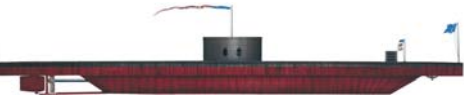

THE MONITOR AND MERRIMACK

Newsletter of the
Greater Hampton Roads Chapter
District 02 – Chapter 03
SOLE– The International Society of Logistics

June 2015

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Newsletter: Carl Lilieberg
Web Master: Charlie Littleton

In this Issue:

From the Chapter Chairman

Thanks to everyone who was able to join us at the May dinner joint meeting with **ASNE Tidewater Chapter**. I want personally thank ***Mr. Mike D'amato, National Vice President for ASNE, Mr. Dave Norris, Chairman*** *and* ***Mr. Herb Hood Vice Chairman, ASNE Tidewater Section*** for welcoming our chapter to this meeting. **Mr. Joseph Ruddy, The Chief Information Officer for the Port of Virginia** gave a great presentation on "***Operations in the Port of Virginia***"

At this month's luncheon we are proud to be able to have a distinguished quest speaker ***Mr. John Sofia, NAVSEA 06, "NAVSEA Commonality Program."*** Please come join us for an update on this vital program.

From our Virtual Chapter's newsletter:
Cradle to Crave
"Life should not be a journey to the grave with the intention of arriving safely in an attractive and well preserved fully mission capable body (container), but rather to skid in sideways in a cloud of smoke, body thoroughly used up, totally worn out, and screaming "WOO HOO what a ride!"
-Phil

See you at the next event!

Charlie Littleton
Chairman GHRC SOLE

Coming Events:

Thursday, 25 June

Luncheon
11:30 AM to 1 PM

John Sofia, NAVSEA 06

"NAVSEA Commonality Program" *

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23 July 2015

Michael Pasquarette
PMS Project Manager,NSLCDET
Norfolk, NNSY

"The Future of PMS" *

*** Teppanyaki Grill and Buffet**
7525 Tidewater Drive, Suite 8
Norfolk, Virginia

Summertime Beains

Certified Professional Logistician Corner

The next CPL Exam will be given in November 2015

1. Test and evaluation plans should be implemented:

   a. as soon as the system/equipment is available.
   b. after approval by corporate authority.
   c. as early as possible.
   d. when reliability qualification is necessary.

2. A test & evaluation maintenance plan would not be written for:

   a. an end item predicted to show low reliability.
   b. an end item predicted to never fail.
   c. an electronic item beyond its "burn-in " phase.
   d. Electro-mechanical end item developed for spare programs.

3. Test & evaluation planning that employs the ideal environment, skilled contractor personnel and sets aside non-changeable failures results in:

   a. true testing
   b. efficient use of critical items.
   c. the design, test & evaluation plan.
   d. large gaps between test results and field observed parameters.

4. The source plan that identifies the adequacy of the logistics support resource for a DOD system/equipment is the:

   a. Supportability assessment plan
   b. Logistics support analysis plan
   c. Test and evaluation master plan
   d. Detailed plans measuring for supportability factors
   e. All of the above

5. The supportability assessment plan limits:
   a. Test & evaluation strategy
   b Potential Test Program Limitations
   c. Critical supportability issues
   d. Detailed plans measuring for supportability factors
   e. All of the above

6. Meaningful critical issues and measures of effectiveness related to the satisfaction of mission need are:

a. Established immediately after testing
b. Established prior to testing
c. Established at DSARC Milestone III
d. Established as necessary

7. Successful accomplishment of test and evaluation objectives are the basis for:

   a. Entering full scale development
   b. Diversions to commit added resources
   c. Updated acquisition schedules
   d. Revised plans and contractual arrangements

8. Within DOD Programs, supportability objectives and criteria are:

   a. Regularly briefed to the Congress
   b. Often overlooked by the Program Manager
   C Integrated with other system engineering test requirements
   d. Recognized as significant cost drivers to any test program

9. The primary document to assess the adequacy of planned test evaluation is:

   a. The supportability assessment plan
   b. The test and evaluation plan
   c The supportability assessment report
   d . The TEMP

10. The accomplishment of non-destructive operations and maintenance tasks on a developmental prototype and its maintenance significant support and test equipment is the definition of:

    a. Test & evaluation
    b. Logistics demonstration
    c. Supportability assessment
    d. Fault insertion

Please see answers on Page 3

Near term Calendar of Events

GHRC SOLE

25 June 2015	**John Sofia, NAVSEA 06 (Ret.) "NAVSEA Commonality Program"**
23 July 2015	**Michael Pasquarette PMS Project Manager** NSLCDET Norfolk, NNSY **"The Future of PMS"**
27 August 2915	**David Floyd, DAU/SOLE District 2 Director,**
24 September 2015	**Tour of Underway Replenishment Training Facility, Joint Expeditionary Base, Little Creek, Virginia**
22 October 2015	**Howard Nudi, Duke Energy, Nuclear Energy and its Relationship to Reliability Engineering"**

ASNE

Dinner Meetings:	**Every 3rd Tuesday, Springhill Suites, Newtown Road, Va. Beach, (1800-1900 Social Hour); 1900-2030 Dinner and Program; Reservations: on l ine at ASNE Tidewater site.**

NDTA

No events scheduled

CPL/CML CORNER ANSWERS

Answers			
1	c	6	b
2	b	7	b
3	d	8	c
4	a	9	**d**
5	e	10	b

May 18, 2015

GHRC Business Meeting Minutes
Attendees:
Charlie Littleton, Chairman; Mike Grimes and Carl Lilieberg

The meeting commenced at 5:00 PM

Charlie mentioned that Michelle Stlaey was trying to get a tour with ACU-2 for September.

Charlie noted that 48 people attended the Joint dinner with the Tidewater Chapter of ASNE Lee Morris (CPL), Mike Grimes, and Charlie all attended. The speaker was Joe Ruddy, Chief Information Officer for the Port of Virginia, who replaced Jphn Reinhart who was callled away on business. He covered the VIT Strategic Plan and ntoed that the port recently had a $10 Million Dollar surplus representing a $26 million dollar turnaround from 2014 fiscal year.

Charlie announced that LCE was donating a used laptop to our chapter to replace our old platform.

There being no further business,, the meeting adjourned at 5:20 PM.

June 15, 2015

GHRC Business Meeting Minutes
Attendees:
Charlie Littleton, Carl Lilieberg, Mike Crimes

The meeting commenced at 5:00 PM on Charlie's pontoon boat and we cruised itno the Chesapeake Bay while conducting our meeting!

Charlie noted that John Sofia (NAVSEA) is set up for the 25th of June (luncheon). He expects a big audience.

Charlie noted that we will have a tour of the UNREP Training Facility in Little Creek, Virginia in September and our speaker for October will be Howard Nudi, from Duke Energy; he will cover " Nuclear Energy and It's Relationship to Reliability Engineering"

There being no further business, we headed for the docks .

Our May 2015 Joint Dinner Meeting With the Tidewater Chapter of ASNE

This event was sponsored by The Tidewater Section of the American Society of Naval Engineers and took place at the Marriott Spring hill Suites on Newtown Road, Norfolk, Virginia.

The scheduled speaker, Mr. John F. Reinhart was unable to make the meeting. In his stead, Mr. Joseph Ruddy, The Chief Information Officer for the Port gave the presentation on “Operations in the Port of Virginia”

He summarized by noting they have had a $26 million dollar turnaround with a $10 million dollar surplus in the current fiscal year. He fielded a variety of questions as the port has been in our local newspapers with operations and port congestion as the biggest issues.

Greater Hampton Roads Area Chapter
SOLE – The International Society of Logistics

present

Mr. John Sofia, NAVSEA 06C
Commonality

NAVSEA
NAVAL SEA SYSTEMS COMMAND

NAVSEA Commonality Program

11:30 to 1 PM
June 25, 2015

7525 Teppanyaki Grill and Buffet
Tidewater Drive, Suite 8
Norfolk, Virginia

Please RSVP by contacting our Chairman, Mr. Charlie Littleton at clittleton@LCE.com or phone him at 757-857-1311 (ext: 4203) NLT cob Wednesday, 24 June. The luncheon is $15.00 cash or check.

Driving Directions: From both east and west on I-64 take the Tidewater Drive Exit north and Turn Left into the Sothern Shopping Center area (before the Little Creek Underpass).

Please join us for a highly interesting logistically related tour of facilities and businesses in the Tidewater Area. Spouses and guests, bosses, and co-workers are welcome and you DO NOT have to be a SOLE Member to attend!

Transportation Topics

Signs point to US shippers' slowing intermodal conversion (Reprinted from JOC online – 18 June 2015)

U.S. shippers are finding it more and more difficult to rationalize shifting their cargo from highway to rail. And questionable service reliability and accelerating intermodal rates are to blame, according to intermodal analysts and a recent shipper survey.

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Expanded Suez Canal to open August 6 (Reprinted from JOC online – 17 June 2015)

The "new" enlarged Suez Canal that will allow two-way transits for ship will open on schedule on August 6, according to the waterway authority.

43 percent of shippers shifting cargo away from West Coast (Reprinted from JOC online – 18 June 2015)

After the eight months of West Coast port congestion that crimped U.S. shippers' supply chains, 43 percent of surveyed shippers who have negotiated annual trans-Pacific contracts said they will shift shipments to East Coast ports. But of those shippers who told JOC.com they would reroute cargo away from the West Coast, half said less than 5 percent of that freight would be permanently diverted through new contracts for 2015-2016.

Delayed pilots aimed at speeding US-Mexico truck trade move forward (Reprinted from JOC online – 18 June 2015)

It's been more than a decade in the making, but the Mexican government has finally cleared a hurdle that prevents U.S. Customs and Border Protection agents from pre-clearing cargo south of the border

Maersk mega-ship order may reveal limits in new vessel sizes (Reprinted from JOC online – 13June 2015)

In its new mega-ship order announced on Tuesday, Maersk Line took a conservative road, achieving a 7 percent capacity increase in ships of almost identical hull dimensions to its Triple-E class In the process, it is showing how carriers are not automatically opting to build ever-larger ships to push the boundaries of economies of scale

Book Review

Systems Engineering Fundamentals, Jan. 2001, DAU University Text (Reprinted from MIT online)

This book provides a basic, conceptual-level description of engineering management disciplines that relate to the development and life cycle management of a system. For the non-engineer it provides an overview of how a system is developed. For the engineer and project manager it provides a basic framework for planning and assessing system development. Information in the book is from various sources, but a good portion is taken from lecture material developed for the two Systems Planning, Research, Development, and Engineering courses offered by the Defense Acquisition University. The book is divided into four parts: Introduction; Systems Engineering Process; Systems Analysis and Control; and Planning, Organizing, and Managing

. The first part introduces the basic concepts that govern the systems engineering process and how those concepts fit the Department of Defense acquisition process. Chapter 1 establishes the basic concept and introduces terms that will be used throughout the book. The second chapter goes through a typical acquisition life cycle showing how systems engineering supports acquisition decision making.

The second part introduces the systems engineering problem-solving process, and discusses in basic terms some traditional techniques used in the process. An overview is given, and then the process of requirements analysis, functional analysis and allocation, design synthesis, and verification is explained in some detail. This part ends with a discussion of the documentation developed as the finished output of the systems engineering process

Part three discusses analysis and control tools that provide balance to the process. Key activities (such as risk management, configuration management, and trade studies) that support and run parallel to the system engineering process are identified and explained .

Part four discusses issues integral to the conduct of a systems engineering effort, from planning to consideration of broader management issues

In some chapters supplementary sections provide related material that shows common techniques or policy-driven processes. These expand the basic conceptual discussion, but give the student a clearer picture of what systems engineering means in a real acquisition

Sustainment and Logistics in Better Buying Power (Reprinted from Def. AT &L, Jul.-Aug. 2015)

Author: David J. Berteau

Berteau is Assistant Secretary of Defense for Logistics and Materiel Readiness. He is responsible for ensuring logistics support to the United States Armed Forces.

From the first issuance of Better Buying Power (BBP) in 2010, its key sustainment initiative has focused on Performance-Based Logistics (PBL). With the updated guidance for BBP 3.0 issued April 9, it is worth expanding the view of these updated initiatives through the sustainment prism. This article finds that sustainment permeates the entire set of BBP initiatives and offers substantial contributions to its overall theme of "Achieving Dominant Capabilities through Technical Excellence and Innovation." Sustainment also underpins the earlier focus of BBP on affordability, on should cost, and on smarter ways to procure services and increasing the professionalism of the workforce. Let's look at how sustainment does that.

Performance-Based Logistics

For years, the signature sustainment initiative under BBP has been Performance-Based Logistics (PBL). The latest guidance from Under Secretary of Defense for Acquisition, Technology, and Logistics Frank Kendall places additional management emphasis and attention not just on increasing PBL but also on ensuring its effective use. Specific actions include developing common ways to measure PBL effectiveness (including benefits and savings), using those measures to track results, and reporting those results quarterly. Regular updates on PBL implementation also will include determinations of and plans for the accessible market by Department of Defense (DoD) Component as well as progress toward those plans. My office will update the PBL Guidebook by October 2015 to improve developing, reviewing, approving and contracting for PBL arrangements.

For PBL, the challenge for today is more on "ensuring" effective use than solely on increasing the number. As Kendall noted, in addition to counting PBL arrangements, "We want to make sure that the ones we have are effective, and we will probably increase our use, but we need to do it in cases where it makes sense, and we need to make sure it's being done well." PBL provides insight and information that can affect costs and performance throughout the sustainment cycle. Let's look at some of the ways to do that.

Several BBP initiatives can incorporate actions that will help foster innovation in sustainment. Two of these are removing barriers to commercial technology utilization and emphasizing technology insertion.

Enabling Innovation in Sustainment

Operational logistics successes of the last 14 years have shown that logistics is a significant U.S. competitive advantage. Maintaining that advantage will require DoD to improve its ability to incorporate logistics technology and process innovation from around the world. Several BBP initiatives can incorporate actions that will help foster innovation in sustainment.

Two of these are removing barriers to commercial technology utilization and emphasizing technology insertion. Expanding access to global logistics innovation can eliminate unproductive processes, increase opportunities for competition and enhance affordability. Specific actions such as taking better advantage of commercial technology refresh cycles can apply to post-production systems as well as systems in development. Technology refresh for components, subsystems and software may offer powerful opportunities for reducing life-cycle costs long after systems have been fielded.

Another initiative that offers potential sustainment benefits is increasing the use of Modular Open Systems Architecture. Under DoD Instruction (DoDI) 5000.02, program managers (PMs) are responsible for applying open systems approaches in product designs wherever feasible and cost-effective. While costs often occur during development, savings from open systems approaches appear in production and in reduced life-cycle sustainment costs, by enabling competition for upgrades, facilitating reuse for additional missions, and supporting technology insertion and software upgrades. Open systems guidance being developed by the Office of the Secretary of Defense (OSD) and the Military Departments will incorporate sustainment goal.

Affordable Sustainment and Should Cost

Affordability remains a core initiative in BBP 3.0. Affordability caps, should-cost based program management, and improved cost estimating have stabilized programs across DoD. The March 2015 Selected Acquisition Reports (SARs) show that, for covered major defense acquisition programs, the DoD gained $10.6 billion in buying power (paying less in procurement and research and development for the same programs). However, significant elements of overall life-

Continued on Page 11

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Long Term 2015 Calendar Greater Hampton Roads Chapter Monthly Schedule

	Business Meeting	Lunch/ Tour	Speaker/Topic
June	11 June	25 June	**John Sofia,** NAVSEA 06 (Ret) "NAVSEA Commonality Program"
July	9 July	23 July	Michael Pasquarette PMS Project Manager NSLCDET Norfolk, NNSY "The Future of PMS"
August	13 August	27 August	David Floyd, DAU/ SOLE District II Director
September	16 Sept.	24 Sept.	Tour of Underway Replenishment Training Facility, Joint Expeditionary Base, Little Little Creek, Virginia
October	14 Oct.	22 Oct.	Howard Nudi, Duke Energy, Nuclear Energy And it's Relationship to Reliability Engineering"

Sustainment and Logistics in Better Buying Power (Cont'd from Page 8)

cycle costs have not kept pace with this decline, based on the initial internal logistics cost baseline. In fiscal year 2014, maintenance costs continue to rise as a percentage of total logistics costs, while transportation costs decline (due in part to falling fuel costs). Extending the positive results of affordability cost caps and should-cost program management to sustainment costs is a major focus of BBP 3.0 implementation.

Historical data show that design decisions made in the Concept Phase determine 70 percent of the total life-cycle costs, climbing to 85 percent by Milestone B. This means that, historically, reducing life-cycle costs requires trade-off decisions during system development. But in the recent past, such decisions have been inadequate to control life-cycle costs. In addition, Operations and Support (O&S) costs comprise 60 percent to 70 percent of total ownership costs for most programs, putting a premium on finding ways to lower O&S expenditures during design and development phases.

Systems in design today hold promise for a better future. DoDI 5000.02, "Operation of the Defense Acquisition System," requires under Enclosure 6 (Life-Cycle Sustainment) that PMs employ a should-cost management and analysis approach to identify and implement system and enterprise sustainment cost-reduction initiatives. Enclosure 6 also tasks DoD Components to:

- fully consider sustainment factors
- reduce O&S cost through system design early in development
- assess product support performance periodically to prevent O&S cost growth
- use system modifications to reduce ownership costs.

Sustainment affordability caps are established at Milestone B, based on a per unit annual cost, but since DoD has been tracking and reporting such costs under BBP for only a few years, a relatively small number of systems have breached the O&S caps.

The majority of annual O&S costs are incurred by systems already fielded, not those currently under development or in production. For these systems, there are fewer opportunities for design-affected changes that will reduce life-cycle costs. OSD Logistics and Materiel Readiness is assessing sustainment models among the military services, to identify cost-reduction opportunities and incentives for lower O&S costs. Success will depend in part on adequate data and reporting to support informed decisions and actions.

Strengthening cybersecurity throughout the product life cycle is critical for DoD, but it will require action across the global supply chain.

Sustainment Information and Data Security

Successful logistics operations have always depended on timely, comprehensive and accurate information. The ideal arrangement for DoD would be an integrated digital product data environment covering product design to product support and fostering decisions with an understanding of their life-cycle cost implications. Such a data environment would help bridge gaps between the engineering and product support analyses and thereby promote affordable system effectiveness via continual trade-offs throughout a weapon system's life cycle.

Even if DoD were to establish such an integrated data environment, better decisions would be undermined by cyber threats. BBP initiatives will help address these problems for sustainment by focusing on strengthening cybersecurity across the product life cycle.

For decades, DoD logistics information systems have been a weak link in cybersecurity, even before the term was used. In part, this is because of the size of logistics databases and the cost to secure them, but it's also because logistics activities need to interoperate with commercial suppliers both within the United States and across the global commercial marketplace.

Strengthening cybersecurity throughout the product life cycle is critical for DoD, but it will require action across the global supply chain. BBP 3.0 accelerates those actions, but DoD cannot achieve success without the private sector strengthening its own cybersecurity.

On April 23, 2015, Secretary of Defense Ashton Carter addressed both information systems and networks: "[T]o defend DoD information networks, secure our data, and mitigate cyber risks to military missions, [we need to be] building a single security architecture that's both more easily defendable and able to adapt and evolve to mitigate both current and future cyber threats. This is to replace the hundreds of networks—separate networks—that we now operate in the Department of Defense."

The loss of critical logistics technical information through cyber vulnerabilities undermines U.S. technological superiority in three ways. First, these losses can help an adversary develop similar capabilities or countermeasures. . Second, sustainment costs

Continued on Page 12

Sustainment and Logistics in Better Buying Power (Cont'd from Page10)

will reduce funds available for national security technology investments needed elsewhere.

Conclusion

O&S costs are determined by the product support strategy defined in the development phase based upon reliability, availability and maintainability of the product. Increasing reliability and reducing cost requires trade-offs between system performance, availability, process efficiency, human factors and cost to maximize weapon systems operational effectiveness. Additionally, associated support and maintenance requirements need assessing for opportunities to incorporate logistics-related technologies to improve maintainability and reduce O&S costs.

BBP 3.0 emphasizes maintaining technological superiority, and a key component is sufficient resources to enable innovation and modernization. Addressing technology opportunities for sustainment parallel to system design can positively affect the affordability of our weapon systems and provide funds needed for innovation. DoD needs to illuminate the costs and benefits of decisions at every stage of system development, from design to post-fielding. Doing the analysis, providing the information and highlighting gains in reduced life-cycle costs from investments today can lead to the best decisions and trade-offs.

FAMOUS LOGISTICS QUOTES

(Reprinted from www Virtual Library online)

You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics. - General Dwight D. Eisenhower

Logistics comprises the means and arrangements which work out the plans of strategy and tactics. Strategy decides where to act; logistics brings the troops to this point. - General Antoine Henri Jomini, *Precis de l'Art de la Guerre (The Art of War)*, 1838

The tactics...no, amateurs discuss tactics,.... Professional soldiers study logistics. - Tom Clancy, Red Storm Rising

The programs of training and exercises form the final test of logistics readiness. Since the majority of junior officers and enlisted men in the logistics services are specialized in a technical field, sound technical training is their fundamental preparation for war. In addition, however, specific attention must be paid to the development of fundamental discipline, leadership, and personal versatility which are so vital to efficient logistics service under wartime conditions. - RADM Henry E. Eccles, USN, Ret, *Logistics in the National Defense*, 1959

CPL Corner (Logistics Support Analysis)

(Reprinted from Wikopedia, June 2011)

Integrated logistics support (**ILS**) is an integrated and iterative process for developing material and a support strategy that optimizes functional support, leverages existing resources, and guides the system engineering process to quantify and lower life cycle cost and decrease the logistics footprint (demand for logistics), making the system easier to support. Although originally developed for military purposes, it is also widely used in commercial product support or customer service organizations.

[

ILS Defined

In general, ILS plans and directs the identification and development of logistics support and system requirements for military systems, with the goal of creating systems that last longer and require less support, thereby reducing costs and increasing return on investments. ILS therefore, addresses these aspects of supportability not only during acquisition, but also throughout the operational life cycle of the system. The impact of ILS is often measured in terms of metrics such as reliability, availability, maintainability and testability (RAMT), and sometimes System Safety (RAMS).

ILS is the integrated planning and action of a number of disciplines in concert with one another to assure system availability. The planning of each element of ILS is ideally developed in coordination with the system engineering effort and with each other. Tradeoffs may be required between elements in order to acquire a system that is: affordable (lowest life cycle cost), operable, supportable, sustainable, transportable, and environmentally sound. In some cases, a deliberate process of Logistics Support Analysis will be used to identify tasks within each logistics support element.

The most widely accepted list of ILS activities include:

- Reliability engineering, Maintainability engineering and Maintenance (preventive, predictive and corrective) Planning
- Supply (Spare part) Support (e.g. ASD S2000M specification)/ acquire resources
- Support and Test Equipment/Equipment Support
- Manpower and Personnel
- Training and Training Support
- Technical Data / Publications
- Computer Resources Support
- Facilities
- Packaging, Handling, Storage, and Transportation (PHS&T)
- Design Interface

Decisions are documented in a life cycle sustainment plan (LCSP), a Supportability Strategy, or (most commonly) an Integrated Logistics Support Plan (ILSP). ILS planning activities coincide with development of the system acquisition strategy, and the program will be tailored accordingly. A properly executed ILS strategy will ensure that the requirements for each of the elements of ILS are properly planned, resourced, and implemented. These actions will enable the system to achieve the operational readiness levels required by the warfighter at the time of fielding and throughout the life cycle.[2][3]

Adoption

ILS is a technique introduced by the US Army to ensure that the supportability of an equipment item is considered during its design and development. The technique was adopted by the UK MOD in 1993 and made compulsory for the procurement of the majority of MOD equipment.

Continued on Page 14

LSA (Cont'd from Page 13)

- **Influence on Design**. Integrated Logistic Support will provide important means to identify (as early as possible) reliability issues / problems and can initiate system or part design improvements based on reliability, maintainability, testability or system availability analysis

- **Design of the Support Solution for minimum cost**. Ensuring that the Support Solution considers and integrates the elements considered by ILS. This is discussed fully below.

- **Initial Support Package**. These tasks include calculation of requirements for spare parts, special tools, and documentation. Quantities required for a specified initial period are calculated, procured, and delivered to support delivery, installation in some of the cases, and operation of the equipment.

The ILS management process facilitates specification, design, development, acquisition, test, fielding, and support of systems.

Maintenance planning

Main articles: reliability engineering and maintainability engineering

Maintenance planning begins early in the acquisition process with development of the maintenance concept. It is conducted to evolve and establish requirements and tasks to be accomplished for achieving, restoring, and maintaining the operational capability for the life of the system. Maintenance planning relies on Level of Repair Analysis (LORA) as a function of the system acquisition process. Maintenance planning will:

- Define the actions and support necessary to ensure that the system attains the specified system readiness objectives with minimum Life Cycle Cost (LCC).

- Set up specific criteria for repair, including Built-In Test Equipment (BITE) requirements, testability, reliability, and maintainability; support equipment requirements; automatic test equipment; and manpower skills and facility requirements.

- State specific maintenance tasks, to be performed on the system.

- Define actions and support required for fielding and marketing the system.

- Address warranty considerations. The maintenance concept must ensure prudent use of manpower and resources. When formulating the maintenance concept, analysis of the proposed work environment on the health and safety of maintenance personnel must be considered.

- Conduct a LORA repair analysis to optimize the support system, in terms of LCC, readiness objectives, design for discard, maintenance task distribution, support equipment and ATE, and manpower and personnel requirements.

- Minimize the use of hazardous materials and the generation of waste

Supply support

Main article: Spare part

Supply support encompasses all management actions, procedures, and techniques used to determine requirements to

Continued on Page 15

LSA Cont'd from Page 14)

- Acquire support items and spare parts.
- Catalog the items.
- Receive the items.
- Store and warehouse the items.
- Transfer the items to where they are needed.
- Issue the items.
- Dispose of secondary items.
- Provide for initial support of the system.
- Acquire, distribute, and replenish inventory

Support and test equipment

Support and test equipment includes all equipment, mobile and fixed, that is required to perform the support functions, except that equipment which is an integral part of the system. Support equipment categories include:

- Handling and Maintenance Equipment.
- Tools (hand tools as well as power tools).
- Metrology and measurement devices.
- Calibration equipment.
- Test equipment.
- Automatic test equipment.
- Support equipment for on- and off-equipment maintenance.
- Special inspection equipment and depot maintenance plant equipment, which includes all equipment and tools required to assemble, disassemble, test, maintain, and support the production and/or depot repair of end items or components.

This also encompasses planning and acquisition of logistic support for this equipment.

Manpower and personnel

Manpower and personnel involves identification and acquisition of personnel with skills and grades required to operate and maintain a system over its lifetime. Manpower requirements are developed and personnel assignments are made to meet support demands throughout the life cycle of the system. Manpower requirements are based on related ILS elements and other considerations. Human factors engineering (HFE) or behavioral research is frequently applied to ensure a good man-machine interface. Manpower requirements are predicated on accomplishing the logistics support mission in the most efficient and economical way. This element includes requirements during the planning and decision process to optimize numbers, skills, and positions. This area considers:

- Man-machine and environmental interface
- Special skills
- Human factors considerations during the planning and decision process

Training and training devices

Training and training devices support encompasses the processes, procedures, techniques, training devices, and equipment used to train personnel to operate and support a system. This element defines qualitative and quantitative requirements for the training of operating and support personnel throughout the life cycle of the system. It includes requirements for:

- Competencies management
- Factory training
- Instructor and key personnel training
- New equipment training team
- Resident training
- Sustainment training
- User training
- HAZMAT disposal and safe procedures training

Embedded training devices, features, and components are designed and built into a specific system to provide training or assistance

Continued on Page 16

LSA (Cont'd from Page 15)

in the use of the system. (One example of this is the HELP files of many software programs.) The design, development, delivery, installation, and logistic support of required embedded training features, mockups, simulators, and training aids are also included.

Technical data

Technical Data and Technical Publications consists of scientific or technical information necessary to translate system requirements into discrete engineering and logistic support documentation. Technical data is used in the development of repair manuals, maintenance manuals, user manuals, and other documents that are used to operate or support the system. Technical data includes, but may not be limited to:

- Technical manuals
- Technical and supply bulletins
- Transportability guidance technical manuals
- Maintenance expenditure limits and calibration procedures
- Repair parts and tools lists
- Maintenance allocation charts
- Corrective maintenance instructions
- Preventive maintenance and Predictive maintenance instructions
- Drawings/specifications/technical data packages
- Software documentation
- Provisioning documentation
- Depot maintenance work requirements
- Identification lists
- Component lists
- Product support data
- Flight safety critical parts list for aircraft
- Lifting and tie down pamphlet/references
- Hazardous Material documentation

Computer resources support

Computer Resources Support includes the facilities, hardware, software, documentation, manpower, and personnel needed to operate and support computer systems and the software within those systems. Computer resources include both stand-alone and embedded systems. This element is usually planned, developed, implemented, and monitored by a Computer Resources Working Group (CRWG) or Computer Resources Integrated Product Team (CR-IPT) that documents the approach and tracks progress via a Computer Resources Life-Cycle Management Plan (CRLCMP). Developers will need to ensure that planning actions and strategies contained in the ILSP and CRLCMP are complementary and that computer resources support for the operational software, and ATE software, support software, is available where and when needed.

Packaging, handling, storage, and transportation (PHS&T)

This element includes resources and procedures to ensure that all equipment and support items are preserved, packaged, packed, marked, handled, transported, and stored properly for short- and long-term requirements. It includes material-handling equipment and packaging, handling and storage requirements, and pre-positioning of material and parts. It also includes preservation and packaging level requirements and storage requirements (for example, sensitive, proprietary, and controlled items). This element includes planning and programming the details associated with movement of the system in its shipping configuration to the ultimate destination via transportation modes and networks available and authorized for use. It further encompasses establishment of critical engineering design

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parameters and constraints (e.g., width, length, height, component and system rating, and weight) that must be considered during system development. Customs requirements, air shipping requirements, rail shipping requirements, container considerations, special movement precautions, mobility, and transportation asset impact of the shipping mode or the contract shipper must be carefully assessed. PHS&T planning must consider:

- System constraints (such as design specifications, item configuration, and safety precautions for hazardous material)
- Special security requirements
- Geographic and environmental restrictions
- Special handling equipment and procedures
- Impact on spare or repair parts storage requirements
- Emerging PHS&T technologies, methods, or procedures and resource-intensive PHS&T procedures
- Environmental impacts and constraints

Facilities

The Facilities logistics element is composed of a variety of planning activities, all of which are directed toward ensuring that all required permanent or semi-permanent operating and support facilities (for instance, training, field and depot maintenance, storage, operational, and testing) are available concurrently with system fielding. Planning must be comprehensive and include the need for new construction as well as modifications to existing facilities. It also includes studies to define and establish impacts on life cycle cost, funding requirements, facility locations and improvements, space requirements, environmental impacts, duration or frequency of use, safety and health standards requirements, and security restrictions. Also included are any utility requirements, for both fixed and mobile facilities, with emphasis on limiting requirements of scarce or unique resources.

Design interface

Design interface is the relationship of logistics-related design parameters of the system to its projected or actual support resource requirements. These design parameters are expressed in operational terms rather than as inherent values and specifically relate to system requirements and support costs of the system. Programs such as "design for testability" and "design for discard" must be considered during system design. The basic requirements that need to be considered as part of design interface include:

- Reliability
- Maintainability
- Standardization
- Interoperability
- Safety
- Security
- Usability
- Environmental and HAZMAT
- Privacy, particularly for computer systems
- Legal

References

The references below cover many relevant standards and handbooks related to integrated logistics support.

Standards

- Army Regulation 700-127 *Integrated Logistics Support*, 27 September 2007
- British Defense Standard 00-600 Integrated Logistics Support for MOD Projects
- Federal Standard 1037C in support of MIL-STD-188
- IEEE 1332, IEEE Standard Reliability Program for the Development and Production of Electronic Systems and Equipment, Institute of Electrical and Electronics Engineers

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- MIL-STD-785, Reliability Program for Systems and Equipment Development and Production, U.S. Department of Defense.
- MIL-STD 1388-1A Logistic Support Analysis (LSA)
- MIL-STD 1388-2B Requirements for a Logistic Support Analysis Record
- MIL-STD-1629A, Procedures for Performing a Failure Mode, Effects and Criticality Analysis (FMECA)
- MIL-STD-2173, Reliability Centered Maintenance Requirements, U.S. Department of Defense (superseded by NAVAIR 00-25-403)
- OPNAVINST 4130.2A
- DEF(AUST)5691 Logistic Support Analysis
- DEF(AUST)5692 Logistic Support Analysis Record Requirements for the Australian Defense Organization`

Specifications - Not standards

The ASD/AIA Suite of S-Series ILS specifications

- SX000i - International guide for integrated logistic support (under development)
- S1000D - International specification for technical publications using a common source database
- S2000M - International specification for materiel management - Integrated data processing
- S3000L - International specification for Logistics Support Analysis – LSA
- S4000P - International specification for developing and continuously improving preventive maintenance
- S5000F - International specification for operational and maintenance data feedback (under development)
- S6000T - International specification for training needs analysis - TNA (definition on-going)
- SX001G - Glossary for the Suite of S-specifications
- SX002D - Common Data Model
- AECMA 1000D (Technical Publications) - Refer to S1000D above
- AECMA 2000M (initial provisioning) - Refer to S2000M above

Handbooks

- Integrated Logistics Support Handbook, third edition - James V. Jones
- MIL-HDBK-217F, Reliability Prediction of Electronic Equipment, U.S. Department of Defense.
- MIL-HDBK-338B, Electronic Reliability Design Handbook, U.S. Department of Defense.
- MIL-HDBK-781A, Reliability Test Methods, Plans, and Environments for Engineering Development, Qualification, and Production, U.S. Department of Defense.
- NASA Probabilistic Risk Assessment Handbook
- NASA Fault Tree Assessment handbook
- MIL-HDBK-2155, Failure Reporting, Analysis and Corrective Action Taken, U.S. Department of Defense • MIL-HDBK-502A, Product Support Analysis, U.S. Department of Defense

Resources

- *Systems Assessments, Integrated Logistics and COOP Support Services*, 26 August 2008
- Aerospace and Defense (ASD) Industries Association of Europe

Article References

- US Defense Acquisition University on Integrated Logistics Support (ILS) Elements
- United Kingdom Ministry of Defense (UK MoD) Through Life Support (TLS) Directorate into the following elements and promulgated in UK Defense Standard (DEFSTAN) 00-600
- "DAU