Logistics Support Engineering

Logistics Support engineering can be considered as an engineering approach to identify the required resources to support a system once it is deployed in the operational theatre. Logistics Support engineering is an integral part of the Integrated Logistics Support (ILS) discipline. ILS comprises of several sub-disciplines and includes:

- Logistics Support Engineering
- Training
- Technical Publication
- PHST
- Provisioning

This section focuses on the Logistics Support engineering activities and the major logistical engineering sub-tasks, which would be implemented in the preparation and development of a Logistic Support Analysis (LSA). The selected application of logistical engineering methods, which themselves are implemented during the acquisition process and as part of the engineering and design process, are to assist in complying with supportability and other ILS program objectives and requirements. These logistics engineering sub-task include:

- Level Of Repair Analysis
- Life Cycle Cost
- Logistics Support Analysis
- Maintenance Task Analysis
- Spares Modeling
- Failure Modes Effects and Criticality Analysis (FMECA)
- Reliability Centered Maintenance Analysis (RCMA)

The Integrated Logistics Support (ILS) manager would be responsible for ensuring that customer requirements are addressed in the most effective and efficient manner. This will include identifying the necessary resources required for conducting a LSA engineering program and could include logistic engineering software tools, applicable training, engineering and product data.

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Logistics Engineering Approach

The approach to a program concerning the logistics engineering effort is dependent upon many factors that include the customers' requirements, the strategy of the company, and the size of the project etc. Detailed in Mil-Std-1388/1A are various tasks associated to logistics engineering. Simply to call out these tasks and implement them in a generic fashion, maybe easier said than done. The effective implementation of a logistics engineering program must take into consideration many other factors. On the surface what may appear to be just a set simple questions, needs to be addressed in a coherent fashion with an element of common sense. How would someone model the life cycle support profile for the end user, or what engineering or data support is required from the key subcontractors and third or even forth tire subcontractors? To what level of engineering detail shall be provided? These are some of the additional issues which must be identified and addressed prior to the implementation of a logistics engineering program.

Logistics Program Requirements

Program requirements can be derived from the customer or the company's business strategy. For example:

Customer Requirements: The customer may request specific logistical engineering tasks to be implemented. These may include the development of maintenance plans to the final spare parts recommendations, and where they are to be located for each operational and repair site. From a viewpoint of the customer, this recommendation maybe implemented based upon a single program where there is just one product for one customer. The customer would normally address the issues associated with support costs.

Company Strategy: The company strategy maybe to develop a support package and capability for their product that would provide an optimum operational and maintenance cost to the end users. This is commonly referred to as Life Cycle Cost of Ownership, and is a vested interest to the company. Should the company invest in a single product or multiple products, for more than one customer, needs to be carefully considered. This may include relatively simple standalone products such as Mobile Radio Sets, to more complex electronic and mechanical systems.

More and more companies and end users (government and commercial agencies), during the selection process (or tender) for new "system" acquisitions are considering ***Life Cycle Cost of Ownership***. Therefore, key in their final decision process is the cost associated with the

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operation and maintenance of the equipment or system, over its intended operational (life) period. Should a company take to market a product, which just addresses and achieves the functionality performance requirements, without taking into consideration the supportability issues, it may be placing themselves and their product in a disadvantaged position.

Logistics Program Plan

The logistics program can be captured in a well throughout program plan. The plan could be developed as a standalone document or integrated in the overall ILS program strategy. The key function for this document is to capture the logistics strategy and all the required supporting logistics program tasks. The structure of the plan could include the following:

- Scope, Purpose and Strategy;
- Program Interfaces;
- Customers Interfaces;
- Subcontractor Interfaces;
- Program Tasks (Logistics);
- Program Milestones;
- Program Schedule; and
- Program Deliverables.

Logistics Program Tasks

The ILS Manager or Logistics Manager will assess the program goals in terms of the product/system support objectives and define the scope of the activity. Logistics engineering activities can be employed throughout all life cycle phases of a system from early development, to field deployment, and eventually to system disposal. These activities will be governed to adhere to contract requirements, as interpreted and captured in logistics engineering program plan. The logistics engineering process utilizes logistics modeling techniques to aid in identifying and provisioning logistic support elements such as required sparing levels, test and support equipment, and personnel quantity/skills.

Logistics Engineering Activities

- Identify Supportability Factors Related to Intended Use;
- Identify Quantitative Factors Related to Intended Use;
- Identify Supportability Constraints;
- Identify Comparative Systems;
- Identify Qualitative Supportability, Cost and Readiness Drivers;
- Identify Standardization Requirements;

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- Identify Supportability Characteristics;
- Identify Unique Supportability and Cost Drivers;
- Identify Technology Opportunities for Improving Supportability;
- Identify Support System Alternatives;
- Identify Supportability Risks and Risk Reduction Approaches;
- Identify Support Concept and Alternatives;
- Identify Alternative Support System Tradeoff Studies;
- Identify Functional Requirements;
- Identify Operations and Maintenance Tasks;
- Establish Logistics Configuration Baseline;
- Establish Logistics Control Numbering System;
- Establish and Maintain Logistics Support Analysis Record;
- Conduct and Document Task Analysis;
- Identify and Document Logistics Resource Requirements;
- Conduct Task Validation;
- Prepare Logistics Resource Recommendations;
- Identify and Prepare Logistics Support Output Products;
- Develop a Logistics Support Analysis Strategy;
- Prepare a Logistics Support Analysis Plan;
- Attend Program and Design Reviews; and
- Develop a Supportability Test, Evaluation and Verification Method.

Inputs to the Logistics Program

The planning and implementation of the logistics engineering process will normally be based on the documents below. However, this list is not applicable in its entirety, as the generation of these documents will vary depending on the complexity of the program and customer requirements.

- Program Management Plan (PMP);
- Statement of Work (SOW);
- Use Study and Maintenance Concept;
- Technical manuals (operational and diagnostic hardware, software and firmware);
- Engineering drawings;
- Provisioning parts breakdown list;
- Reliability, availability and maintainability data; and
- Failure Modes and Effects Analysis data