



SYSTEMS MANAGEMENT STANDARD	TA-STD-0017™	REV. A
	Issued 2012-11 Revised 2022-03	
	Superseding TA-STD-0017	
(R) Product Support Analysis		

RATIONALE

This standard has been reformatted from TechAmerica to SAE style formats and rules and has been revised to incorporate updates to various Product Support Analysis (PSA) activities.

FOREWORD (INFORMATIVE)

This standard provides general requirements and activity descriptions governing performance of Product Support Analysis (PSA) during the life cycle of products. This standard applies to all system acquisition programs, major modification programs, and applicable research and development projects through all phases of the product life cycle. This standard is for use by both industry and Government activities performing PSA on products to which this standard applies.

This standard was developed by the SAE Life Cycle Logistics Supportability (LCLS) Committee. For further information about SAE TA-STD-0017 or how to participate in the SAE LCLS, please refer to the following URL: <https://www.sae.org/works/committeeHome.do?comtID=SMCLCLS>.

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CHANGE LOG		
REVISION	DESCRIPTION OF CHANGE	DATE
-	INITIAL RELEASE	2012
A	- Implemented new numbering scheme <u>Added Foreword</u> <u>Added Rationale</u> <u>Added Acronym List</u> <u>Updated Definitions</u> <u>Updated References</u> <u>Updated Product Support Analysis section</u> <u>Updated Product Support Analysis Documentation section</u> <u>Updated Recycled, Recovered, or Environmentally Preferable Materials section</u> <u>Added Support System Standardization section</u> <u>Added Integrated Data Environment for Product Support (IDE-PS) section</u> <u>Added DevSecOps section</u> <u>Added Digital Thread section</u> <u>Updated Quantitative Factors section</u> <u>Updated Support Resource Standardization section</u> <u>Updated Standardization Costs section</u> <u>Updated Comparative Products section</u> <u>Updated BCS Supportability, Costs, and Readiness Drivers section</u> <u>Updated BCS Updates section</u> <u>Updated Supportability Characteristics section</u> <u>Updated Intellectual Property and Data Rights section</u> <u>Updated Key Performance Parameters section</u> <u>Updated Objectives, Goals, and Thresholds section</u> <u>Added Advanced Manufacturing section</u> <u>Added Failure Modes and Effects Analysis section</u> <u>Updated Fault Tree Analysis section</u> <u>Updated Design Alternatives section</u> <u>Updated Function Updates section</u> <u>Updated Diagnostics Tradeoffs section</u> <u>Updated Tradeoff/Evaluation Performance section</u> <u>Updated Support System Tradeoffs section</u> <u>Added Environment, Safety and Occupational Health (ESOH) Analysis section</u> <u>Updated DMSMS Management, Obsolescence Management, and Counterfeit Prevention section</u> <u>Added Counterfeit Prevention section</u> <u>Added Management of Reliability Drivers through Failure Reporting Analysis and Corrective Action System (FRACAS) section</u> <u>Updated Disposal Analysis section</u> <u>Added In-Service Supportability section</u> <u>Added Supportability in Mission Planning section</u> <u>Added Supportability in Engineering Change section</u> <u>Added Supportability Performance Assessment section</u> <u>Added Establish Performance Measurement Framework section</u> <u>Added Measure and Compile Supportability Performance Data section</u> <u>Added Analyze Performance Levels section</u> <u>Added Propose Changes to Support Solution section</u>	2020/21



CHANGE LOG		
REVISION	DESCRIPTION OF CHANGE	DATE
	• <u>Added Update Performance Measurement Framework, PSP, and LPD section</u> • <u>Added Annex A – Activity Cross-reference</u> • <u>Added Annex B – Product Support Analysis Life Cycle Phases</u> • <u>Added Annex C – PSA Standards Evolution</u>	

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1. SCOPE

This standard establishes general principles and descriptions of activities which, when performed in a logical and iterative nature, comprise the Product Support Analysis (PSA) process.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AS1390	Level of Repair Analysis (LORA)
AS6174	Counterfeit Materiel; Assuring Acquisition of Authentic and Conforming Materiel
GEIA-STD-0007	Logistics Product Data
GEIA-STD-0009	Reliability Program Standard for Systems Design, Development, and Manufacturing
SAE1010	Best Practice Standard for Manpower and Personnel
SAE6906	Standard Practice for Human Systems Integration (HSI)
STD-0016	Standard for Preparing a DMSMS Management Plan
TA-HB-0007-1	Logistics Product Data Reports Handbook

2.1.2 U.S. Government Publications

Available from Defense Standardization Program Office, 8725 John J. Kingman Road, Stop 5100 Fort Belvoir, VA 22060-6220.

5000.02T	Operation of the Defense Acquisition System
SD-22	Diminishing Manufacturing Sources and Material Shortages Guidebook
SD-26	DMSMS Contract Language Guide Book

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Telephone: 215-697-6257, Web address: <http://quicksearch.dla.mil/qsSearch.aspx>.

MIL-HDBK-1390	Level of Repair Analysis
MIL-STD-882	System Safety

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

ARP5580	Recommended Failure Modes and Effects Analysis (FMEA) Practices for Non-Automobile Applications
AS6140	Nut, Spanner Bearing Retaining, Phosphate Treated Aeronautical, UNS G41400
AS6171	Test Methods Standard; General Requirements, Suspect/Counterfeit, Electrical, Electronic, and Electromechanical Parts
EIA-649	Configuration Management Standard
EIA-836	Configuration Management Data Exchange and Interoperability
GEB1	Diminishing Manufacturing Sources and Material Shortages (DMSMS) Management Practices
GEIA-HB-0007	Logistics Product Data Handbook
JA1011	Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes
JA1012	A Guide to the Reliability-Centered Maintenance (RCM) Standard
SAE1001	Integrated Project Processes for Engineering a System

2.3 Definitions

ACTIVITY: A unit of specific work behavior with a clear beginning and ending point. However during the course of the product's life cycle each activity may occur multiple times due to a variety of reasons, such as redesign, program schedule changes, life cycle extensions, etc. The activity should be directly observable or an otherwise measurable process, frequently resulting in a product that can be evaluated for quantity, quality, and accuracy.

ADDITIVE MANUFACTURING: Additive Manufacturing refers to manufacturing or fabrication processes that involve the joining of materials to make objects from three dimensional model data, usually layer upon layer, as opposed to subtractive manufacturing and formative manufacturing methodologies. Examples of available additive manufacturing technologies are 3D printing, powder bed fusion, and cold spray.

ADVANCED MANUFACTURING: Advanced Manufacturing refers to activities that depend on the use and coordination of information, automation, computation, software, sensing and networking and/or make use of cutting edge materials and emerging capabilities enabled by the physical and biological sciences. It involves both new techniques to manufacture existing products and the manufacture of new products emerging from new advanced technologies. It includes, but is not limited to, additive manufacturing (also known as three-dimensional, or "3D," printing), artificial intelligence, robotics, and advanced composite materials.

AVAILABILITY: A measure of the degree to which a product is in an operable and committable state. Availability is typically expressed in terms of two components: Materiel Availability, which is a fleet-wide measure, and Operational Availability, which is an operational unit-level measure. Establishing an acceptable level of operational availability is an integral step in determining fleet-wide availability.

BASELINE COMPARISON SYSTEM (BCS): The Baseline Comparison System facilitates comparative decision making by modelling alternatives against a current design (the baseline) to estimate supportability performance characteristics (e.g., system readiness, support resource levels, and ownership costs). The initial BCS is developed from a current operational product or a composite of current operational products, the design, operational, and support characteristics of which most closely represent those of the new products under development. The product and support solution design will be represented as a functional, physical, and logistical breakdown working within an expected operational requirement. The BCS is updated as the new product becomes more clearly defined. The maturing baselines of the BCS establish the current known definition of the new support solution.

COLLABORATIVE ENVIRONMENT (CE): Tools or services that help people work together on activities (e.g., online software, project management software, whiteboards, flipcharts, online software, email).

COLLECTIVE TASK: A task that requires more than one individual to complete with each individual performing a discrete part of the collective task.

COMPARATIVE ANALYSIS: An examination of two or more products and their relationships to discover resemblances or differences.

CONSTRAINTS: Restrictions or key boundary conditions that impact overall capability, priority, and resources in system acquisition.

CONTRACTOR: The organization that provides goods or services as defined in a written agreement.

CONTRACTOR FURNISHED MATERIAL: Material provided by the contractor to a customer to be incorporated in, attached to, used with, or in support of a product to be delivered to the customer.

CONTRACTOR LOGISTICS SUPPORT (CLS): A Product Support Strategy (PSS) that contracts the responsibility of sustaining a product by performing or integrating various support functions such as maintenance, engineering, and/or materiel management.

CORRECTIVE MAINTENANCE: All actions performed in order to restore a product to a specified condition after a failure has occurred.

CUSTOMER: An organization purchasing or requiring Product Support Analysis.

CUSTOMER FURNISHED MATERIAL: Material provided by the customer to a contractor to be incorporated in, attached to, used with, or in support of a product to be delivered to the customer.

DESIGN PARAMETERS: Qualitative, quantitative, physical, and functional value characteristics that are inputs to the design process, for use in design tradeoffs, risk analyses, and development of a product that is responsive to product requirements.

DEVSECOPS: DevSecOps is an organizational software engineering culture and practice that combines software development (Dev), security (Sec), and operations (Ops). The product's security and function capabilities are tested and built simultaneously, and typically iteratively, throughout the life cycle phases.

DIGITAL THREAD: An extensible, configurable, or component enterprise-level analytical framework that seamlessly expedites the controlled interplay of authoritative technical data, software, information, and knowledge in the enterprise data, information and knowledge systems, based on the Digital System Model template, to inform decision makers throughout a system's life cycle by providing the capability to access, integrate, and transform disparate data into actionable information.

DIGITAL TWIN: A highly complex virtual model that is the exact counterpart (or twin) of a physical object or process. This pairing of the virtual and physical worlds allows analysis of data and monitoring of systems to head off problems before they even occur, prevent downtime, develop new opportunities, and even plan for the future by using simulations.

ELECTRONIC DATA EXCHANGE (EDE): The transfer of data from one computer system to another by standardized message formatting, without the need for human intervention. EDE is synonymous with Electronic Data Interchange.

ENGINEERING DATA FOR PROVISIONING (EDFP): The engineering data used in the initial provisioning of support resources. This technical data provides definitive identification of dimensional, material, mechanical, electrical, or other characteristics adequate for the provisioning of support items for the end item(s) on contract. EDFP includes data needed to indicate the physical characteristics, location, and function of the item. EDFP may also include government or industry specifications or standards, engineering drawings, production or commercial drawings and associated lists, commercial catalogs, and sketches or photographs with descriptive characteristics. EDFP is also used synonymously with the term form, fit, and function data.

ELECTRONIC DATA INTERCHANGE (EDI): The transfer of data from one computer system to another by standardized message formatting, without the need for human intervention. EDI is synonymous with Electronic Data Exchange.

ENTERPRISE RESOURCE PLANNING (ERP): The integrated management of key business processes, frequently in real-time and mediated by software and technology.

ENVIRONMENT, SAFETY, AND OCCUPATIONAL HEALTH (ESOH): The combination of disciplines that encompasses the processes and approaches for addressing laws, regulations, Executive Orders, customer policies, environmental compliance, and hazards associated with environmental impacts, system safety (e.g., platforms, systems, system-of-systems, weapons, explosives, software, ordnance, combat systems), occupational safety and health, hazardous materials management, and pollution prevention. DoD customers please refer to MIL-STD-882.

FACILITIES: The permanent, semi-permanent, or temporary real property assets required to operate, support, and sustain the new or modified product.

FAILURE MODES AND EFFECTS ANALYSIS (FMEA): The procedure by which each potential failure mode defined for the product is analyzed to determine its effects on the product.

FAILURE MODES, EFFECTS, AND CRITICALITY ANALYSIS (FMECA): The procedure by which each potential failure mode is analyzed to determine its effects on the product and then classified according to its severity.

FAILURE REPORTING, ANALYSIS, AND CORRECTIVE ACTION SYSTEM (FRACAS): A closed loop failure reporting, analysis, and corrective action system where failures and faults of both hardware and software are formally reported, analysis is performed to the extent such that the failure cause is understood, and positive corrective actions are identified, implemented, and verified to prevent further recurrence of the failure.

FAULT TREE ANALYSIS (FTA): A top-down model that graphically depicts all known events or combinations of events that can occur regarding a specific undesirable event (i.e., a failure).

HUMAN SYSTEMS INTEGRATION (HSI): A comprehensive management and technical approach applied to systems development and integration as part of a wider Systems Engineering process to ensure that human performance is optimized to increase total system performance and minimize the total system ownership cost. HSI efforts accomplish this by ensuring that the human is fully and continuously considered as part of the total system in the development and acquisition of all systems. HSI considerations comprise Human Factors Engineering, Safety and Occupational Health, Habitability, Force Protection and Survivability, Manpower, Personnel, and Training. Refer to SAE6906 Best Practice Standard for Human Systems Integration for more information.

INTEGRATED DATA ENVIRONMENT FOR PRODUCT SUPPORT (IDE-PS): A common information technology environment that integrates product support data, computer software, and processes throughout a product life cycle.

INTEGRATED PRODUCT/PROCESS TEAM (IPT): A team composed of representatives from multiple functional disciplines which develops and follows an integrated process for a particular product.

INTEGRATED PRODUCT SUPPORT (IPS) ELEMENTS: Those critical functions related to product readiness including, but not limited to, materiel management, distribution, technical data management, maintenance, training, cataloging, configuration management, engineering support, repair parts management, failure reporting and analysis, reliability growth tracking, and the logistics components (e.g., support equipment, spares) required to accomplish the functions. All of the IPS elements shall be considered during the development of the Product Support (PS) strategy. The IPS elements consist of the following: Product Support Management; Supply Support; Packaging, Handling, Storage & Transportation; Maintenance Planning & Management; Design Interface; Sustaining Engineering; Technical Data; IT Systems Continuous Support; Facilities & Infrastructure; Manpower & Personnel; Support Equipment; and Training & Training Support.

INTELLECTUAL PROPERTY (IP): A work or invention that is the result of creativity that has commercial value, and to which one has rights. IP includes inventions, trademarks, patents, industrial designs, copyrights, data rights, intellectual property, and technical information including software, data designs, technical expertise, manufacturing information and expertise, techniques, Technical Data Packages, manufacturing data packages, and trade secrets.

INTERIM SUPPORT ITEMS CONFERENCE: A conference in which the customer reviews, selects, and approves the items recommended by the contractor for use in interim contractor support. The primary purpose of this conference is to establish the cost effectiveness of procuring the items prior to the time provisioning for operational requirements has been accomplished and a provisioned item order (PIO) has been provided.

INTEROPERABILITY: The ability of products, units, or organizations to provide information or services to and accept the same from other products, units, or organizations and to use the shared information or services to enable them to operate effectively together.

LEVEL OF REPAIR ANALYSIS (LORA): An analytical methodology used to assist in developing maintenance concepts, influencing design, and establishing the maintenance level at which components will be replaced, repaired, or discarded based on economic constraints, non-economic constraints, and operational readiness requirements.

LIFE CYCLE COST (LCC): Life Cycle Cost consists of Research and Development (R&D) costs, investment costs, Operating and Support (O&S) costs, and disposal costs over the entire life cycle.

LIFE CYCLE MANAGEMENT (LCM): A management process applied throughout the life of a product that bases all programmatic decisions on the anticipated usage and economic benefits derived over the life of the product.

LOGISTICS PRODUCT DATA (LPD): That portion of Product Support Analysis (PSA) documentation consisting of detailed data pertaining to the system and equipment design characteristics, including failure modes, reliability and maintainability, maintenance, supply support, human factors, PHS&T, and ESOH which contributes to the identification of the required Product Support resources and sustainment requirements of the products.

LONG LEAD TIME ITEMS PROVISIONING CONFERENCE: A conference for the customer personnel to review and select the long lead time items required for support of the product.

MAINTAINABILITY: The design characteristics that determine the ability of a product to be retained in, or restored to, a specified condition when maintenance is performed by personnel having specified skill levels, using prescribed procedures and resources at each prescribed level of maintenance and repair.

MAINTENANCE LEVELS: The basic levels of maintenance into which all maintenance activity is divided.

MAINTENANCE PLANNING: The process conducted to evolve and establish maintenance/support concepts and requirements for the life cycle of a product.

MANPOWER: A quantitative term referring to the amount of people or amount of time required by a person or persons to perform an identified task, i.e., 20 personnel to operate and maintain a product, 100 man-hours to accomplish an inspection.

MANPOWER AND PERSONNEL: A term used to identify the amount of personnel resources and their specialized capability and experience required to operate, maintain, and support a product over its expected life cycle.

MANPOWER AND PERSONNEL ANALYSIS: The process of reviewing job content and context as it pertains to an emerging product design to classify units of work (duties, or primary skills, and tasks, or discrete skills) within a job, and not to acquire the required qualified personnel to operate and support a product over its lifetime in the defined operational environment.

MATERIAL: Elements, constituents, or substances from which something is composed or can be made. Not to be confused with “materiel.”

MATERIEL: Equipment, apparatus, and supplies used by an organization or institution. Not to be confused with “material.”

MOBILITY: A term used by military forces to describe the timely movement, positioning, and sustainment of personnel, materiel and forces to, from, or within a theater of operations.

NON-OPERATING RELIABILITY: The reliability of a system after taking the effects of expected dormancy and/or storage into account.

OPERATING AND SUPPORT (O&S) COSTS: The cost of operation, maintenance, manpower, infrastructure, and follow-on product support of the product and its associated support systems.

OPERATIONAL CONCEPT: A general description of the way in which an entity is used or operates.

OPERATIONAL ENVIRONMENT: An environment that addresses all operational requirements and specifications required of the final product, to include its platform and packaging. May include factors such as physical environment, operational or nonoperating use, operational scenarios, EMI/EMC, ESD, compatibility issues, interoperability issues, and geographical location.

OPERATIONAL RELIABILITY: A measure of the system's or product's performance during the item's operational life that includes the combined effect of the item's design, installation, quality, environment, operation, maintenance, and repair.

OPERATIONAL SCENARIO: A description of a sequence of events that includes the interaction of the product with its environment in accordance with an operational concept.

PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION (PHS&T): The resources, processes, procedures, design considerations, and methods to ensure that all product, equipment, and support items are preserved, packaged, handled, and transported properly including environmental considerations and preservation requirements for short and long term storage, and transportability.

PERFORMANCE MEASUREMENT FRAMEWORK: A consistent approach for systematically collecting, analyzing, utilizing, and reporting on the performance of a product.

PERFORMANCE SUPPORT: Interventions delivered in the context of performance of a target activity designed to promote successful completion of the target activity. Performance Support focuses on work itself while training focuses on the knowledge, skills, and attitudes required to do the work. Performance Support methods include Job Aids, Interactive Electronic Technical Manuals, Augmented Reality, and Tutors.

PERSONNEL: Individuals, identified by specialty or classification, skill, skill level, and grade, rate, or position, required to satisfy the manpower demand associated with a product.

PREVENTIVE MAINTENANCE: All actions performed in an attempt to retain a product in specified condition by providing systematic inspection, detection, and prevention of incipient failures.

PRODUCT: The result of Research, Development, Test, and Evaluation (RDT&E) in terms of hardware or software being produced or manufactured, also known as an end item. In addition, a product is the item stipulated in a contract to be delivered under the contract (i.e., service, study, or hardware).

PRODUCT READINESS: A measure or measures of the ability of a product to undertake and support its designed function over its lifetime operational environment.

PRODUCT SUPPORT (PS): A unified and iterative approach to the management and technical activities needed to influence operational and materiel requirements and design specifications, define the support requirements best related to product design and to each other, develop and acquire the required support, provide required operational support at lowest cost of ownership, improve readiness and Life Cycle Cost (LCC) in the product and support systems during the operational life cycle, and repeatedly examine support requirements throughout the service life of the product.

PRODUCT SUPPORT ANALYSIS (PSA): The selective application of scientific, engineering, and logistics assessment activities undertaken throughout the life cycle, as part of the system engineering design and sustainment process.

PRODUCT SUPPORT ANALYSIS DOCUMENTATION: All data (reports, files, regulatory compliance, etc.) resulting from performance of PSA activities conducted under this standard.

PRODUCT SUPPORT ANALYSIS GUIDANCE CONFERENCE: A conference used to ensure that the contractor and the customer have a firm and common understanding of the relationship of the PSA activities to the PSA documentation, milestones, and funding levels contractually required. The provisioning guidance conference may be held in conjunction with or as a part of the PSA guidance conference if the provisioning activity agrees.

PRODUCT SUPPORT ANALYSIS PLAN (PSAP): A document which identifies and integrates all Product Support Analysis activities, identifies management responsibilities, and outlines the approach toward accomplishing PSA activities to meet program requirements.

PRODUCT SUPPORTABILITY BASELINE (PSB): The agreed and approved set of Product Support Analysis (PSA) documentation, subject to configuration control and data management, and continuously updated throughout the product's life cycle based on accepted design and support changes.

PRODUCT SUPPORT STRATEGY (PSS): The PSS outlines the execution of the support package and will describe sustainment requirements in system design and the technical, business, and management activities to develop, implement, and deliver a support package that achieves effective and affordable operational materiel readiness outcomes.

PROGNOSTICS AND HEALTH MANAGEMENT (PHM): The engineering discipline associated with the design and use of monitoring capabilities on a system, and the analysis of the data thereof, to make informed decisions regarding the management of maintenance actions that must be performed on the product.

PROVISIONED ITEM ORDER (PIO): A formal requirements document furnished to the contract administration activity to identify items to be bought through the provisioning process on a contract, providing the specific items to be ordered, the estimated cost, and the required delivery schedule and destination.

PROVISIONING: The process of determining and acquiring the range and quantity (also called "depth") of spares and repair parts, and support and test equipment required to operate and maintain a product of materiel for an initial period of service.

PROVISIONING CONFERENCE: A conference for reviewing provisioning technical data and related engineering data for provisioning, customer validation of support items, and the assignment of technical and management codes made during the PSA process, when specified by the provisioning activity analyst. Existing drawings and provisioning and technical data are reviewed and requirements for revisions to data scope are determined. The PSA is the analytical source from which the provisioning decisions are made.

PROVISIONING GUIDANCE CONFERENCE: After contract award, a provisioning guidance conference is conducted. Normally the provisioning guidance conference is required within 90 days after production contract award for all major acquisitions and any nonmajor programs that require provisioning technical data. The program manager, the contracting officer, the provisioning activity, and all personnel who will prepare provisioning documentation must attend. The focus must be to ensure an understanding of the contract provisioning requirements and responsibilities among program team members. It should include discussions on maintenance concepts, provisioning techniques, level of detail, item identification, design changes, and provisioning technical data delivery schedules. Attendees should review the contract requirements and prepare to present any provisioning requirement questions and recommendations.

PROVISIONING PREPAREDNESS REVIEW CONFERENCE: This conference is held for the customer to determine the adequacy of the provisioning documentation, facilities, and the overall preparations made by the contractor to conduct a provisioning conference.

READINESS DRIVERS: Those product characteristics which have the largest effect on a product's readiness values.

RECOVERABILITY: The ability to restore and maintain a product's functionality after sustaining damage. Recoverability is considered a subset of survivability.

RELIABILITY: Reliability is the ability/probability of failure free performance of the system/product, over the expected service use profile and environmental conditions over a given period of time. Reliability is expressed in terms of operational reliability and non-operating reliability.

RELIABILITY CENTERED MAINTENANCE (RCM): A logical, structured process used to determine the optimal failure management strategies for any product based upon product reliability characteristics and the intended operating context.

REPAIR PARTS: Individual non-repairable parts or non-repairable subassemblies required for the repair of spares or major products.

RESEARCH & DEVELOPMENT (R&D): Includes all scientific study and experimentation directed toward increasing knowledge and understanding in the fields of the physical, engineering, environmental, and life sciences.

RESEARCH & DEVELOPMENT (R&D) COSTS: Those costs primarily associated with R&D efforts including the development of a new or improved capability to the point where it is appropriate for operational use.

RESEARCH, DEVELOPMENT, TEST, AND EVALUATION (RDT&E): Activities for the development of a new product or to expand the performance of established products.

RISK: A future event or condition that may have a negative effect on achieving program objectives for cost and/or schedule and/or performance. Also, a measure of future uncertainty.

SENSITIVITY ANALYSIS: An analysis concerned with determining the amount by which model parameter estimates can be in error before the generated decision alternative will no longer be superior to others.

SPARES: Repairable items within a product architecture that are an integral part of the product.

STANDARDIZATION: The process by which members achieve the closest practicable cooperation—the most efficient use of research, development, and production resources—and agree to adopt on the broadest possible basis the use of (1) common or compatible operational, administrative, and logistics procedures; (2) common or compatible technical procedures and criteria; (3) common, compatible, or interchangeable supplies, components, or equipment; and (4) common or compatible doctrine with corresponding organizational compatibility.

SUITABILITY: The degree to which a system can be satisfactorily placed in use with consideration to a composite of support considerations. Suitability comprises performance and supportability.

SUPPLY SUPPORT: The process conducted to determine, acquire, catalog, receive, store, transfer, issue, replenish, and dispose of secondary items necessary for the support of products and support items.

SUPPORT CONCEPT: A complete system level description of a support system that meets the functional support requirements and is in harmony with the design, maintenance, and operational concepts.

SUPPORT EQUIPMENT: All equipment and tools (mobile or fixed), not integral to a product, but required to support its operation and maintenance.

SUPPORT ITEMS: Items subordinate to, or associated with, a product (i.e., spares, repair parts, tools, support and test equipment, and sundry materials) and required to operate, service, repair, or overhaul a product.

SUPPORT PLAN: A detailed description of a support system covering each element of PS and having consistency between the elements of PS.

SUPPORT RESOURCES: The materiel, infrastructure, and personnel elements required to operate and maintain a product to meet readiness and supportability requirements.

SUPPORT SOLUTION: The integrated design and coherent support provided throughout the life cycle of a system that is realized in its integrated support system and the associated technical data. The support solution comprises the sum of the services, resources, and information required to effectively support the equipment throughout its in-service life.

SUPPORT SYSTEM: A composite of all the services and resources that shall be acquired for operating and maintaining a product throughout its life cycle.

SUPPORTABILITY: A key component of availability and suitability. It includes design, technical support data, and maintenance procedures to facilitate detection, isolation, and timely repair and/or replacement of product anomalies.

SUPPORTABILITY ASSESSMENT: An evaluation of how well the composite of support considerations necessary to achieve the effective and economical support of a product for its life cycle meets stated quantitative and qualitative requirements.

SUPPORTABILITY FACTORS: Qualitative and quantitative indicators of supportability.

SUPPORTABILITY-RELATED DESIGN FACTORS: Those supportability factors which include only the effects of a product's design. Examples include reliability and maintainability values, testability values, and transportability characteristics.

SURVIVABILITY: The capability of a system or its crew to avoid or withstand a manmade hostile environment without suffering an abortive impairment of its ability to accomplish its designated mission.

SUSCEPTIBILITY: The degree to which a device, equipment, or weapon system is open to effective attack as a result of one or more inherent weaknesses. Susceptibility is a function of operational tactics, countermeasures, probability of enemy fielding a threat, etc. Susceptibility is considered a subset of survivability.

SYSTEM OPERATIONAL EFFECTIVENESS: A measure of the degree to which a system achieves a set of mission requirements regarded as the product of three factors: Readiness, reliability, and capability.

SYSTEM ENGINEERING PROCESS: A logical sequence of activities and decisions transforming an operational need into a description of product performance parameters and a preferred product configuration.

TASK ANALYSIS: The process that is initiated when a maintenance action is prescribed to include both preventive and corrective maintenance actions. It identifies maintainer steps, sub-steps, and resources required to include spares, materials, tools (common and peculiar), spares, support equipment, and facility requirements. This process also identifies personnel skill designation(s), manpower requirements, and estimates of time to complete the required steps.

TASK INVENTORY: A comprehensive listing of all tasks performed by personnel to operate and maintain the product.

TECHNICAL DATA: Recorded information regardless of form or character (e.g., manuals, drawings) of a scientific or technical nature.

TESTABILITY: A design characteristic that allows the status (operable, inoperable, or degraded) of a product and the location of any faults within the product to be confidently determined in a timely fashion.

THRESHOLD: The threshold value for an attribute is the minimum acceptable value considered achievable within the available cost, schedule, and technology at low-to-moderate risk.

TRADEOFF: The determination of the optimum balance between product characteristics. Cost, schedule, performance, and supportability are the most relevant characteristics for product support considerations.

TRAINING: The structured process by which individuals are provided with the skills necessary for successful performance in their job, slot, billet, or specialty.

TRANSPORTABILITY: The design characteristics determining the inherent capability to move materiel to specified locations with available and projected transportation assets to meet planned delivery schedules and/or mobility plans. It includes consideration of the limitations and restrictions of the transportation assets and modes in conjunction with the required product equipment and support items required to enable the movement of the materiel.

VULNERABILITY: The characteristics of a system that cause it to suffer a definite degradation (loss or reduction of capability to perform the designated mission) as a result of having been subjected to a certain (defined) level of effects in an unnatural (man-made) hostile environment. Vulnerability is considered a subset of survivability.

2.4 Acronyms

3-D	Three-Dimensional
BCS	Baseline Comparison System
BIT	Built-in-Test
CE	Collaborative Environment
CLS	Contractor Logistics Support
DAPS	Document Automation and Production Service
DEVSECOPS	Development/Security/Operations
DMSMS	Diminishing Manufacturing Sources and Material Shortages
DoD	United States Department of Defense
EC	Engineering Change
EDE	Electronic Data Exchange
EDFP	Engineering Data for Provisioning
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
ESOH	Environment, Safety, and Occupational Health
FMEA	Failure Modes and Effects Analysis
FMECA	Failure Modes, Effects, and Criticality Analysis
FRACAS	Failure Reporting, Analysis and Corrective Action System
FTA	Fault Tree Analysis
GIDEP	Government-Industry Data Exchange Program
HSI	Human Systems Integration
IDE-PS	Integrated Data Environment for Product Support
IP	Intellectual Property
IPS	Integrated Product Support
IPT	Integrated Product/Process Team
KPP	Key Performance Parameter
LCLS	Life Cycle Logistics Supportability Committee
LCC	Life Cycle Cost
LCM	Life Cycle Management
LORA	Level of Repair Analysis
LPD	Logistics Product Data

O&M	Operations and Maintenance
O&S	Operating and Support
PHS&T	Packaging, Handling, Storage, and Transportation
PHM	Prognostics & Health Management
PIO	Provisioned Item Order
POL	Petroleum, Oil, and Lubricants
PS	Product Support
PSA	Product Support Analysis
PSAP	Product Support Analysis Plan
PSB	Product Supportability Baseline
PSP	Product Support Package
PSS	Product Support Strategy
RCM	Reliability Centered Maintenance
R&D	Research & Development
R&M	Reliability and Maintainability
RDT&E	Research, Development, Test and Evaluation
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
RoHS	Restriction of Hazardous Substances
SLCM	System Life Cycle Management
SOE	System Operational Effectiveness
T&E	Test and Evaluation
TES	Test and Evaluation Strategy
XML	Extensible Markup Language

3. GENERAL REQUIREMENTS

3.1 Product Support Analysis Program

An effective PSA program shall be established and maintained as part of the System Life Cycle Management (SLCM) program. It shall be planned, integrated, developed, and conducted in conjunction with other requirements definition, design, development, production, deployment, operations and sustainment functions to achieve overall program objectives cost effectively. The PSA program shall be established in a manner consistent with the type and phase of the acquisition and sustainment program, and procedures shall be established to ensure that the PSA program is an integral part of the system engineering and logistics product resources development and sustainment processes. Interfaces between the PSA program and other system engineering and logistics sustainment programs shall be identified. The PSA program shall include the management and technical resources, plans, procedures, schedules, and controls for the performance of PSA requirements throughout the life cycle of the system or product.

3.1.1 Program Interfaces and Coordination

Maximum use of analyses and data resulting from requirements of other system engineering programs to satisfy PSA input requirements shall be made. PSA 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 product support resource planning, design tradeoff study inputs, and PSA documentation preparation.

3.1.2 Product Support Analysis Process

A systematic and comprehensive set of analyses shall be conducted on an iterative basis through all phases of the product life cycle to satisfy supportability objectives. The level of detail of the analyses and the timing of activity performance shall be tailored to each product. The tailoring shall be done with respect to program budget, schedule, and milestone constraints.

3.2 Quantitative Requirements

Quantitative supportability and supportability-related design requirements for the product shall be included in appropriate sections of the product specifications, other requirements documents, or contracts, as appropriate. Sub-tier values not established by the customer shall be established by the contractor to achieve affordable System Operational Effectiveness (SOE). Requirements shall be defined in terms related to operational availability, materiel availability, reliability, ownership costs, or mean down time.

3.3 Management, Surveillance, and Control

Management procedures shall be established to ensure continuing assessment of analysis results and to allow for product design and PSA program adjustments as required. Feedback and corrective action procedures shall be established which include controls to ensure that deficiencies are documented and corrected. Assessments, validations, and verifications shall be conducted throughout the product life cycle to demonstrate, within stated confidence levels, the validity of the analyses performed and the products developed from the analyses. The analysis results and products shall be adjusted as applicable.

3.4 Product Support Analysis Documentation

PSA documentation shall consist of all data resulting from analysis activities conducted under this standard and shall be the primary source of validated, integrated design-related supportability data throughout the product's life cycle. PSA documentation shall be developed and maintained commensurate with design, redesign, support, and operational concept development, and shall be updated to reflect changes or availability of more extensive information based on testing, configuration changes, operational concept changes, and support concept changes during the product's entire life cycle.

Accumulated PSA documentation shall provide an audit trail of supportability and supportability-related design analyses and decisions, and shall be the basis for actions and documents related to manpower and personnel requirements, training programs, provisioning, maintenance planning, resources allocation, funding decisions, and other product support resource requirements. Configuration control procedures shall be established over PSA documentation updates to ensure proper coordination among other system engineering programs, the PSA program, and the development of other documents using PSA data.