiators

Paladin / FAASV (1 NSN)
FMTV (1 NSN)
HMMWV (2 NSNs)

Most Suppliers going away from Copper/Brass & lead soldering (environmental)



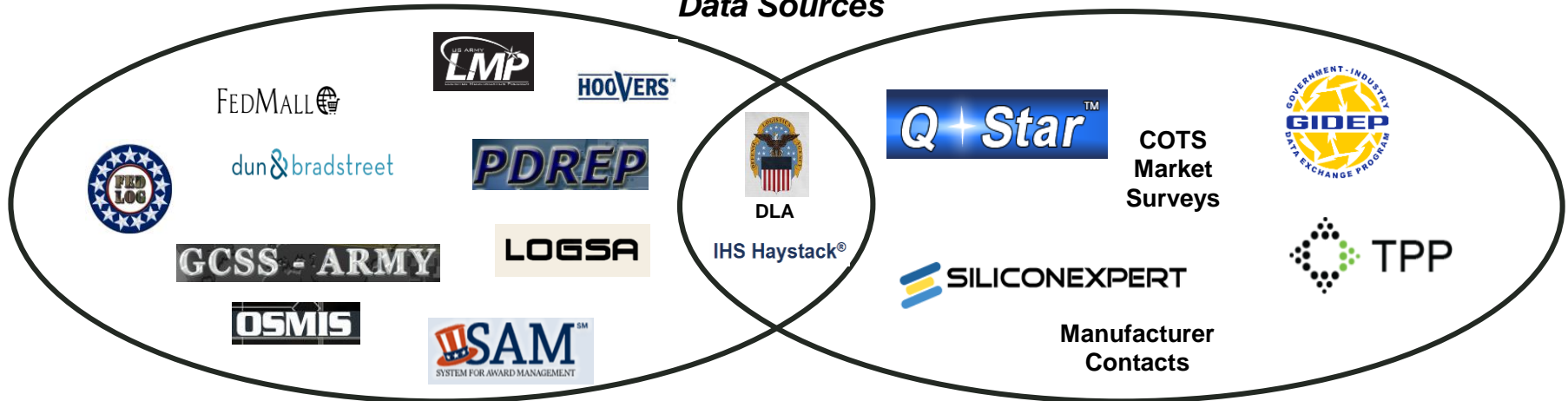
Axles



NSN VS PART NUMBER BASED TOOLS



Data Sources



SERA

Typical Electronics Monitoring Tools

**All Provisioned (NSN) Parts –
Electronic, Mechanical, Hydraulic, etc.
(typical Program = 27,000 NSNs)**

- Utilizes platform provisioning data
- Identifies all platform suppliers
- Supplier Financial Health
- Procurement History
- Part Hierarchy (Assemblies and Sub-assemblies)
- Logistics Engineering Factors
- Maintenance History

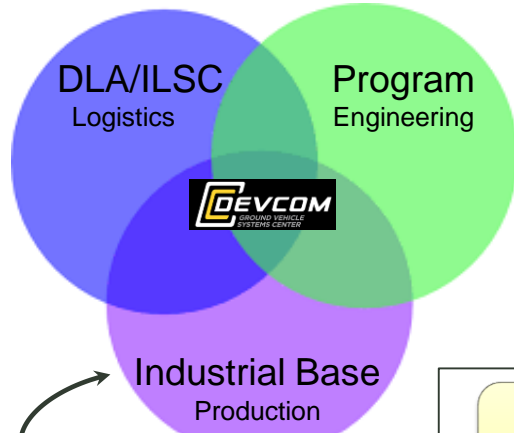
Major Attributes

**Strength is non-provisioned
component level electronics
(typical Program = 700 part nos.)**

- Microelectronic part availability status and forecasted future availability
- Manufacturer recommended replacement parts
- Weekly alerts from tools
- Suspected counterfeit and non-conforming parts risk.
- Case management tool



GVSC DATA ANALYSIS PROCESS



Includes DoD Organic Capability

Attributes we can "affect"

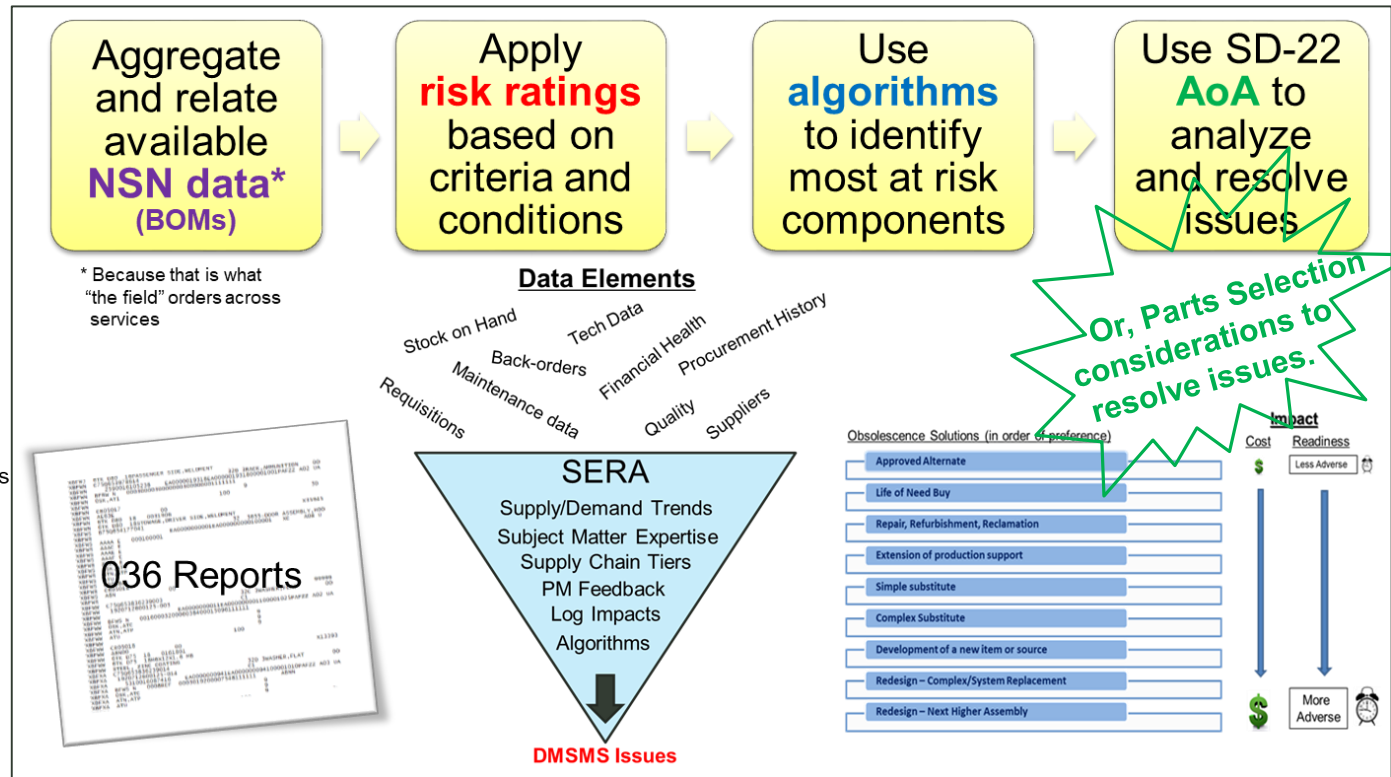
Micro

- Customer Wait Time
- Administrative Lead Time
- Backorders
- Stock On Hand (of required parts)
- Identify Valid Sources of Critical Parts
- Resolve common parts Issues across platforms
- Procurement Contract Language
- Technical Data and Intellectual Property Purchase

Macro

- Cost
- Readiness
- Industrial Preparedness

A holistic and customer specific **Predictive Obsolescence** approach relying on data driven analysis and including the logistics, engineering and industrial base communities identifying critical obsolescence efforts and resolving issues before a readiness impact - at the lowest possible cost.

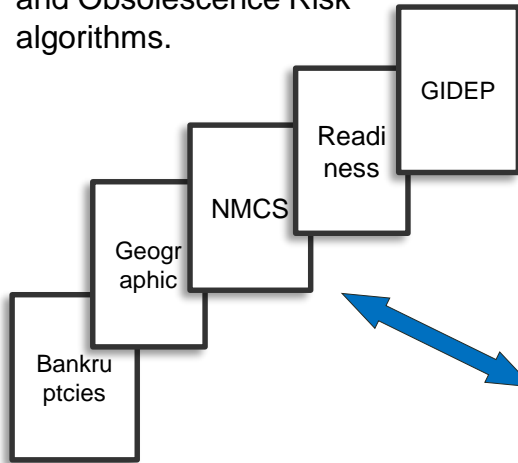




SERA ARCHITECTURE

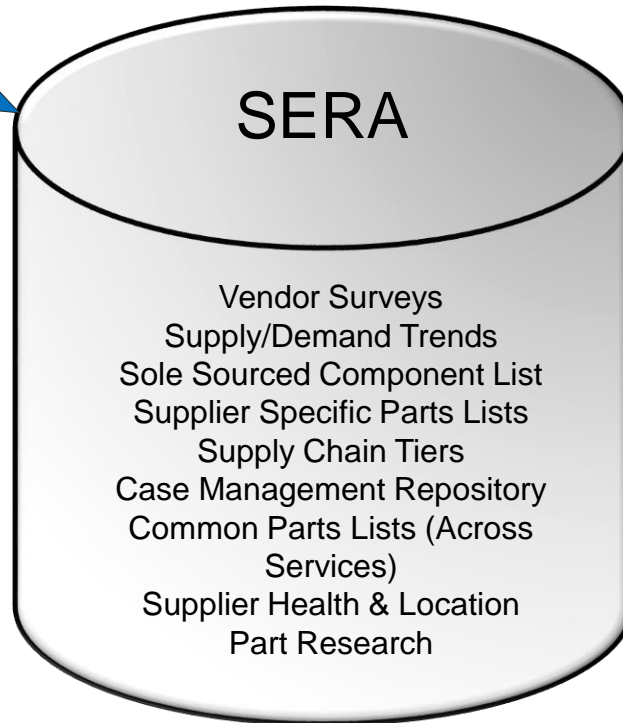
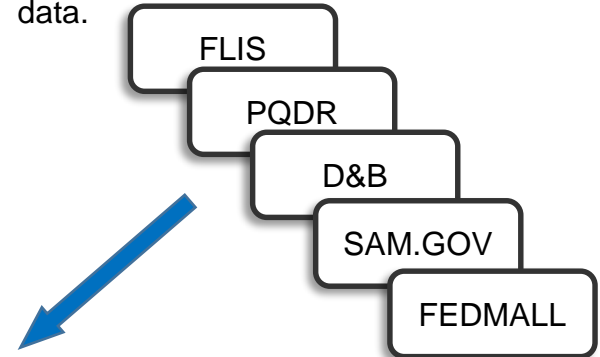


Reports automatically generated based upon statistical analysis and Obsolescence Risk algorithms.

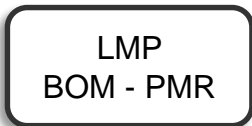


Completely government operated, updated & managed.

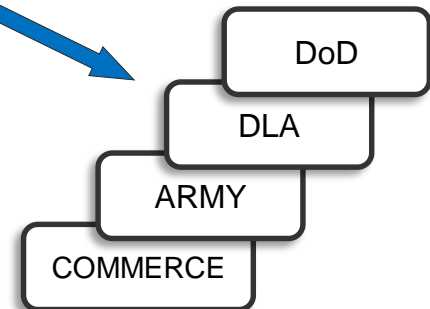
Automated Data Feed from Government and Commercial sources providing “real time” data.



Connectivity to BOMs with a feedback loop to scrub PMR & improve BOM Accuracy.



Ability for **multiple government agencies** to utilize the tool and share data on parts and suppliers.



- Not a comprehensive depiction of SERA inputs/outputs



SUSTAINMENT ENGINEERING RISK ASSESSMENT



This information system is approved for UNCLASSIFIED/FOUO data



SERA



Queries



SERA is a government owned/hosted database and analytical tool used to gather, combine, relate and interpret specific equipment data involving logistics, maintenance, engineering, quality and supplier health. It is used by U.S. Army CCDC GVSC Obsolescence SMEs in a holistic and predictive manner to identify obsolescence and readiness risks and minimize the cost of issue resolution.

Search/Lookup



Logistics Code Glossary



Data Management



SERA involves the use of queries to conduct focused analyses on a specific platform item/list of items and searches to gain insight on a specific item/list of items, vendor(s) or keyword. Due to the proprietary nature of the data contained in SERA, roles are constrained to ensure access to platform restricted data is controlled. There are two public roles, one for a specific platform which provides data associated with that system along with all general information, and a general role which allows search capability on vendors, NSN/Part numbers and keywords but does not display proprietary platform data.

You are logged in as a member of the DORE Team role. This gives you the following access:

- All non-system administrator functions



SERA FOCUS: NIINS/SUPPLIERS



This information system is approved for UNCLASSIFIED/FOUO data



SERA



Queries



Search/Lookup



Logistics Code Glossary



Data Management



NIINS

130K

Procurement
History

Provisioning
Data

Supply /
Demand

Suppliers

50K

Financial
Health

Quality

Contract
History



NIIN RELATED DATA



Provisioning Data

Counts

PN/Nom/CAGEs:	8	PCCNs:	1
Weapon Systems:	2	UOCs:	13
Related NIINs:	0	PLISNs:	1
339s:	0	NHA PLISNs:	1
355s:	0	Immediate Down PLISNs:	0
PQDRs:	0	All Down PLISNs:	0

NIIN information

Characteristics

Complexity:	No
Source Control:	No
Rand Readiness Driver:	No
Persistent Backorder:	No

Supply / Demand

Army Stock On Hand:	129
Last Update:	2018-11-28
<hr/>	
DLA:	Yes
Stock On Hand:	127
Monthly Consumption:	0.1
Last Demand Date:	2020-02-04
Last Update:	2020-04-30

Codes

Acquisition Advice Code:	Z
Acquisition Method Code:	3
Acquisition Method Suffix Code:	D
Shelf Life Code:	0
Essentiality Code:	C
Hazardous Material Indicator Code:	P
Hazard Count:	0

NATO Item Identifier (NIIN):	01-517-5329
Nomenclature:	SWITCHSUBASSEMBLY
Federal Supply Group:	59
Federal Supply Classification:	5930
Mat-Cat (4,5) (FEDLOG):	00
Supply Class:	9
Assign Date:	2004-02-11
Weight (pounds):	0.2
Source of Supply (SOS):	SMS
AMDF Price:	\$60.75
PMR Price UM:	0
PMR Price UI:	0



NIIN RELATED SUPPLIER DATA



NIIN Procurement History

Supplier Group Name	CAGES	Valid CAGES	Contracts	Quantity	Total Amount	Average Price
AUSTIN-WESTRAN LLC	1	1	0	0	\$0.00	\$0.00
B.T.M.C. CORPORATION	1	1	2	130	\$5,861.90	\$45.05
DIVERSIFIED AEROSPACE SERVICES LLC	1	0	1	2	\$288.00	\$144.00
OSHKOSH	1	1	0	0	\$0.00	\$0.00
RUTA SUPPLIES INC	1	1	3	503	\$22,273.20	\$54.20
VSE Corporation	1	1	1	803	\$36,303.63	\$45.21
ZECON INDUSTRIES INC.	1	0	2	1,086	\$48,914.28	\$45.02

Nomenclature	CAGE	CAGE Status	CAGE Name and Location	RNCC	RNVC	DAC	DUNS	D&B Rating
	55683	A	Wheeler Bros., Inc.; SOMERSET, PENNSYLVANIA				014586911	33BZ
	1Q7T5	A	Zecon Industries, Inc.; EVANS, GEORGIA				828190202	68CI
	7S526	A	B.T.M.C. CORPORATION; COLUMBUS, OHIO				092158245	68CO
SWITCH SUBASSEMBLY	24234	A	AUSTIN-WESTRAN LLC; BYRON, ILLINOIS	3	2	E	006015804	68BG
	24234	A	AUSTIN-WESTRAN LLC; BYRON, ILLINOIS	3	2	E	006015804	68BG
	3BMD2	A	DIVERSIFIED AEROSPACE SERVICES LLC; ARLINGTON, TEXAS				119338783	00HW



SERA RISK REPORT



Risk Report Example

SERA												
NIIN Query - Force Projection - Bridging CBT												
NIIN	Nomenclature	AAC	AMC	AMSC	EC	FSC	FSG	Haz Mat	Mat-Cat	NCBC	SC	SLC
01-517-5329	SWITCHSUBASSEMBLY	Z	3	D	C	5930	59	P	00	01	9	0
01-222-5497	WIRINGHARNES, BRAN	Y	3	D	J	5995	59	N	00	01	9	0
01-193-6746	CARRIER, PLANET	D	1	L	C	2590	25	N	00	01	9	0
01-409-0914	PIN, STRAIGHT, HEADLE	J	3	R	G	5315	53	N	NR	01	9	0
01-560-7945	HOSEASSEMBLY, NONME	Z	1	R	J	4720	47	N	00	01	9	0
01-166-8794	STRAINERASSEMBLY	Z	1	L	J	4730	47	N	NR	01	9	0
01-132-0606	SEAT, VALVE	Z	1	Z	C	4820	48	N	00	01	9	0
01-212-6134	NUT, PLAIN, CAP	D	3	L	G	5310	53	N	00	01	9	0
01-528-6636	TRUCKTRACTOR	A	0	0	A	2320	23	N	NR	01	7	0
00-098-6350	PLUG, EXPANSION	Z	1	C	C	5340	53	P	00	00	9	0
00-253-5626	SCREW, DRIVE	D	1	G	C	5305	53	N	CC	00	9	0

25 rows |< < 1-25 of 9856 > >|



SUPPLIER (CAGE) RELATED DATA

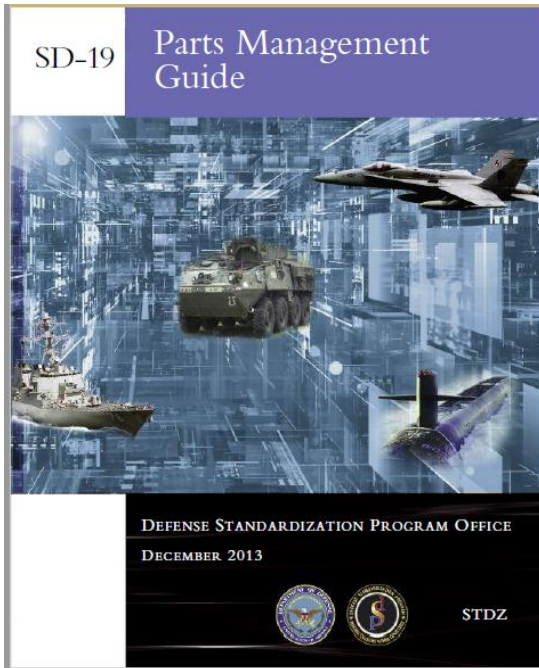


Supplier Data

DUNS Information			Counts		
DUNS:	006070445	Immediate Parent:	FSG:	37	
DUNS Name:		Domestic Parent:	FSCs:	121	
DUNS Address:	1917 Four Wheel Dr	Ultimate Parent:	CAGES in Group:	23	
City, State, Zip:	OSHKOSH, 54902-2400	Founded:	1917	Part Numbers:	20672
Country:		Out Of Business:	No	Weapon System:	1,655
DUNS Latitude:	43.99	Square Footage:	15944	339s:	45
DUNS Longitude:	-88.55	Employees:	15400	355s:	932
		Revenue:	\$7,705,500,000.00	PQDRs:	1,760
Viability Rating Date:	2020-10-25				
Viability Rating:	12AA				
Viability Score:	1 - Low				
Portfolio Comparison:	2 - Low				
Data Depth Ind:	A - Rich Firmographics, Extensive Commercial Trading Activity, Comprehensive Financial Attributes				
Company Rating:	A - Available: 3+ Trade				
Company Rating Desc2:	Large: Employees:50+ or Sales: \$500K+				
Company Rating Desc3:	Established: 5+				
Contract Information					
Contract Count:	411,787				
Contract NIINs:	5848				
Average Contract Quantity:	7264				
Total Quantity:	2991320531				
Average Contract Amount:	\$752.74				
Total Amount:	\$309,969,621.88				
Average Item Price:	\$0.10				
From:	1974-05-01				
To:	2017-04-28				
NIIN					
Count:	17654				
Sole CAGE Count:	172				
Sole Source Percent:	0.97				

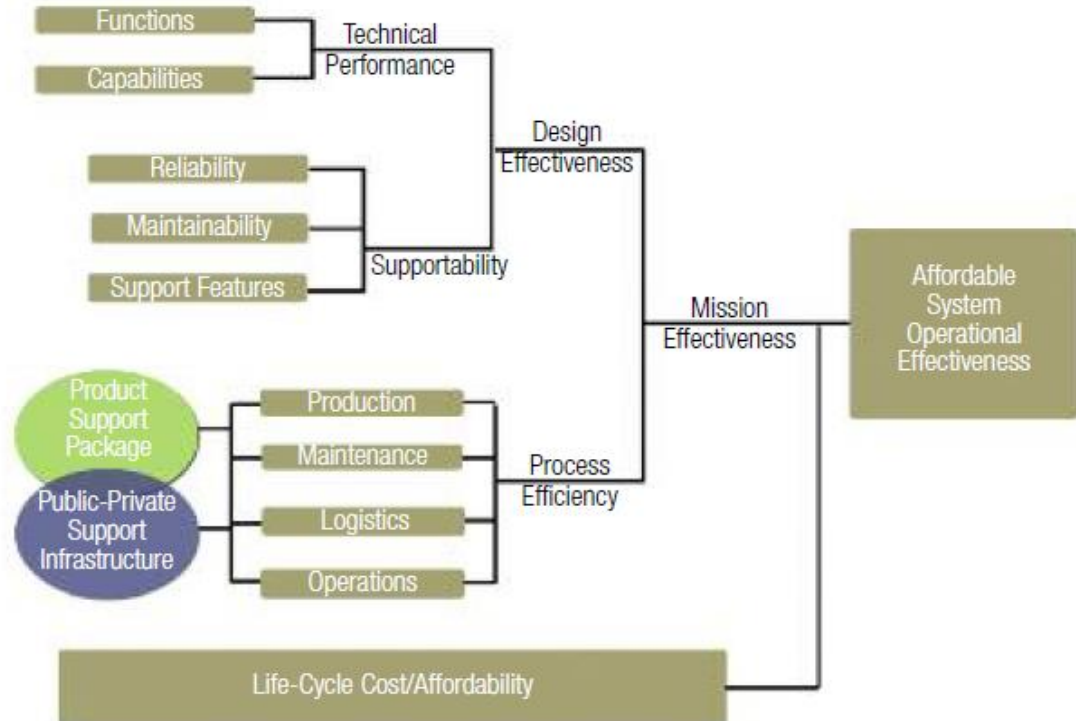


SD-19 PARTS MANAGEMENT



- Disciplined parts management is critical to minimize downstream part obsolescence issues.
- Used in conjunction with MIL-STD-3018 (Parts Management)
- Identification of the optimum parts while considering all the factors that affect program outcomes.

Figure 1. Framework for Ensuring Affordable System Operational Effectiveness



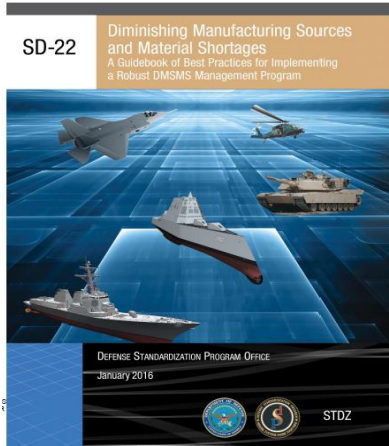
Source: *Defense Acquisition Guidebook*, <https://acc.dau.mil/CommunityBrowser.aspx?id=489752&lang=en-US>, accessed November 14, 2013.

Design Considerations

- Reliability and Maintainability
- Standardization
- DMSMS
- CRM (Counterfeit Risk Mgmt.)
- Environmental Issues
- Part and Supplier Quality



SD-22 OBSOLESCENCE INSIGHTS



The Congressional Budget Office reported an average Fleet age of 23 years old in 2020 with useful lives being pushed out to beyond 30 years. In some instances, tactical support systems (everything from trucks, mobile generators & construction equipment to HMMWVs - in the 1000's) are being used well beyond that.

...Nearly everything will become obsolete or unavailable over time. However, **not all situations need to be handled proactively. In some circumstances, the risk of impact is low if a program waits until an item cannot be purchased before dealing with the situation.** For example, there may be commercially available alternatives to certain parts categories, such as electrical and mechanical COTS assemblies and standard industrial parts. **Active monitoring may be more important for custom electronic and COTS assemblies.** While proactive monitoring may not be necessary for one-time manufactured items, the program should be properly prepared (i.e., with technical data) to reproduce those items if required.

In some situations (especially for common mechanical items), a reactive DMSMS management approach is robust, because many alternatives can be used.

...standard/common industrial items, such as mechanical components, connectors, cabling, and consumables, that typically do not present a significant risk, because most of these items are easily and quickly replaced when they become obsolete. Generally, these items can be eliminated from monitoring. Some circumstances, however, warrant a DMT's monitoring of these types of items. For example, some items may have something unique about their operating environment, may be identified by the DMT as important, or may require extensive requalification. The DMSMS SME and engineering activity representative should understand the associated risk before choosing not to monitor such items and should revalidate that decision periodically.

- o *Items where preparations should be taken.* Custom-fabricated items (such as fenders or castings) that will no longer be produced after final delivery also should not be monitored for DMSMS issues; however, logistics managers and PMs should ensure that enough of these items are acquired for system sustainment through system disposition. As a safeguard, the program should obtain sufficient documentation to enable the reacquisition of custom-fabricated items in case of future need, through new acquisition contracts.

For the casual reader of the DoD SD-22 Guidebook (no-seriously), it's obvious to see that being proactive/predictive for microelectronic parts is important, BUT..... It is also important for non-microelectronic parts and that message has been a little less clear. For Army Ground Systems, not being predictive in general has added cost, lengthened resolution times and negatively impacted readiness. In either case, a strategic and comprehensive **DATA-DRIVEN** approach is called for.



In **ACQUISITION**: Using parts data analysis to select parts with....

- A more robust supply chain (vendor health, history, demographics)
 - Enhanced quality and reliability metrics (actual or surrogate data)
 - Consideration for all stakeholders (Eng, Log, PM) – Input to LCSP
 - Commonality across weapon systems (economies of scale)
 - Minimum DMSMS risk (impact on life cycle costs and readiness)
-

In **SUSTAINMENT**: Monitoring/analyzing parts data to “early-identify”....

- Supply chain issues (vendor health, backlogs, natural events, M&A)
- Quality, Maintenance and Reliability issues
- Potential risk items for stakeholder attention (Eng, Log, PM)
- Common issues affecting multiple weapon systems
- Mitigation plan for obsolescence risk (AoA/Business Case analysis)