ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

1810.6

11/13/92

SUBJ: POLICY FOR USE OF NONDEVELOPMENTAL ITEMS (NDI) IN FAA ACQUISITIONS

1. PURPOSE. This order establishes the requirements for consideration of Nondevelopmental Items (NDI) in all acquisitions to meet Federal Aviation Administration (FAA) requirements.

2. DISTRIBUTION. This order is distributed to the branch level in Washington and the FAA Technical Center, the division level in regions with a branch-level distribution in the regional Airway Facilities Divisions, and the branch level at the FAA Academy and the FAA Logistics Center at the Aeronautical Center.

3. DEFINITIONS.

a. Nondevelopmental Item. A nondevelopmental item is any:

(1) Item available as a commercial product.

(2) Previously developed item in use by a Federal, state, or local Government agency of the U.S. or a foreign government.

b. Commercial Product. Commercial product means a product, such as an item, material, component, subsystem, or system, sold or traded to the general public in the course of normal business operations at prices based on established catalog or market prices.

(1) Prototypes, models, or experimental production runs generally do not qualify.

(2) It may be appropriate to make provisions for products currently in production, without sales history, that are improved versions of items previously sold.

4. POLICY. Requirements shall be satisfied to the maximum extent through the use of NDI when such products will meet the user's needs and are cost-effective over the entire life cycle of the item and are readily available without developmental cost. Even when NDI products do not meet all of the stated requirements, NDI shall be considered. Generally, on high dollar programs, decisions on when to use NDI will be approved by the Acquisition Review Committee as part of the program approval process.

Distribution: A-WZ-3; Z-X(minus AF)-2; A-X(AF)-3; A-Y(AY/DE)-3 Initiated By: ACQ-1

5. CONFLICTS WITH OTHER FAA DOCUMENTS. Should this order conflict with other FAA policies, specifications, standards, or other current FAA documents when planning to acquire NDI, the conflict should be immediately raised to the appropriate Associate Administrator for resolution and appropriate waivers initiated.

6. RESPONSIBILITIES. This paragraph contains the organizational responsibilities for use of NDI in FAA acquisitions.

a. The Executive Director for System Development (AXD) ensures compliance with the NDI policy.

b. The Associate Administrator for NAS Development (AND):

(1) Ensures that the program manager and his/her matrix team conduct market surveillance and perform a market investigation to ensure that the Government considers NDI options for new acquisitions. The requirements originator(s) should participate.

(2) Ensures, through the program manager, that all requirements not met are resolved with the originator prior to initiating procurement action.

(3) Determines item/system/subsystem economic life cycle and estimates total life-cycle costs based on market investigation in conjunction with other organizations such as ANS, ASM, NAS System Engineering Service (ASE), and the Operations Research Service (AOR).

c. The Associate Administrator for System Engineering and Development (ASD):

(1) Ensures that the program manager and his/her matrix team conduct market surveillance and perform a market investigation to ensure that the Government considers NDI options for new acquisitions. The requirements originator(s) should participate.

(2) Ensures, through the program manager, that all requirements not met are resolved with the originator prior to initiating procurement action.

(3) Determines item/system/subsystem economic life cycle and estimates total life-cycle costs based on market investigation in conjunction with other organizations such as ANS, ASM, AND, ASE, and AOR.

(4) Supports requiring offices through the conduct of mission needs analysis.

d. NAS System Engineering Service (ASE):

(1) Identifies projected need by analysis of NDI operational performance data and supportability data. Identifies opportunities to perform more effectively the assigned mission. Develops requirements for item/system/subsystem upgrade or replacement prior to time the economic life cycle has been reached and the time which the item/system/subsystem will no longer be supportable. Coordinates input to the Capital Investment Plan (CIP).

(2) Performs comparative analysis on the functional, performance, and physical characteristics of documented NDI equipment to determine if the FAA requirements not met are essential to the mission.

(3) Provides assistance and guidance concerning configuration control issues pertaining to NDI hardware and software as requested.

(4) Determines that when NDI meet most but not all of the stated requirements, ASE will be responsible for identifying these differences to the program manager and to the requirements originator and identifying variances from standards, specifications, or requirements that are not met.

(5) Ensures that procurement of NDI that do not meet initially stated requirements shall be with concurrence of the user/maintenance organizations.

(6) Identifies any interface problems that might occur between the NDI and NAS equipment.

e. The Associate Administrator for Airway Facilities (AAF):

(1) Approves waivers to standard/specification requirements applicable to supportability requirements.

(2) Initiates timely action through the CIP process for item/system/subsystem upgrades or replacement in sufficient time to ensure mission capability is maintained prior to the time the economic life cycle of the NDI has been reached.

(3) Makes the deployment determination as chairman of the Deployment Readiness Review (DRR) Executive Committee for all item/system/subsystem/software entering the National Airspace System (NAS).

f. The Systems Maintenance Service (ASM):

(1) Identifies projected need by analysis of NDI operational performance data and supportability data. Develops requirements for item/system/subsystem upgrade or replacement prior to time the economic life cycle has been reached and the time which the item/system/subsystem will no longer be supportable. Coordinates input to the CIP.

(2) Monitors system support to ensure life cycle supportability for item/system/subsystem is consistent with the support strategy defined for NDI.

(3) Develops maintenance requirements for all NAS items/ systems/subsystems.

(4) Participates in the market surveillance/investigation process to ensure user requirements are adequately satisfied.

g. The NAS Transition and Implementation Service (ANS):

(1) Ensures logistics system requirements are included in NDI acquisitions.

(2) Monitors subsystem acquisition throughout the acquisition cycle to ensure that agency supportability and maintainability requirements have been satisfied.

(3) Participates with the program manager and his/her team to conduct market surveillance and perform a market investigation to ensure that the Government considers NDI options for new acquisitions. In addition to the normal matrix management team, the requirements originator(s) should participate.

(4) Ensures, through the program manager, that all requirements not met are resolved with the originator prior to initiating procurement action.

(5) Determines item/system/subsystem economic life cycle and estimates total life-cycle cost based on market investigation in conjunction with other organizations such as ASM, ASE, and AOR.

(6) Initiates timely action through the CIP process for item/system/subsystem upgrades or replacement in sufficient time to ensure mission capability is maintained prior to the time the economic life cycle of the NDI has been reached.

h. The Operational Support Service (AOS):

(1) Identifies projected need by analysis of NDI operational performance data and supportability data. Develops requirements for item/system/subsystem upgrade or replacement prior to time the economic life cycle has been reached and the time which the item/system/subsystem will no longer be supportable. Coordinates input to the CIP.

(2) Ensures that second level engineering support capabilities are provided for the item/system/subsystem life cycle. In unique situations, the purchase of commercially available data or specially developed supplemental data may be required.

(3) Ensures shakedown testing is accomplished.

i. The Regional Airway Facilities Divisions:

(1) Provide Systems Maintenance Service with status of the item/system/subsystem in accordance with contractual requirements.

(2) Advise the Systems Maintenance Service, the NAS Transition and Implementation Service, the FAA Academy, and the FAA Logistics Center at the Aeronautical Center of maintenance and supply support issues as they pertain to resupply and supportability.

j. The Associate Administrator for Air Traffic (AAT):

(1) Initiates the need for new system functionality. Initiates need requests through the CIP process.

(2) Participates as appropriate in the market surveillance/investigation process to ensure user requirements are adequately satisfied.

k. The Associate Administrator for Aviation Standards (AVS) and other FAA users:

(1) Identify projected need by analysis of NDI operational performance data and supportability data. Develops requirements for item/system/subsystem upgrade or replacement prior to time the economic life cycle has been reached and the time which the item/system/subsystem will no longer be supportable. Coordinates input to the CIP.

(2) Participate, as appropriate, in the market surveillance/investigation process to ensure user requirements are adequately satisfied.

l. The Associate Administrator for Regulation and Certification (AVR):

(1) Identifies projected need by analysis of NDI operational performance data and supportability data. Develops requirements for item/system/subsystem upgrade or replacement prior to time the economic life cycle has been reached and the time which the item/system/subsystem will no longer be supportable. Coordinates input to the CIP.

(2) Participates, as appropriate, in the market surveillance/investigation process to ensure user requirements are adequately satisfied.

m. The Mike Monroney Aeronautical Center:

(1) The FAA Logistics Center:

(a) Ensures systems supportability for the item/system/subsystem life cycle consistent with the support strategy defined in the Integrated Logistics Support Plan (ILSP) for each NDI.

(b) Advises the Systems Maintenance Service of commercial vendor support issues that adversely affect field maintenance.

(c) Ensures that the NAS Transition and Implementation Service, the Systems Maintenance Service, and other program services are advised of commercial repair source supportability issues as they occur.

(d) Provides support services as required during the market surveillance/investigation.

(2) The FAA Academy:

(a) Ensures that training capabilities are consistent with the determined life cycle and support strategy as defined in the ILSP.

(b) Provides its assessment of contractor training based upon information contained in the market surveillance and investigation analysis.

(c) Coordinates recommendations as a result of the assessment of contractor training with the Office of Training and Higher Education (AHT).

n. The FAA Technical Center provides an Associate Program Manager for Test (APMT), who manages and is responsible for the implementation of the entire test program. The APMT will conduct Operational Test and Evaluation (OT&E)/integration and operational testing, and ASM will conduct OT&E/shakedown. In addition, the APMT:

(1) Provides advice/direction concerning NDI test requirements.

(2) Participates in the market analysis/survey.

(3) Establishes the overall test schedule.

(4) Coordinates tests.

(5) Ensures that all test requirements are satisfied and the tests are performed in accordance with approved test procedures.

(6) Provides test and evaluation assessments to support the DRR.

(7) Develops test plans which are reflective of and suitable for NDI acquisitions.

o. The Assistant Administrator of Human Resource Management (AHR):

(1) Participates in the market surveillance/investigation process to ensure training requirements are adequately satisfied.

(2) Approves all waivers to standards and/or specifications requirements applicable to technical training.

(3) Provides program managers with training programs cost data based on the service's requirements.

(4) Provides guidance to the FAA Academy on implementation of training programs.

p. The Director of Independent Operational Test and Evaluation Oversight (IOT&E), (ATQ) is responsible for the identification and assessment of operational suitability and effectiveness for all programs designated for oversight by the DOT or FAA Acquisition Executive. As a member of the Acquisition Review Committee and the Test Policy Review Committee for programs designated for IOT&E Oversight, the Director ensures that NDI operational effectiveness and suitability issues are properly addressed, both programmatically and in testing.

7. PROCEDURES.

a. Requirements. Requirements shall be stated in terms of required function, performance, and/or physical characteristics in sufficient detail so that market investigation can be performed. A market investigation will be conducted as outlined in Appendix 3, Department of Defense Pamphlet SD-2, "Buying NDI." The pamphlet contains guidance in sufficient detail so that it can also be used when preparing specifications or other solicitation documents. The market investigation shall contain adequate detail so that it can be used to help determine whether NDI, including logistics support and interface requirements, is available and that it meets the agency's needs.

(1) Non-government standards (e.g., Institute of Electrical & Electronics Engineers, American National Standards Institute) and commercial item descriptions will be used in preference to Federal and military specifications and standards whenever practicable, and appropriate tailoring techniques will be applied to specify only what FAA needs.

(2) Market surveillance and investigation shall be conducted in conjunction with developing requirements to determine the suitability and market availability prior to the commencement of an acquisition. Prior to the release of a Request For Proposal, vendors may conduct an informal demonstration of NDI equipment. Such demonstrations may be at no cost to the Government. An operational capability demonstration of item suitability shall be conducted as part of the source selection process when necessary.

(3) NDI should not be modified unless absolutely necessary. Modification causes the item to become a unique Government item which may be difficult to support. In those instances where modifications are necessary to meet mission requirements, modifications should be allowed only after the sponsor, the program office, and the maintenance and supporting organizations reach a coordinated decision that the best approach is to modify an existing commercial item. Appendix 2, Modifications: Can the FAA Tolerate the Risk?, explains the risks in modification. Modification may result in the item loosing its identity as NDI.

b. Suitability. NDI shall be evaluated for operational use by considering all aspects of the items' suitability for the intended purpose. Critical NAS item/system/subsystem/firmware/hardware/software shall require more thorough testing and documentation when considering suitability for NAS.

(1) Suitability criteria shall include technical performance, safety, human factors, ease of use, reliability, maintainability, availability, interoperability, logistics support, including training and documentation, expected operational environment, and intended life-cycle cost. Operation, maintenance, and logistics support risks will be evaluated to determine acceptability.

(2) Commercial software/firmware upgrade issues shall also be considered with system hardware product improvement issues, since licensing fees and software maintenance represent a major cost to the system life cycle.

(3) NDI acquisitions that are intended to operate in the same environment for which designed should lead to more reliance on market surveillance and investigation, item history, and existing test data in order to verify suitability. However, NDI requiring modification or which are intended to operate in a different environment than originally designed shall require additional operational testing in order to verify performance, operational effectiveness, and suitability. Representatives from FAA testing organizations, under the leadership of the APMT, and with concurrence of the program manager, shall determine which FAA test requirements were satisfied through vendor demonstrations/test data and what additional testing is required.

(4) Programs using commercial systems or equipment will make maximum use of existing commercial logistics support and data. Development of new organic logistics support will be based on critical mission need and/or cost savings.

(5) Existing logistics support procedures may be modified to allow for maximum use of NDI. This may involve innovative logistics and training concepts to support accelerated deployment schedules and require acquisition techniques such as life-of-type buy, warranties, life-cycle spares buy, and rights in data escrow. The use of these techniques and concepts, where cost effective, is preferred to developmental efforts.

c. Acquisition Strategy. The acquisition strategy shall be tailored to the extent practicable to employ commercial practices when purchasing commercial products or other nondevelopmental items. This strategy involves:

(1) Seeking the greatest benefit in terms of overall cost, product quality, reliability, availability, maintainability, rights in technical data, timeliness of delivery, and supportability (past performance should be a significant factor in making such determinations).

(2) Accepting commercial operational, maintenance, training, and safety data and commercial logistics support that meets FAA requirements, consistent with the user's operational and logistics needs.

(3) Using commercial marking, preservation, and packaging to the maximum extent consistent with user needs.

(4) Using commercial warranties, including extended warranties, where appropriate.

(5) Using original equipment manufacturer's item upgrades.

(6) Considering the option of leasing NDI equipment which includes supply support.

d. Planning and Budgeting.

(1) When a decision is made to use NDI, an economic life cycle shall be determined at that time and a CIP update or new project shall be developed for system replacement by the ASD, AAF, the AAT, or other requirements organization.

(2) Budget items shall provide for planned product improvement and funding for logistics support.

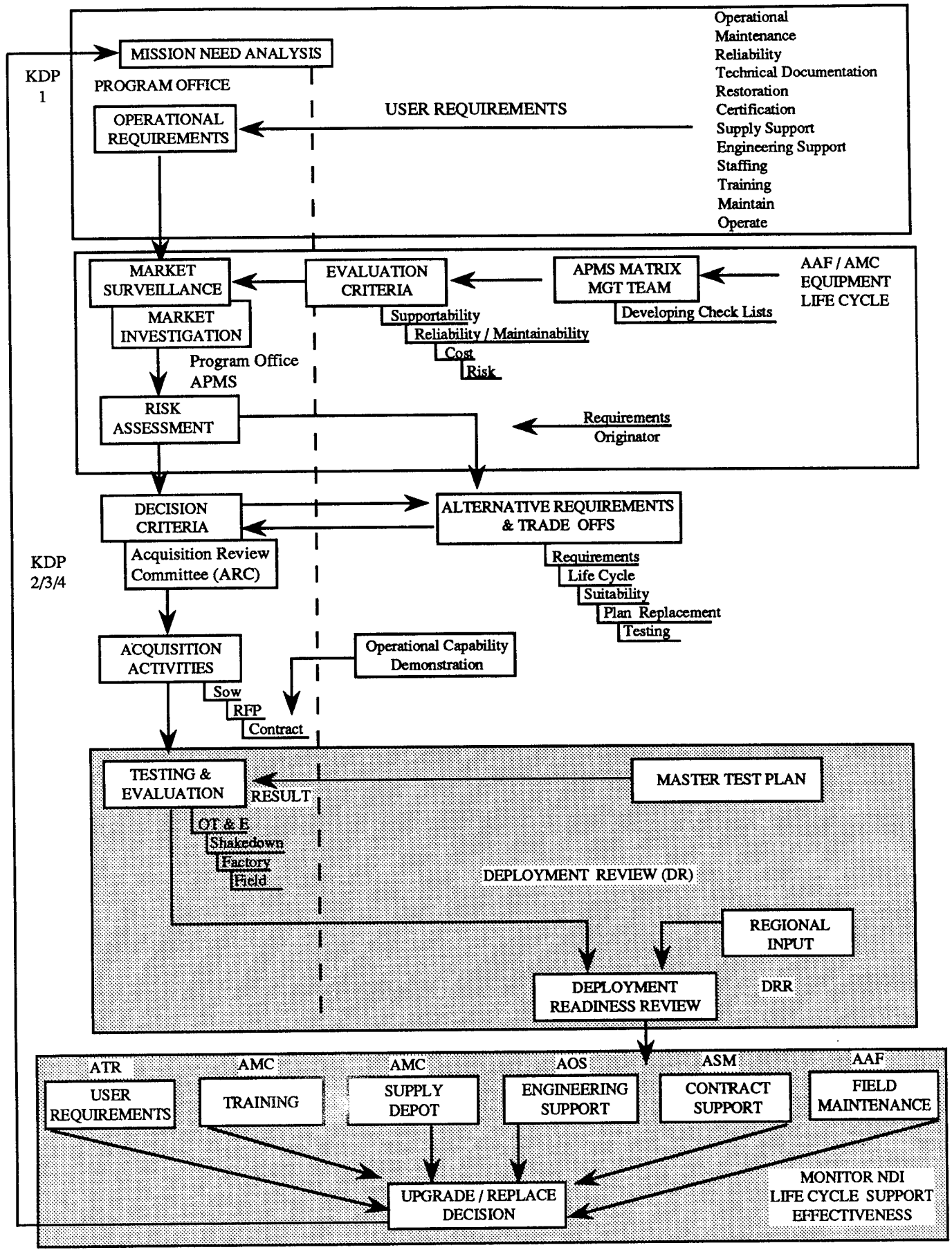
(3) The Procurement Readiness Review and the DRR process will address the acquisition and support of NDI.

(4) Appendix 1 is a sample flow chart which graphically depicts an NDI decision matrix. It is provided for illustrative purposes only.

8. AUTHORITY TO CHANGE THIS ORDER. The Executive Director for System Development is authorized to issue changes to this order which do not contain policy, a delegation of authority, or an assignment of responsibility.

Thomas C. Richards
Administrator

APPENDIX I. - SAMPLE FLOW CHART OF
NONDEVELOPMENTAL ITEM (NDI)/COMMERCIAL-OFF-THE-SHELF (COTS)
MARKET SURVEILLANCE/MARKET INVESTIGATION MODEL



APPENDIX 2. MODIFICATIONS: CAN THE FAA TOLERATE THE RISKS?

Modification Type	Modification by Original Equipment Manufacturer (OEM)	Modification by Prime Contractor	Modification by Government
Cosmetic only (form: add a decal, change color, etc.).	Okay.	Okay.	Okay.
Change software or firmware only (function).	Probably okay if properly documented; buy data to show change.	Be careful! May build in problems and OEM will not recognize (support or warrant) the result.	Avoid it! Odds are you'll degrade, not improve the product; OEM won't recognize the result, and a prime probably can't help; besides, how will you get the source data and special equipment?
Add items, no surgery (function: plug-in, bolt-in, etc.).	Probably okay; OEM should be most responsible about inserting items from other source; document it.	Be careful! If no proprietary connection with original or inserted item, may not be sensitive about latent glitches or induced failures; buyer beware!	Be careful! It's usually easier to plug it in than get help from either source if problems arise.
Internal surgery (function or repackage/ruggedize (form/fit).	Be careful! Could mess up an otherwise reliable product; will certainly produce a unique product that the OEM may abandon when you need support.	Avoid it! Prime has no handle on some other source's internal configuration; may do whatever works at the time, which can differ between successive examples; no reliable documentation in most cases, and it usually voids the OEM's warranty.	Avoid it! The Government's track record in such things could be better; who will help when the trouble starts?

Appendix 3. DOD Pamphlet SD-2, "Buying NDI."

Nondevelopmental
Item Program

SD-2

BUYING NDI

OCTOBER 1990

SDMP

OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE
FOR PRODUCTION AND LOGISTICS
WASHINGTON, D.C. 20301-8000

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FOREWORD

Nondevelopmental item acquisition represents a cost effective approach to meeting requirements for major systems and associated support items, items of supply, other goods, and services. For major systems, NDIs represent an opportunity to reduce the time and cost of development programs. For items of supply, other goods, and services, NDIs represent an opportunity to take advantage of economies of scale and high quality products available in commercial markets. Thus, when properly applied, NDI acquisitions help reduce the cost of a sound national defense. The Department of Defense must explore and implement NDI solutions which provide best value in terms of life-cycle cost, system capability, supportability, and quality.

It is important to note that NDI acquisition procedures are neither new nor significantly different from established acquisition procedures. The objective of the acquisition process, obtaining best value in meeting requirements, must still be achieved with NDIs. The acquisition process ensures that operational and logistical requirements are met before systems and equipments are selected, acquired, and deployed.

To be successful, an NDI acquisition requires flexibility, innovation, and practical trade-offs between performance, supportability, cost, and schedule. The NDI solution must meet the basic operational requirements and function in the operational environment. That is, both NDI and developmental acquisition programs must address logistics support, test and evaluation, reliability and maintainability, electromagnetic compatibility, and safety issues. An advantage to NDI is that it usually has a performance history addressing these issues that can be used to reduce or eliminate additional efforts required to resolve them.

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CHAPTER 1
INTRODUCTION

Nondevelopmental items (NDI) are referred to as already developed hardware or software, capable of fulfilling operational requirements either "as is" or with modification, thereby minimizing or eliminating the need for costly, time-consuming, government-sponsored research and development programs. NDI acquisitions also allow the Government to take advantage of advances in technology and high quality standards of commercial markets resulting from competitive pressures in those markets.

1.1 Background

The 1972 recommendations of the Commission on Government Procurement first emphasized the need for a shift in fundamental philosophy toward commercial product acquisition. The impetus for the shift was the high cost of developing products to meet detailed or unique government specifications and of duplicating existing commercial distribution systems. The new philosophy envisioned greater reliance on privately developed, off-the-shelf products and using established commercial distribution channels to support those products.

The commission's recommendations became policy in 1976 when the Office of Federal Procurement Policy issued the first in a series of memoranda governing procurement of commercial products. The memoranda also stated that the Government should use commercial distribution channels in supplying commercial products to its users. The policy implied that detailed specifications were not needed to ensure the quality of an item that had been accepted in the marketplace. It further implied that the Government should be able to establish performance and reliability of a commercial product through an effective market research effort.

In June of 1986, the President's Blue Ribbon Commission on Defense Management (the Packard Commission) in its final report emphasized greater use of components, systems, and services available "off-the-shelf". The report recognized a need for development of new or custom-made items only when it had been established that those readily available were clearly inadequate to meet military requirements. Specifically, the Packard Commission recommended:

> Rather than relying on excessively rigid military specifications, the Department of Defense (DoD) should make greater use of components, systems, and services available 'off-the-shelf.' It should develop new or custom made items only when it has been established that those readily available are clearly inadequate to meet military requirements.

The 1987 Defense Science Board report "Military Software" also recognized the applicability of the NDI approach to the software components of defense systems. It recommended that acquisition contracts be structured so that contractors will be motivated to build, sell, and buy, for use in DoD systems, existing software. It also recognized the need to include in the request for proposals and the contract the proper incentives with respect to data rights, warranties, licenses, liabilities, and maintenance.

The NDI Preference Act of 1987 required the Department of Defense to state requirements for supplies in terms of functions to be performed, performance required, and essential physical characteristics: "defining requirements so that NDI can be procured to fulfill them." The Act required a preference for nondevelopmental items be established in defense acquisitions.

National Security Review 11 on Defense Management (June 1989) acknowledges the findings of previous studies and recommends actions to increase the use of nondevelopmental items in meeting

DoD requirements. The review identified areas where practices could be improved to encourage greater use of NDIs. These areas include simplifying the contracting process and eliminating practices which inhibit NDI acquisition. In the technical requirements areas the review identifies improving communication with the user in establishing requirements and stating requirements in performance terms.

1.2 Nondevelopmental Items Defined

Nondevelopmental item is a broad, generic term that covers material available from a wide variety of sources with little or no development effort required by the Government. NDIs include:

- Items obtained from a domestic or foreign commercial marketplace

- Items already developed and in use by the Services, other Defense activities, and government agencies

- Items already developed by foreign governments which can be supplied in accordance with mutual defense cooperation agreements and Federal and Department of Defense acquisition regulations.

Given the above definition, one can see that the terms commercial off-the-shelf items and nondevelopmental items are not synonymous. Commercial off-the-shelf items are only one category of what DoD considers NDI.

Within the NDI definition it should be recognized that defense standardization programs are sources for providing already developed standard hardware and software. Some typical programs of this type include: standard computers, software, peripherals, and operating system software; standard hardware acquisition and reliability programs, including standard electronic modules; and

National Security Agency standard communications security products.

Figure 1-1 delineates categories of nondevelopmental items and lists sample items from each. It shows that NDI, which includes other Service, and foreign military items, represents much more than commercial items. The figure also illustrates the wide range of requirements which can be satisfied through NDI acquisitions. Note that the sample items are not restricted to the categories in which they are shown. For example, communications systems, listed under foreign military may also come from commercial sources, or other Services.

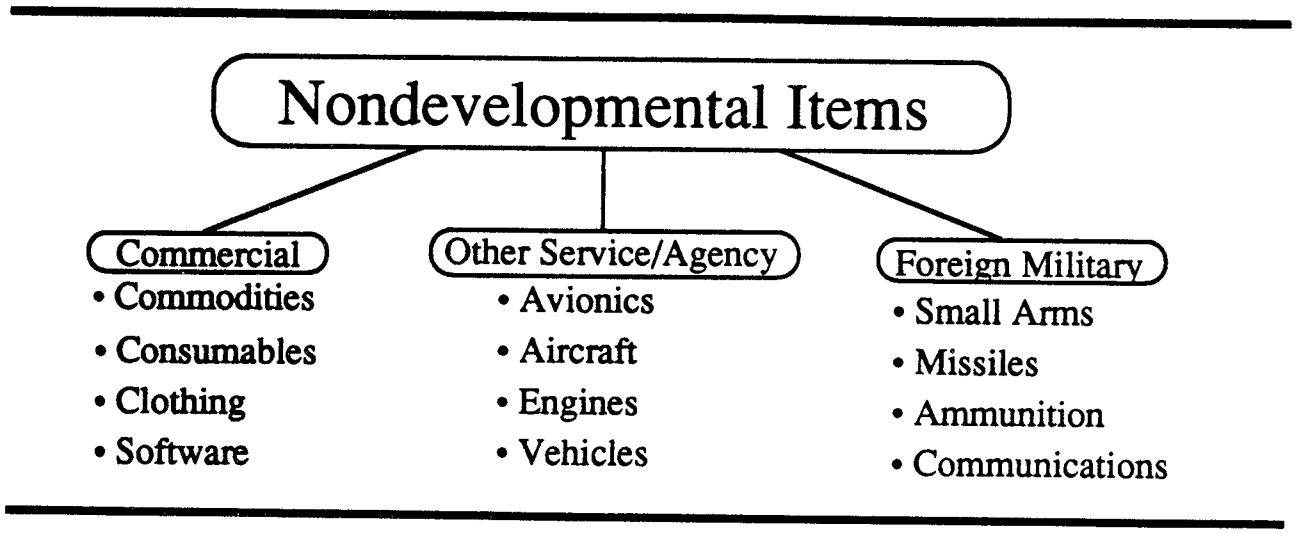

Figure 1-1

1.3 Benefits and Challenges of NDI

NDI acquisitions offer four major benefits:

- Quick response to operational needs
- Elimination or reduction of research and development costs

- Application of state-of-the-art technology to current requirements

- Reduction of technical, cost, and schedule risks

NDI acquisitions also present certain challenges in that the item, having been developed for other than Department of Defense needs, may not meet all requirements. Based on information gained from investigation of existing products, mission performance trade-offs may be required to gain the advantages from pursuing NDI alternatives. Additional challenges in NDI acquisitions include providing logistics support, product modifications, and continued product availability. It is therefore important to ensure that operational and support requirements and acquisition plans maintain flexibility to avoid unnecessary development programs. Similarly, it is important that product descriptions are based on functional performance requirements which allow maximum innovation and consideration of nondevelopmental item alternatives to meeting requirements. Decisions governing operational requirements trade-offs require user review and approval.

Systems acquisitions require trade-offs between performance and cost and between one performance parameter and another. For example, increasing a tank's survivability through additional armor will reduce its range. These trade-offs are made to optimize satisfaction of user requirements and to ensure that the user's absolute requirements or minimum thresholds are met. These trade-offs are also an important tool in acquiring a system that represents best value.

NDI acquisitions offer benefits in reduced risk and development cost. These benefits may be offset by performance trade-offs. The nearly immediate availability coupled with savings from reduced risk and cost of development may be much

more important to the user than the marginal increase in performance possible from a full developmental program. The program manager must be mindful of the priority of "requirements" and must be vigilant in assuring that satisfaction of those needs is optimized.

When performance trade-offs are not possible, determine the feasibility of modifying or augmenting the NDI to fully meet service requirements. Modifying nondevelopmental items to more completely meet the user requirements may be a viable approach. However the extent to which an NDI is modified must be reflected in testing plans to ensure the success of the modification effort.

Acquisition managers must ensure the appropriate type of funds are being used in the acquisition of NDI. If modification, development, and operational testing are required, then Research, Development, Test, and Evaluation funds must be used. For actual acquisition of production NDI, Procurement or Other Procurement funds may be used depending on the type equipment. On occasions when an NDI will be integrated into higher level developmental systems, they will usually be procured with the Research, Development, Test and Evaluation resources of the higher level system until the entire system transitions to production. Foreign Weapons Evaluation funds may be used for acquiring for test purposes systems and equipments developed by U.S. allies.

Integrated logistics support (ILS) activities normally accomplished in preproduction phases often have to be accelerated for NDI acquisitions and require increased up-front planning. Standard logistics support systems may have to be supplemented by interim contractor support or other innovative integrated logistics support strategies. Up-front planning should address the availability of the technical data and data rights needed to complement support strategies being considered. These strategies

may be used while more standard logistics support can be developed and put in place.

1.4 Handbook Organization and Use

This handbook has been written as a guide for acquisition managers and functional personnel who are, or will be, involved in NDI acquisitions. Users of this handbook should be familiar with the acquisition process and have an understanding of government contracting. The handbook contains information helpful in implementing NDI acquisitions, without inhibiting creative and innovative strategies. Where checklists are provided, they are intended for guidance only. Users of these checklists should tailor and supplement them to meet the unique circumstances of their acquisitions.

This handbook provides guidance for increasing the use of NDI across the entire spectrum of acquisitions. Its use requires selective application and tailoring of the guidance to the unique circumstances of individual programs and acquisitions. For example, the chapter on developing requirements documents is generally applicable to all acquisitions while the chapter on integrated logistics support is more related to system acquisitions.

This handbook does not stipulate step by step procedures to follow in acquiring nondevelopmental items. Rather it describes tools and techniques for increasing the use of NDI and avoiding common pitfalls. This approach permits the handbook to be used on a broad range of acquisitions and allows DoD agencies to issue service specific guidance as necessary (see Appendix B, Additional References).

This handbook is not intended in any way to supplant existing laws and regulations governing the contracting process. If there is a conflict between this handbook and laws and regulations that

govern the contracting process, the latter prevail. Further, as laws and regulations change, this handbook will continue to be a useful tool for planning and executing NDI acquisitions.

The spectrum of possible NDI and their application varies from commercial off-the-shelf items such as pocket calculators, to the adaptation of a major foreign weapon system. Because of the broad range of potential NDI acquisition contingencies, it is impossible to provide specific detailed procedures that would be valid for all NDI cases. Program and acquisition managers, using the appropriate support organizations must tailor the acquisition for each particular NDI and its specific operational application. Acquisition personnel should tailor the use of this handbook to focus on those areas pertinent to that particular acquisition.

CHAPTER 2
NDI CONCEPTS AND ISSUES

2.1 Application of Nondevelopmental Item Acquisition

Nondevelopmental item acquisition applies to the entire spectrum of goods and services needed by DoD. Acquisitions of major weapon systems, basic consumable items, and everything in between, offer opportunities to reduce cost and improve quality through increased use of NDI. While the issues and challenges vary across this range of acquisitions, the objectives of meeting the user's requirements and receiving best value are the same.

Using a nondevelopmental item as a major weapon system presents several challenges to the acquisition manager. These challenges may include non-standard technical data, lack of configuration control, and limited supply support. The acquisition manager must address operational suitability and supportability as well as the performance capability of the system. These challenges are met through sound planning and carefully tailoring the system acquisition process.

Using NDI acquisition to provide less complex items present somewhat different challenges to acquisition personnel. Selecting and writing the technical requirements to facilitate NDI can be difficult for these items particularly in the area of quality assurance. The specification writer has to ensure all requirements are met and simultaneously use a specification which encourages commercial products to be offered.

2.2 NDI Within the Acquisition Process

NDI alternatives permit considerable tailoring of the acquisition process. Tailoring of the acquisition process should reflect the environment in which the item will be used, the extent of modification necessary, and the amount of testing

necessary to evaluate the item and to make sound program decisions. Examples of such tailoring opportunities include:

- An NDI meeting operational requirement with no modification may allow a single decision review (Milestone I/III) to verify the item's suitability and to initiate production.

- An NDI requiring modification may entail an abbreviated engineering development phase to verify suitability of modifications prior to full-scale development of the modifications. Thus Milestones I and II could be combined with subsequent Milestone III production decision upon completion of the verification testing of the modification.

- An NDI being integrated into an existing system may also employ a combined Milestone I/II decision when the integration engineering required is considered to be low risk.

The application of NDI to an acquisition should be viewed as a matter of degree rather than an all or nothing proposition. Figure 2-1, Nondevelopmental Item Spectrum, illustrates this point. As the extent to which NDI is used in an acquisition, that is, moves from full development toward off-the-shelf, development cost and time are reduced. The figure shows that many NDI opportunities require modifying an existing item (e.g., ruggedize, militarize) and incorporating NDIs into larger elements of a system.

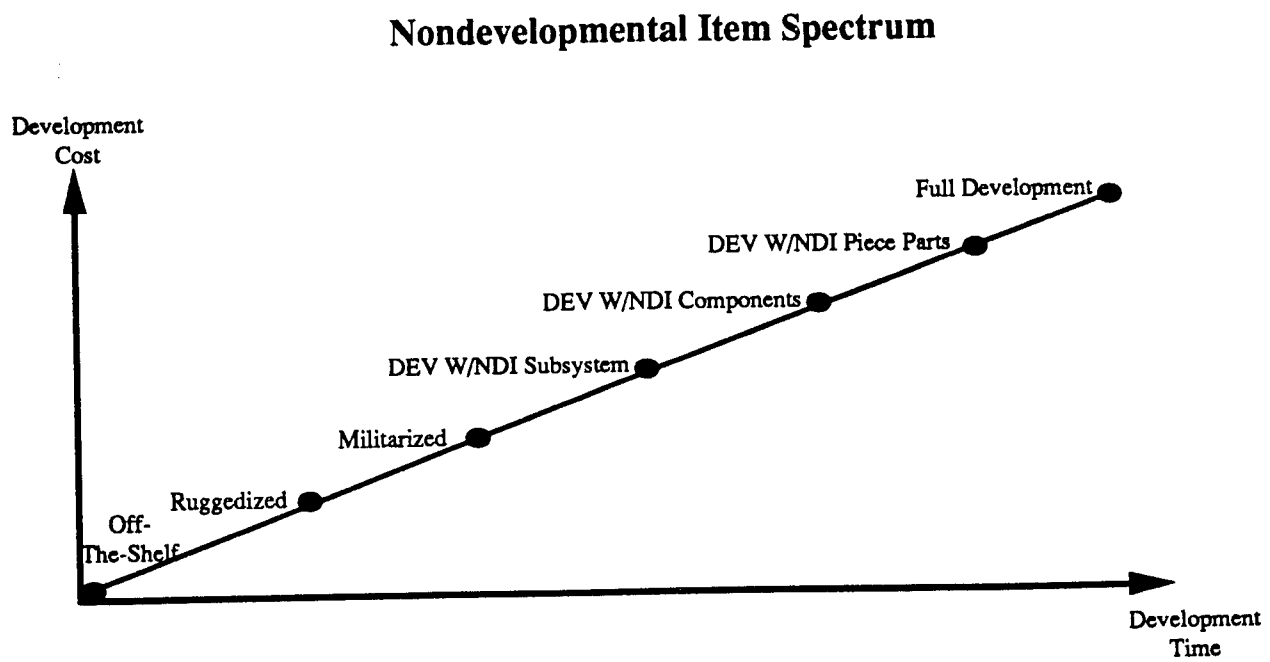

Figure 2-1

A predominant use of NDI is related to the insertion of NDI at subsystem, equipment, component, and piece part levels in major developmental programs. These opportunities should be explored as part of system engineering and system integration processes. The use of NDI in satisfying approved operational requirements could involve a combination of items (e.g. commercial, individual or joint Service, foreign, or standard DoD) coupled with and integrated into a significant developmental effort. There are considerable opportunities for system-level NDI acquisition strategies where the requirements may call for stand-alone systems such as sonar, radar, radio, navigation, and other electronic systems.

2.3 Basic Concepts of NDI

The most fundamental NDI concept is that it must meet users' needs and function in users' environment. Further, NDI solutions must represent the most cost effective approach to meeting DoD requirements. That is, an NDI should meet requirements at the lowest life-cycle cost. The effective implementation of NDI procedures requires changes in mindsets and a willingness to spend the extra front-end effort to investigate potential sources of existing products that meet requirements, at a more reasonable price, even if some performance trade-offs are required.

Flexibility in operational requirements is an important consideration in the effective use of NDI. This flexibility should be pursued by both the user and the developer through communication and coordination. The developer must be responsive to legitimate needs but be conscious of technical risks and affordability constraints. The user must be realistic in stating needs and considering trade-offs. After weighing the benefits of proven capability and more rapid deployment against any performance limitations, the user must determine whether the trade-offs are acceptable. When performance trade-offs are made, they must be formally changed in operational requirements documents.

NDI acquisitions are managed within the overall system acquisition process used for development programs. With NDI, however, many of the steps, procedures, requirements and safeguards associated with the acquisition process may be unnecessary or even counterproductive. These standard process elements should be scrutinized to determine their applicability to an NDI acquisition. Many standard process elements may have been accomplished already. For example, documented market investigation results or contractor test and performance data may be adequate to assess manpower and training requirements, supply

support, reliability, transportability, and other support requirements.

2.3.1 Effectiveness Trade-offs. In determining NDI viability, it is intended that the NDI not be assessed solely on the basis of performance but in the context of all the usual total system effectiveness parameters. This is particularly important when evaluating commercial products or other items not designed for the intended environment. Federal Acquisition Regulations, Part 11, provides that acceptability of commercial items depends on reliability, performance, logistics supportability, cost, and other factors.

For example, an NDI alternative would not be selected unless its reliability requirement (e.g., 300 hours mean time between failure) was either met, could be met with additional stress testing and process control, or a decision could be reached during the trade-off analysis to accept a lesser reliability. The trade-off might demonstrate that the NDI reliability shortfall could be compensated for by other equipment performance parameters. Also, NDI reliability would be assessed vis-a-vis the total system reliability. Similar analysis should be used to evaluate producers' processes, production methods, and production control procedures. Often, it is preferable to accept or tailor these rather than impose totally new and more costly procedures.

2.3.2 Life Cycle Cost. Life-cycle cost is as important in NDI decisions as in all acquisition strategies. In considering alternatives, an NDI should be selected that has the lowest projected life-cycle cost, within acceptable risks, and meets essential requirements.

2.3.3 Logistics Support. NDI must operate and be supportable in the anticipated mission environment. NDI may present special

integrated logistics support challenges because some lead times associated with the development of organic logistics support may exceed the total time required to acquire and field the NDI. To compensate for this, the acquisition strategy should consider the possibilities of interim or permanent contractor logistics support after careful consideration of the risks and benefits in relation to the intended use of the NDI. Consideration should also be given to the appropriate mix of contractor and organic logistics support. Issues in the planning for and acquisition of ILS elements associated with NDI are addressed in Chapter 8.

2.3.4 Configuration Control. The Services and other DoD components have considerably less control over configuration of NDIs than developed items. The NDI strategy, therefore, must consider the availability of the product and its support elements throughout the projected life cycle. In NDI acquisitions, especially for extended life cycles, it may be necessary to consider one-time buys or acquisition of reprocurement technical data to ensure this support of the product over the entire life cycle.

2.3.5 Safety and Environment. NDIs may present special safety and environmental problems due to lack of compliance with military standards. In some instances, it may be possible to overcome these problems by modifying the NDI or by using cautionary labels, special training, or procedural changes. For example, NDIs that involve flight critical parts or part characteristics that must be controlled to preserve their integrity must have those parts and characteristics clearly identified.

2.3.6 Manpower and Personnel. As with any acquisition strategy, manpower and personnel issues must be considered and factored into the total system manpower and personnel needs. Since some

NDIs may be very complex, detailed analysis of the NDI alternative and the support concept may be required to assess system demands on future personnel inventories.

2.3.7 Training. The acquisition of NDI may affect both formal classroom and on-the-job training. Training plans should consider not only the impact on training but also the possibility that the item may require new, additional, or modified training devices.

2.3.8 Data Rights. For NDI, we must consider all the alternatives and associated costs and risks when deciding whether to acquire data rights. Data rights are not always available. When available, their value to the Government must be assessed in terms of complying with the support philosophy intended for that system or end item. When reprocurement is a consideration, reprocurement costs versus data costs need to be considered. If data is not procured, we must assure ourselves that life-cycle support will be available at reasonable costs. NDI contracts must also address the ability to breakout and competitively procure NDI spare parts whenever possible. The ability to procure appropriate data rights in the event that the vendor drops the product line must also be considered.

2.3.9 Survivability Requirements. Survivability requirements may be critical in evaluating NDI. A system may have requirements for surviving designated conventional effects, prompt nuclear weapons effects, nuclear, biological, and chemical (NBC) contamination effects, or even directed energy weapons effects (lasers, particle beams, etc.). An item that is electrical or electronic in nature and has a nuclear survivability requirement may have to be resistant to high altitude electromagnetic pulse (HEMP). Modifying already developed, non-hardened equipment may be extremely difficult.

For example, non-hardened circuit boards usually require complete redesign of the boards and other components. In addition to being able to survive such environments, this equipment must be suitable for use by personnel wearing productive gear.

2.3.10 Test and Evaluation Requirements. Test and evaluation shall begin early to reduce acquisition risks and to assess the ability of the NDI to meet requirements. Critical test and evaluation issues (to include effectiveness and suitability issues), objectives, methodologies, and evaluation criteria shall be defined during initial planning. Initial planning should also address the utility of previous testing and test data performed by the developer or users of the NDI. These criteria shall define the testing required for each phase of the acquisition program and shall provide the structure to guide the testing program.

2.3.11 Support Equipment. It should be kept in mind that NDI equipment does not usually stand alone. The NDI may require tools, test equipment, calibration standards, computer resources, maintenance manuals and other associated support equipment. NDI must be treated in its total system context.

2.3.12 Specifying Requirements. Specifications should be of the form, fit, and functional performance type versus "how to" requirements that could preclude NDIs from being offered. Chapter 4, addresses this and other actions critical to the preparation of requirements documents which facilitate NDI acquisition.

2.4 Commercial Versus Military Environment

In deciding on the viability of NDI for a military application, it is important to consider the relationship between the environment for which the NDI was designed and DoD's intended

operational environment. NDIs to be used in essentially the same environment for which they were designed generally require a less stringent level of testing than NDI that will be used in a different environment. For NDI expected to be used in essentially the same environment, planned test and evaluation may take advantage of established market acceptability in proving its utility. If the NDI is to be a subsystem, component, or piece part of a developmental system, it will be subjected to the appropriate system-level tests prescribed in the overall Test and Evaluation Master Plan.

For NDI where the DoD component would use the product in a different environment than originally designed, test and evaluation considerations change substantially. NDI of this type often require some level of modification to prove useful in the military environment. The test and evaluation required must ensure that the NDI, when modified, will fully meet Service needs. In these cases, the fact that the basic NDI obtained commercial market acceptability should be considered in determining the extent of test and evaluation required. Again, when the modified NDI is to be a subsystem, component, or piece part of a developmental system, it will also be tested as part of the next higher assembly.

The tailoring of test and evaluation programs to NDI acquisitions must be done very carefully. While NDI acquisitions may permit some reduction in testing programs, ensuring that the item is suitable and that it will function in the intended environment is the primary consideration. For example, while some developmental test and evaluation can and should be waived for NDI acquisitions, great care should be exercised in tailoring out operational testing requirements. In some cases, operational testing requirements for an NDI may increase because it has not undergone the rigors of the standard developmental testing cycle.

2.5 Activities Subsequent to Program Initiation

When a determination is made that an NDI is available and the NDI will be used in the same environment for which it was designed without significant modification, the acquisition strategy should reflect this consideration. Since this represents the simplest type of NDI, consideration should be given to obtaining Acquisition Executive approval to streamline the acquisition by eliminating the formal Concept Exploration phase and combining the Demonstration and Validation Phase with the Full-Scale Development phase (i.e. consolidating milestones, using a Milestone I/II decision). Then, following the Milestone III decision, the NDI would enter the Production/Deployment Phase.

2.5.1 NDI Support Considerations. A decision to eliminate phases and constrict schedules must be tempered by the fact that any necessary support to be developed may not be as easily compressed. Organic support planning and execution is not as time responsive to NDI as is equipment procurement. From a test and evaluation standpoint, consideration should be given to qualifying the item through bid sample testing. The acquisition manager, working with the test directors of operational test and evaluation agencies, should consider the type of NDI, assess the engineering and test data obtained during the Market Investigation, and determine the extent to which operational tests are required.

2.5.2 NDI in Different Environments. For less than major programs when an NDI will be used in a different environment than originally designed and modification is required, the acquisition strategy should reflect these considerations. Even though modification will be required, the acquisition can be streamlined; required modifications solicited, test and

evaluation conducted, and functional specification developed in a combined Demonstration/Validation and Full-Scale Development Phase. Since the basic NDI will be modified and since the environment for use will be different, an appropriate development and operational test program will most likely be required to assure effectiveness and suitability.

2.5.3 NDI Modification. There may be opportunities to modify an NDI to enhance its operational performance or operational suitability characteristics. Modifications to the item may be made by the manufacturer, supplier, other contractor, or by an in-house activity (e.g. laboratory, depot, arsenal, etc.). The total effect of modifications should be evaluated, particularly in the area of logistics support. For example, a vendor may not recognize or support the resulting redesigned item for which DoD has little or no organic support capability. Additionally, such modifications are likely to increase testing program requirements. Modifications to NDIs are an effective way to meet requirements but require careful evaluation.

2.5.4 NDI Below End Item Level. For development programs, contract language should be considered for the solicitation to require offerors to maximize the selection of NDI for incorporation into the proposed system design. Effectiveness in selecting NDI should also be factored into the source selection evaluation criteria (Section M of the Request for Proposal) to encourage NDI considerations. Again, the objective is to minimize life-cycle costs by avoiding unnecessary developmental costs for equipment that is available or that could be suitable after modification.

CHAPTER 3

NDI FEASIBILITY INVESTIGATION AND ANALYSIS

The DoD acquisition process is well established and intended to recognize and analyze feasible options early in the process. However, identification of NDI alternatives, particularly at the system and subsystem levels, has not always been considered early enough to allow sufficient analyses and dialogue with users to permit timely pursuit of these NDI alternatives. This chapter focuses on how an acquisition manager can identify NDI alternatives and conduct market analysis to help in deciding if NDI is the right option to pursue.

Federal Acquisition Regulations call for the conduct of market analysis to determine the availability of marketplace products for government use. Market analysis provides information on technologies, existing hardware, and inherent industrial capabilities, determining feasibility of a nondevelopmental item acquisition to satisfy a need. The market analysis effort may be seen as covering two separate but related activities, namely market surveillance and market investigation.

This chapter contains several lists of actions, questions, and considerations in conducting market surveillance and market investigation. Using these lists requires selective application to the unique circumstances of each acquisition.

3.1 Market Surveillance

Market surveillance is the continuing effort by acquisition and development activities (including laboratories) to become and remain technically current within their areas of technical and commodity expertise. These activities are established sources of information which maintain awareness of marketplace activities, technologies and products with potential for service use. Program managers and acquisition managers should use these

sources in developing acquisition strategies and in identifying NDI alternatives. This should include investigation into the existence and availability of suitable items already in the DoD or other government inventories. Market surveillance also provides a knowledge base for determining whether technology and products may be available to meet military needs expressed in operational requirements. Such knowledge may be used in developing and modifying operational requirements. Primary sources for market surveillance information and data include but are not limited to:

- Industry publications/catalogs and product data sheets
- Federal Catalog System
- General Services Administration Catalogs
- Trade shows and industry workshops
- Journals
- Compilation guides and registers (e.g., Dun & Bradstreet/Thomas Register)
- Automated data bases (see DoD Pamphlet SD-5, "Locating Off-the-Shelf Items")
- Defense Logistic Agency catalogs
- Symposia proceedings
- Independent research and development reports and presentations
- Previous government contracts
- Product Deficiency Reporting and Evaluation Program
- Joint Logistic Commanders commodity groups
- Counterparts in other Services
- Counterparts in Federal or state agencies
- Site visits
- Discussions with industry representatives

- Participation in standardization committees
- Participation in Professional Societies and related activities
- Unsolicited proposals
- Industry participation (see Chapter 4)
- Concept Evaluation Programs
- Equipment test and evaluations
- Foreign military data exchange
- International Materiel Evaluation
- Patent searches
- Government/Industry Data Exchange Program (GIDEP)
- Attending seminars and related training courses

3.2 Market Investigation

Market surveillance is the initial attempt to assess NDI availability. However, it is usually necessary to obtain more detailed information from the marketplace to assess the NDI feasibility. Feasibility not only from an operational performance standpoint but also from the standpoints of reliability, supportability, cost-effectiveness, manpower and personnel, safety, etc. This marketplace assessment is termed the market investigation and responds to a specific requirement.

The market investigation is the central activity in evaluating the suitability of NDIs prior to an initial milestone review decision on pursuing the NDI. The market investigation provides the basis for finalizing the operational requirement; developing a form, fit and function description to obtain competition; determining logistic support requirements; and determining what additional testing is required. The acquisition manager leads the market investigation effort in the attempt to find NDIs that

can satisfy the requirements. The various discipline proponents and operational testers participate in this process by identifying issues that should be addressed to ensure user operational suitability.

3.2.1 Conduct of Market Investigations. Market investigations vary from informal telephone inquiries to comprehensive industry-wide reviews. Maximum use should be made of available data (e.g., contractor sources, user experiences, independent test and certification agencies). Market Investigations are normally conducted in two phases.

During the first phase, the acquisition manager should consolidate the known information from the market surveillance. The acquisition manager should assess the information, given an operational requirement, and determine the nature of available products (including foreign products) and the number of potential vendors. Based on this preliminary determination, the acquisition manager decides if there is sufficient information to make the NDI decision or what additional information is needed to support a sound NDI decision. This information is gathered in the second phase.

During the second phase, data is collected to support a definitive NDI decision. This may include requests for information or sources sought announcements in the Commerce Business Daily, as well as letters of inquiry to embassies and other information sources on foreign items. The request for information is a brief narrative description of a requirement which invites interested vendors to respond. Respondents should be sent draft performance specifications and a detailed questionnaire designed specifically to determine their product's ability to meet requirements. Care should be taken to avoid descriptions which focus on a particular product. This phase may include the purchasing or leasing of test samples or test items

to conduct operational and combat suitability tests. These tests and the resulting data help build the functional purchase description or product specification. It is also worth noting that these tests should not be used to select or eliminate any particular vendor or product. This second phase should also attempt to finalize the appropriate requirements document and develop an acquisition strategy for meeting program goals.

3.2.2 Market Investigation Questions. The following lists of questions are useful in collecting information relevant to evaluating NDI opportunities. The first list is tailored to collecting the information and should be asked of the vendor. The second list of questions are appropriate for analyzing information provided by manufacturers and suppliers. It is useful to send questionnaires to current commercial and military users of the product, especially when quality and logistics experience is critical to the NDI decision. For potential high-cost NDIs it may be beneficial to conduct on-site visits to manufacturers and their users to obtain such information.

3.2.3 Communicating the Requirement. An important first step in conducting market investigations is early communication of DoD requirements to industry. This information allows industry to identify potential NDIs and to better answer questions asked later during subsequent market investigation and analysis. DoD requirements can be communicated to industry through sources sought announcements, requests for information, bidders conferences, etc. DoD requirements should be as detailed as is practical and stated in performance rather than "how-to" terms. Information provided to industry should include:

System Performance Requirements:

- Detailed operating parameters for hardware and software
- Environmental conditions

- Other tougher-than-commercial demands
- Usage (fixed, airborne, tactically deployable, etc)
- System interface, integration requirements
- For computers: required software language, speed, throughput, ports, memory and expansion potential
- Radio transmission frequency requirements
- Radio transmission frequency allocation status
- Rules for government use of frequency spectrum.
- For communications-computer system interfaces, requirements for:
  - Use of Government Open Systems Interconnection Profile (GOSIP) communications protocols (Federal Information Publication 146)
  - Use of Latest-generation language tools, and compliance with American National Standards Institute (ANSI) standards
  - Software portability to other communications-computer systems
  - Ability to integrate into DoD or Service communications-computer environment
- Operating duty cycle (24 hours, intermittent, etc.)
- Climate (operating, shipment and storage)
- Altitude (operating, shipment and storage)
- Shock and vibration thresholds (operating and shipment)
- Input power quality (drops, surges, spikes, noise, etc.)
- Environmental stress screening (ESS) requirement

Reliability, Maintainability, and Survivability

- Reliability requirements
- Nuclear hardening requirements
- Chemical/biological/radiological survivability

- Electromagnetic interference (EMI)/electromagnetic compatibility (EMC)/TEMPEST requirements
- Electrostatic discharge (ESD) protection
- Maintainability requirements
  - Self-test requirements
  - Limitations, if any, on organizational-level support equipment (SE)

Logistics Support

- Planned maintenance echelons
- Maintainer proficiency levels
- Software maintenance plans
- Limitations on evacuation of reparables (battlefield, underground, rough handling, etc.)
- Maintenance environment (weather, mud, etc.)
- Supply support, support equipment needs, limitations
- Training needs
- Technical data needs

Questions to ask potential supplier include:

System Related Questions

- What portions of the system or equipment do you intend to provide in the form of NDI equipment?
- How, in detail, will each item or assembly meet stated requirements?
- Must any of it be modified to meet requirements? In that event, are you or your vendor(s), as applicable, willing to share design visibility and control with the Government so the modified design can be maintained and supported by the Government?
- How stable is the design of the equipment? Give history and your perception of future stability prospects for each

design proposed. How mature is the current design, and what are your criteria for measuring that?

- How long has the item been on the commercial market? How many are currently in commercial use? What are the prospects for product longevity? How long will you support it?

Reliability, Maintainability, and Survivability Related Questions

- What is the reliability history of the product (e.g. mean time between failure, corrective maintenance actions, etc.)?

- What are the maintainability features of the design (i.e., self-test features, accessibility, need for separate support equipment to verify failures, preventive maintenance needs, etc.)?

Logistics Support Related Questions

- What flexibility do you offer for government maintenance? Will you allow the Government to acquire licensing and subscription services to enable organic or competitive maintenance?

- If the NDI is to be used as part of a system, how do you perceive the criticality interfacing with other subsystems, software, etc. for overall system integrity? That is, if it later became necessary to replace an NDI because the original became unsupportable, could it be done without driving a major modification or replacement of the entire system?

- Can the proposed item(s) be maintained according to the conditions we have given you, or will special arrangements be required? If so, what are they?

- Is there a competitive market for contract repair and support of the proposed item(s), or is it restricted to a single source?

- Is the proposed equipment covered by a warranty? What are the warranty's provisions? If your product will reach the Government through a prime contractor, will your warranty carry through with it?

- Identify at least 3 commercial users of your product. Also name present military customers, if any.

- What is your estimate of your product's life cycle cost over a ____ year(s) period?
- What training is needed to operate and maintain your product, and is such training available from any source besides yourself?

In addition to the above questions, the various functional discipline proponents and independent testers, along with the technical experts, should provide questions to be answered by the market investigation process. Specific questions peculiar to the item to be procured (e.g., performance, operation, design features), need to be asked as they must be addressed in the Test and Evaluation Master Plan.

3.2.3 Information Obtained from Market Investigations. While the value, type, and complexity of the needed products will influence the data to be gathered, the following are examples of information that must be obtained from the market investigation:

- Product availability-related data
  - Product quality, electromagnetic compatibility, reliability, and maintainability experience of similar users.
  - List of NDI products and company services satisfying identical or similar service requirements.
  - Are modifications to the NDI needed?
  - Product descriptions used by other government activities or in commercial transactions, including commercial specifications and standards.
  - Stability of current configuration and technology.
- Industry-related data
  - Number and competitiveness of manufacturers.
  - Size and location of manufacturers and their current market.
  - Product distribution channels.

- Business practices in sales and distribution from manufacturers to wholesaler, distributor, or retailer to user.

- Production capacity to meet requirements as part of commercial sales and the appropriate time to buy.

- Packaging, handling, storage, and transportation practices.

- Average time between model changes and practice of providing continued parts inventories or production for phased-out models.

- Length of time the product has been produced by a manufacturer.

o Commercial market acceptability-related data

- Product quality, reliability, and maintainability experience of similar users.

- Description of contractor's quality controls including extent of statistical process controls.

- Warranty terms and practices.

- Need for any preproduction or production qualification testing and special quality assurance requirements.

- Product evaluation criteria (including life-cycle criteria, as applicable).

- Hardware, software, and manpower interface issues such as human factors and product safety as experienced by similar users.

o Product support-related data;

- Repair parts availability and lead times, documentation, pricing, and distribution systems.

- Customer service, installation, checkout, and user maintenance instructions.

- Requirements and provisions for manpower and personnel.

- Competitive or sole source repair and support base.

- Training and training support requirements.

- Requirements for and availability of tools, test equipment, computer support resources, calibration procedures, operations, and maintenance manuals.
- Warranty procedures and commercial repair capabilities.
- Manufacturer calibration, repair, and overhaul practices and capabilities documentation.
- Manufacturer commitment to outyear support.
- Degree of technical data package availability.

If a market investigation is to be thorough, it is important that all possible sources of data be explored. The sources will vary with the functional nature and complexity of the items under consideration.

CHAPTER 4

SELECTING AND PREPARING REQUIREMENTS DOCUMENTS

Nondevelopmental item acquisitions are particularly sensitive to the effectiveness with which DoD communicates its requirements to industry. The requirements document should address user requirements without prescribing less than optimal solutions. It should be written in terms compatible with standard commercial practices while providing quality assurance suitable for items used in the military environment.

Selecting and preparing the requirements document is essential to increasing the use of NDI acquisitions and to ensuring their success. The previous chapter focused on identifying industry capabilities and nondevelopmental items with the potential of meeting requirements. This chapter focuses on using that information in the preparation of requirements documents.

4.1 Selecting the Requirements Document

DoD communicates its technical requirements in a solicitation through statements of work, contract data requirements list and contract specifications. These documents comprise the scope of effort which the contractor will perform. The statement of work is used to define the work effort required from contractor to support DoD programs. Contract Data Requirements Lists (CDRLs) identify data requirements and specifics as to how the data is to be developed, prepared, and delivered as part of a specific acquisition. The contract specification describes the essential technical requirements for purchased material. These requirements documents rely on a large body of specifications, standards, and data item descriptions to further set forth technical requirements through referencing. The following

provides a brief description of the technical requirements documents and the references they use.

4.1.1 Statement of Work. The statement of work is the document by which all nonspecification requirements for contractor efforts must be established and defined either directly or with the use of specifically cited documents. Examples of requirements which should be included in a statement of work are reliability programs, maintainability programs, reliability prediction, and design reviews. When properly written, the statement of work establishes tasks and identifies the work effort to be performed expressed as minimal needs. Statement of work tasks shall not include the description and delivery requirements for data.

Statements of work should incorporate requirements from military specifications and standards only when absolutely necessary. The incorporation of any such specifications and standards shall be thoroughly justified before being placed in the applicable documents and text of a statement of work. When they are invoked, the statement of work should specifically define the limitations of the appropriate parts of military specifications and standards through application and tailoring. More detailed guidance in preparing statements of work can be found in MIL-HDBK-245, Preparation of Statements of Work.

4.1.2 Contract Data Requirements List. The contract data requirements list (CDRL), DD Form 1423, is a list of the data requirements that are authorized to be acquired for a specific acquisition. The CDRL provides both administrative and technical requirements for data. The CDRL establishes administrative requirements such as delivery date, approving activities, and receiving activities. The technical requirements are established by referencing data item descriptions.

Data Item Descriptions, DD Form 1664, define the data required of a contractor. The form specifically defines the data content, preparation instructions, format, and intended use. Data item descriptions which have been approved for repetitive contractual application in DoD acquisitions are listed in DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List. Guidance on the preparation of data item descriptions is contained in DoD-STD-963, Preparation of Data Item Descriptions.

Acquiring existing data in contractor format and commercial data associated with NDI requires careful tailoring of data item descriptions. Data item descriptions should be tailored to ensure maximum flexibility and consideration of commercially available data that meets requirements.

4.1.3. Contract Specification. The contract specification is a document prepared specifically to support an acquisition. The contract specification should include essential technical requirements for purchased material and procedures necessary to determine that the requirements have been met. There are several alternative sources of contract specifications both non-government and government. Contract specifications may be unique to an acquisition or a program and invoke, via reference, additional non-government and government specifications and standards.

It is DoD policy that the selection of standards and specifications used in the design, acquisition, construction, and support of material give preference to using commercial practices and non-government standards. An order of preference for the selection of standards and specifications has been established

which reflects this policy. The order of preference is set forth in MIL-STD-970, Order of Preference for the Selection of Standards and Specifications.

Several specification alternatives are described below. Considerations in selecting from these alternatives and developing specifications which support NDI acquisitions are discussed in subsequent sections of this chapter.

Non-Government Specifications and Standards. Standardization documents developed by private sector associations, organizations, and technical societies which plan, develop, establish, or coordinate standards, specifications, handbooks, or related documents. Non-government specifications and standards are used to specify requirements through adoption, reference, and excerpts.

Adoption is the process by which DoD expresses formal acceptance of non-government documents. This process also provides visibility to the DoD components through incorporation into the DoD Index of Specifications and Standards. Non-government specifications and standards can be used for acquisition without being adopted.

Referencing is the use of a non-government specification or standard in a contract specification. Referencing is appropriate in applications for which control over changes to the document is not required to maintain its suitability as a reference or when the intention is specifically to authorize all future changes to the referenced document.

Excerpts are extractions from non-government specifications or standards which are included in contract specifications.

While not a form of official adoption, excerpts from non-government documents may be utilized by direct copying of pertinent portions into military documentation whenever it is more economical and efficient than adoption. Activities utilizing excerpts from non-government documents shall make appropriate arrangements with the publisher to avoid violation of copyrights.

Commercial Item Description (CID). A simplified product description or specification that describes by salient functional or performance characteristics the available, acceptable commercial products that will satisfy the Government's needs. CIDs are prepared under guidelines issued by the General Services Administration, Federal Supply Service and are listed in the DoD Index of Specifications and Standards. Appendix C contains additional guidance on the preparation of commercial item descriptions. CIDs are useful in adding definition to and augmenting non-government standards which are not sufficiently definitive for procurement use.

Federal Specifications and Standards. Federal specifications and standards should be used where it is determined that a commercially available material, product, process, procedure, practice, or method exists, but specific design, performance, interface, or other essential characteristics cannot be adequately described by a non-government standard or commercial item description. More detailed information and guidance on the preparation of Federal specifications and standards can be found in the GSA Standardization Handbook, FPMR 101-29, and the Defense Standardization Manual, DoD 4120.3-M. Federal specifications and standards are listed in the "DoD Index of Specifications and Standards."

Military Specifications. Documents prepared specifically to support acquisition which clearly and accurately describe essential technical requirements for systems, subsystems, items, materials, or products that are intrinsically military in character or are used in, or in support of, weapon systems and involve an essential system function or interface. Military specifications are listed in the DoD Index of Specifications and Standards. Military specifications should only be used when non-government specifications, commercial item descriptions, or Federal specifications are not available or not appropriate. More detailed information and guidance can be found in MIL-STD-961B, Preparation of Military Specifications and Associated Documents.

Military Standards. Military standards are documents which establish engineering and technical requirements for processes, procedures, practices, and methods that have been adopted as standard military practice. Military standards are listed in the DoD Index of Specifications and Standards. Military standards are usually invoked via referencing in the statement of work, contract specification, or contract data requirements. Military standards should only be used when non-government standards and Federal standards are not available or inappropriate. Guidance on their preparation can be found in "Preparation of Military Standards and Handbooks," MIL-STD-962.

Multiple Award Schedules. Multiple award schedules are contracts made with more than one supplier for comparable supplies and services. Such contracts are awarded to suppliers of the same generic types of items at varying prices for delivery within defined geographic areas. Contractor catalogs and price lists must be used with the schedules to prepare delivery orders.

The catalogs and price lists contain information such as item descriptions, prices and discounts, order limitations and delivery. Multiple award schedules provide a simplified means of obtaining commonly used supplies and services at prices associated with volume buying. Multiple award schedules are a part of the Federal Supply Schedule Program directed and managed by the General Services Administration. Information on the use of multiple award schedules and a listing of schedules can be found in a General Services Administration publication, GSA Supply Catalog. More information on obtaining and using the GSA Supply Catalog is included in Appendix G.

Multiple award schedules are suitable for use when non-government standards and commercial item descriptions are not available nor appropriate. Multiple award schedules allow flexibility in choosing product characteristics from a variety of products to meet specific requirements. In addition to facilitating NDI acquisition, multiple award schedules can reduce lead times, allow greater authority to acquisition personnel, and encourage procurement based on best value.

Purchase Description. A description of the essential physical characteristics and functions required to meet the Government's needs. Purchase descriptions should only be used when no applicable indexed specification exists. A purchase description should set forth the essential physical and functional characteristics of the materials and services required. Guidance on the use of purchase descriptions can be found in Federal Acquisitions Regulations, Part 10, Specifications, Standards, and Other Purchase Descriptions.

Program Peculiar Documents. Program peculiar documents are those that are unique to a particular weapon system or program

with little or no potential for application to other systems or programs. They are typically used in development programs to establish configuration control and product baselines. Guidance on the preparation and use of program peculiar documents is set forth in MIL-STD-490, Specification Practices.

Even though program peculiar documents are used for development programs, they should encourage the use of nondevelopmental piece parts, components, equipments, and subsystems wherever it is possible. Program peculiar documents typically reference other requirements documents (as described above). These references should follow respective guidance on usage and preparation. Further program peculiar documents should be written in performance rather than how-to terms whenever practical.

4.2 Considerations in Selecting Requirements Documents

There are many factors to consider in selecting and developing requirements documents. A thorough understanding of the user's need and relevant industry practices is essential. In selecting the best way to communicate requirements DoD must:

- Ensure that stated requirements accurately reflect the user's operational requirements and any associated supportability requirements.

- Establish criteria by which proposed items will be evaluated and by which overall best value can be determined.

Acquisition of major systems and associated hardware, items of supply and commodities generally requires a specification document. Major systems and associated hardware are typically

acquired using military specifications containing requirements unique to that system. Items of supply and commodities are often purchased through use of non-government specifications, commercial item descriptions, or purchase descriptions.

In selecting a specification one must consider any extraordinary circumstances or peculiar characteristics associated with the user's requirement. Examples of these include restrictive form, fit, and function constraints, electromagnetic interference, supportability issues, and standardization requirements. Such requirements need to be addressed regardless of the specification document selected. Further, these aspects of the user's requirement will affect the selection of a requirements document.

Another important consideration is the intended environment. If the environment is similar to that for which the item was designed, then an existing non-government specification should be suitable. If an NDI is to be used in a more severe environment (e.g. shock, humidity, temperature, electromagnetic interference), then military specifications or other special requirements may have to be added. Identifying and evaluating differences between the intended environment and the environment for which the item was designed is helpful in selecting and preparing requirements documents.

The market in which potential NDIs are produced and used will also affect selecting and preparing a requirements document. The market will have established standards for quality, materials used, and production techniques. The market will also have established norms for product support, technical data, and warranties. Deviating from prevailing market standards and quality control practices can erode the benefits of using

nondevelopmental items. Such deviations should be carefully evaluated and justified before inclusion in a requirements document. Guidance on establishing quality assurance provisions based on a product's market acceptability can be found in Appendix F.

4.3 Developing an Effective Requirements Document

Once selected, requirements documents must be tailored to reflect unique needs and circumstances of an acquisition. The following discusses tools and techniques for developing a requirements documents. Applying these tools and techniques to developing requirements documents can facilitate NDI acquisitions and support DoD efforts in achieving best value.

4.3.1 Building on Market Analysis Data. Data generated during market analysis is a valuable resource for developing requirements documents. Familiarity with commercial product capabilities, industry standards and terminology, and existing industry specifications permit development of a requirement which is more easily understood by potential suppliers. Market analysis may identify non-government specifications suitable for use in an acquisition.

Data obtained during market analysis may also be used in developing an entirely new or modified requirements document. A purchase description, for example, could incorporate requirements from a variety of sources. This allows development of a requirements document which is tailored to DoD needs while maintaining the terminology and standards used by industry.

4.3.2 Communicating with the User. There is no substitute for thoroughly understanding the operational requirement in developing a technical requirements document. Such an

understanding is fostered by communication between the user and the acquisition activity. This communication should be oriented toward further consideration of market analysis results and exploration of flexibility in the user's requirements.

When developing a requirements document take every opportunity to communicate to the user results of the market analysis. The objective is to identify new products, technologies, materials, etc. being used by industry. This information allows the user to evaluate operational requirement currency and make adjustments as necessary. The user also can validate the acceptability of new products, technologies, or materials being considered.

Establishing flexibility in a user's needs in a requirements document allows consideration of a broader range of alternatives (especially nondevelopmental items). The requirements document should reflect the user flexibility by stating requirements in terms of acceptable ranges or thresholds to be met rather than exact requirements. Doing so allows a broader range of alternatives to be considered.

4.3.3 Performance-Oriented Requirements. Every opportunity should be taken to state requirements in performance rather than "how-to" terms. This allows suppliers to offer existing products which meet our requirements. Unnecessarily specifying how a requirement will be met restricts the range of products which may be considered. For example, consider the following requirement statement for a fire extinguisher horn bracket:

> "Each fire extinguisher shall be equipped with a metal clip or bracket to hold the discharge horn when not in use."

"Each fire extinguisher shall be equipped with a device to hold the discharge horn when not in use."

Unless there is an operational requirement that the horn bracket be made of metal, the second statement (device vs. metal clip or bracket) is preferred. It allows fire extinguisher manufacturers to offer a best commercial practice horn bracket regardless of material used. The later statement is more likely to result in a commercial fire extinguisher horn bracket being offered.

4.3.4 Application and Tailoring. Application and tailoring is an important step in preparing a requirements document. It allows the preparer to consider the pertinence and cost effectiveness of requirements imposed through referenced standardization documents. Application is the orderly process of reviewing and selecting from the total realm of available specification and standards those that are considered to have application to the particular acquisition and contractually invoking these wholly, or in part, at the appropriate point in the acquisition cycle. Tailoring is the process by which individual requirements (sections, paragraphs, or sentences) of the applicable specifications, standards, or related documents are evaluated to determine the extent to which they are most suitable for a specific system and equipment acquisition and the modification of these requirements to ensure that each achieves an optimal balance between operational need and cost.

Effective application and tailoring is particularly important to increasing the use of NDI. Industry can be precluded from offering NDI which meet basic requirements but do not meet unintended requirements resulting from overapplication of standardization documents. Application and tailoring facilitates

stating requirements in terms compatible with commercial practices. This makes it easier for suppliers to evaluate the acceptability of existing products.

Application and tailoring should be performed on statements of work, data requirements, and the requirements document. Statements of work typically contain references to military standards which describe requirements for processes, procedures, practices and methods. Contract Data Requirements are established through referenced data item descriptions. The requirements document contains references to military specifications which establish additional requirements for purchased material. It is these referenced documents which must be applied and tailored to the unique circumstances of each acquisition. Application and tailoring techniques are presented below.

Non-Government Standards. Before invoking a Federal or military specification or standard consider non-government standards which meet requirements. In many instances industry is more familiar with these and can more readily identify and offer NDI alternatives.

Incorporation into Source Document. Consider revising the source document (SOW, requirements document) so that the applicable paragraphs of the referenced standard are incorporated into the source document. This provides for a stand-alone document and ensures that only essential elements of the referenced standard are included.

The same benefits can be attained by extracting the relevant portions of referenced documents and transcribing them into the source document verbatim. This technique should be limited by

the length of the extracted requirement. Generally, an extraction of more than two pages should be avoided.

4.3.5 Industry Participation. Industry participation refers to actions which encourage industry to provide input on future acquisitions. Industry input can be used to clarify requirements, identify improperly referenced or unnecessary military specifications and standards, and reveal more effective alternatives to meeting requirements. Techniques for obtaining industry participation are described below.

Sources Sought and Requests for Information. Sources sought and requests for information announcements in the Commerce Business Daily allow industry to provide information related to a basic requirement. This information can be used in preparing requirements documents. Further, these announcements encourage industry to identify NDI which may meet requirements. These announcements are also an effective market investigation tool.

Draft Solicitation. Prior to issuing a formal solicitation containing the technical requirements, allow industry to comment on a draft of the solicitation. The draft solicitation, issued through an announcement in the Commerce Business Daily to potential offerors, allows industry to identify unclear, ambiguous requirements, inappropriately invoked requirements through referenced specifications and standards, and areas where standard industry practices and products are being unnecessarily precluded. These comments can be used to modify the requirements documents to be more consistent with existing products and practices. It should be noted that industry comments are subject to government approval and must be evaluated to ensure the recommended changes are in DoD's best interest.

Presolicitation Conferences. Prior to or during development of requirements documents, conferences can be held with potential offerors. These conferences can be held to educate industry on DoD requirements and encourage industry input on those requirements.

CHAPTER 5

SOLICITATION AND SOURCE SELECTION

Prior to solicitation, the NDI effort should not identify a specific product but rather determine if the marketplace would support a full or partial NDI acquisition. Through the solicitation process, offers will be obtained from those manufacturers or suppliers who desire to provide an NDI to the Government. These offers may even include manufacturers or suppliers who were not involved in pre-solicitation activities. In NDI procurements, it may be necessary to require contractor services (e.g. contractor logistics support, technical data) in addition to the hardware item. It is important that the solicitation documents, including Requests for Proposals, Requests for Quotations, and Invitations for Bid, are carefully prepared and tailored so that the required services are also solicited. For system-level NDI procurements, the solicitation documents should be structured to encourage offerors to propose NDI alternatives in full or partial fulfillment of the need. The following paragraphs discuss some particular aspects and procedures for NDI solicitations and source selection.

5.1 Solicitation Documents

The proposal preparation instructions of the solicitation document (Section L of the solicitation) for NDI procurements should require, based upon prior market surveillance, specific product information. Such information may include:

- A complete description of performance and supportability characteristics, range of operation, physical properties, and environmental behavior of the offeror's system and components.
- Supporting evidence of the offeror's testing, including test results, test data, test methodology, test documentation, and conditions used to verify and validate the NDI.
- Acceptance test plans for the system and its components.

- Recommended lists of range and depth for all repair items and consumables required to support an end item, including support and test equipment.

- Identification of all current sources of spare and repair parts.

- Plans for identifying and qualifying NDI subsystems and components.

- Plans for providing form, fit, and function controls while maintaining a reasonable flow of performance and maintenance improvements.

- Plans to ensure availability of product, components, spares and repair parts over the life-cycle.

- Industrial Preparedness Plans that ensure availability of product in support of surge and mobilization requirements.

- Identification of military and other government and non-government specifications and equivalent standards that are met by the proposed system. Offerors should identify those requirements contained in the specification that are not satisfied and explain differences, or propose a satisfactory equivalent.

- Description of recommended data, documentation, manuals, and training materials to be furnished. This includes proposals and pricing data for contractor-furnished support on a continuing basis and to assist the user in establishing any necessary training programs or facilities.

- Identification of proprietary items and data rights.

- Any past quality history data on the product, e.g., acceptance test records, customer complaints, warranty claims, scrap, repair, and rework data.

- Identification of the types of skills and quantities of personnel required to operate, maintain, and repair the item when in the United States or in a military environment.

- Certification that the product meets health and safety requirements stated in the solicitation document.

- Description of proposed warranty procedures.

- Identification of unique warranty provisions or procedures that would inhibit use or preclude organic maintenance.

- Availability of contractor engineering technical services.

5.2 Evaluation Criteria

A key factor in a contractor's preparation of an offer is a complete understanding of the evaluation criteria. Evaluation criteria (Section M of the solicitation) for NDI should be explicitly stated in the solicitation document. The following guidelines apply to the development of evaluation criteria:

- A physical demonstration of the system's characteristics and support, using the offeror's hardware and specifications set forth in the solicitation document may be required. The demonstrated system must show compliance with functional areas of the operational requirement and performance specifications.

- Evaluation of technical offers and prices submitted by offerors, whose proposed NDI has demonstrated compliance with operational requirements and performance specifications, should determine the best value to the Government. The offeror's past quality history will be a key consideration in making this determination or, in the case of a technically acceptable group of offerors, including an acceptable quality history, low realistic price alone may be the sole award criterion.

- Careful identification and selection of performance criteria to meet essential requirements consistent with user needs must be accomplished. Criteria must be balanced between operational effectiveness and suitability requirements and overly restrictive or general requirements that would inhibit the source selection process.

5.3 Procurement Alternatives

The Acquisition Plan, if required, will reflect the NDI program objectives, strategy, conditions and constraints. Requirements governing competition, as provided in the Competition in Contracting Act of 1984, apply to NDI procurements as they do to all procurements. Fixed price is preferred where little modification or testing is required. Where significant modification and testing is required, a cost type contract may be

considered for the prototype or initial production contract. A common procurement methods used for NDI acquisitions is the two-step sealed bid. The fixed-price negotiation contracting method is often used for more complex NDI acquisitions.

5.3.1 Two-Step Sealed Bid. The two-step sealed bid method of contracting is appropriate when NDI modification is either not required or minor. This approach allows the development of a descriptive specification of the requirement that is not too restrictive. Step One of a two step sealed bid consists of the solicitation and evaluation of technical offers (unpriced). These offers should include supporting data in terms of manpower requirements, provisioning data, commercial technical manuals, training packages, proposed warranties, quality history, reliability data, and other elements required to evaluate the offer. Step Two involves the submission of sealed priced bids for technically acceptable offers identified during step one. Award is made to the responsive and responsible offeror proposing the best price.

5.3.2 Negotiation. Contracting by negotiation is used when, due to the nature and complexity of the acquisition, direct negotiation is required to discuss technical and delivery issues and to determine the best value. This method is more applicable to NDI with extensive modification and to development efforts involving NDI component integration.

5.3.3 Solicitations. Requests for Proposals and Requests for Quotations should be structured to encourage industry to propose NDIs as alternatives to conventional research and development or production programs. Such structuring includes stating performance requirements as ranges rather than fixed points. This permits procuring agencies to effect performance versus cost and schedule trade-offs within performance ranges. The users

should be involved in establishing performance ranges and in trade-off analyses.

5.3.4 Alternative Proposals. NDI alternatives do not have to meet all stated performance requirements and technical specifications. In such cases, the item should be considered if there is a potential for savings in cost or time in opting for the alternative item. These items will require resolicitation to ensure regulatory compliance. The user should be involved in evaluation of such items. A formal change to operational requirements accommodating these items must be approved by the user. A sample solicitation clause for obtaining such NDI alternatives is shown below:

> "a. Use of NDI is the preferred method of satisfying operational requirements of the Department of Defense where such use does not significantly degrade the operational or performance requirements.
>
> b. Offerors are encouraged to propose NDI alternatives to research and development or military specification production hardware or software requirements of this solicitation at all levels of the work breakdown structure (e.g. end item, subsystem, component, piece part). All proposed NDI alternatives shall be clearly identified in the proposal. The intent of the NDI alternative is to provide the Department of Defense with effective and economical solutions to its essential operational requirements. Less than full compliance with all performance, technical, or operational objectives does not preclude the use of NDI, and offerors should propose such NDI in order for the Department of Defense to consider technical

and performance trade-offs. However, NDI alternatives that significantly degrade the performance characteristics of the contract product(s) will not be considered. Offerors are requested to present in the proposal the cost benefit analysis that supports the intelligent employment of NDI alternatives."

The mechanics of the alternative proposal process is illustrated by the following example.

Original solicitation (w/alternative proposal clause):

"All moving parts will be cleaned with an acid base solvent so that all dirt, oil, and foreign matter are removed."

Alternative proposal (received from supplier):

"The cleaning operation could be performed in a much more cost effective manner by using an ultrasound system, used by industry, to clean these parts. This procedure has proven to be as effective as acid based cleaners and usually costs 30% less. We estimate savings on this procurement of $10,000.

The Government could consider the alternative proposal to determine if its technically acceptable and worth cancelling the original solicitation and issuing a modified one such as:

"All moving parts will be cleaned so that all dirt, oil, and foreign matter are removed."

Once issued, the Government may award to a supplier offering the ultrasound or any other technically acceptable method of cleaning the parts.

5.3.5 Solicitations for NDI Subsystems and Components. For system-level development programs, contractual language should be inserted in the solicitation to encourage offerors to seek out NDI subsystems and components. Offerors should be required to submit their plans for identifying and qualifying NDI subsystems and components. Consideration should also be given to inserting evaluation criteria that would enhance award potential for offerors with superior programs for the identification and insertion of NDI into the system.

5.4 Warranties

Warranties are required by statute (Title 10 United States Code 2403) for weapon systems that are used directly in combat operations and exceed $100,000 in unit cost or $10 million in total procurement cost. The DOD FAR Supplement, Subpart 46.7, (Product Performance Agreements), includes major subsystems and provides detailed warranty guidance. Additional information on the use of warranties is found in the "Warranty Handbook," Defense Systems Management College, Fort Belvoir, Virginia. The primary emphasis of the warranty program is to:

- Tailor warranty provisions to the type of NDI being warranted and to existing supply and maintenance systems as much as practical. Commercial warranties often require unique procedures, forms, and notification processes which may not be compatible with the government usage or logistics support systems. The basic purpose is to support equipment under warranty in the same manner that will occur in post-warranty operation.

- Ensure that to the maximum extent possible, warranties are transparent (i.e., require no workload) to the organizational or intermediate maintenance levels.

- Ensure that, warranties are cost-effective. This includes warranties that are voluntary in addition to those required by statute. Weapon system warranties require formal cost/benefit analysis using approved methodology. Voluntary warranty cost/benefit analysis must also be documented in contract files.

- Comply with the requirements of the statute for mandatory weapon system warranties. Also, assure that warranty coverage is compatible with the warranty administration system.

For NDI, the Government should attempt to adopt the contractor's standard commercial warranty if it is consistent with what would be offered to the Government under a warranty-of-supplies clause or other contract terms. If a commercial item has been altered or modified through a contract specification, or if the planned use of the NDI is different from its commercial usage, the warranty language may need to be altered as a result of the cost/benefit analysis required to justify such warranty alteration/modification.

5.5 Small and Disadvantaged Business Considerations

The Department of Defense encourages the participation of small and disadvantaged business concerns in its acquisitions. To extend this approach to NDI acquisitions, the following actions should be considered:

- Application of regulatory small and disadvantaged business utilization preference programs;
- Assurance that NDI planning, approval and solicitation documents do not place unnecessarily restrictive burdens on small and disadvantaged business participation;
- Identification, where possible, of NDI candidates which are particularly suitable for small and disadvantaged business concerns.

5.6 Foreign Procurement

The acquisition of NDI from outside the United States presents certain challenges and requires special emphasis and work-arounds. Some of these are:

- Provide timely translation and interpretation of technical data in order to develop military technical manuals

- Ensure that all required technical data is written in English or that all translation costs are identified when determining total procurement costs

- Ensure that all repair parts are available and that adequate technical data packages written in English are available for procurement of spare parts.

- Handle "buy-outs" of the acquisition objective and production planning for surge and mobilization requirements or establish a U.S. source

- Provide contractor support comparable to the degree provided by military or commercial sources

- Obtain data rights or establish procedures to obtain the data rights if necessary

- Ensure that foreign safety and health characteristics meet United States standards

- Obtain licensing arrangements between foreign and domestic contractors

- Identify additional testing requirements for licensed items produced with new tooling.

The Deputy Directory Defense Research and Engineering (Test and Evaluation) and the Assistant Secretary of Defense (Production and Logistics) will, upon request, provide guidance, policy and procedures with respect to acquisition of foreign material and technology. Part of the decision process to procure foreign hardware should also include an evaluation of the limitations, if any, placed upon the U.S. Government by the selling government which restricts the U.S. Government from reselling the equipment to other U.S. Allies in response to direct foreign requests under the U.S. Security Assistance Program.

5.7 Reprocurement Data Rights

NDI acquisitions must consider all the alternatives and associated risks when deciding whether to acquire data rights for NDIs. Data rights are not always available, yet even when they

are available, their competitive reprocurement/support value versus acquisition cost must be assessed in determining the level of data rights (e.g., specific components versus total system) to purchase. To facilitate this decision, the procuring activity should request that contractors identify all proprietary components/parts, including those of subcontractors. DoD can avoid the expense of purchasing reprocurement data rights or reverse engineering but then must rely on the vendor or market driven parts availability in providing repair parts throughout the life-cycle of NDI.

It is desirable to avoid the potential high life-cycle cost associated with sole-source procurements. Therefore, where practical, reprocurement data packages should be obtained as part of the NDI acquisition effort. This will reduce data risk and enhance future competition. The Government may also require the vendor to provide the data rights after a specified period or in the event of significant configuration changes or changes in corporate visibility. NDI contracts must also address competitive reprocurement of spare and repair parts. When data is required, a prior disclosure or previous submission clause should be used in the event the Government may have already procured the data.

5.7.1 Spare Parts Breakout and NDI. Application of spare parts breakout policy to NDI must consider the particular reprocurement data package and the NDI category. The specific parts breakout and reprocurement data package options are dependent upon the source selection. The breakout program will be applied to centrally managed replenishment spare and repair parts for military systems to the maximum extent possible. For NDI, reprocurement data packages will support the intended use. For breakout purposes, the following is the desired amount of data required:

- NDI expected to operate in essentially the same environment:

  - Performance specifications (form, fit, and function)
  - Full disclosure of sources of supply
  - Unique or special processes required to achieve the level of performance needed
  - Identification of critical parts and critical characteristics.

- NDI to operate in a different environment than originally designed commercially:

  - Performance specification
  - Altered item drawings
  - Specification control drawings
  - Commercial format drawings
  - Full disclosure of sources of supply
  - Unique or special processes required to achieve the level of performance needed
  - Identification of critical parts and critical characteristics.

5.8 Standardization

Several programs exist for the purchase of quantities less than planned due to funding or other constraints. The Acquisition Plan should recognize the need for reprocurements. The Federal Acquisition Regulation, Subpart 6.3, (Other Than Full and Open Competition), includes provisions for support of standardization for procurement of additional units or replacement items using other than full and open competition. Application of this subpart requires a notice (reference FAR 52-215-4) in Section L of the original solicitation document. Program participants must carefully assess the potential for future procurements and apply this subpart, as appropriate.

5.9 Industry Application of NDI

Industry should be encouraged to identify NDI alternatives whenever and wherever they exist. Whenever refers to the different acquisition life-cycle phases and before and after a contract is awarded. Wherever refers to the various levels, system, subsystem through piece part. That encouragement can be provided through formal requirements or incentive clauses included in the solicitation.

Encouraging industry to increase use of NDI can be accomplished through:

- Value Engineering. Value engineering is a technique used to identify and propose changes to the product, service or process which meet requirements in a more cost effective manner. The Value Engineering discipline is useful in identifying NDI alternatives. Contractors can be encouraged to use the discipline through formal VE programs paid for by the Government or through incentive clauses which allow contractors to share in the savings resulting from a value engineering change proposal. More guidance on using value engineering can be found in DoD 4245.8-H, Value Engineering.

- Parts Control. A parts control program requires contractors to screen existing DoD inventories of piece parts to identify already stocked items which are suitable for use in a higher level system being developed. Parts control programs can be required through invoking MIL-STD-965, Parts Control Program. Note that this standard must be tailored to the unique needs of a program.

- Design-to-Cost. A cost control technique which requires engineering knowledge of the system to identify potential unit production and operations cost savings. Rigorous but realistic objectives are established early in the acquisition life-cycle. When appropriate, incentives are established to encourage contractors to meet proposed goals. Given these incentives, contractors will identify NDIs which achieve the design to cost goals. Note that NDIs will be pursued not only for reducing acquisition cost but also for reducing operation and support cost.

- Acquisition Streamlining Contract Clause. Acquisition Streamlining is an effective way of identifying NDI acquisition alternatives. In order to contractually implement acquisition streamlining in acquisition programs, the DoD Federal Acquisition Regulation Supplement (DFARS) has been modified to include a contract clause which encourages contractors to employ acquisition streamlining techniques. The clause is contained in DFARS Part 52. The clause requires the contractor to prepare and submit acquisition streamlining recommendations in accordance with associated statement of work provisions. More detailed guidance on using this clause can be found in MIL-HDBK-248B, Acquisition Streamlining.

CHAPTER 6
PRODUCT ASSURANCE

Product assurance is a general term that refers to those efforts directed toward assuring that the systems and equipments that are provided to operating forces have, and will continue to have throughout their life cycle, performance characteristics that satisfy the mission needs stated in the operational requirements documents. Product assurance considerations for NDI acquisitions include quality assurance, electromagnetic compatibility, reliability, and maintainability.

While product assurance is important in all acquisitions, it is a much more involved process for nondevelopmental items in system-level acquisitions, acquisition of complicated items, and those items with significant support requirements. This chapter addresses product assurance issues in the context of these acquisitions. The concepts discussed generally apply to all acquisitions. However specific steps and actions may not be appropriate for acquisition of items of supply, consumables, and commodities.

Product assurance for items of supply, consumables, and commodities is largely a function of the contract specification used in the procurement. In these cases, product assurance is achieved through the use of an appropriate and well prepared contract specification which includes necessary quality assurance provisions. Chapter 4 addresses the selection and preparation of specification documents. Appendix F contains guidance on establishing product assurance through market acceptability criteria.

6.1 Quality Assurance

Product quality is a central issue throughout the acquisition life cycle and is a reflection of quality of design, prevention of defects and quality of conformance; or the extent to which the item conforms to the design criteria or requirements. The fact that an NDI may already be accepted in the commercial marketplace indicates that a quality program may exist, at least in part, for the item. To be usable the available quality history must show stability of product quality over time and acceptable quality in the market place. In-process quality data, such as process and test yields, can be assessed to determine product quality.

Warranties are generally available for commercial equipment and if NDI are being purchased in the commercial marketplace, they will probably have limited warranties. It is necessary for the acquisition manager to determine whether such warranties are translatable to the intended use and if it would be cost-effective to use them. This determination should include consideration of the need for establishing the logistic channels necessary to turn in items for repair, and the cost to reimburse maintenance facilities for their repair efforts or the scrap of the items. If existing warranty provisions must be modified, a cost/benefit analysis is required to justify the modification.

6.2 Reliability

As noted earlier in the discussion of basic NDI concepts, military equipment must meet a military need and function in the military mission environment. Reliability, with its impact on operation and support costs, must receive critical attention in the NDI market investigation, solicitation, and source selection process. In the traditional acquisition process, the developer typically inserts reliability requirements in the system specification and development specifications and incorporates tailored tasks from MIL-STD-785 in the Statement of Work allowing

the contractor to conduct a disciplined reliability program to achieve the requirements. Often with NDIs, the basic product is already designed and its reliability established. Consequently, it becomes critical to assess the existing levels of the NDI reliability in military applications and military environments. This section provides guidance pertinent to reliability assessment and considerations during the NDI Market Investigation phase and also during solicitation.

6.2.1 Reliability Considerations During the Market Investigation Phase. Since the basic design of an NDI cannot be controlled by the services, the objective is to determine whether well-established and sound reliability practices were applied during the item's development. Thus, during field visits or in questionnaires used to gather information to ascertain NDI viability, a series of reliability questions should be asked of the manufacturers. Some typical questions and requests that should be considered are:

- Briefly describe your overall reliability design program.
- What mean time between failure does your product exhibit? If government repair is practical, what is your product's mean time to repair? What are its build-in-test capabilities?
- Describe the mission environment of your design.
- Does the reliability design program include:
  - A specific design policy on parts and materials derating?
  - Thermal analysis?
  - Failure modes, effects and criticality analysis?
  - Environmental stress screening?
  - Reliability allocations and predictions?
  - Shock and vibration analysis?

- Parts selection and qualification program including incoming inspection of critical parts?
- System and subsystem reliability testing?

These questions are not intended to be all-inclusive but rather to illustrate the scope of the reliability issues to be explored. Not all commercial products will have accumulated the required reliability data or the extensive testing required for military qualification. However, some items will have substantial market-generated performance data. In some cases, this data will be more extensive than that which could be generated through testing programs or experimental use. The utility of market data should be considered even when more demanding environments are anticipated.

Experience has shown that the information and data provided during the Market Investigation may be of less detail than desired. However, the Market Investigation process is directed at exploring the viability of an NDI strategy, not the adequacy of a specific product from a reliability standpoint. Reliability experts will generally be able to decide, based on the analysis of the information and data, whether an NDI alternative should be pursued. If it is determined that reliability information is inadequate to make a judgment, consideration should be given to obtaining some typical marketplace products for evaluation by the acquisition activity so that the viability of an NDI approach may be established through hands-on use of the product.

6.2.2 Reliability Considerations during the Solicitation Phase. When contracting for NDI, it is imperative that the offeror's NDI be thoroughly qualified before a contract is awarded. Specifically, the following should be considered either in a two-step sealed bid or a negotiated solicitation:

- Submission of a bid sample for qualification testing. It should be recognized that because of the available reliability history on the NDI the reliability qualification tests may not be as extensive as those conducted in a development effort. However, the test should be stringent enough to permit a confident decision that the product will meet military requirements.

- The offerors should be required to provide information and data to demonstrate adequately that sound reliability practices were used in the design of the product. The questions discussed under Market Investigation can be considered for insertion in the solicitation to obtain the desired information.

- Evaluation criteria should include statements to ensure that suitability of the product (from a reliability standpoint) will be an important factor in source selection.

6.2.3 Reliability Considerations. Industry should be contractually encouraged to select NDI for insertion into developmental systems. The basic concepts with respect to NDI and reliability are applicable not only to the Government but to its contractors as well. Contractual language should require the contractor to institute an NDI Market Investigation-type effort and a qualification program to ensure that only suitable NDI is inserted into the system. Also, from an overall standpoint, the contractor will be required to meet system reliability requirements. In the contractor's apportionment of reliability, the NDI contribution will have to be established and demonstrated in the overall test and evaluation program.

6.2.4 Reliability Considerations Based on Use Environment. The level of the qualification testing should be governed by the situation, namely whether the NDI would be used in the same environment or for a different environment than originally designed. In a same-environment situation, it would be expected that some confidence could be placed on general marketplace

acceptability and therefore a lesser level of qualification testing should be considered.

6.3 Maintainability

Maintainability is an important characteristic in DoD systems and equipment. In development programs, maintainability features are designed into the product. With NDIs, maintainability features are usually designed to support a maintenance concept very different from that of the DoD activity. Maintainability features such as: accessibility, interchangeable parts and components, standard parts, built-in-test, maintenance equipment, and ease of handling, must be carefully assessed when considering an NDI. Such assessments should include the current systems maintainability as well as assessments of opportunities for enhancing maintainability through modifications.

6.4 Reliability and Maintainability (R&M) Requirements

Quantitative R&M requirements should be developed for all NDI. Prior to Milestone I, a thorough analysis should be accomplished and R&M parameters established for comparison with what is available in the marketplace. Criteria for evaluating R&M for NDI should be the same as for standard development programs.

6.4.1 NDI R&M Data Characteristics. In most cases, accurate quantitative R&M data will not exist, particularly for commercial items. Where data is available, it must be carefully evaluated to determine if it is representative of use in the desired military mission or environment. When quantitative data is not available, review of analyses may be useful, e.g., R&M predictions; failure mode, effects and criticality analyses; thermal and stress analyses; even service and warranty records. However, such alternative data is never as good as accurate performance data based on operational history. Since NDI are

readily available typically, it may be best to conduct hardware tests rather than to exhaustively evaluate paper analyses.

6.4.2 R&M Data During Market Investigation. Many approaches can be taken to gather valid data during the Market Investigation. One approach is to request and review any R&M analysis that the manufacturer performed in the development of the item. The R&M requirements stated in operational requirements should be used as a baseline for R&M assessment. When quantitative R&M data is not available, it may be possible to assess relative R&M values. These approaches and others should be used to obtain enough R&M data upon which to base an NDI decision.

6.4.3 R&M Data Acquisition. If the acquisition manager or cognizant R&M proponent determines that the Market Investigation did not provide sufficient data to resolve the R&M issues, testing may be required. Program office, functional area activities, and test activity personnel should coordinate planning and execution of testing programs and provide test alternatives to the decision maker. Acquisition activities should not demand test data in rigid formats, but should be flexible in accepting data that answers essential reliability questions.

6.4.4 R&M Data Alternatives. When Market Investigation or testing demonstrate that available equipment cannot meet R&M requirements, several alternatives exist:

- Existing commercial equipment may be modified to meet R&M requirements
- Modification of existing mission profiles or basis of issue to determine if the commercially demonstrated R&M values are acceptable

- If R&M is an extremely critical design characteristic, or when the commercial R&M parameters are far inferior to requirements, the NDI strategy may have to be abandoned.

6.4.5 R&M Program Requirements. For all NDI acquisitions, a Reliability Program (MIL-STD-785) and Maintainability Program (MIL-STD-470) should be tailored. Depending on the information gathered during market and life-cycle cost analyses, reliability and maintainability program tasks may be waived or partially implemented. Reliability and maintainability programs should be implemented for end items assembled from commercial components, unless Market Surveillance or Market Investigation information can show the integration process would be low risk. Requirements for formal R&M programs, or rationale for not pursuing a formal program should be documented in the milestone decision process. Follow-on evaluations may need to be performed on those items that have demonstrated marginal reliability and maintainability characteristics during qualification tests.

6.5 Electromagnetic Compatibility

The degree of electromagnetic compatibility compliance with military specifications and standards must be ascertained to ensure performance is not degraded in the mission environment. The NDI must also be electromagnetically compatible with existing operational equipment and systems. The fact that an NDI may already be accepted in the commercial marketplace does not ensure electromagnetic compatibility requirements are met.

6.5.1 Electromagnetic Compatibility in Design. Electromagnetic compatibility is an important design consideration during development programs. In NDI, however, the basic product is already designed. It is essential, therefore, to assess the intended environment and required electromagnetic compatibility characteristics of candidate NDIs. Modifications implemented to correct electromagnetic compatibility problems in an operational

NDI can be time consuming and very costly. Electromagnetic compatibility problems can present a potentially hazardous situation resulting in loss of life, damage to hardware, or degradation of mission performance capability.

6.5.2 Electromagnetic Compatibility Requirements. Quantitative electromagnetic compatibility requirements should be developed for electrical and electronic NDIs. Prior to Milestone I, a thorough analysis should be accomplished and electromagnetic compatibility parameters established for comparison with what is available in the marketplace. Criteria for evaluating electromagnetic compatibility for NDI should be the same as in development programs.

6.5.3 Electromagnetic Compatibility Market Data. Many approaches can be taken to gather valid data during the market investigation. One approach is to request and review any electromagnetic compatibility analysis that the manufacturer performed during design and development of the item. The electromagnetic compatibility requirements stated in the Operational Requirement should be used as a baseline for electromagnetic compatibility assessment. When quantitative data is not available, it may be possible to assess relative electromagnetic compatibility values. These approaches and others should be used to obtain enough electromagnetic compatibility data upon which to support an NDI decision. If the acquisition manager determines that the market investigation did not provide sufficient data to resolve electromagnetic compatibility issues, testing may be required. An Electromagnetic Compatibility Board should be convened to provide alternatives to decision makers.

6.5.4 Alternatives to Deficient Electromagnetic Compatibility. When market investigations or testing of an NDI demonstrate that

available equipment cannot meet electromagnetic compatibility requirements, several alternatives exist:

- Shielding or isolation of the NDI
- Existing commercial equipment may be modified to meet electromagnetic compatibility requirements.
- Existing mission profiles may be reassessed to determine if the commercially demonstrated electromagnetic compatibility values are acceptable.
- If electromagnetic compatibility is an extremely critical design characteristic, or when the commercial electromagnetic compatibility parameters are far inferior to requirements, the NDI strategy may have to be abandoned.

6.5.5 Tailoring Electromagnetic Compatibility Programs for NDIs. For all NDI acquisitions, an Electromagnetic Compatibility Program (MIL-HDBK-237) should be tailored. Depending on the information gathered during market and life cycle analysis, electromagnetic compatibility program tasks may be waived or implemented for end items assembled from commercial components, unless market surveillance or market investigation information can show the integration process would be low risk. Requirements for formal electromagnetic compatibility integration programs, or rationale for not pursuing a formal program should be documented in the milestone decision process. Follow-on evaluations may need to be performed on those items that have demonstrated marginal electromagnetic compatibility characteristics during qualification tests.

CHAPTER 7
TEST AND EVALUATION

Test and evaluation is a major control mechanism of the acquisition process. Programs typically move from one acquisition phase to the next or are funded incrementally based on resolution of critical operational issues and achievement of preset thresholds verified through test and evaluation. An important advantage of many NDI acquisitions is reduced procurement time. This is partly achieved through fewer testing requirements as a result of testing previously accomplished and due to general acceptance of a product in the commercial marketplace or other usage. The general guidance for NDI acquisitions is that testing may be limited when existing data (contractor or other sources) is sufficient. However, it is important that the development and operational test proponents become involved early enough to actively participate in the verification of existing test data and the planning for additional tests if required.

The material below is oriented toward larger system and complex equipment acquisitions. Many of the tests discussed below are not appropriate for items of supply, consumables, or commodities which are typically prequalified or tested at time of procurement. The goal is to minimize NDI testing requirements by using existing historical data and marketplace acceptance of the product. Testing should focus on those areas where data is inconclusive or where performance assessment against unique operational requirements must be conducted.

7.1 NDI Test and Evaluation

NDI acquisitions offer the opportunity of using manufacturer-supplied or user-supplied data, which could reduce the amount of testing required. Testing concepts for conventional research and development acquisitions also apply to NDI acquisitions. An NDI still requires verification of

performance capability in intended environments through both technical and operational evaluation, as appropriate. However, circumstances unique to each NDI acquisition will dictate the required level of testing required, which, if necessary, will be reflected in the Test and Evaluation Master Plan. The acquisition manager should involve the operational test director as early in the process as possible to assist in determining test requirements.

NDI acquisitions with little or no modification, that are intended to operate in the same environment for which designed, should lead to more reliance on existing test data and item history. NDI requiring modification, or which are intended to operate in a different environment than originally designed, require additional testing in order to verify performance, operational effectiveness, and suitability. NDI integrated into larger systems will conform to the conventional development and operational testing of the higher system, which includes testing to ensure NDI interoperability with other components of the system.

The acquisition manager for an NDI can facilitate preparation for development and operational testing by ensuring that data from manufacturers or other sources is obtained early in the acquisition. Data planned to satisfy certain NDI operational test requirements should be coordinated with the acquisition manager and operational test director and reflected in the initial Test and Evaluation Master Plan.

7.1.1 Development Test and Evaluation. This testing is conducted on modified NDI to verify attainment of technical performance objectives and is planned and reported by the developing agency acquisition manager. Development testing will not be reduced unless the acquisition manager or the test proponents identify specific existing commercial or other test

data that meets the needs of the development test program. Acquisition activities should not demand test data in rigid formats, but should be flexible in accepting data that answers essential performance questions. Risks associated with hardware/software modifications and integration of components should also be carefully considered when determining development test requirements.

7.1.2 Qualification Testing. Qualification testing is used to verify the design and the manufacturing process and provides a baseline for subsequent acceptance tests. This involves preproduction and production tests:

- Preproduction qualification tests are formal contractual tests that ensure design integrity over the specified operational and environmental range. These tests usually use prototype or preproduction hardware fabricated to the proposed production design specifications and drawings.

- Production qualification tests ensure the effectiveness of the manufacturing process, equipment, and procedures. These tasks are conducted on the initial production items in the case of high dollar value items (i.e., large missiles), or a sample lot taken at random from the first production lot of less expensive items such as ammunition.

[Note: These tests are not related to qualification testing associated with Qualified Products List (QPL) or Qualified Manufacturers Lists (QML).]

The solicitation may require that one or more contractors be selected to provide test samples. This burden is placed on NDI suppliers to provide test articles and attendant repair parts and support for the acquisition manager to conduct qualification testing. However, in some cases, the acquisition manager may

require the purchase of limited quantities of an item from technically qualified sources. Test samples would typically be evaluated in the following areas:

- Does the system or equipment satisfactorily comply with the minimum performance requirements of the Statement of Work or contract specification?
- Can the equipment withstand the military environment in which it will be used (shock, electromagnetic interference, vibration, temperature range, etc.)?
- Does it possess the reliability and maintainability capability that will satisfy requirements? (Note: These parameters may be appropriate to trade-offs against cost and schedule.)
- Does it function acceptably in operational use by military personnel?
- Is technical documentation available to support life-cycle operation and maintenance? To what extent?

The qualification test data is used along with other factors such as cost and management approach to determine the final selection of a production contractor.

7.1.3 Operational Test and Evaluation. This testing is used to assess a systems operational effectiveness and operational suitability, identify the need for modifications and provide information on tactics. An NDI usually requires operational testing. However, if the cognizant developing agency can demonstrate that the market investigation data indicates that the NDI meets operational and suitability requirements, operational testing may be waived. This determination must be included in the decision milestone review documentation and approved by the Program Decision Authority.

7.2 Market Investigation Test Data

Testing during Market Investigation should be limited to that testing essential to obtain sufficient data to make the NDI

decision. This testing may be accomplished as part of the market investigation or, as an alternative to actual testing, acquisition managers may:

- Obtain and assess manufacturer test results
- Observe manufacturer testing at his facilities
- Obtain usage and failure data from other customers or service users
- Obtain test results from independent test organizations (e.g., Underwriter's Laboratory.)

If, based on initial data collection, it is decided that more information is needed to make a sound NDI decision, the market investigation may enter into an evaluation phase. NDI candidates may be purchased or leased, and development and operational tests conducted. These test results are not to be used to select a specific contractor or producer but are inputs to the NDI decision process. The test results will:

- Directly support the decision to accept or reject the NDI alternative
- Influence preparation or refinement of the operational requirement
- Assist in preparation of solicitation documents.

Test and evaluation after the Market Investigation, if required, will be described and justified in the approved Test and Evaluation Master Plan.

7.3 Testing by NDI Type

Testing requirements must be tailored to each specific system. The following guidance is provided for testing activities appropriate to NDI type:

- NDI intended to be used in the same environment for which it was designed: No development testing is required prior to Production Qualification Test except when the contract is awarded to a contractor who has not previously produced an acceptable finished product and the item is assessed as moderate to high risk. In that case, some preproduction testing should be accomplished. Operational testing is required when an organic maintenance environment is a development or unknown feature.

- NDI intended to be used in an environment different from that for which it was designed: Early qualification testing will probably be required in the operational and maintenance environment. Preproduction Qualification Testing will be required if early qualification testing leads to modification of the original item. Production Qualification Testing will be required.

- NDI intended for integration into a larger system: Feasibility testing to qualify a test sample should be done prior to selection and integration into the system. Preproduction testing of the complete system is required. Hardware and software integration testing will be necessary.

7.3.1 Follow-On Evaluation. Testing immediately after initial deployment is oriented toward validating and refining the logistics support strategy (e.g., operating and support cost data, reliability and maintainability characteristics, logistics support, training, supply support, etc.). It is mainly to aid the users and supporters in refining their support structure. Subsequent testing may be required to verify upgrades or modifications are suitable or acceptable.

7.3.2 System Safety Requirements. Essential safety characteristics specified in the operational requirement will be used as the minimum safety criteria during the Market Investigation process. Safety verification (testing) of the hardware may be necessary to validate acceptability of the system in the military environment.

7.4 Joint Service and Foreign NDI Issues

When an acquisition involves a system developed and tested by another service or foreign agency, a memorandum of understanding between the agencies involved will provide guidance on the mutual acceptance of test and evaluation results.

Foreign Weapons Evaluation and North Atlantic Treaty Organization Comparative Test (NCT) Programs have formalized considerations of foreign NDIs. These programs are Department of Defense funded with overall direction provided by the Deputy Director Defense Research and Engineering (Test and Evaluation). The programs evaluate foreign weapons systems, equipment and technologies that have the potential to satisfy a specific U.S. service requirement. The programs are essentially the same, the primary difference being that the NATO Comparative Test Program is concerned only with items of NATO origin. The potential benefits of these programs are to:

- Eliminate or reduce R&D costs
- Accelerate availability dates
- Enhance Allied interoperability and standardization
- Achieve economies of scale
- Increase competition

DoD component candidate systems for Foreign Weapons Evaluation and NATO compatibility testing must meet the following criteria. Proposed test projects must clearly describe, and will be evaluated on:

- The extent to which the candidate system does the following:

- Provides a solution to a valid DoD component requirement or operational or technical deficiency, for which there is no existing U.S. system; or,

- Provides a legitimate alternative to a U.S. system under development; or

- Offers a cost, schedule, or performance advantage over existing equipments and/or systems for which there is only one source.

o Demonstrated completion of a preliminary market investigation determining the nature of available equipment and number of potential vendors, with indication of any further market investigation required to support a sound acquisition strategy.

o Off-shore procurement restrictions.

o Support within the DoD Component (e.g., serious intent to procure the item, system, or technology and willingness to share test costs).

o Procurement funds availability.

o Potential for establishing a U.S. source to produce, under license, foreign design equipment.

o Willingness of foreign government and/or industry to contribute to test costs.

o Standardization, rationalization, interoperability, and support considerations (i.e., is the item or system in service with, or about to enter service with, one or more allies?)

- Results of the sponsoring DoD component's investigation into the interest of other DoD components in this effort (i.e., Does another Military Service have a similar requirement? If so, do they support this project? If not, why not?).

Acquisition managers who have identified a potential foreign application or need to discuss their requirements should coordinate with the in-Service or Agency point of contact or the Office of the Deputy Director of Defense Research and Engineering for Foreign Systems.

CHAPTER 8

INTEGRATED LOGISTICS SUPPORT

Integrated logistics support (ILS) is often the most difficult aspect of NDI acquisitions. Shortened schedules, technology-driven configuration changes, and greatly extended service life all contribute to the challenge of NDI support. Every NDI acquisition requires an individualized logistics support strategy based upon the program's characteristics. The development and execution of an NDI support strategy resolving these problems will require innovative and nontraditional logistic support approaches. Acquisition activities should not demand data in rigid format, but should be flexible in accepting data that answers essential integrated logistics support questions. The material below is oriented toward larger systems requiring the planning for and acquisition of integrated logistics support to fully meets its mission.

8.1 Integrated Logistics Support Planning

Support decisions should be based on trade-offs of system use factors and other program considerations. Support options should not be ruled out simply because one logistics element may exceed its generally accepted impact parameter. For example, the decision to forego organic support should not be made solely on the basis that parts proliferation will be an accompanying fact of life. The entire process of planning for and acquiring logistics support must be tailored to the constraints inherent in the nondevelopmental item being supported and incorporated into the Integrated Logistics Support Plan.

Selecting an NDI solution to an acquisition does not imply that any of the elements of ILS can be ignored. The ILS elements of NDI candidates must be thoroughly assessed during the market investigation so that ILS remains a critical factor in the decision whether an NDI strategy is feasible. In arriving at a

decision regarding ILS for an NDI, it should be kept in mind that the NDI alternatives may require a departure from traditional methods of acquiring logistics support. The early application of ILS requirements influences design in order to optimize system supportability. This is not necessarily the case for an NDI and it is important that the Government considers what has been accomplished in all the logistics elements of an NDI to assist in the NDI decision and identify areas requiring more effort.

The planning and execution of initial provisioning for logistics support usually takes place during the development and production phases. Generally, these phases are long enough to accommodate requirements for provisioning conferences, reviews of technical data, and obtaining National Stock Numbers. However, in an NDI acquisition, the time required to complete the various planning and provisioning tasks could very well delay deployment.

It is recognized that risk increases when organic support capability can not be provided at initial operational capability. The services have often relied on interim contractor support during initial deployment. This interim support period, which may last two years or more, allows a system to be deployed and operational while organic support capability is being established. NDIs may require more extensive interim support because there is little or no development time to establish an organic support capability. A decision to rely on lifecycle contractor logistics support must be agreed upon by users and supporting activities and be accompanied by adequate planning. In the absence of a formal agreement for life-cycle contractor logistics support, plan for appropriate levels of organic management and support of NDI assets.

Figure 8-1, Contractor Versus Organic Support Considerations, may be used as a guide in developing a logistics support strategy. There are five system use factors: How the NDI will

be used from "as is" to fully militarized modification; where the NDI will be used, i.e., in what environment, from a fixed/industrial/nonhostile one to a mobile/austere/hostile one; how long the NDI system will be used, i.e., the system's projected service life; when the NDI is to be used, i.e., to be deployed immediately or sometime in the future; and, why an NDI is being selected, to take advantage of an advancing technology (with changing configurations) or the availability of a proven, stable design. Each use factor shows a range of support methods. These methods range from no support, which implies disposal upon failure to full organic support, and includes full contractor support and combined contractor/organic support. The proposed NDI and its system use factors may serve as a guide in planning the logistic support strategy.

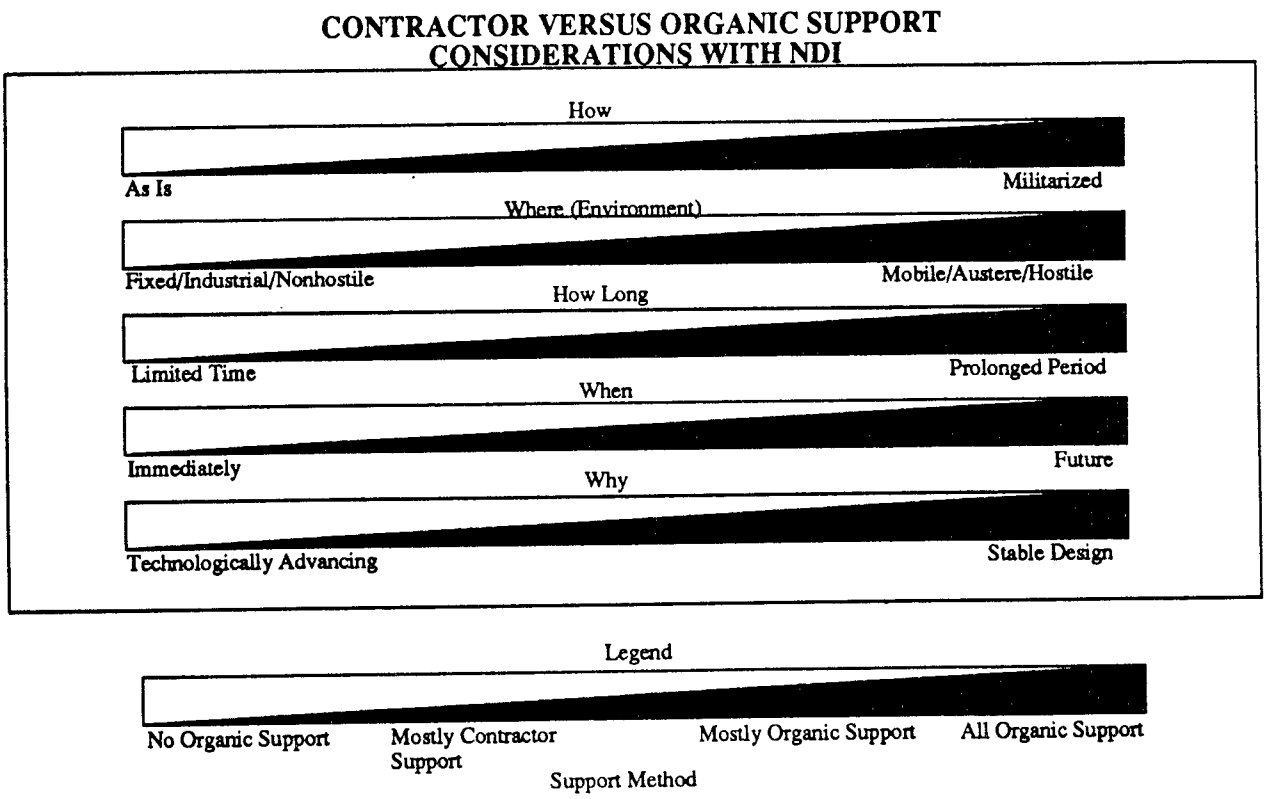

Figure 8-1

An NDI alternative may have characteristics, such as unique features or capabilities which require reevaluation of support concepts. For example, a low-cost NDI, with high reliability using a rapidly changing technology may require considering alternative support concepts. In such cases for example, a dispose and replace concept may be preferred to a provisioned, repair on-site concept.

As in any other acquisition program, a successful NDI integrated logistics support program can only be achieved through the joint efforts of the user, the logistics review group, the acquisition manager, the logistics manager, and the contractor. Based on the logistics support knowledge gained during the market investigation, a tailored ILS plan should be prepared and documented to include:

- Overall ILS requirements, including ILS budget estimates
- The initial support package that will be available during and after deployment, based on the operational requirements.
- Level of repair and breakout.
- How to achieve initial support capability.
- Post-production support
- How to transition to organic support within a reasonable time period if required.
- Requirements and detailed plans for each function and element of ILS using information obtained from the Market Investigation and logistics support analyses.

The NDI ILS Plan provides the basis for establishing ILS requirements and terms of the solicitation document. Tailoring of MIL-STD-1388-1 and -2, Logistics Support Analysis (LSA) and Logistics Support Analysis Record, is essential in the NDI arena. Appendix D contains examples of how to tailor LSA requirements to NDI acquisitions. ILS considerations must be given appropriate

weight in the source selection criteria and contract provisions. Instructions to offerors of the NDI procurement should require specific logistics related information on their products such as:

- Description of supportability characteristics
- Pricing information for repair parts and consumables required to support the NDI, including support and test equipment. Identification of all current sources of each repair item with justification (e.g., reliability, price) for preferential selection of sources
- Plans for ensuring availability of products, components, and repair parts over the intended life cycle
- Description of data, documentation, manuals, and training materials to be furnished or available
- Proposals and pricing data for contractor logistics support and associated warranties as required in the proposal
- Identification of the types of skills and quantities of personnel required to operate, maintain and repair the NDI when employed in the intended environment
- Certification/evidence that the NDI meets service health and safety requirements stated in the solicitation document
- Identification of proprietary items and data rights
- Description of proposed warranty procedures.

Where such information is inadequate or unavailable, it may be necessary to have it modified or developed.

8.2 Integrated Logistics Support Elements

The unique support considerations of an NDI must be evaluated within the context of the ten integrated logistics support elements. Opportunities and challenges associated with the integrated logistics support element are described in this section.

8.2.1 Maintenance Planning. The initial maintenance concept generally accepted for most NDIs is to provide the user organization with the capability for fault isolation to the Line Replaceable Unit. This is done through the use of built-in-test-equipment or the use of test measurement and diagnostic equipment test procedures. The maintenance technicians in the user organization then remove the Line Replaceable Unit and replace it with a working element, sending faulty units to the Intermediate Maintenance Activity or Depot. Intermediate facilities would stock units for direct exchange purposes. Note that both organizational units and intermediate levels are usually manned by operators and maintenance personnel. Items not replaced at the intermediate level are shipped to a depot, which may be manned by military, civilian, and/or contractor personnel. Depots usually have the capability to repair to the piece-part level. It is important that criteria and subsequent maintenance concepts be identified and transition plans formulated when required.

Developing maintenance plans is a subset of ILS functions and analysis described in MIL-STD-1388-1. This standard prescribes a number of tasks which generate data to support logistics planning, including maintenance. Logistics Support Analysis tasks associated with maintenance include: readiness analysis, reliability and maintainability, repairable item identification, task and skills analysis, etc. These tasks should be invoked in NDI acquisitions to generate data necessary to support maintenance planning.

The acquisition manager must ensure that continued preventive and corrective maintenance will be provided throughout the life of the NDI. Use of NDI has the potential of providing the alternative of using existing commercial or other service maintenance facilities to replace or supplement existing organic maintenance facilities, reducing life cycle costs, personnel,

training, and documentation requirements. If the NDI will be supported and maintained by the Service, the NDI's Maintenance Plan and supporting data must ultimately be purchased. Systems and equipments requiring organic support should avoid or limit the amount and duration of contractor logistics support. Maintenance plans must meet all program requirements (economic, readiness, performance, operational, safety, etc.).

The challenge with respect to a maintenance plan for NDI acquisitions will be how to best use existing commercial or other maintenance and support systems. Among the factors that will influence the decision are:

- The degree to which manufacturers, other military services, or other sources already provide maintenance support to existing customers,
- Responsiveness of such support activity to meet military requirements in peacetime and wartime (mean logistic down time, need for priority service, wartime surge, etc.),
- The degree to which the Service will be able to provide organic maintenance support, and the need for support facilities or a training and rotational base for service technical personnel, and
- A need to minimize "down time."

Manufacturers of commercial items may be willing and able to support their products with preventive maintenance, repair parts, and technical personnel through the item's expected service life. Possible support strategies might include:

- Return to factory for repairs
- Provision of test equipment, procedures and parts for intermediate or depot-level repair
- Provision of test equipment, procedures, and parts for user repair
- On-site repair by contractor personnel

- A combination of the above

8.2.2 Manpower and Personnel. The number and skill levels of people required to operate and maintain the NDI must be considered and evaluated. Specific areas influencing NDI decisions should include:

- Number and type of people required for operation
- Number and type of people required for maintenance
- New skills, knowledge or grades required

These considerations should be made for all planned support and maintenance levels.

Manpower and Personnel activities begin during formulation of the operational requirement. Unlike new developments, NDI limits options because the acquisition is for a defined end-product or component.

For strictly off-the-shelf items, analysis is required to determine if the standard NDI configuration meets Manpower and Personnel criteria. If it does not, this leads to a reevaluation of the basic NDI decision or modification of initial support concepts.

If pursuing a modified NDI strategy, then deficient findings might be compensated by simple system design modifications. Results of Manpower and Personnel analysis could dictate modification of commercial equipment, affect source selection, drive contractor logistics support, or eliminate NDI as a solution.

8.2.3 Supply Support. Manufacturer and other historical usage data may significantly aid in the accurate prediction of initial

provisioning requirements for repair parts and related support equipment and help estimate follow-on provisioning needs. Previous user experience and manufacturer observations and projections may be of great value in determining usage factors. Usage factors include service life, environment, and other factors that may differ between the intended application and the original design application. For example:

- Military systems generally have a longer expected service life than their commercial counterparts. Acquisition managers must consider the possible obsolescence of replacement parts needed to sustain the repair of fielded hardware for NDI.
- Items designed for surface use but selected as NDI for airborne application could face stresses that cause quite different failure modes.

The impact on the supply system of commercial items must be considered. Modular construction of commercial items often requires unique repair parts. Where the impact is great, alternative supply methods should be investigated and employed where cost-effective. Some possible alternatives are:

- Manufacturers provide storage and distribution of spares and repair parts
- Prime system contractors provide supply support
- Life-of-type procurement of all repair parts maintained and distributed outside of the military supply system.

A major logistics issue resulting from NDI acquisitions which must be addressed is the need to provide support for items which change from one procurement to the next. This has a severe impact on the logistics system in that each time a new or different item is brought into the inventory, new manuals, drawings and parts will have to be procured while simultaneously, the existing equipment has to be supported.

8.2.4 Support Equipment and Test and Measurement Systems. Requirements for support and test equipment must be identified as early as possible and included in organization authorization documents. Use of military standard test equipment in lieu of contractor-recommended unique test equipment is preferred, but may not be feasible for NDI. A determination should also be made regarding the need for new calibration standards and procedures to support the required test equipment.

8.2.5 Technical Data. Technical data for logistics support includes specifications, drawings, technical manuals, calibration procedures and other data required to procure, manufacture, test and inspect, perform preventive and corrective maintenance, operate and repair the item or its parts. The technical data required must complement the maintenance and supply support strategies. Problems concerning availability, maintenance, storage, and distribution to all requiring personnel and activities must be resolved before acquisition of proposed NDI.

Where suppliers claim proprietary rights in data, the logistics manager should validate the claim and review the data requirements to ensure that expensive and unnecessary rights in data are not procured.

8.2.6 Training and Training Support. Overall training requirements have to be determined on an expedited basis. Equipment and personnel requirements are identified in authorization documents. Extensive contractor assistance is required for initial new equipment training and establishing the institutional training base. These requirements are determined jointly by the acquisition office in close coordination with the Manpower/Personnel sponsor. If training aids or devices are required, use of contractor owned or contractor provided equipment may be necessary. Special needs of the user will be

identified and met where possible. The amount of training for operation and maintenance should also be considered.

8.2.7 Computer Resources Support. This element includes the facilities, hardware, software, documentation, manpower, and personnel needed to operate and support embedded computer systems. This area is NDI intensive. Careful front-end investigation of all support, mission, interoperability, and market issues, while complying with applicable computer resource policies, will ensure an appropriate NDI acquisition.

8.2.8 Facilities. Introducing a new system or equipment into service requires careful evaluation of facility requirements. Such evaluation is important for NDIs as well as service developed systems. With NDIs, however, two factors, compressed schedule and non-DoD design increase the demands of facilities planning. It is important that early logistics considerations include defining the types of facilities, facility improvements, locations, space, and environmental requirements necessary to support the NDI.

8.2.9 Packaging, Handling, Storage and Transportation. Prior to completion of the solicitation package, requirements for packaging, handling, storage, and transportation are determined. Commercial standards are used to the extent they satisfy military requirements. However, any required modifications should be included in the solicitation package. Where necessary, Navy and Marine Corps transportability experts should participate in precontract award negotiations. The high cost of postproduction modification must be avoided.

8.2.10 Design Interface. During all life-cycle phases and as part of the Market Investigation, the design characteristics are evaluated in terms of supportability issues, costs, and compatibility with support equipment. These characteristics are

included in source selection criteria, thus serving the intent of design influence and interface.

8.3 Logistics Support Analysis and Record

Logistic Support Analysis is an integral part of the development of requirements documents and the Market Investigation. It is used in determining initial and life-cycle support concepts and projecting potential support problems and solutions. It also details ILS element requirements via the Logistics Support Analysis Record. The Record is tailored to provide phased delivery of data required to determine interim and subsequent support resource requirements. Logistics Support Analysis deliverables should be required to provide timely completion of ILS schedules. Appendix D contains examples of how logistics support analysis tasks can be tailored to NDI acquisitions.

8.4 Integrated Logistics Support Resources

Overall ILS resources (funding and manpower) should be identified and provided as part of the early NDI life-cycle process. Where necessary, reprogramming to fund additional ILS resources may be required to support both government and contractor ILS efforts. In particular, ILS funding requirements or estimates should be a key factor up front in the NDI alternative decision process.

8.5 Supportability Test and Evaluation

If commercial marketplace testing does not address the intended military environment and equivalent information cannot be obtained from existing sources, test and evaluation may be required. This testing is used to determine or verify suitability/supportability requirements, maintenance skill requirements, training requirements, transportation issues, and the use of standard support and test equipment. Independent evaluation results will be provided to the developer and the user

and may result in minor modifications to the NDI prior to delivery.

8.6 Configuration Management and Control

Configuration management and configuration control must be carefully evaluated when considering NDI alternatives. Over time, other users, commercial or military, may drive changes to the item which affect the user's ability to support the item. Such possibilities require close scrutiny to support decision makers and to allow flexibility and adaptability of logistics support planning. The ability of the user to adjust to possible configuration changes which are beyond its control is an important consideration for NDI acquisitions. Limited configuration control and configuration management will affect data requirements. For example with limited configuration control, form, fit, and function data is preferred to full design disclosure engineering data. The latter being more expensive and more prone to obsolescence.

CHAPTER 9
SUMMARY

NDI is a potential solution to an acquisition that may offer significant payoffs in terms of cost and time because an NDI has already been developed and should also have an operating history. NDI acquisitions are not something new but are merely competing alternatives which are addressed within the acquisition life-cycle spectrum at the system, subsystem, component or piece part levels.

The difference between conventional developments and NDI alternatives is basically how design attributes are addressed. In a conventional military development, areas such as Reliability, Maintainability, Integrated Logistics Support, Safety, Survivability, Vulnerability, Shock and Vibration are typically designed into the system. However, an NDI is the product of some "other" design effort and the design attributes that may be considered essential or desirable by the military users may not have been an influence or factor in the original design.

It is most important when exploring NDI alternatives, that we find out what attributes exist and what resources would be required to meet military requirements before a decision is made to proceed with the NDI acquisition. Many of the "horror stories" of commercial, off-the-shelf acquisitions have been a result of less than adequate Market Investigations or inadequate logistic support analyses to ensure that equipment was maintainable and supportable prior to its procurement and fielding. It is also important to consider the adequacy of technical data and quality of manufacturing of NDI.

There are often opportunities to affect savings in instances where an NDI does not meet all of the military user requirements.

Rather than discarding these NDI alternatives, further investigation should be accomplished to determine if: (1) modification of the NDI could attain the desired results or (2) further dialogue with the user might indicate sufficient flexibility in the requirements to reach an NDI solution.

The selection and implementation of an NDI alternative may have to clear major hurdles in today's acquisition environment. This could be due to a traditional development acquisition mindset, a natural preference for "business as usual", a general lack of experience with NDI acquisitions, or an aversion based on "horror stories" of the past. Those who think the pace of a standard acquisition is hectic will undoubtedly be dismayed with the pace required for an NDI acquisition.

The ultimate goal for NDI acquisitions is the same for all Department of Defense acquisitions; that is to provide reliable, supportable systems to the operational forces in a timely manner at a reasonable cost. An NDI may achieve this goal with the potential advantages of significantly reducing time and cost. The Congress has legislated increased use of NDI by the Department of Defense. Effective evaluation and application of viable NDI solutions can maximize the return to both the user, developing agencies, and the taxpayer.

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APPENDIX B
Additional References

The COTS Book: Selecting and Supporting Commercial Products for the Military , United States Air Force

U.S. Marine Corps Nondevelopmental Item Handbook, United States Marine Corps, May 1989

Material Acquisition Handbook, United States Army, (AMC-TRADOC Pamphlet 70-2), March 1987

Department of the Navy Handbook for Implementation of Nondevelopmental Item Acquisitions, June 1988

Acquisition Streamlining, MIL-HDBK-248B, February 1989

APPENDIX C
Preparation and Use of Commercial Item Descriptions

Appendix C provides guidance on the preparation and use of commercial item descriptions. More specific guidance on content, format, language style, and CID processing information is available in the General Services Administration (GSA) Handbook on Federal Standardization, FPMR 101-29; the information provided here is supplementary to that manual for DoD use. The following guidance addresses the content of the six sections of a commercial item description: abstract, salient characteristics, regulatory requirements, quality assurance provisions, packaging, and notes.

APPENDIX C

Preparation and Use of Commercial Item Descriptions

Commercial Item Descriptions (CIDs)

What is a commercial item description?

A commercial item description is a simplified specification that describes, by salient functional or performance characteristics, the available, acceptable commercial or commercial-type products that will satisfy the Government's needs. It is a type of Federal specification. The goal of the CID program is to prepare technical documents that are easier for suppliers to use and that allow manufacturers to provide products to DoD from their standard production line. Therefore, CIDs need to be concise, descriptive documents that relay requirements to potential offerors in simple language. They are not instructions on how to make or inspect a particular product.

What is the difference between a CID and other government specifications?

A CID is less detailed than other government specifications. Generally, a CID does not contain special design, testing, quality control, packaging, or marking requirements, relying instead, on suppliers' standard procedures in these areas, developed for providing the product to a commercial market. Special requirements may be included in a CID when they are essential to assure the product will meet the Government's needs. The number of special requirements should be minimized. In those instances where extensive, detailed, design-type requirements cannot be avoided, a government specification other than a CID should be used. Normally, commercial and commercial-type items acquired by DoD should be described by a commercial item

description, unless an adequate non-government standard exists. Use of a government specification for these items should be exceptional.

What is a commercial product?

A commercial product is an item, material, component, subsystem, or system that is: (a) regularly used for other than government purposes (b) sold or traded to the general public in the course of normal business operations, and (c) sold at established catalog or market prices.

What is a commercial-type product?

A commercial-type product is a commercial product that is: (a) modified or altered to comply with Government requirements without degrading the quality, appearance, or function of the commercial product, and as such is usually sold only to the Government and not through normal retail outlets, or (b) identified, packaged, or marked differently than the product normally sold to the general public.

CID Preparation

Specific guidance on format, language style, etc. is in the GSA Handbook on Federal Standardization, FPMR 101-29; the information provided here is supplementary to that manual for DoD use. The following guidance addresses the content of six sections of a commercial item description: abstract, salient

characteristics, regulatory requirements, quality assurance provisions, packaging, and notes.

Abstract:

This is a statement that combines the scope and intended use of the item. This section may also include common or colloquial item names and an indication of any further classification of the item(s) described. The purpose of the abstract is to provide potential suppliers and users a brief, in context description of the item(s), which will allow suppliers to decide if they may be able to supply the item and users to decide if the CID is appropriate for use in meeting their requirements. The abstract may also be used in the synopsis of the procurement in the Commerce Business Daily. Some examples follow.

Sample CID Abstract for Rotary Files: This commercial item description covers tree shape, radius nose, high speed steel or tungsten carbide rotary files of the standard, heavy duty, and commercial type, which are used in a production environment. Figure 1 depicts the shape of these files.

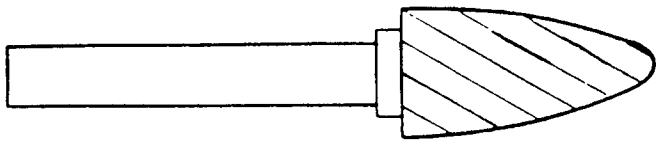


Figure 1. Illustration of tree shape, radius nose rotary file

Four styles of these files are included:

Style A	Right-hand spiral fluting
Style B	Right-hand spiral fluting with chip breaker
Style C	Double cut fluting
Style D	Diamond cut fluting

Abstract for Erlenmeyer Flask. This description covers plastic Erlenmeyer flasks, in three sizes, suitable for use in laboratory procedures.

Abstract for X-Ray Storage Cabinet: This description covers a metal cabinet with light limit switch suitable for the storage of X-Ray film.

Although the use of an abstract section is optional in FPMR 101-29, it is recommended in DoD-prepared CIDs. The intended use of an item is helpful in understanding item requirements.

Salient Characteristics:

Salient characteristics are the important technical aspects of the item which provide a definitive basis for its acceptance or rejection. User requirements and research and analysis of comparable items available commercially provide the basis for preparing the salient characteristics section of a commercial item description. Salient characteristics shall be stated as function and performance requirements to allow for supplier

innovation to the maximum extent practicable. Design requirements such as dimensions, material, composition, and formulation should be included only to the extent design control is necessary to ensure interchangeability of replacement parts. Characteristics shall be stated to permit maximum competition in consonance with the essential level of quality and utility required. When a product, component, or material is required to have a specific physical property, the physical property and test method shall be mentioned together. For example:

> The mandrel shall have a hardness of not less than 60 or more than 65 on the Rockwell "C" scale.
>
> The tensile strength shall be 1,100 psi minimum when tested in accordance with ASTM D412.

Referencing Military specifications and standards in CIDs is discouraged. Referencing non-government test methods and standards is the preferred method for incorporating technical characteristics, materials, and testing procedures. Commonly used commercial test methods and units of measurement should be used. If a non-government standard is not available for the entire item or sufficiently definitive, consider using non-government standards in part or as a basis. For example:

The lamp shall be in accordance with ANSI standard C78.105, with the following additional requirements:

Design volts - 6.4.

Screw terminal.

Hemispherical shield is in front of filament which masks all direct light.

A workmanship statement may be included, but keep it specific. The following workmanship statement for a mountain piton snap link is a good example:

> Workmanship: The snap links shall be free of burrs, sharp edges and cracks. All fillets shall be rounded smoothly. The snap links shall be free of any forging laps.

It may be useful to use a picture either to assist in your narrative description or to specify a requirement. The following is an example of a picture used only to help describe the item.

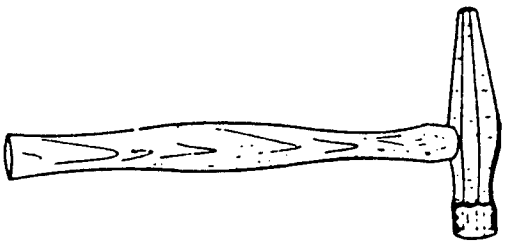


Figure 1.

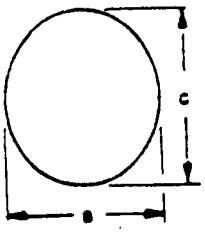


Figure 2.

(Figures are illustrative and not restrictive)

The following is an example of a picture used to define a characteristic.

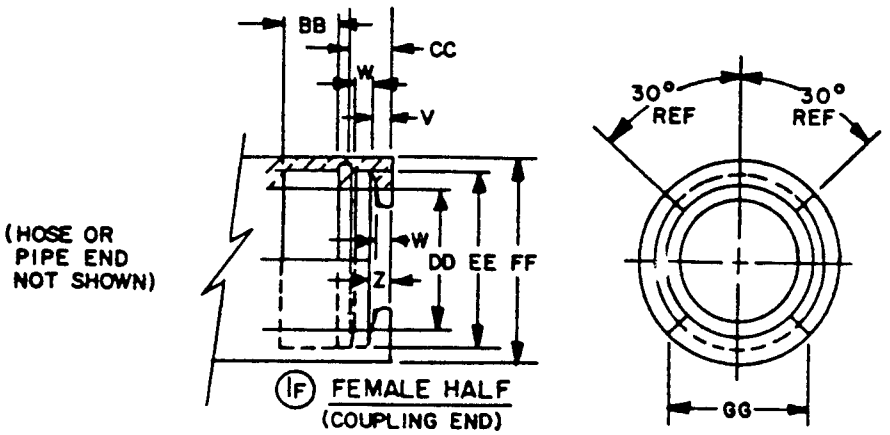


Figure 1. Coupling details.

Determining the appropriate salient characteristics is a very item specific, technically demanding task which, in the end, is based on the judgement of the technical expert or engineer assigned responsibility for the item. However, user input and feedback, market research, and industry comments and the input of the buying activity are essential considerations. The following tools and techniques are available to the specification preparer in developing salient characteristics initially and in keeping them current, in response to changing user requirements and technology.

1. Test and evaluation of product samples.
2. Industry publications such as catalogs and product data sheets.
3. Technical journals.
4. Previous Government contract performance.
5. Discussions with manufacturers and users.
6. Industry references (Dun and Bradstreet, Thomas Register, etc.)
7. SD-5, Locating Off-The-Shelf Items
8. Trade shows
9. Foreign military data exchange programs
10. Standardization organizations

Quality assurance provisions:

The contractor certification section included in the CID format in FPMR 101-29 is optional for DoD use. DoD users may substitute "Quality Assurance Provisions" for this section, and DoD preparers may include requirements for market acceptability, bid samples or testing and inspection, in addition to contractor certification, in this section. However, only the inclusion of the contractor certification statement is mandatory. The quality assurance of products described using a CID should rely entirely or primarily on the manufacturer's standard quality assurance program in providing products for the commercial market. For this reason, market acceptability requirements are especially useful and appropriate for use in a CID. Testing and inspection should be directed toward determining compliance with the salient

characteristics of the CID and Government acceptance of the product.

1) Contractor Certification Statement. The following statement shall be used as a minimum and may be expanded as necessary:

> The contractor shall certify, and maintain objective quality evidence, that the product offered meets this commercial item description, and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

2. Market Acceptability. A requirement for a product to have achieved market acceptability may be included as needed to obtain a product of acceptable quality to meet the Government's needs. Producers, who have provided the item described to DoD successfully in the past, may not be excluded. Flexibility is encouraged in constructing market acceptability requirements to fit the product and may vary, i.e. volume of product, time on the market, etc. Appendix F contains detailed guidance on development and use of market acceptability criteria.

3. Bid samples may be required in a CID and incorporated into the certification statement when necessary to assure product quality. For example:

> The contractor shall certify and maintain objective quality evidence that the product offered meets this CID, and that the product conforms to the producer's own drawings, specifications, standards, quality assurance practices, and is the same as the product provided as a bid sample. The Government reserves the right to require proof of such conformance prior to the first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

Bid sample requirements and tests also must be listed, unless stated elsewhere in the CID.

4. Testing and inspection requirements. The inclusion of requirements on how to inspect or sample in a CID is discouraged, but not prohibited, and should be (1) minimized and (2) used only when no other method of assuring quality is acceptable. Military standards should not be referenced. The following is an example of the type of self-contained inspection and testing requirements which may be included in a CID.

> 4.1 Responsibility of inspection. Unless otherwise specified in the contract or purchase order, the contract is responsible for the performance of all inspection, examination, and test requirements

specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections, examinations, or tests set forth in this description where such inspections, examinations, and tests are deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Examination. Each grooving machine shall be visually examined to determine conformance with all requirements of this description.

4.3 Operational test. Each grooving machine shall be operated without performing grooving operations to ensure operation of all moving parts and adjusting mechanisms.

Appropriate justification for using "how to" quality assurance provisions should be documented in the CID file. Once again, if extensive quality assurance requirements are necessary, a product description other than a CID should be used.

Regulatory requirements:

Include applicable Federal regulatory requirements in this section. Some examples of potentially appropriate regulatory requirements are Department of Agriculture standards and the

Food, Drug and Cosmetic Act. Avoid the redundancy of including regulatory requirements, properly cited here, in the salient characteristics section of the CID.

Packaging and marking:

In the absence of special packaging or marking requirements, the CID shall include the following statement: "Preservation, packing, labeling, and marking shall be as specified in the contract or order." In using this statement levels of pack above commercial are used only as necessary for a particular shipment. Packing requirements may be included in this section only when standard commercial methods will not meet the Government's essential needs.

CID based part identification numbers. CIDs may contain a method for developing identification numbers. Numbers shall be developed as follows:

A 12345-1	Example of a part identification number A12345-1
	Dash number consisting of Arabic numerals, capital letters, or combinations thereof. Codes may be assigned to variable characteristics of the item and used in the makeup of the dash number (e.g., sizes, types, tolerances, materials, ratings, etc.)

CID number. Does not include the revision letter or activity symbol.

Designates a Commercial Item Description.

CID based identification numbers shall not be developed for items described by a valid Federal or Military specification. These items shall retain the specification based part number until the specification is either cancelled or replaced by a CID.

Identification numbers shall be kept short and not exceed 15 alphanumeric characters. Identification numbering shall be uniform for all parts covered by the same CID; uniformity is also preferred for all part numbers within the same group of closely related items.

The following statement shall precede the instructions for developing a CID based part identification number:

> CID based part identification number. The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor.

Notes:

This section contains relevant information which is useful to buyers, users, and suppliers in the process of procuring the item. Examples of such information are:

1. Addresses for obtaining copies of referenced documents.
2. Ordering data.
3. Sources of supply (manufacturers whose product is known to meet CID requirements, including market acceptability criteria as appropriate). When sources of supply are listed, a statement that competition is not limited to those products must be included.

List the uncoded name, address and phone number of the preparing activity in this section; a point of contact also may be included.

CID Publication

DoD activities obtain CID numbers from their respective Department or Agency Standardization Offices. CIDs shall not be amended but may be revised. Revisions shall be identified in the same manner as in Federal specifications. The following statement shall be included on the top of the cover page of CIDs not yet approved:

"DRAFT - NOT APPROVED FOR ACQUISITION PURPOSES"

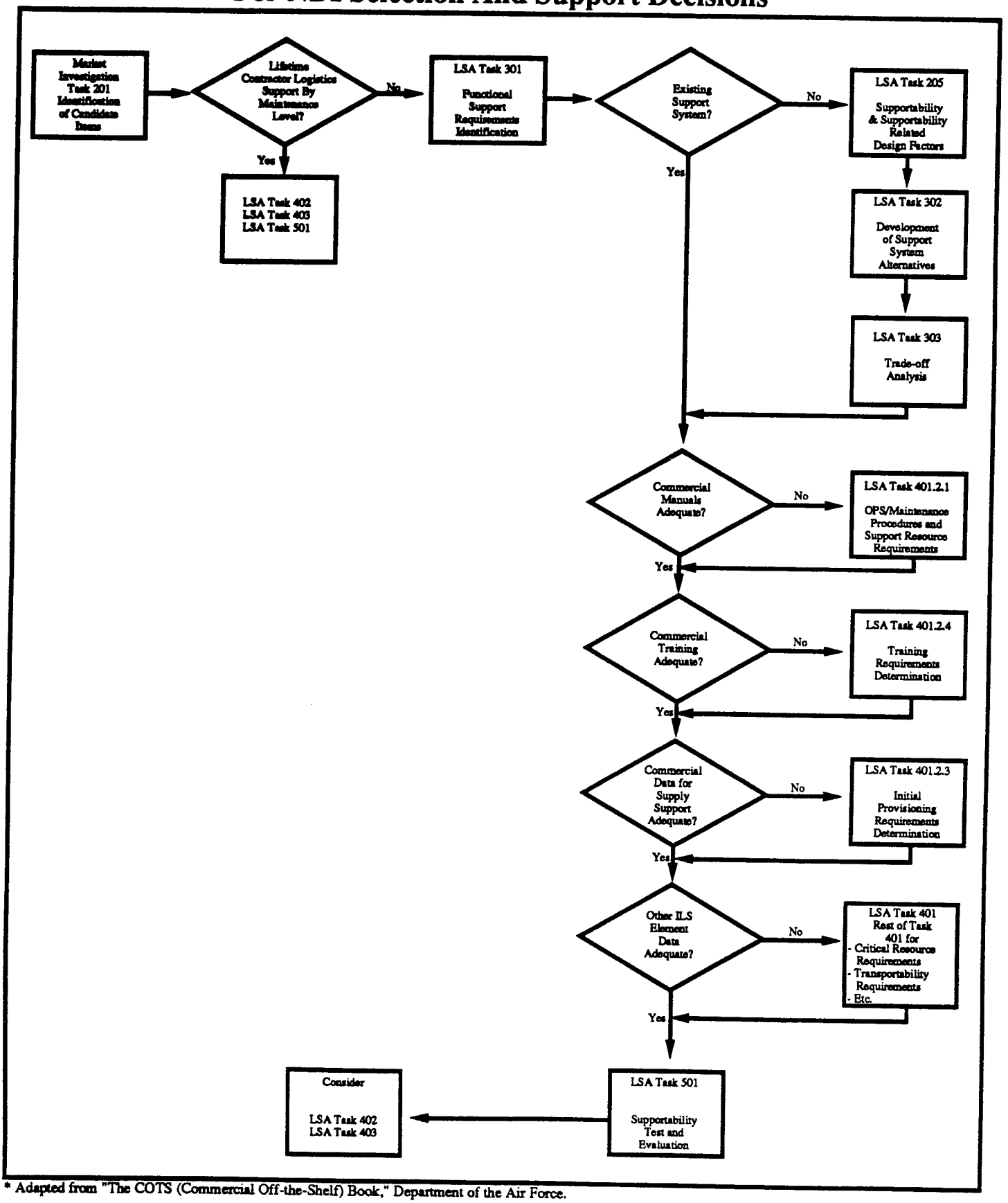
The DoD project number shall be shown below the DoD concluding material for CIDs prepared by DoD. DoD prepared CIDs are printed by Naval Publications and Forms Center, using the procedures established previously for DoD prepared federal standardization documents.

APPENDIX D

Tailoring LSA for NDI Acquisitions

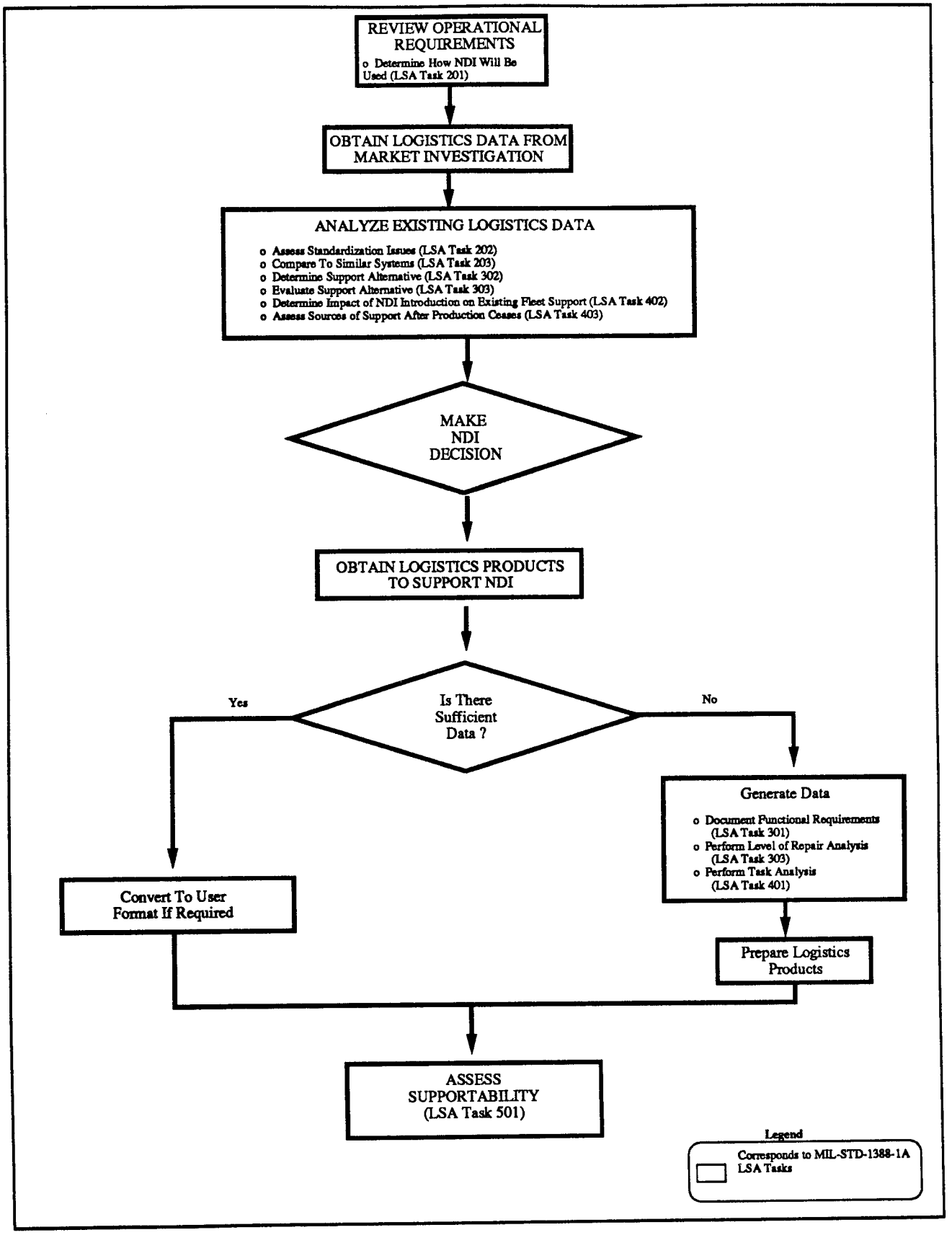
This appendix contains examples of how LSA programs can be tailored to support NDI acquisition programs. The decision tree format illustrates how an LSA program can be tailored to addresses the unique characteristics of NDI acquisitions.

Logistics Support Analysis (LSA) Process For NDI Selection And Support Decisions *



* Adapted from "The COTS (Commercial Off-the-Shelf) Book," Department of the Air Force.

APPENDIX D (CONT'D)
LSA In The NDI Acquisition Process *



* Adapted from "Systems and Procedures Manual," Naval Sea Systems Command.

APPENDIX E

Nondevelopmental Item Acquisition Program Checklist

Appendix E provides a checklist of issues typically associated with NDI acquisition programs. The checklist is provided as an example and should not be applied generally to an acquisition. It can be used as a baseline for developing a similar checklist tailored to unique needs of other NDI acquisitions. The checklist was adapted from the NDI Feasibility Checklist, United States Marine Corps Nondevelopmental Item Handbook, May 1989.

APPENDIX E

Nondevelopmental Item Acquisition Program Checklist *

- o Establish matrix support team early
  - User
  - Program Management
  - Contracts
  - Logistics Community

- o Performance purchase description/specification coordinated with industry
  - Draft solicitation
  - Draft requirements documents
  - Bidders conference

- o Data collected to support NDI decision
  - Market investigation
  - Market analysis

- o Manufacturers data format acceptable
  - Technical manuals
  - R&M test results
  - Software
    - * Ada
    - * Other_____
  - Engineering drawings
    - * Proprietary rights
  - Provisioning technical documentation

- o NDI satisfy operational requirements
  - Functional
  - Reliability

* Adapted from the NDI Feasibility Checklist, United States Marine Corps Nondevelopmental Item handbook, May 1989.

- Maintainability

o Can be modified to satisfy operational requirement
- Electrical
  * Standard Input
    - Voltage - Frequency
  * 24 volt
  * Batteries
    - Lithium - Other_____
- Shock mounting
- Environmental conditioned
- Chemical agent retardant coating paint

o Additional testing required
- Manufacturers site
- Department of Defense
- Other_____

o Survivability issues
- Temperature
  * Operating
  * Storage
- Shock-vibration
- Rain-sand-dust-salt spray humidity
- Human factors
  * Cold weather gear
  * NBC suits
    - Blast
    - Thermo
    - EMP
  * Collective protection
  * Individual protection
- Electromagnetic interference

Appendix E
Nondevelopmental Item Acquisition Program Checklist
(Cont'd)

- Electromagnetic compatibility
- Nuclear hardened
  * Blast
  * Thermo
  * EMP

o Supportability issues
- Interim contractor support
- Spares acquisition integrated with production
- Life-of-type buy
- Normal organic support
  * Initial
  * Transition
- Second sources identified
- Support equipment
- Training
- Special tools
- Configuration management control
  * Defined by proven configuration identification documents that are available
  * Availability of status accounting data
- Intraoperable/Interoperable
- Transportability
- Facilities
  * MILCON
  * Administrative
  * Personnel support
  * Storage
  * Maintenance
- Manufacturer off-shore
  * Technical data translated
  * Licensing agreement
  * Data rights
  * Potential of change in diplomatic relations

        * Replenishment of critical items during conflict
        * Surge capability

- Safety issues
    - Radioactive materials
    - Lifting/towing features certified
        * Shipboard
        * Helicopter
        * Tie down
    - Swimming
    - Laser protection
    - RF radiation
    - Operator-maintainer safety features
    - Environmental
- Quality assurance
    - Manufacturer's product assurance program adequate
        * Additional inspection and testing required
    - R&M analysis and test results available
    - Warranty and guarantee
    - Manufacturers quality history adequate
- Security issues
    - Classification requirements
    - Tempest
    - Physical security

APPENDIX F

Guidance on Development and Use of Market Acceptability Criteria

The following is DoD guidance on market acceptability criteria prepared by the Office of the Assistant Secretary of Defense (Production and Logistics).

APPENDIX F

Guidance on Development and Use of Market Acceptability Criteria

INTRODUCTION

The Department of Defense (DoD) will satisfy materiel requirements, to the maximum extent practicable, with commercial or modified commercial items. We will buy those items using simplified product descriptions -- Commercial Item Descriptions (CIDs) -- without unnecessary and potentially restrictive design requirements, and with fewer tests and inspections than military specifications. One way to assure quality when using a simplified product description is to require that items have been accepted in the market. This technique relies on the market forces to cause suppliers to maintain performance and quality. Market acceptability criteria establish the threshold for determining whether an item has been accepted in the marketplace.

This approach relies heavily on market research and a continuing of the marketplace. The use of simpler, more flexible product descriptions should increase the interest of commercial firms in supplying items to the DoD. This is consistent with the competition in Contracting Act, with General Accounting Office (GAO) case history, and with the DoD preference for the use of commercial and other nondevelopmental items stated in 10 USC 2325.

GUIDANCE FOR SPECIFICATION PREPARING ORGANIZATIONS

Market Acceptability Criteria

Market Acceptability Criteria establish the threshold for determining whether an item has been accepted by a market. Market research helps you decide whether a CID can be used and whether reasonable market acceptability criteria can be identified. For more information regarding market research or CID development refer to FAR 11.004, the NDI Handbook (SD-2), and DoD guidance on CID preparation (Appendix C). You must be prepared to demonstrate that a market-tested item is required to meet the Government's needs. If this cannot be established, then this method cannot be used.

APPENDIX F

Guidance on Development and Use of Market Acceptability Criteria (Cont'd)

MA criteria must be developed considering both the item and the market in which it sells (e.g. a spray gun sold to professional body shops). The criteria can be whatever reasonably indicates that an item will meet the intended application, for example:

- number of items sold;
- length of time the product has been on the market;
- reliability and performance of the item;
- maintenance and logistics arrangements -- especially for an item no longer in production.

The criteria could be as simple as, "The item offered must have been sold to the government or commercial market," or may require some combination of factors. Whatever criteria you chose, they should relate to the history of the item itself, rather than to the supplier's capability, and must be supported by market research.

Here are some examples of actual case determinations where market acceptability criteria was used and upheld:

- A modified commercial, off-the-shelf item is required to minimize design and engineering risk.
- A commercial item is required to assure that an established end product is routinely supported by spare and repair parts.
- A market tested item is required to preclude untested or experimental units.
- Demonstrated reliability (developed products, product improvements, established quality control procedures, broad-based parts availability) is required to assure compliance with Federal safety and environmental requirements.
- A commercial item is required to ensure serviceability, reliability, and quality of materials.
- A currently produced item is required to help ensure up-to-date technology, especially in light of

multiple-year contract duration and rapid advancement experienced in the technology.

Your market acceptability criteria should allow for items supplied under recent or current contracts with government-only suppliers, if any, as well as commercially available items.

Documentation

Document market research information, minimum needs assessment, and findings substantiating the market acceptability criteria, and retain them along with the product description or CID file. Be sure that the file describes the method, extent, and findings of the market research and identifies suppliers that were found to meet the market acceptability requirement.

Market acceptability criteria should be part of the Quality Assurance Provisions section of the CID. List suppliers known to meet the criteria in the Notes section of the CID. Also in the Notes section, give the name, address, and phone number of the preparer so the buying activity can more easily obtain needed information or additional documentation to support the market acceptability requirement.

GUIDANCE FOR CONTRACTING OFFICERS

The Notes section of the product description contains the name and address of the preparing activity and a list of suppliers capable of meeting the Government's requirement, including the market acceptability criteria. The preparing activity maintains detailed information on both the technical aspects of the item you are buying and the market research supporting the market acceptability requirement. You should talk with the preparer if you need support for the market acceptability requirement. As with any solicitation, validate the currency of the product description prior to use.

Solicitation

When procuring with a CID, solicit all sources identified in the CID, previous sources, and sources identified by the local technical component of contracting office.

For Commerce Business Daily notices:

- highlight use of a commercial item description;

Guidance on Development and Use of Market Acceptability Criteria (Cont'd)

- state the market acceptability criteria;
- stress agency interest in attracting new commercial sources capable of complying with the market acceptability criteria; and
- encourage potential sources to immediately identify features of the solicitation that are inappropriate or burdensome.

To the extent practical, modify the solicitation or issue solicitation amendments to correct deficiencies or delete inappropriate requirements. Provide feedback to the CID preparer regarding new sources, and about features of the CID that were identified as inappropriate or burdensome so that the CID may be updated and refined.

Evaluation

Market acceptability criteria which relates to the history of the item (as required in the guidance), rather than to a supplier's capability, has been judged by GAO to be a responsiveness issue. The solicitation should state that offerors failing to meet market acceptability criteria will be deemed nonresponsive under sealed bidding or technically unacceptable under a negotiated acquisition.

APPENDIX G

GSA Supply Catalog Information

The following contains information about obtaining and using GSA Supply Catalog.

APPENDIX G

GSA Supply Catalog Information
(Cont'd)

OBTAINING COPIES

Copies of the GSA Supply Catalog (in printed or microfiche format) may be obtained by submitting GSA Form 457, Federal Supply Schedule (FSS) Publications Mailing List Application, specifying Mailing List Code OSSC-0001, to the following address:

General Services Administration
Centralized Mailing List Service
819 Taylor Street
P.O. Box 17077
Fort Worth, TX 76102-0077
FTS: 334-4040

In addition, you may submit a FEDSTRIP requisition using the following information:

Item:	Basic Catalog
NSN (Printed):	7610-01-283-3779
NSN (Microfiche):	7670-01-283-3783
Unit of Issue:	Each

ADDITIONAL INFORMATION

To answer questions about the catalog or to learn more about the many GSA/FSS programs designed to save time and money - call one of the FSS Customer Service Officers at the locations listed below.

APPENDIX G

GSA Supply Catalog Information
(Cont'd)

FSS CUSTOMER SERVICE OFFICERS

Location	FTS No.	Commercial
Washington, DC	472-1932	(202) 472-1932
Boston, MA	835-7302	(617) 565-7302
New York, NY	264-3592	(212) 264-3592
New Cumberland, PA	590-3868	(717) 782-3868
York, PA	590-4062	(717) 848-1867
Chesapeake, VA	827-6510	(804) 441-3115
Baltimore, MD	922-4422	(301) 692-4422
Atlanta, GA	242-3026	(404) 331-3026
Chicago, IL	353-7549	(312) 353-7549
Kansas City, MO	926-7364	(816) 926-7364
Fort Worth, TX	334-2892	(817) 334-2892
San Antonio, TX	730-6119	(512) 229-6119
Denver, CO	776-7548	(303) 236-7548
San Francisco, CA	454-9233	(415) 974-9233
Stockton, CA	463-6231	(209) 946-6231
Laguna Niguel, CA	796-4126	(714) 643-4126
Auburn, WA	396-7119	(206) 931-7119

EUROPE: (Frankfurt, Germany)-Autovon 330-6085/7985; International Direct Dialing: 011-49-69-699-7985

PACIFIC: (Honolulu, Hawaii)-FTS 551-1776, COM (808) 541-1776

FAR EAST: (Kadena AB, Okinawa, Japan)-Autovon 634-0175; International Direct Dialing: 011-81-98-938-1111, etc. 40175.

COMMENT SHEET FOR

NONDEVELOPMENTAL ITEM HANDBOOK

This handbook is based on the authors' knowledge of the system acquisition process and experience with NDI acquisition. We recognize that valuable knowledge and experience is resident in the acquisition workforce. Because of the dynamic nature of the acquisition process and the numerous issues associated with NDIs, revisions and updates to this guide are expected. The Office of the Assistant Secretary of Defense (Production and Logistics) solicits your comments on this handbook and on your experiences with NDI acquisitions.

If you have comments, please tear this sheet out, write the comments in the space provided below or on additional sheets as required, fold, tape closed, and mail to:

OASD(P&L) SDM
The Pentagon, Room 2A318
Washington D.C., 20301-8000

Name and Title: _____

Activity and Address: _____

_____

Tel: Commercial: (____) _____ AV: (____) _____ FTS: (___)

_____ Comments:

*U.S. Government Printing Office: 1993 — 717-105/60950