





Presented to: RAM VI Workshop

Logistics Engineering

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16 Oct 13



Shadow 200 System Not Just an Air Vehicle!





RDECON Logistics Engineering (LogE)

"The GAP"





Logistics Engineers Bridge the Gap between Engineering & Logistics

EXAMPLE COM LogE Advisory Panel/Workshops AMRDEC





LogE Mission Development



Logistics Engineering Activity/Responsibilities

			LogE Readiness Level			-		Life Cycle Activities								Man	ager										
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Built-In Test (BIT) Development	Contributes			X					_			2.0	X	X	X	X	X	X			3.2	5	4/			X	
Standardization Analysis/Opportunities	Develops			X					_			2.0	X	X	X		×	X			3.4	5	55			X	
Review and Analyze Deliverables	Develops								_			NA		Х	X	Х	X				3.5	4	30				
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Test and Evaluation Master Plan (TEMP)	Contributes						X		_			3.0		X	X	X	X				3.5	4	30	X		X	X
Provisioning Technical Documentation	Contributes						X		_			3.0			X	X					3.5	2	12	X		X	Х
Tool and Test Equipment List	Contributes						х		_	X		3.0			X	X					3.5	2	12	X		X	X
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Maintenance Task Analysis	Develops			х								2.0		х	Х	Х		х			3.8	4	46	х		X	х



LogE Competencies



CRIT	TICAL	IMPORTANT							
LogE Specialized Training	Other avenues/certifications	LogE Specialized Training	Other avenues/certifications						
Missile Systems Fundamentals to include rockets, GSE, etc.	Project Management Concepts and Tools	Performance Metrics	Oral Communications						
Aviation Systems Fundamentals	Software Tools	Disruptive Technology	Written Communications						
Airworthiness Concepts	Earned Value	Production/Inventory Systems	Technical Data Management, Interface Management						
Condition Based Maintenance Concepts	Cost and Scheduling	Enterprise Integration	Configuration Management						
LOGSA Tools	Lean Six Sigma	Cost and Risk Mitigation	Contract Negotiations						
Clockwork	PBL Concepts	Product and Process Design and Improvement	Value Engineering Methodology						
COMPASS	Systems Engineering Toolkit	Transportation/Distribution	CRP Preparation						
Maintenance Systems	Requirements Analysis	System Maturity Process	Spare/Repair Parts Concepts						
Problem Solving tools (e.g., pareto analysis, modeling and	Allocation	Technology Readiness Levels	Tech Loop Process						
simulation tools, root cause analysis, scatter diagrams,	Systems Engineering Management	Manufacturing Readiness Levels	Quality Management Process to include QDR/PQDR						
histograms, fishbone diagrams, Deming's 14 points, etc.)	Experiential Knowledge	Supportability Readiness Levels	Aviation and Missile Unique Issues						
Inventory Management	Flight line, e.g. Ft. Campbell	Risk Assessment and Analysis	Logistics Modernization Program Utilization						
Logistics Engineer Role in Weapons system life cycle	Missile Maintainer	Tech Manuals and IETMs	Financial Management						
Design for Supportability Concepts	TRADOC		Budget						
Data Mining	LOGSA		Execution						
Maintenance and Supportability Concepts	IMMC		Funding Streams & Utilization						
Design of Experiments	Depot—CCAD/LEAD								
Supportability KPPs	Missile & Aviation Contractor: Log and Production								
Logistics Support Analysis (LSA) including Hands on concepts	PM Rotations								
ILS Process	ED divisions								
LogE Role in the Weapons System Life Cycle	RAM								
LORA/SORA	PIF								
Supportability Strategy	Engineering Support (TPS/Prognostics/Diagnostics)								
Product Support Package	Supply Chain								
Log Demos Planning and Results									
Discrete Simulation-stochastic rather than 6-DOF continuous									
Analysis of Alternatives									
Interfacing with TRADOC									
Life Cycle Management									
DOTMLPF (Doctrine/Organization/Training/Materiel/Leadershi	p/Personnel/Facitlities)								
RAM Concepts									
RAM Tools									
FMECA Design									
Root Cause Analysis									
Statistics									



Moving From Acquisition to Life Cycle Management Framework AMRDEC





- Integration of Acquisition and Sustainment into LCM
- Focus on Materiel Readiness
- One set of metrics throughout the System Life Cycle
- Sustainment Maturity Levels
- Strengthened Governance



UH-60A/L Main Rotor Blade Category IV Repairs



Background

- New blade cost = \$127K (9600hr life limit)
- Sikorsky Cat IV program repairs MRBs considered "beyond DMWR" at \$97k/per
 - Current program requires only 1100hrs useful life remaining
 - Still life limited by spar after repair
- Study needed to determine beyond economic repair criteria

Project Savings



Accomplishments

- Analyzed 2410 data to build age distribution models of the blade fleet
- Developed Monte Carlo Simulation to optimize screening point
- Optimal screen adjusted to 3600hrs useful remaining life (+2500FHs)
- Recommendation incorporated into FY2010 M&O SOW for MRB

Path Forward

- Project Complete
- Use similar methodology on other AMCOM M&Os



UH-72A Engine Coking



Description

- Engine seizing (after shutdown only) due to coking at Ft. Polk, LANG-Pineville, and TXNG-Austin. 69 total engine manifolds affected (multiple repeat coking events). \$35,000 per manifold (minimum).
- Initiatives to mitigate engine coking events and effects while root cause is investigated and corrective action is developed.
 - +100 use (not effective at preventing coking)
 - "Piston Kleen" engine wash
- #1 Sustainment issue for PM LUH.

Accomplishments

- +100 Program
 - Eliminated storage / HAZMAT issues
 - Developed redundant +100 initiation procedures to disallow inadvertent fueling of transient A/C
 - Simplified use, training, and calibration by selecting electronic pump and coordinating on-site training by OEM
- Used engineering test data and Logistics fuel consumption data to show manifolds at Ft. Polk coked on in-specification fuel.
- Cleared Piston Kleen for use at Ft. Polk
- Projected PM LUH 10 year cost savings \$13.52M

Path Forward

- "Piston Kleen" periodic maintenance alignment.
 - Storage, shipping, frequency, HAZMAT
- Develop long-term solution (manifold design, coatings).
 - Work in tandem with PM LUH SE to minimize impacts to ILS elements / Fleet Management





LogE Barometer

Life Cycle Phase								
MSA	TD	EMD	P&D	O&S				
			Х					

- Data Mining/Analysis
- Develop Supportability Strategies
- Design Impact
- Cost benefit analysis
- Provide meeting/IPT support
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Logistics Engineering Timeline





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RDECOM



Logistics Engineering



Influence Design for Sustainment





AMRDEC'S LogE Activity



- •Pilot 2009
- •Formal Team Jul 2011
- •IO Group Sep 2012
- •Growth:
 - •From 2 Eng in Blackhawk
 - •To 16 organic and 6 Contractors in 9 organizations.





Logistics Engineering Landscape





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LogE Workshops/Training/Site Visits

- 1-11 Defining, Developing, and Implementing Logistics Engineering
- **12 June 2011** Inventory Management/ Supply Chain/ Production Planning
- 13 September 2011:, Reliability Centered Maintenance Fleet Management, CBM, RCM, CTR
- 14 December 2011: Cost Analysis & EPDM CBA, CASA, ePDM, Performance Metrics, Data Modeling, Knowledge Management, System Improvement, Cost Engineering, & Rights in Technical Data
- **15 March 2012: Analysis Tools -** LORA, COMPASS, Inventory Modeling, Predictive Logistics Enterprise Solutions,
- 16 June 2012: Projects IPT Obsolescence Management, RIP, PIPP&
- 17 October 2012: Test Measurement Diagnostic Equipment (TMDE), USATA

Overview, ESD Overview, & Logistics Engineering Training Modules Training: Learning Teams

18 - February 2013: Technical Publications

Site Visits: Intermodal Center, SESI, Ft Campbell

19 - August 2013: Packaging, Handling, Storage & Transportability



LogE CAREER MANAGEMENT







Year Two

Auburn, MS Industrial & Systems Eng. Fall 2012, Spring and Summer 2013



Training Facility Student Work Area



ALLC Distance Learning Studio TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



TA-STD-0017 Product Support Analysis





Front End Analysis

- Developing Product Support Performance Requirement'
- Conduct Functional Requirements Analysis
- Mission Hardware, Software, & Support System Standardization
- Analyzing support systems for similar systems
- Technological Opportunities
- Supportability Related Design Factors
- Design/Supportability Trade-offs
 - Assessing Alternatives For Meeting Design Requirements
- Logistics Product Development
 - Technical Manuals, Maintenance Allocation Charts, Bill of Materials, Provisioning Lists, etc.

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Product Support Analysis

	CRA-STD-0005.8	TechAmerica Standard Logistics Product Data		
		GEIA-STD-0007-B		
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GEIA-STD-0007 – Logistics

- Product Data
- •Updated in May 2013
- Identifies
 - Data Relationships
 - XML Tags for Data Transfer

Handbooks

•GEIA-HB-0007 -Logistics Product Data Handbook

Data Handbook

•TA-HB-0007-1-Logistics Product

Data Reports Handbook

•May 2013





Product Support Manager's ເງິນໄປອອດຊ



- Lays out roles of Product Support Manager – whose role is to integrate product support elements in DOD Acquisition Programs.
- Includes Guidance on:
 - Life Cycle Sustainment Plan
 - Sustainment Maturity Levels





Army Guidance

Department of the Army Pamphlet 700–28	
Logistics	
Independent Logistics Assessments	
Headquarters	
Bepartment of the Army Washington, DC 9 Jone 2013 UNCLASSIFIED	

- DA Pam 700-28 Independent Logistics Assessments –
 - June 2013
 - Calls for independent assessments of Army programs to ensure logistics considerations are being addressed throughout the lifecycle.
 - First Army document to call out the aforementioned GEIA and TA standards.





Army Regulation and Guidance • AR 700-127 – Integrated Product Support



(ILS)

- Being revised to reflect latest changes to the product support area
- Currently in Staffing
- Lays out Army's roles and activities related to Product Support Management
- Includes the aforementioned GEAI /TA documents:
 - GEIA-STD-0007 and TA-STD-0017
- Includes adherence to the Sustainment Maturity Levels!

DA PAM 700-127-1 – Integrated Product Support (ILS) -

- Additional Guidance on
 - PSM Roles
 - Metrics
 - Contracting for product support

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Summary

- How does the AMRDEC help to integrate Logistics into the design process?
 - Follow OSD, Army, and Industry regulations, standards, and guidance
 - Integrate Systems Engineers into Logistics Organizations (Logistics Engineers)
 - Created Logistics Engineering career roadmap and training programs
 - Established formal AMRDEC Logistics Engineering group to manage program, coordinate efforts, build/maintain the functional Logistics Engineering discipline