MILITARY STANDARD

MIL-STD-1388-1A
Notice 1
9 Feb 88

LOGISTIC SUPPORT ANALYSIS

TO ALL HOLDERS OF MIL-STD-1388-1A

1. THE FOLLOWING PAGES OF MIL-STD-1388-1A HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE(S)	DATE	SUPERSEDED PAGE(S)	DATE
1	11 April 1983	1	REPRINTED WITHOUT CHANGE
2	9 February 1988	2	11 April 1983
5 thru 8	9 February 1988	5 thru 8	11 April 1983
9	11 April 1983	9	REPRINTED WITHOUT CHANGE
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15	11 April 1983	15	REPRINTED WITHOUT CHANGE
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84	11 April 1983	84	REPRINTED WITHOUT CHANGE
91	11 April 1983	91	REPRINTED WITHOUT CHANGE
92 and 93	9 February 1988	92 and 93	11 April 1983
94	11 April 1983	94	REPRINTED WITHOUT CHANGE
95 thru 102	9 February 1988	95 thru 102	11 April 1983

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-STD-1388-1A will verify that the page changes indicated herein have been entered. This notice will be retained as a check sheet. This issuance is a separate publication. Each notice is to be retained be stocking points until the Military Standard is completely revised or cancelled.

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Preparing Activity
  Army - TM

(Project No. ILSS-0005)

1. SCOPE

1.1 __Purpose__. This standard provides general requirements and task descriptions governing performance of Logistic Support Analysis (LSA) during the life cycle of systems and equipment.

1.2 __Application of Standard__. This standard applies to all system/ equipment acquisition programs, major modification programs, and applicable research and development projects through all phases of the system/equipment life cycle. This standard is for use by both contractor and Government activities performing LSA on systems/ equipment to which this standard applies. As used in this standard, the "requiring authority" is generally a Government activity but may be a contractor when LSA requirements are levied on subcontractors. The "performing activity" may be either a contractor or Government activity. The use of the term "contract" in this standard includes any document of agreement between organizations to include between a Government activity and another Government activity, between a Government activity and a contractor, or between a contractor and another contractor.

1.2.1 __Tailoring of Task Descriptions__. Individual tasks contained in this standard shall be selected and the selected task descriptions tailored to specific acquisition program characteristics and life cycle phase. Application guidance and rationale for selecting tasks and tailoring task descriptions to fit the needs of a particular program are included in Appendix A. This appendix is not contractual and does not establish requirements.

1.3 __Method of Reference__. This standard, the specific task description number(s), applicable task input to be specified by the requiring authority, and applicable task outputs shall be included or referenced in the Statement of Work (SOW).

1.4 __Scope of Performance__. The performing activity shall comply with the general requirements section and specific task requirements only to the degree specified in the contract.

1.5 __Parts__. MIL-STD-1388-1A is Part 1 of two parts.

2. REFERENCED DOCUMENTS

2.1 __General__. Unless otherwise specified, the following standards and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this standard to the extent specified herein.

Military Standards.

MIL-STD-1366	Materiel Transportation System Dimensional and Weight Constraints, Definition of.

MIL-STD-1388-2   DOD Requirements for a Logistic
                     Support Analysis Record.

MIL-STD-1629   Procedures for Performing a
                     Failure Mode, Effects, and
                     Criticality Analysis.

(Copies of specifications, standards, drawings, and publications
required by contractors in conjunction with specific procurement
functions should be obtained from the procuring activity or as
directed by the contracting officer.)

3. DEFINITIONS

3.1 General. Key terms used in this standard are defined in the
Glossary, Appendix B.

4. GENERAL REQUIREMENTS

4.1 LSA Program. An effective LSA program shall be established and
maintained as part of the ILS program. It shall be planned, inte-
grated, developed, and conducted in conjunction with other design,
development, production, and deployment functions to cost effective-
ly achieve overall program objectives. The LSA program shall be
established consistent with the type and phase of the acquisition
program, and procedures shall be established to assure that the LSA
program is an integral part of the system engineering process.
Interfaces between the LSA program and other system engineering pro-
grams shall be identified. The LSA program shall include the man-
agement and technical resources, plans, procedures, schedules, and
controls for the performance of LSA requirements.

4.1.1 Program Interfaces and Coordination. Maximum use shall
be made of analyses and data resulting from requirements of
other system engineering programs to satisfy LSA input re-
quirements. Tasks and data required by this standard, which
are also required by other standards and specifications, shall
be coordinated and combined to the maximum extent possible.
LSA data shall be based upon, and traceable to, other system
engineering data and activities where applicable. Design and
performance information shall be captured, disseminated, and
formally controlled from the beginning of the design effort to
serve as the design audit trail for logistic support resource
planning, design tradeoff study inputs, and LSA documentation
preparation.

4.1.2 LSA Process. A systematic and comprehensive analysis shall
be conducted on an iterative basis through all phases of the
system/equipment life cycle to satisfy supportability objectives.
The level of detail of the analyses and the timing of task
performance shall be tailored to each system/equipment and shall be
responsive to program schedules and milestones. Figure 1 depicts
the major LSA process objectives by program phase. Figures 2 and 3

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TABLE I. Index of Logistic Support Analysis Tasks.

TASK SECTION	PURPOSE OF TASK SECTION	TASK/SUBTASK	INFLUENCE*		
			SYS/EQUIP DESIGN	SUPPT SYS DESIGN	LOG REQMTS DETERMINATION
100 - PROGRAM PLANNING & CONTROL	TO PROVIDE FOR FORMAL PROGRAM PLANNING AND REVIEW ACTIONS	101 - DEVELOPMENT OF AN EARLY LOGISTIC SUPPORT ANALYSIS STRATEGY 101.2.2 COST ESTIMATE 101.2.3 UPDATES	PRIMARY PURPOSE OF 100 SERIES TASKS IS THE MANAGEMENT AND CONTROL OF THE LSA PROGRAM		
		102 - LOGISTIC SUPPORT ANALYSIS PLAN 102.2.1 LSA PLAN 102.2.2 UPDATES			
		103 - PROGRAM AND DESIGN REVIEWS 103.2.1 ESTABLISH REVIEW PROCEDURES 103.2.2 DESIGN REVIEWS 103.2.3 PROGRAM REVIEWS 103.2.4 LSA REVIEW			
200 - MISSION & SUPPORT SYSTEMS DEFINITION	TO ESTABLISH SUPPORTABILITY OBJECTIVES AND SUPPORTABILITY RELATED DESIGN GOALS, THRESHOLDS, AND CONSTRAINTS THROUGH COMPARISON WITH EXISTING SYSTEMS AND ANALYSES OF SUPPORTABILITY, COST, AND READINESS DRIVERS	201 - USE STUDY 201.2.1 SUPPORTABILITY FACTORS 201.2.2 QUANTITATIVE FACTORS 201.2.3 FIELD VISITS 201.2.4 USE STUDY REPORT AND UPDATES	X X X	X X X	
		202 - MISSION HARDWARE, SOFTWARE, AND SUPPORT SYSTEM STANDARDIZATION 202.2.1 SUPPORTABILITY CONSTRAINTS 202.2.2 SUPPORTABILITY CHARACTERISTICS 202.2.3 RECOMMENDED APPROACHES 202.2.4 RISKS	X X X	X X	X X

* X INDICATES THAT THE SUBTASK IS ORIENTED TOWARD INFLUENCING THE INDICATED FACTOR(S).

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TABLE I. Index of Logistic Support Analysis Tasks. - Continued

TASK SECTION	PURPOSE OF TASK SECTION	TASK/SUBTASK	INFLUENCE		
			SYS/EQUIP DESIGN	SUPPT SYS DESIGN	LOG REQMTS DETER-MINATION
		203 - COMPARATIVE ANALYSIS			
		203.2.1 IDENTIFY COMPARATIVE SYSTEMS	X	X	
		203.2.2 BASELINE COMPARISION SYSTEM	X	X	
		203.2.3 COMPARATIVE SYSTEM CHARACTERISTICS	X	X	
		203.2.4 QUALITATIVE SUPPORTABILITY PROBLEMS			
		203.2.5 SUPPORTABILITY, COST, AND READINESS DRIVERS	X	X	
		203.2.6 UNIQUE SYSTEM DRIVERS	X	X	
		203.2.7 UPDATES	X	X	
		203.2.8 RISKS AND ASSUMPTIONS	X	X	
		204 - TECHNOLOGICAL OPPORTUNITIES			
		204.2.1 RECOMMENDED DESIGN OBJECTIVES	X	X	
		204.2.2 UPDATES	X	X	
		204.2.3 RISKS			
		205 - SUPPORTABILITY AND SUPPORTABILITY RELATED DESIGN FACTORS			
		205.2.1 SUPPORTABILITY CHARACTERISTICS	X	X	
		205.2.2 SENSITIVITY ANALYSIS	X	X	
		205.2.3 IDENTIFY PROPRIETARY DATA	X	X	
		205.2.4 SUPPORTABILITY OBJECTIVES & ASSOCIATED RISKS	X	X	
		205.2.5 SPECIFICATION REQUIREMENTS	X	X	
		205.2.6 NATO CONSTRAINTS	X	X	
		205.2.7 SUPPORTABILITY GOALS AND THRESHOLDS	X	X	

TABLE I. Index of Logistic Support Analysis Tasks. - Continued

TASK SECTION	PURPOSE OF TASK SECTION	TASK/SUBTASK	SYS/EQUIP DESIGN	SUPPT SYS DESIGN	LOG REQTS DIFFERENTIATION
300 - PREPARATION AND EVALUATION OF ALTERNATIVES	TO OPTIMIZE THE SUPPORT SYSTEM FOR THE NEW ITEM AND TO DEVELOP A SYSTEM WHICH ACHIEVES THE BEST BALANCE BETWEEN COST, SCHEDULE, PERFORMANCE, AND SUPPORTABILITY	301 - FUNCTIONAL REQUIREMENTS			
		301.2.1 FUNCTIONAL REQUIREMENTS		X	X
		301.2.2 UNIQUE FUNCTIONAL REQUIREMENTS		X	X
		301.2.3 RISKS		X	X
		301.2.4 OPERATIONS AND MAINTENANCE TASKS	X	X	
		301.2.5 DESIGN ALTERNATIVES			X
		301.2.6 UPDATES			
		302 - SUPPORT SYSTEM ALTERNATIVES			
		302.2.1 ALTERNATIVE SUPPORT CONCEPTS		X	
		302.2.2 SUPPORT CONCEPT UPDATES		X	
		302.2.3 ALTERNATIVE SUPPORT PLANS		X	
		302.2.4 SUPPORT PLAN UPDATES		X	
		302.2.5 RISKS			
		303 - EVALUATION OF ALTERNATIVES AND TRADEOFF ANALYSIS			
		303.2.1 TRADEOFF CRITERIA	X	X	
		303.2.2 SUPPORT SYSTEM TRADEOFFS	X	X	X
		303.2.3 SYSTEM TRADEOFFS	X	X	X
		303.2.4 READINESS SENSITIVITIES	X	X	X
		303.2.5 MANPOWER AND PERSONNEL TRADEOFFS		X	
		303.2.6 TRAINING TRADEOFFS	X	X	X
		303.2.7 REPAIR LEVEL ANALYSES		X	X
		303.2.8 DIAGNOSTIC TRADEOFFS		X	X
		303.2.9 COMPARATIVE EVALUATIONS	X	X	X
		303.2.10 ENERGY TRADEOFFS	X	X	
		303.2.11 SURVIVABILITY TRADEOFFS	X	X	
		303.2.12 TRANSPORTABILITY TRADEOFFS		X	
		303.2.13 SUPPORT FACILITY TRADEOFFS		X	

INFLUENCE *

TABLE I. Index of Logistic Support Analysis Tasks. - Continued

TASK SECTION	PURPOSE OF TASK SECTION	TASK/SUBTASK	INFLUENCE		
			SYS/EQUIP DESIGN	SUPPT SYS DESIGN	LOC/RQMT'S DETERMINATION
400 - DETERMINATION OF LOGISTIC SUPPORT RESOURCE REQUIREMENTS	TO IDENTIFY THE LOGISTIC SUPPORT RESOURCE REQUIREMENTS OF THE NEW SYSTEM IN ITS OPERATIONAL ENVIRONMENT(S) AND TO DEVELOP PLANS FOR POST PRODUCTION SUPPORT	401 - TASK ANALYSIS			
		401.2.1 TASK ANALYSIS			X
		401.2.2 ANALYSIS DOCUMENTATION			X
		401.2.3 NEW/CRITICAL SUPPORT RESOURCES			X
		401.2.4 TRAINING REQUIREMENTS AND RECOMMENDATIONS			X
		401.2.5 DESIGN IMPROVEMENTS	X	X	
		401.2.6 MANAGEMENT PLANS	X	X	X
		401.2.7 TRANSPORTABILITY ANALYSIS	X	X	X
		401.2.8 PROVISIONING REQUIREMENTS			X
		401.2.9 VALIDATION	X	X	X
		401.2.10 ILS OUTPUT PRODUCTS			
		401.2.11 LSAR UPDATES			
		402 - EARLY FIELDING ANALYSIS			
		402.2.1 NEW SYSTEM IMPACT			X
		402.2.2 SOURCES OF MANPOWER AND PERSONNEL SKILLS			X
		402.2.3 IMPACT OF RESOURCE SHORTFALLS			X
		402.2.4 COMBAT RESOURCE REQUIREMENTS			X
		402.2.5 PLANS FOR PROBLEM RESOLUTION			
		403 - POST PRODUCTION SUPPORT ANALYSIS			
		403.2 POST PRODUCTION SUPPORT PLAN		X	X
500 - SUPPORTABILITY ASSESSMENT	TO ASSURE THAT SPECIFIED REQUIREMENTS ARE ACHIEVED AND DEFICIENCIES CORRECTED	501 - SUPPORTABILITY TEST, EVALUATION, AND VERIFICATION			
		501.2.1 TEST AND EVALUATION STRATEGY	X	X	X
		501.2.2 SYSTEM SUPPORT PACKAGE COMPONENT LIST	X	X	X
		501.2.3 OBJECTIVES AND CRITERIA	X	X	X
		501.2.4 UPDATES AND CORRECTIVE ACTIONS	X	X	X
		501.2.5 SUPPORTABILITY ASSESSMENT PLAN (POST DEPLOYMENT)	X	X	X
		501.2.6 SUPPORTABILITY ASSESSMENT (POST DEPLOYMENT)			X

TASK SECTION 100

PROGRAM PLANNING AND CONTROL

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TASK 101

DEVELOPMENT OF AN EARLY LOGISTIC SUPPORT ANALYSIS STRATEGY

101.1 PURPOSE. To develop a proposed LSA program strategy for use early in an acquisition program, and to identify the LSA tasks and subtasks which provide the best return on investment.

101.2 TASK DESCRIPTION

101.2.1 Prepare potential supportability objectives for the new system/equipment, identify and document the risk of accomplishing the supportability objectives, and identify proposed LSA tasks and subtasks to be performed in each phase of the acquisition program. Identify the organizations to perform each task and subtask. The proposed supportability objectives and analysis tasks and subtasks shall be based on the following factors:

a. The probable design, maintenance concept, and operational approaches for the new system/equipment and gross estimates of the reliability and maintainability (R&M), O&S costs, logistic support resources, and readiness characteristics of each design and operational approach.

b. The availability, accuracy, and relevance of readiness, O&S cost, and logistic support resource data required to perform the proposed LSA tasks and subtasks.

c. The potential design impact of performing the LSA tasks and subtasks.

101.2.2 Estimate the cost to perform each task and subtask identified under 101.2.1 and the cost effectiveness of performing each, given the projected costs and schedule constraints.

101.2.3 Update the LSA strategy as required based on analysis results, program schedule modifications, and program decisions.

101.3 TASK INPUT

101.3.1 Expected mission and functional requirements for the new system/equipment.*

101.3.2 Expected program funding and schedule constraints and other known key resource constraints that would impact support of the system/equipment such as projected deficits in numbers or skills of available personnel, limited priorities on strategic materiel, etc.*

101.3.3 Data bases available from the requiring authority for use in LSA tasks.*

101.3.4 Delivery identification of any data item required.*

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101.3.5 Previously conducted DOD or Service mission area and system/equipment analyses which are pertinent to the new system/equipment. *

101.4 **TASK OUTPUT**.

101.4.1 An LSA strategy outlining proposed supportability objectives for the new system/equipment and proposed LSA tasks and subtasks to be performed in each phase of the acquisition program which provide the best return on investment. (101.2.1, 101.2.2)

101.4.2 LSA strategy updates as applicable. (101.2.3)

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TASK 102

LOGISTIC SUPPORT ANALYSIS PLAN

102.1 **PURPOSE.** To develop a Logistic Support Analysis Plan (LSAP) which identifies and integrates all LSA tasks, identifies management responsibilities and activities, and outlines the approach toward accomplishing analysis tasks.

102.2 **TASK DESCRIPTION**

102.2.1 Prepare an LSAP which describes how the LSA program will be conducted to meet program requirements. The LSAP may be included as part of the Integrated Support Plan (ISP) when an ISP is required. The LSAP shall include the following elements of information, with the range and depth of information for each element tailored to the acquisition phase:

a. A description of how the LSA program will be conducted to meet the system and logistic requirements defined in the applicable program documents.

b. A description of the management structure and authorities applicable to LSA. This includes the interrelationship between line, service, staff, and policy organizations.

c. Identification of each LSA task that will be accomplished and how each will be performed. Identification of the major tradeoffs to be performed under Subtask 303.2.3, when applicable.

d. A schedule with estimated start and completion points for each LSA program activity or task. Schedule relationships with other ILS program requirements and associated system engineering activities shall be identified.

e. A description of how LSA tasks and data will interface with other ILS and system oriented tasks and data. This description will include consideration of nuclear hardness criticality and required analysis and data interfaces with the following programs, as applicable:

      (1) System/Equipment Design Program.

      (2) System/Equipment Reliability Program.

      (3) System/Equipment Maintainabiltiy Program.

      (4) Human Engineering Program.

      (5) Standardization Program.

      (6) Parts Control Program.

      (7) System Safety Program.

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(8) Packaging, Handling, Storage, and Transportability Program.

(9) Initial Provisioning Program.

(10) System/Equipment Testability Program.

(11) Survivability Program.

(12) Technical Publications Program.

(13) Training and Training Equipment Program.

(14) Facilities Program.

(15) Support Equipment Program.

(16) Test and Evaluation Program.

f. Work Breakdown Structure (WBS) identification of items upon which LSA will be performed and documented. Identification of an LSA candidate list, and LSA candidate selection criteria. The list shall include all items recommended for analysis, items not recommended and the appropriate rationale for selection or non-selection.

g. Explanation of the LSA control numbering system to be used.

h. The method by which supportability and supportability related design requirements are disseminated to designers and associated personnel.

i. The method by which supportability and supportability related design requirements are disseminated to subcontactors and the controls levied under such circumstances.

j. Government data to be furnished to the contractor.

k. Procedures for updating and validating of LSA data to include configuration control procedures for LSA data.

l. LSA requirements on Government furnished equipment/materiel (GFE/GFM) and subcontractor/vendor furnished materiel including end items of support equipment.

m. The procedures (wherever existing procedures are applicable) to evaluate the status and control of each task, and identification of the organizational unit with the authority and responsibility for executing each task.

n. The procedures, methods, and controls for identifying and recording design problems or deficiencies affecting supportability, corrective actions required, and the status of actions taken to resolve the problems.

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o. Description of the data collection system to be used by the performing activity to document, disseminate, and control LSA and related design data.

p. A description of the LSAR ADP system to be used and indentification of the validated status when independently developed LSAR ADP software is recommended.

102.2.2 Update the LSAP as required, subject to requiring authority approval, based on analysis results, program schedule modifications, and program decisions.

102.2.3 DI-ILSS-   , Logistic Support Analysis Plan, applies to this task and shall be specified when required as a deliverable data item.

102.3 **TASK INPUT**

102.3.1 Identification of each LSA task required under this standard and any additional task to be performed as part of the LSA program.*

102.3.2 Identification of the contractual status of the LSAP and approval procedures for update.*

102.3.3 Identification of any specifix indoctrination or LSA training to be provided.*

102.3.4 Duration of the LSAP to be developed.*

102.3.5 Delivery identification of any data item required.*

102.3.6 System/equipment requirements and development schedule.*

102.3.7 Task and subtask requirements specified in the LSA strategy from Task 101.

102.4 **TASK OUTPUT**

102.4.1 Logistic Support Analysis Plan (102.2.1).

102.4.2 Logistic Support Analysis Plan updates as applicable. (102.2.2).

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TASK 103

PROGRAM AND DESIGN REVIEWS

103.1 **PURPOSE.** To establish a requirement for the performing activity to plan and provide for official review and control of released design information with LSA program participation in a timely and controlled manner, and to assure that the LSA program is proceeding in accordance with the contractual milestones so that the supportability and supportability related design requirements will be achieved.

103.2 **TASK DESCRIPTION**

103.2.1 Establish and document design review procedures (where procedures do not already exist) which provide for official review and control of released design information with LSA program participation in a timely and controlled manner. These procedures shall define accept/reject criteria pertaining to supportability requirements, the method of documenting reviews, the types of design documentation subject to review, and the degree of authority of each reviewing activity.

103.2.2 Formal review and assessment of supportability and supportability related design contract requirements shall be an integral part of each system/equipment design review (e.g., system design review (SDR), preliminary design review (PDR), critical design review (CDR), etc.) specified by the contract. The performing activity shall schedule reviews with subcontractors and suppliers, as appropriate, and inform the requiring authority in advance of each review. Results of each system/equipment design review shall be documented. Design reviews shall identify and discuss all pertinent aspects of the LSA program. Agendas shall be developed and coordinated to address at least the following topics as they apply to the program phase activity and the review being conducted.

    a. LSA conducted by task and WBS element.

    b. Supportability assessment of proposed design features including supportability, cost, and readiness drivers and new or critical logistic support resource requirements.

    c. Corrective actions considered, proposed, or taken, such as:

        (1) Support alternatives under consideration.

        (2) System/equipment alternatives under consideration.

        (3) Evaluation and tradeoff analysis results.

        (4) Comparative analysis with existing systems/equipment.

        (5) Design or redesign actions proposed or taken.

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    d. Review of supportability and supportability related design
requirements (with review of specifications as developed).

    e. Progress toward establishing or achieving supportability
goals.

    f. LSA documentation required, completed, and scheduled.

    g. Design, schedule, or analysis problems affecting
supportability.

    h. Identification of supportability related design recommenda-
tions to include a description of the recommendation; whether or not
it has been approved or is pending; rationale for approval (e.g.,
cost savings, maintenance burden reductions, supply support reduc-
tions, reliability improvements, etc).

    i. Other topics and issues as appropriate.

103.2.3 Formal review and assessment of supportability and support-
ability related design contract requirements shall be an integral
part of each system/equipment program review specified by the con-
tract. Program reviews include, but are not limited to, ILS manage-
ment team meetings, reliability program reviews, maintainability
program reviews, technical data reviews, test integration reviews,
and supply support reviews. The performing activity shall schedule
program reviews with subcontractors and suppliers, as appropriate,
and inform the requiring authority in advance of each review.
Results of each system/equipment program review shall be documented.
Program reviews shall identify and discuss all pertinent aspects of
the LSA program. Agendas shall be developed and coordinated to
address at least the topics listed under 103.2.2 as they apply to
the program phase activity and the review being conducted.

103.2.4 The LSA program shall be planned and scheduled to permit
the performing activity and the requiring authority to review pro-
gram status. The status of the LSA program shall be assessed at LSA
reviews specified by the contract. The performing activity shall
schedule LSA reviews with subcontractors and suppliers, as appropri-
ate, and inform the requiring authority in advance of each review.
Results of each LSA review shall be documented. LSA reviews shall
identify and discuss all pertinent aspects of the LSA program to a
more detailed level than that covered at design and program reviews.
Agendas shall be developed and coordinated to address at least the
topics listed under 103.2.2 as they apply to the program phase ac-
tivity and the review being conducted.

103.3 TASK INPUT

103.3.1 Identification and location of design, program, and LSA
reviews required.*

103.3.2 Advance notification requirements to the requiring authori-
ty of all scheduled reviews.*

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103.3.3   Recording procedures for the results of the reviews.*

103.3.4   Identification of requiring authority and performing activity follow-up methods on review of open items.*

103.3.5   Delivery identification of any data item required.*

103.4   TASK OUTPUT

103.4.1   Design review procedures which provide for official review and control of released design information with LSA program participation in a timely and controlled manner.   (103.2.1)

103.4.2   Agendas for and documented results of each design review to include design recommendations identified in accordance with 103.2.2h. (103.2.2)

103.4.3   Agendas for and documented results of each system/equipment program review.   (103.2.3)

103.4.4   Agendas for and documented results of each system/equipment LSA review (103.2.4).

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TASK SECTION 200

MISSION AND SUPPORT SYSTEMS DEFINITION

204.4   TASK OUTPUT

204.4.1   Recommended design specifications to achieve improvements on the new system/equipment.   (204.2.1)

204.4.2   Updates to the design ojectives established as new system/ equipment alternatives become better defined.   (204.2.2)

204.4.3   Any additional funding requirements, risks associated with the design objectives established, any development and evaluation approaches needed to verify the improvement potential, and any cost or schedule impacts to implement potential improvements.   (204.2.3)

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TASK 205

SUPPORTABILITY AND SUPPORTABILITY RELATED DESIGN FACTORS

205.1 PURPOSE. To establish (1) quantitative supportability
characteristics resulting from alternative design and operational
concepts, and (2) supportability and supportability related design
objectives, goals and thresholds, and constraints for the new
system/equipment for inclusion in program approval documents,
system/equipment specifications, other requirements documents, or
contracts as appropriate.

205.2 TASK DESCRIPTION

**205.2.1 Identify the quantitative supportability characteristics
resulting from alternative design and operational concepts for the
new system/equipment. Supportability characteristics shall be ex-
pressed in terms of feasible support concepts, R&M parameters, sys-
tem readiness, O&S cost, and logistic support resource requirements.
Both peacetime and wartime conditions shall be included.**

**205.2.2 Conduct sensitivity analysis on the variables associated
with the supportability, cost and readiness drivers identified for
the new system/equipment.**

**205.2.3 Identify any hardware or software for which the Government
will not or may not have full design rights due to constraints im-
posed by regulations or laws limiting the information the contractor
must furnish because of proprietary or other source control consid-
erations. Include alternatives and cost, schedule and function
impacts.**

**205.2.4 Establish supportability, cost, and readiness objectives
for the new system. Identify the risks and uncertainties involved
in achieving the objectives established. Identify any supportabili-
ty risks associated with new technology planned for the new system/
equipment.**

205.2.5 Establish supportability and supportability related design
constraints for the new system/equipment for inclusion in specifica-
tions, other requirements documents, or contracts as appropriate.
These constraints shall include both quantitative and qualitative
constraints. Document the quantitative constraints in the LSAR or
equivalent format approved by the requiring authority.

205.2.6 Identify any constraints that preclude adoption of a NATO
system/equipment to satisfy the mission need.

205.2.7 Update the supportability, cost, and readiness objectives
and establish supportability, cost, and readiness goals and thresh-
olds as new system/equipment alternatives become better defined.

205.3   TASK INPUT

205.3.1   Applicable program documentation.*

205.3.2   Delivery identification of any data item required.*

205.3.3   Identification of supportability and supportability related
design factors associated with GFE/GFM.*

205.3.4   Description of new system/equipment alternatives under con-
sideration including new technology planned for the new system/
equipment.

205.3.5   Supportability, cost, and readiness values and drivers for
comparative systems from Task 203.

205.3.6   Technological opportunities for the new system/equipment
from Task 204.

205.3.7   Supportability and supportability related design con-
straints for the new system/equipment based upon support system,
mission hardware, or mission software standardization considerations
from Task 202.

205.4   TASK OUTPUT

205.4.1   Supportability characteristics resulting from alternative
system/equipment design and operational concepts including efforts
to eliminate design rights limitations. (205.2.1 through 205.2.3)

205.4.2   Supportability, cost, and readiness objectives for the new
system/equipment and associated risks. Supportability risks assoc-
iated with new technology planned for the new system/equipment.
(205.2.4)

205.4.3   Qualitative and quantitative supportability and support-
ability related design constraints for the new system. LSAR data
documenting the quantitative supportability and supportability re-
lated design constraints. (205.2.5)

205.4.4   Identification of any constraints that preclude adoption of
a NATO system/equipment to satisfy the mission need. (205.2.6)

205.4.5   Updated supportability, cost, and readiness objectives.
Supportability, cost, and readiness goals and thresholds for the new
system/equipment. (205.2.7)

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TASK SECTION 300

PREPARATION AND EVALUATION OF ALTERNATIVES

303.2.2 Conduct evaluations and tradeoffs between the support sys-
tem alternatives identified for each system/equipment alternative
(Task 302). For the selected support system alternative(s), identi-
fy and document any new or critical logistic support resource
requirements. Any restructured personnel job classification shall
be identified as a new resource.

303.2.3 Conduct evaluations and tradeoffs between design, opera-
tions, and support concepts under consideration.

303.2.4 Evaluate the sensitivity of system readiness parameters to
variations in key design and support parameters such as R&M, spares
budgets, resupply time, and manpower and personnel skill
availabilty.

303.2.5 Estimate and evaluate the manpower and personnel implica-
tions of alternative system/equipment concepts in terms of total
numbers of personnel required, job classifications, skill levels,
and experience required. This analysis shall include organizational
overhead requirements, error rates, and training requirements.

303.2.6 Conduct evaluations and tradeoffs between design, opera-
tions, training, and personnel job design to determine the optimum
solution for attaining and maintaining the required proficiency of
operating and support personnel. Training evaluations and trades
shall be conducted and shall consider shifting of job duties between
job classifications, alternative technical publications concepts,
and alternative mixes of formal training, onthe-job training, unit
training, and use of training simulators.

303.2.7 Conduct repair level analyses (RLA) commensurate with the
level of design, operation, and support data available.

303.2.8 Evaluate alternative diagnostic concepts to include varying
degrees of built-in-test (BIT), off-line-test, manual testing, auto-
matic testing, diagnostic connecting points for testing, and
identify the optimum diagnostic concept for each system/equipment
alternative under consideration.

303.2.9 Conduct comparative evaluations between the supportability,
cost, and readiness parameters of the new system/equipment and ex-
isting comparative systems/equipment. Assess the risks involved in
achieving the supportability, cost, and readiness objectives for the
new system/equipment based upon the degree of growth over existing
systems/equipment.

303.2.10 Conduct evaluations and tradeoffs between system/equipment
alternatives and energy requirements. Identify the petroleum, oil,
and lubricant (POL) requirements for each system/equipment alter-
native under consideration and conduct sensitivity analyses on POL
costs.

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303.2.11 Conduct evaluations and tradeoffs between system/equipment alternatives and survivability and battle damage repair characteristics in a combat environment.

303.2.12 Conduct evaluations and tradeoffs between system/equipment alternatives and transportability requirements. Identify the transportability requirements for each alternative under consideration and the limiting constraints, characteristics, and environments on each of the modes of transportation.

303.2.13 Conduct evaluations and tradeoffs between system/equipment alternatives and support facilities (including power/utilities and pavements) requirements. Identify the facility requirements for each support system alternative under consideration and the limiting constraints, characteristics, and environment on each type of facility.

303.3 **TASK INPUT**

303.3.1 Delivery identification of any data item required.*

303.3.2 Method of review and approval of identified evaluations and tradeoffs to be performed, evaluation criteria, analytical relationships and models to be used, analysis results, and the sensitivity analyses to be performed.*

303.3.3 Specific evaluations, tradeoffs, or sensitivity analyses to be performed, if applicable.*

303.3.4 Specific analytical relationships or models to be used, if applicable.*

303.3.5 Any limits (numbers or skills) to operator or support personnel for the new system/equipment.*

303.3.6 Manpower and personnel costs for use in appropriate tradeoffs and evaluations which include costs related to recruitment, training, retention, development, and washout rates.* (303.2.2, 303.2.5, 303.2.6)

303.3.7 Support alternatives for the new system/equipment from Task 302.

303.3.8 Description of system/equipment alternatives under consideration.

303.3.9 Supportability and supportability related design objectives, goals and thresholds, and constraints for the new system/ equipment from Task 205.

303.3.10 Historical CER/PER that exist which are applicable to the new system/equipment.

303.3.11 Job and task inventory for applicable personnel job classifications. (303.2.2, 303.2.5, 303.2.6)

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303.4 **TASK OUTPUT**

303.4.1 For each evaluation and tradeoff performed under this task:

a. Identification of the evaluation criteria, analytical relationships and models used, selected alternative(s), appropriate sensitivity analysis results, evaluation and tradeoff results, and any risks involved.

b. Tradeoff and evaluation updates, as applicable.

303.4.2 Recommended support system alternative(s) for each system/equipment alternative and identification of new or critical logistic support resource requirements. (303.2.2)

303.4.3 Recommended system/equipment alternative(s) based on cost, schedule, performance, readiness, and supportability factors. (303.2.3)

303.4.4 System/equipment readiness sensitivity to variations in key design and support parameters. (303.2.4)

303.4.5 Estimates of total manpower and personnel requirements for alternative system/equipment concepts. (303.2.5)

303.4.6 Optimum training and personnel job design for attaining and maintaining the required proficiency of operating and support personnel. (303.2.6)

303.4.7 Repair level analysis results. (303.2.7)

303.4.8 Optimum diagnostic concept for each system/equipment alternative under consideration. (303.2.8)

303.4.9 Comparisons between the supportability, cost, and readiness parameters of the new system/equipment and existing comparable systems/equipment. (303.2.9)

303.4.10 Tradeoff results between system/equipment alternatives and energy requirements. (303.2.10)

303.4.11 Tradeoff results between system/equipment alternatives and survivability and battle damage repair characteristics. (303.2.11)

303.4.12 Tradeoff results between system/equipment alternatives and transportability requirements. (303.2.12)

303.4.13 Tradeoff results between system/equipment alternatives and facilities requirements (303.2.13)

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TASK SECTION 400

DETERMINATION OF LOGISTIC SUPPORT RESOURCE REQUIREMENTS

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TASK 501

SUPPORTABILITY TEST, EVALUATION, AND VERIFICATION

501.1 PURPOSE. To assess the achievement of specified support-
ability requirements, identify reasons for deviations from pro-
jections, and identify methods of correcting deficiencies and
enhancing system readiness.

501.2 TASK DESCRIPTION

501.2.1 Formulate a test and evaluation strategy to assure
that specified supportability and supportability related design
requirements are achieved, or achievable, for input into system
test and evaluation plans. The test and evaluation strategy
formulated shall be based upon quantified supportability re-
quirements for the new system/equipment; the supportability,
cost, and readiness drivers; and supportability issues with a
high degree of risk associated with them. Tradeoffs shall be
conducted between the planned test length and cost and the
statistical risks incurred. Potential test program limitations
in verifying supportability objectives based on previous test
and evaluation experience and the resulting effect on the ac-
curacy of the supportability assessment shall be documented.

501.2.2   Develop a System Support Package (SSP) component list
identifying support resources that will be evaluated during
logistic demonstration and will be tested/validated during
development and operational tests. The component lists will
include:

   a. Supportability test requirements.

   b. Applicable Maintenance Allocation Chart (MAC).

   c. Technical publications.

   d.   Spares and repair parts.

   e. Training devices/equipment.

   f. Special and common tools.

   g. Test, measurement and diagnostic equipment (TMDE).

   h. Manpower/personnel requirements.

   i. Training courses.

   j. Transportation and materiel handling equipment.

   k. Calibration procedures and equipment.

   l. Mobile and/or fixed support facilities.

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m. Embedded software requirements.

n. Other support equipment.

501.2.3 Establish and document test and evaluation program objectives and criteria and identify test resources, procedures, and schedules required to meet the objectives for inclusion in the coordinated test program and test and evaluation plans. The objectives and criteria established shall provide the basis for assuring that critical supportability issues and requirements have been resolved or achieved within acceptable confidence levels.

501.2.4 Analyze the test results and verify/assess the achievement of specified supportability requirements for the new system/equipment. Determine the extent of improvement required in supportability and supportability related design parameters in order for the system/equipment to meet established goals and thresholds. Identify any areas where established goals or thresholds have not been demonstrated within acceptable confidence levels. Do not duplicate analyses performed in Task 303. Develop corrections for support ability problems uncovered during test and evaluation. These could include modifications to hardware, software, support plans, logistic support resources, or operational tactics. Update the documented support plan and logistic support resource requirements as contained in the LSAR and LSAR output reports based on the test results. Quantify the effects of these updates on the projected cost, readiness, and logistic support resource parameters for the new system/equipment.

501.2.5 Analyze standard reporting systems to determine the amount and accuracy of supportability information that will be obtained on the new system/equipment in its operational environment. Identify any shortfalls in measuring accomplishment against the supportability goals that were established for the new system/equipment, or in verifying supportability factors which were not tested during the acquisition phases of the item's life cycle. Develop viable plans for obtaining required supportability data from the field which will not be obtained through standard reporting systems. Conduct tradeoff analyses between cost, length of data collection, number of operational units in which to collect data, and statistical accuracy to identify the best data collection plan. Document the data collection plan selected to include details concerning cost, duration, method of data collection, operational units, predicted accuracy, and intended use of the data.

501.2.6 Analyze supportability data as it becomes available from standard supply, maintenance, and readiness reporting systems and from any special data collection programs implemented on the new system/equipment. Verify achievement of the goals and thresholds established for the new system/equipment. In those cases where operational results deviate from projections, determine causes and corrective actions. Analyze feedback information and identify areas where improvements can be cost effectively accomplished. Document recommended improvements.

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501.3 TASK INPUT

501.3.1 Delivery identification of any data item required. *

501.3.2 Information available from the requiring authority relative to standard reporting systems. *   (501.2.5)

501.3.3 Previous test and evaluation experience on comparable systems.

501.3.4 Supportability and supportability related design factors from Task 205.

501.3.5 Supportability, cost, and readiness drivers for the new system/equipment from Task 203.

501.3.6 Evaluation and tradeoff results from Task 303.

501.3.7 Test results. (501.2.4)

501.3.8 Supportability data on the new system/equipment in its operational environment from standard maintenance, supply, and readiness reporting systems and any special reporting system developed for the new system/equipment. (501.2.6)

501.4 TASK OUTPUT

501.4.1 Test and evaluation strategy for verification of supportability and identification of potential test program limitations and the effect on the accuracy of the supportability assessment. (501.2.1)

501.4.2 System support package component lists. (501.2.2)

501.4.3 Test and evaluation plan for supportability to include test and evaluation objectives, criteria, procedures/methods, resources, and schedules. (501.2.3)

501.4.4 Identification of corrective actions for supportability problems uncovered during test and evaluation. Updated support plan, logistic support resource requirements, LSAR data, and LSAR output reports based upon test results. Identification of improvements required in order to meet supportability goals and thresholds. (501.2.4)

501.4.5 Detailed plans to measure supportability factors on the new system/equipment in its operational environment. (501.2.5)

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501.4.6 Comparison of achieved supportability factors with
projections, identification of any deviations between projec-
tions and operational results, reasons for the deviations, and
recommended changes (design, support, or operational) to cor-
rect deficiencies or improve readiness. (501.2.6)

Custodians: Preparing Activity:
    Army - TM   Army - TM
    Navy - AS
    Air Force- 95   (Project No. ILSS-0005)

Review Activities:
 Army - ME, MI, AV, AT, CR
 Navy - SH, YD, OS, MC
 Air Force - 11, 13, 15, 16, 17
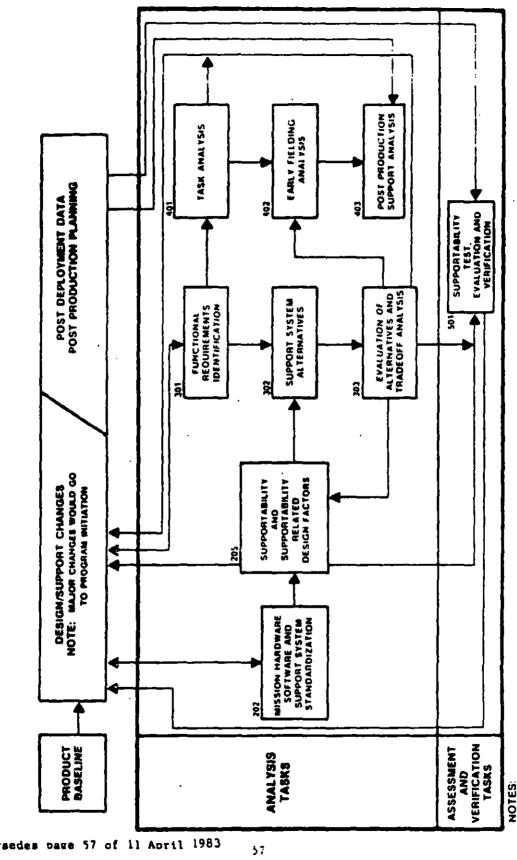 Miscellaneous DOD/NASA - NS, NA, DC, DH

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PRODUCTION/DEPLOYMENT/POST PRODUCTION PHASE

FIGURE 3. Logistic Support Analysis Process Flow Chart.

NOTES:

1. TASKS 101, 102 AND 103 ARE MANAGEMENT ACTIVITIES THAT ARE AN INTEGRAL PART OF THE LSA PROCESS THOUGH NOT SHOWN IN THIS FIGURE

2. REFER TO TABLE III FOR SUBTASK APPLICABILITY BY PROGRAM PHASE

3. TASKS 402 AND 403 PROVIDE DATA TO ILS MANAGEMENT

APPENDIX A

APPLICATION GUIDANCE FOR IMPLEMENTATION OF LOGISTIC
SUPPORT ANALYSIS PROGRAM REQUIREMENTS

10. SCOPE

10.1 General. This appendix provides rationale and guidance for the
selection and tailoring of LSA tasks in this standard. This appendix
is to be used to tailor LSA requirements in the most cost effective
manner to meet program objectives. However, it is not to be referenced
or implemented in contractual documents. No requirements are contained
in this appendix. The users of this appendix may include the Depart-
ment of Defense contracting activity, Government in-house activity,
and prime contractor or subcontractor, who wishes to impose LSA tasks
upon a supplier.

10.2 How to Use this Appendix. This appendix provides guidance on
structuring LSA programs (paragraph 40) and on applying the individual
task and subtask requirements (paragraph 50). The user should first
review the major considerations affecting the development of the LSA
program contained in paragraph 40 and then refer to the appropriate
parts of paragraph 50 based on the tasks and subtasks selected.

20. REFERENCED DOCUMENTS

Military Standards

MIL-STD-680   Contractor Standardization
                      Program Requirements.

MIL-STD-965   Parts Control Program.

MIL-STD-1629   Procedures for Performing a
                      Failure Mode, Effects, and
                      Criticality Analysis.

MIL-STD-1388-2   DOD Requirements for a Logistic
                      Support Analysis Record

DOD Directives

DODD 5000.1   Major System Acquistions.

DODD 5000.39   Acquisition and Management of
                      Integrated Logistic Support for
                      Systems and Equipment.

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50.2.4.5 Qualitative supportability problems (Subtask 203.2.4) on existing systems should be thoroughly analyzed to provide insight into areas for improvement during the development of the new system/ equipment.

50.2.4.6 Supportability, cost, and readiness drivers are identified (Subtask 203.2.5 and 203.2.6) so that areas of improvement can be identified and supportability and supportability related design con- traints can be formulated to achieve the improvements. Major problems on existing systems must be identified and approaches to eliminate or reduce these problems must be developed. As with other tasks in this standard, the timing and scope of this effort must be commensurate with the timing and scope of the system/equipment design effort in order for the constraints to be effective. Concept phase analyses would be at the system and subsystem level so that system and subsys- tem level constraints could be defined prior to entry into the Demon- stration and Validation Phase.

50.2.4.7 Supportability, cost, and readiness drivers may be iden- tified from a number of perspectives: drivers could be specific ILS elements, specific support functions (e.g., alignment or calibration requirements), specific mission subsystems/components, or specific features of the operational scenario/requirement. Proper driver iden- tification is a prerequisite to establishment of the most effective constraints for achieving improvements. Care must be exercised to assure that true drivers are identified and not the effects of a driver. For example, supply support cost is not a cost driver if it is a result of poor reliabilty of a subsystem. In this case, the sub- system reliability would be the cost driver. The identification of drivers is dependent upon the availability of data on comparative sys- tems. When citing Subtasks 203.2.5 and 203.2.6, the requiring authority must consider the data bases available to support driver identification. Additionally, this task can be performed by specialty areas and the results consolidated under the LSA program. For example, manpower, personnel, and training analysis may be performed by human engineering and training specialists, and maintainability comparisons may be done under the maintainability program.

50.2.5 Technological Opportunities (Task 204). This task should be performed by design personnel in conjunction with supportabilty specialists. It is designed to identify potential technological approaches to achieve new system/equipment supportability improve- ments. It will identify the expected effect of improvements on supportability, cost, and readiness values so that supportability and supportability related design objectives for the new system/ equipment can be established. Particular attention should be devoted to the application of technological advancements to system/ equipment drivers and areas where qualitative problems were identified on comparative systems. Improvements can be developed at

any level (system, subsystem, or below), however, they should be prioritized based on the contribution of each to system and subsystem level supportability values.

50.2.6. Supportability and Supportability Related Design Factors (Task 205).

50.2.6.1 This task establishes the supportability parameters governing the new system/equipment's development. These parameters will include objectives, goals and thresholds, qualitative and quantitative constraints, and system/equipment specification requirements. Subtask 205.2.1 quantifies the supportability impacts of alternative concepts which serve as a basis for the remaining subtasks.

50.2.6.2 The type of parameter developed as a result of performing Task 205 will depend on the phase of development. Generally, prior to Milestone I, supportability objectives will be established (Subtask 205.2.4). These objectives are established based on the results of previous mission and support systems definition tasks, especially the opportunities identified as a result of Task 204, and are subject to tradeoffs to achieve the most cost effective solution to the mission need. After Milestone I and prior to Milestone II, goals and thresholds are established (Subtask 205.2.7) which are not subject to tradeoff. Thresholds represent the minimum essential levels of performance that must be satisfied at specified points in the acquisition.

50.2.6.3 Overall system/equipment objectives or goals and thresholds must be allocated and translated to arrive at supportability requirements to be included in the system, subsystem, or support system specification or other document for contract compliance (Subtask 205.2.5). This subtask is necessary to assure that specification or contract parameters include only those parameters which the performing activity can control through design and support system development. The support burden and other effects of the GFE/GFM, administrative and logistic delay time, and other items outside the control of the performing activity must be accounted for in this process. For example, if the overall threshold for manpower is 100 manhours/system/year, and a government furnished subsystem requires 25 manhours/system/year, then the contract should reflect a threshold of 75 manhours/system/year for performing activity developed hardware. This translation from supportability objectives or goals and thresholds to specification requirements is also important for readiness parameters. When the item under procurement is a complete weapon system, then applicable readiness parameters may be suitable for inclusion in the system specification. However, if the item under procurement is less than a weapon system (i.e., subsystem or equipment going into a weapon system) then other parameters would be more appropriate (e.g., logistic related R&M parameters).

50.2.6.4 When performing Subtask 205.2.5, thorough consideration
should be given to possible supportability incentives which may be
included in the contract. However, incentives should be at the system
level (possibly subsystem for some acquisitions) to prevent optimiza-
tion approaches at lower levels which do not represent optimum system
level solutions. This should not preclude component level initiatives
such as reliability improvement warranties (RIW).

50.3 Task Section 300 - Preparation and Evaluation of Alternatives.

50.3.1 General Considerations.

50.3.1.1 Iterations. The tasks contained in this section are highly
iterative in nature and are applicable in each phase of the life cy-
cle. Additionally, they are generally performed in sequence; that is,
functions are identified (Task 301), alternatives are developed to
satisfy the functions (Task 302), and evaluations and tradeoffs are
conducted (Task 303). This process is then iterated to increasingly
lower levels of indenture and detail in the classic system engineering
manner.

50.3.1.2 Timing. The identification of functions, development of
alternatives, and tradeoff analyses should be conducted to a level of
detail and at a time consistent with the design and operational con-
cept development. In the early phases of the life cycle, functions
and alternatives should only be developed to the level required to
analyze differences and conduct tradeoffs. More detail can be devel-
oped after tradeoffs are made and the range of alternatives is nar-
rowed. At the same time, the support plan must be finalized at a time
which allows for the development and testing of the necessary ILS ele-
ment resources to carry out the support plan.

50.3.2 Functional Requirements Identification (Task 301). Iden-
tification of the operating and maintenance functions for the new
system/equipment must coincide with critical design decisions to
assure development of a system which achieves the best balance between
cost, schedule, performance, and supportability. Special emphasis
should be placed on the functional requirements which are suppor-
tability, cost, or readiness drivers for the new system/equipment
or which are new functions that must be performed based on new design
technology or new operational concepts. Identification of the
functions which are drivers provides a basis for developing new sup-
port approaches or design concepts to enhance the supportability of
the new system/equipment. Identification of the new functional re-
quirements provides the basis for management attention due to the
potential supportability risks. Functional flow block diagrams are a
useful tool in identifying functional requirements and establishing
relationships between functions. Additionally, other system
engineering programs provide a significant input to the functional
requirements identification process. For example, human engineering

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specialists may be best qualified to identify and analyze operations functions, transportation specialists may be best qualified to identify and analyze transportation requirements, etc. The LSA program under Task 301, consolidates the functional requirements developed by the appropriate specialty areas to assure the support system developed for the new system/equipment satisfies all functional requirements.

50.3.2.1 Task 301 is designed to provide for varying levels of detail from system and subsystem level functions (Subtasks 301.2.1 through 301.2.3) to detailed operations and maintenance tasks requirements (Subtask 301.2.4). Appropriate subtask requirements should be identified based on the level of design definition and schedule requirements. Table III provides general guidelines for the timing of each subtask.

50.3.2.2 Operations and support task requirements (Subtask 301.2.4) are identified using three analysis techniques: (1) FMECA, (2) an RCM analysis, and (3) a detailed review of the system/equipment functional requirements. The FMECA identifies the failure modes of the system and its components thus identifying the corrective maintenance requirements. The RCM analysis identifies preventive maintenance requirements (1) to detect and correct incipient failures either before they occur or before they develop into major defects, (2) to reduce the probability of failure, (3) to detect hidden failures that have occurred, or (4) to increase the cost effectiveness of the system/ equipment's maintenance program. The review of the system/equipment's functional requirements identifies those tasks which are neither corrective nor preventive but must be performed in order for the system/ equipment to operate as intended in its environment. These tasks include operations, turnaround tasks, reloading, mission profile changes, transportation tasks, etc.

50.3.2.3 A FMECA systematically identifies the likely modes of failure, the possible effects of each failure, and the criticality of each effect on mission completion, safety, or some other outcome of significance. The FMECA requirements will generally be included under the Reliability Program, however, FMECA requirements for a system must be developed in conjunction with the LSA program requirements due to the necessity of having FMECA results to conduct some LSA tasks. In particular, the FMECA provides the basis for built-in and external test specification and evaluation. This coordination should consider the timing of the FMECA, level of detail, and documentation requirements.

50.3.2.4 RCM analysis consists of a systematic approach of analyzing system/equipment reliability and safety data to determine the feasibility and desirability of preventive maintenance tasks, to highlight maintenance problem areas for design review consideration, and to establish the most effective preventive maintenance program

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data on the system/equipment in its operational environment. In the
first case, the assessments are made prior to deployment and, where
applicable, upon initial deployment during follow-on test and evalua-
tion. In the second case, the assessments are made based upon data
available on the system/equipment in its normal operating environment.

50.5.1.2 <u>Test and Evaluation</u>. The supportability test and evaluation
program must serve three objectives: (1) provide measured data for
supportability and supportability related design parameters for input
into system level estimates of readiness, O&S costs, and logistic sup-
port resource requirements; (2) expose supportability problems so that
they can be corrected prior to deployment; and (3) demonstrate con-
tractual compliance with quantitative supportability and supportabili-
ty related design requirements. Test and evaluation planning,
scheduling, and cost investment must be related to these objectives to
maximize the return on investment. Development of an effective test
and evaluation program requires close coordination of efforts between
all system engineering disciplines to prevent duplication of tests and
to maximize test program effectiveness. Reliability tests, main-
tainability demonstrations, publications validation/verification
efforts, environmental tests, endurance/durability tests, and other
tests shall be used in satisfying supportability assessment
requirements. A well integrated test program involves establishing
test conditions that maximize the utility of the test results. This
is an important factor considering that the availability of hardware
and time to conduct tests and evaluations are generally at a premium
for most acquisitions, and that test results are a vital feedback loop
because they represent the first hard data available for the new
system/equipment.

50.5.1.3 <u>Test Environment</u>. One major factor that determines the
utility of test results to satisfy the objectives of the supportabili-
ty test and evaluation program is the test environment. Historically,
there has been a large gap between test results and field-observed
parameters. This wide gap is to a large degree caused by conducting
tests in ideal environments, using contractor technicians to perform
maintenance during test, ignoring some test results (nonchargeable
failures), and not using the planned resources (technical manuals,
tools, test equipment, personnel, etc.) during the tests. Realistic
test environments must be established considering the intended opera-
tional environment and the intended logistic support resources (all
elements of ILS) that will be available to operate and maintain the
system/equipment after deployment. While a total simulation of the
field environment may not be practical or cost effective, test
environments should be established to be as close as possible and
known differences between the test and field environments must be ac-
counted for in using test results to update system level projections
for readiness, O&S costs, and logistic support resource requirements.
Additionally, expected levels of maturation to supportability
parameters should be applied to test and evaluation results to get a
good projection of expected supportability.

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50.5.1.4 <u>Post-Deployment Assessments</u>. A system's ultimate measure of supportability is determined by how well it performs in its environment after deployment. Analysis of feedback data from the operational environment is the necessary final step in verifying that the system/ equipment has met its objectives and in evaluating post deployment support. In some cases, this assessment can be made using field feedback data that is routinely available from standard readiness, supply, and maintenance reporting systems; while in other cases, data from standard reporting systems must be supplemented in order to meet the verification objective within acceptable confidence levels. Any requirement for supplemental data must be weighed against the cost and resources to obtain the data and any impact upon using units to gather the data.

50.5.2 <u>Supportability Test, Evaluation, and Verification (Task 501)</u>.

50.5.2.1 Initial supportability test and evaluation planning (Subtask 501.2.1) occurs prior to the life cycle phase in which the tests will be conducted. This planning shall include identification of the resources (hardware, time, and support) required for testing. Test and evaluation strategies should be based on the supportability and supportability related design requirements; the supportability cost, and readiness drivers; and areas with a high degree of risk associated with them. Test and evaluation plans shall include supportability objectives and criteria integrated with other system engineering test requirements. Pre-Milestone I planning shall include strategies for evaluation (during Demonstration and Validation Phase testing) of design and operational features that affect the feasibility of the system/equipment's supportability, cost, and readiness objectives. Pre-Milestone II planning shall include strategies for demonstrating (during FSD testing) established supportability and supportability related design objectives within stated confidence levels through the intermediate/general support maintenance level; evaluation of operability and operator training; demonstration of the adequacy of the logistic support plan to include all elements of ILS; and quantification of requirements for fuel, ordnance, supply, and other ILS elements. Preproduction planning shall include strategies for assessing (during FOT&E) mission hardware, software, and support items not fully tested prior to production; demonstration, in an operational environment, that initial production items meet the thresholds for mature systems; and, refinement of operating tactics, training requirements, and force unit organizational concepts as required.

50.5.2.2 Detailed test plans and criteria are established (Subtask 501.2.3) based on the test and evaluation objectives of the system/ equipment. An important category of data that must be provided by the LSA program is the identification of the ILS elements that must be provided to testing activities for test and evaluation. This identification is an integral part of Tasks 301, 303, and 401. Task 501 provides detailed plans for test and evaluation of these resources.

50.5.2.3 Data resulting from testing will be analyzed as part of
Task 501 (Subtask 501.2.4) to accomplish the following:

a. Correct deficiencies discovered during test and validate cor-
rective actions implemented to eliminate deficiencies identified
during previous tests.

b. Update system level projections for readiness, O&S costs, and
logistic support resource requirements.

c. Identify the amount of improvement required in supportability
and supportability related design parameters to meet established goals
and thresholds.

d. Identify achievement or nonachievement of contractual
requirements.

e. Provide an assessment of supportability for input into the
materiel acquisition decision process.

f. Update LSAR data.

g. Provide a data base of experience information for subsequent
comparative analyses on future system/equipment acquisitions.

50.5.2.4 Subtasks 501.2.5 and 501.2.6 provide the requirements for
post deployment assessment of the new system/equipment. In those
cases where existing standard field reporting systems will not provide
the necessary data or accuracy to conduct this analysis, then sup-
plemental data collection programs must be planned, approved, budgeted
for, and implemented. Planning activities (Subtask 501.2.4) would
normally occur prior to production, and data review and analysis (Sub-
task 501.2.5) would occur following deployment. Care should be exer-
cised in planning this activity to assure that field results are col-
lected during "normal" field operations. Collecting data immediately
after deployment may be biased if any of the following situations are
in effect:

a. New equipment fielding teams are with the system/equipment.

b. Operator and maintenance personnel received training from
other than the intended normal training sources.

c. Initial supply support was obtained from other than standard
supply systems.

d. Interim support resources are being used pending deployment
of other items (e.g., support and test equipment).

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50.5.2.5 Analysis of data obtained from field reporting systems can provide significant information for system/equipment enhancements through logistic support resource modifications, product improvement programs, or modifications of operating tactics. Additionally, comparative analysis between field results, test and evaluation results, and engineering estimates can provide information for use on future acquisition programs to better project supportability, cost, and readiness parameters.

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TABLE II. Logistic Support Analysis Information Requirements
for Major Systems by Milestone.

INFORMATION REQUIREMENT	RELATED LOGISTIC SUPPORT ANALYSIS TASKS (SUBTASKS)
PROGRAM INITIATION	
1. Manpower and other logistic resource constraints for the new system.	1. 201 (201.2.1, 201.2.2) 203 (203.2.1, 203.2.3)
MILESTONE I	
1. Support cost, manpower requirements and R&M of current comparable equipment.	1. 203 (203.2.3)
2. Manpower, cost, and readiness drivers.	2. 203 (203.2.5)
3. Readiness and support cost targets for improvement.	3. 204 (204.2.1)
4. Evaluation of logistic resource implications of alternative operational and support concepts.	4. 205 (205.2.1 205.2.2, 205.2.3)
5. System readiness objectives.	5. 205 (205.2.4)
6. New technology items that require advances in repair technology.	6. 301 (301.2.2)
7. Major items of support-related hardware and software requiring development.	7. 303 (303.2.2)
8. Manpower sensitivity to alternative employment concepts.	8. 303 (303.2.5)
9. Significant differences in the training implications of alternative systems considered.	9. 303 (303.2.6)
10. Critical manpower, logistic, and R&M parameters compared to existing systems.	10. 303 (303.2.9)

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TABLE II. Logistic Support Analysis Information Requirements for Major Systems by Milestone - Continued

INFORMATION REQUIREMENT	RELATED LOGISTIC SUPPORT ANALYSIS TASKS (SUBTASKS)
MILESTONE II	
1. Manpower and support resource sensitivity changes in key parameters, associated impacts on system readiness, and logistic risk areas.	1. 205 (205.2.1) 303 (303.2.5)
2. Readiness, R&M, manpower, and other logistic goals and thresholds, and comparison with existing systems.	2. 205 (205.2.7) 303 (303.2.9)
3. Baseline support concepts.	3. 301 (301.2.1) 302 (302.2.1) 303 (303.2.2)
4. Subsystems considered for long-term contractor support.	4. 302 (302.2.1) 303 (303.2.2)
5. Tradeoff results to optimize the balance among hardware characteristics, support concepts and support resource requirements.	5. 303 (303.2.3)
6. Formal training requirements.	6. 303 (303.2.6) 401 (401.2.4)
7. Capability of current and planned support systems to meet logistic objectives.	7. 303 (303.2.1)
8. Adequate test and evaluation plans to assess achievement of support-related thresholds, adequacy of support plans and resources, and impacts on cost and readiness objectives.	8. 501 (501.2.2, 501.2.3)
9. Effect of test results on support resource requirements.	9. 501 (501.2.4)
10. Updated Milestone I information.	10. 203/204/205 301/302/303

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TABLE II. Logistic Support Analysis Information Requirements
for Major Systems by Milestone - Continued.

INFORMATION REQUIREMENT	RELATED LOGISTIC SUPPORT ANALYSIS TASKS (SUBTASKS)
PRODUCTION 1. Detailed support planning requirements.	1. 302 (302.2.3) 303 (303.2.2) 401/402
2. Manpower and training requirements to support peacetime readiness and wartime employment.	2. 401/402
3. Acceptable R&M demonstrations, maintenance plan, manpower, and support resources.	3. 401/402 501 (501.2.4)
4. Impact on system readiness of failure to obtain required personnel.	4. 402 (402.2.3)
5. Plans for evaluating manpower requirements during FOT&E.	5. 501 (501.2.3)
6. Updated Milestone II information.	6. 205 301/302/303 401 501

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TABLE III

Logistic Support Analysis Task Application and Documentation Matrix

TASK TITLE	APPLICABILITY BY PHASE*					APPLICABLE DATA ITEM DESCRIPTIONS	REMARKS
	PRE-CONCEPT	CON-CEPT	DVAL	FSD	PROD		
101 DEVELOPMENT OF AN EARLY LOGISTIC SUPPORT ANALYSIS STRATEGY	G (4)	G (3,4)	G (3,4)	G (3,4)	G (3,4)	DI-L-7114 Logistic Support Analysis Strategy Report	
102 LOGISTIC SUPPORT ANALYSIS PLAN	NA	G (4)	G (4)	G (4)	G (4)	DI-ILSS-80531 Logistic Support Analysis Plan	
103 PROGRAM AND DESIGN REVIEWS	NA	G (2,4)	G (2,4)	G (2,4)	G (2,4)	DI-A-7088 Conference Agenda / DI-A-7089 Conference Minutes / DI-ILSS- Logistic Support Analysis Plan	DI-A-7088 and DI-A-7089 apply to any conference or review. Subtask 103.2.1 only.
201 USE STUDY	G(5)	G(4)	G(4)	G(4)	NA	DI-S-7115 Use Study Report	

TABLE III

Logistic Support Analysis Task Application and Documentation Matrix

TASK TITLE	APPLICABILITY BY PHASE*					APPLICABLE DATA ITEM DESCRIPTIONS	REMARKS
	PRE-CONCEPT	CON-CEPT	DVAL	FSD	PROD		
202 MISSION HARDWARE, SOFTWARE, AND SUPPORT SYSTEM STANDARDIZATION	NA	G (2,4)	G (2,4)	G (2,4)	C (2,4)	DI-S-3606 System/Design Trade Study Reports DI-E-7026 Parts Control Program Plan DI-MISC-80072 Program Parts Selection List (PPSL) DI-MISC-80071, Parts Approval Requests DI-E-7029 Military Detail Specifications and Specification Sheets DI-E-7030 Test Data for Nonstandard Parts	DI-E-7026 through DI-E-7030 pertain to the Parts Control Program. These DID's require citing MIL-STD-965 on the contract.
203 COMPARATIVE ANALYSIS	G	G	G	G	NA	DI-S-7116 Comparative Analysis Report	
Subtask 203.2.1	G(5)	G(5)	G(4)	NA	NA		
Subtask 203.2.2	G(5)	G(5)	G(4)	G(4)	NA		
Subtask 203.2.3	G(5)	G(5)	G(4)	NA	NA		
Subtask 203.2.4	G(5)	G(5)	G(4)	G(4)	NA		
Subtask 203.2.5	G(5)	G(5)	G(4)	G(4)	NA		
Subtask 203.2.6	G	G	G	NA	NA		
Subtask 203.2.7	NA	G(5)	G(4)	G(4)	NA		
Subtask 203.2.8	G	G	G	G	NA		

TABLE III

Logistic Support Analysis Task Application and Documentation Matrix

TASK TITLE	APPLICABILITY BY PHASE*					APPLICABLE DATA ITEM DESCRIPTIONS	REMARKS
	PRE-CON-CEPT	CON-CEPT	DVAL	FSD	PROD		
204 TECHNOLOGICAL OPPORTUNITIES	NA	G	G	S	NA	DI-S-7117 Technological Opportunities Report	
205 SUPPORTABILITIY AND SUPPORTABILITY RELATED DESIGN FACTORS	NA	G	G	G	C	DI-S-3606 System/Design Trade Study Reports	See MIL-STD-1388-2 for LSAR data element definitions and applicable DIDs.
Subtask 205.2.1	NA	G	G	NA	NA		
Subtask 205.2.2	NA	G	G	NA	NA		
Subtask 205.2.3	NA	G	G	G	C		
Subtask 205.2.4	NA	G(4)	G(4)	NA	NA		
Subtask 205.2.5	NA	NA	G	NA	NA		
Subtask 205.2.6	NA	G(4)	G(4)	NA	NA		
Subtask 205.2.7	NA	NA	G	NA	NA		
301 FUNCTIONAL REQUIREMENTS IDENTIFICATION	NA	G	G	G	C	DI-S-3606 System/Design Trade Study Reports	Data requirements must be coordinated with Reliability, Maintainability, and Human Engineering Program requirements. See MIL-STD-1388-2 for LSAR data element definitions and applicable DIDs.
Subtask 301.2.1	NA	G	G	S(1)	C(1)		
Subtask 301.2.2	NA	G	G	S(1)	C(1)		
Subtask 301.2.3	NA	G	G	S(1)	C(1)		
Subtask 301.2.4	NA	S	G	G	C		
Subtask 301.2.5	NA	G	G	G	C		
Subtask 301.2.6	NA	G	G	G	C		

TABLE III

Logistic Support Analysis Task Application and Documentation Matrix

TASK TITLE	APPLICABILITY BY PHASE*					APPLICABLE DATA ITEM DESCRIPTIONS	REMARKS
	PRE-CON-CEPT	CON-CEPT	DVAL	FSD	PROD		
302 SUPPORT SYSTEM ALTERNATIVES	NA	G	G	G	C(1)	DI-S-3606 System/Design Trade Study Reports	
Subtask 302.2.1	NA	G(4)	G(4)	NA	NA		
Subtask 302.2.2	NA	G	G	S	NA		
Subtask 302.2.3	NA	S	S	G(4)	C(1,4)		
Subtask 302.2.4	NA	S	S	G	C(1)		
Subbtask 302.2.5	NA	G	G	G	C(1)		
303 EVALUATION OF ALTERNATIVES AND TRADE-OFF ANALYSIS	NA	G	G	G	C	DI-S-3606 System/Design Trade Study Reports	
Subtask 303.2.1	NA	G	G	G	C		
Subtask 303.2.2	NA	G	G	G	C		
Subtask 303.2.3	NA	G	G	G	C		
Subtask 303.2.4	NA	G	G	G	NA		
Subtask 303.2.5	NA	G	G	S	NA		
Subtask 303.2.6	NA	G	G	G	C		
Subtask 303.2.7	NA	S(1)	C	G	C		
Subtask 303.2.8	NA	G	C	S(1)	NA		
Subtask 303.2.9	NA	G(5)	G(4)	S(1)	C(4)		
Subtask 303.2.10	NA	G(5)	G(4)	s	C(4)		
Subtask 303.2.11	NA	G(5)	G(4)	G(4)	C(4)		
Subtask 303.2.12	NA	G(5)	G(4)	NA	NA		
Subtask 303.2.13	NA	G(5)	G(4)	G	NA		

TABLE III

Logistic Support Analysis Task Application and Documentation Matrix - Continued

TASK TITLE	APPLICABILITY BY PHASE*					APPLICABLE DATA ITEM DESCRIPTIONS	REMARKS
	PRE-CON-CEPT	CON-CEPT	DVAL	FSD	PROD		
401 TASK ANALYSIS	NA	NA	S	G	C	DI-S-3606 System/Design Trade Study Reports	Subtasks 401.2.5, 401.2.6, and 401.2.9.
Subtask 401.2.1	NA	NA	S	G	C		
Subtask 401.2.2	NA	NA	S	G	C		Data require-
Subtask 401.2.3	NA	NA	S	G(4)	C(4)		ments must be
Subtask 401.2.4	NA	NA	S	G(4)	C(4)		coordinated with
Subtask 401.2.5	NA	NA	S	G	C		ILS element data
Subtask 401.2.6	NA	NA	S	G	C		requirements.
Subtask 401.2.7	NA	NA	NA	S(1)	C(1)		See MIL-STD-1388-2
Subtask 401.2.8	NA	NA	S	G	C		for LSAR data
Subtask 401.2.9	NA	NA	S	G	C		element definitions
Subtask 401.2.10	NA	NA	S	G(4)	C(4)		and applicable DIDs.
Subtask 401.2.11	NA	NA	S	G	C		
402 EARLY FIELDING ANALYSIS	NA	NA	NA	G	C	DI-S-7118 Early Fielding Analysis Report	
403 POST PRODUCTION SUPPORT ANALYSIS	NA	NA	NA	NA	G	DI-P-7119 Post Production Support Plan	
501 SUPPORTABILITY TEST, EVALUATION, AND VERIFICATION	NA	G	G	G	G	DI-S-7120 Supportability Assessment Plan	Subtasks 501.2.1, 501.2.3, and 501.2.5.
Subtask 501.2.1	NA	G	G	S	NA	DI-S-7121 Supportability Assessment Report	Subtasks 501.2.4 and 501.2.6.
Subtask 501.2.2	NA	NA	G(4)	G(4)	G(4)	DI-ILSS-80532 System Support Package Component List	Subtask 501.2.2.
Subtask 501.2.3	NA	NA	G(4)	G(4)	S		These data require-
Subtask 501.2.4	NA	NA	G(4)	G(4)	S		ments must be co-
Subtask 501.2.5	NA	NA	NA	G(4)	S		ordinated with other
Subtask 501.2.6	NA	NA	NA	NA	G(4)		system test planning
							and reporting
							requirements. See
							MIL-STD-1388-2 for
							LSAR data element
							definitions and
							applicable DIDs.

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