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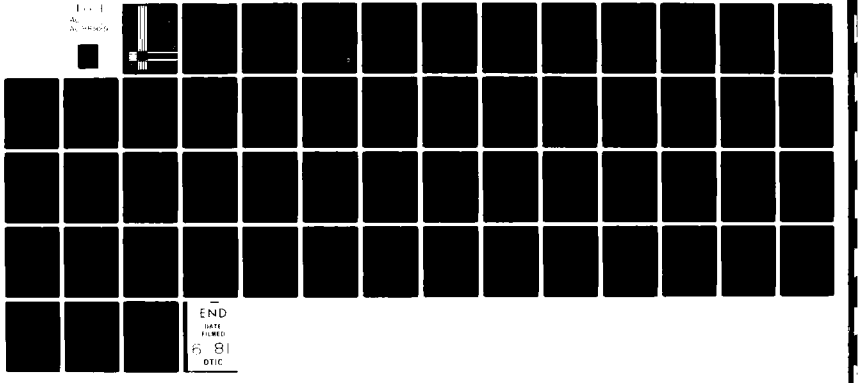

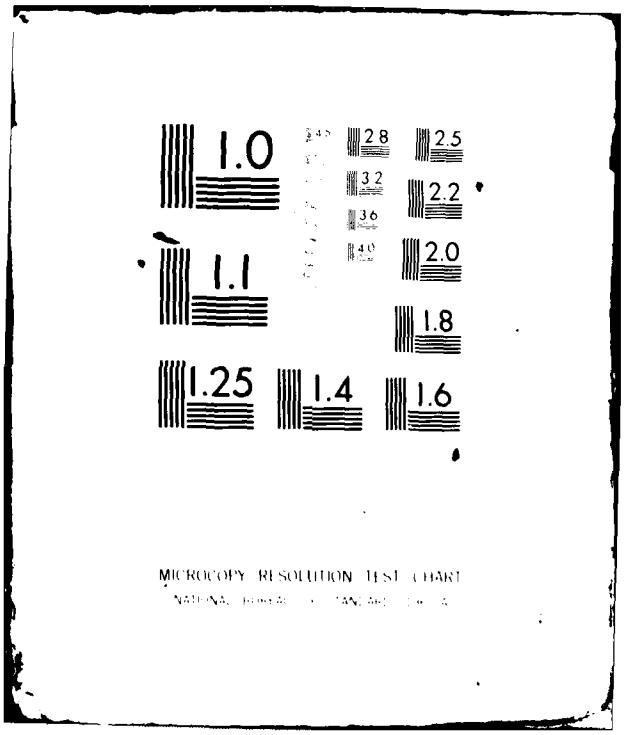
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ACQUISITION RESEARCH TOPICS CATALOG

1981

AIR FORCE BUSINESS RESEARCH MANAGEMENT CENTER
Wright-Patterson Air Force Base, Ohio 45433

THE AIR FORCE BUSINESS RESEARCH MANAGEMENT CENTER
WRIGHT-PATTERSON AIR FORCE BASE

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The Air Force Business Research Management Center (AFBRMC) is the Air Force's focal point for research about the acquisition process. Part of the AFBRMC's mission is to match acquisition problems with research capabilities. This catalog has been developed to provide the academic, business, and Government research communities with a better understanding of the Air Force's needs for acquisition research. The catalog highlights specific research topics and objective statements. Research needs are focused on those issues which, if resolved, can aid significantly in the improvement of defense capabilities.

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ACQUISITION RESEARCH TOPICS CATALOG

INTRODUCTION

PURPOSE OF CATALOG

The Air Force Business Research Management Center (AFBRMC) is the Air Force's focal point for research about the acquisition process. Part of the AFBRMC's mission is to match acquisition problems with research capabilities. Therefore, this Research Topics Catalog has been developed to provide the academic, business, and Government research communities with a better understanding of the Air Force's needs for acquisition research. The catalog highlights specific research topics and objective statements. Attainment of the specific objectives is important to the overall improvement and effectiveness of the Air Force in acquiring and supporting major weapon systems. Research needs are focused on those issues; including long-term issues, which, if resolved, can aid significantly in the improvement of defense capabilities. The intent of the catalog is to increase the availability of Air Force acquisition research problems to possible researchers and to improve the quality of proposals received.

USE OF CATALOG

This catalog is organized to provide potential researchers a framework for reviewing the acquisition process, an appreciation of topics which need to be researched, and an understanding of the procedures for proposal submission. Please read the Management Overview section of the catalog before evaluating the individual research needs.

Individuals not affiliated with the Department of the Air Force may submit unsolicited proposals on any of the research needs stated in this document. However, before you submit an unsolicited proposal to the AFBRMC, we strongly encourage you to discuss your research approach, and AFBRMC budgetary limitations, with the AFBRMC's point of contact, who can be reached by calling Area Code (513) 255-6221 or Autovon 785-6221.

Although Air Force employees who are students or faculty at various academic institutions are not required to make formal proposals, we encourage them to discuss the research topic with the AFBRMC's point of contact for additional information and assistance.

Unsolicited Proposals

Definition of an Unsolicited Proposal: written offer to perform a proposed task or effort, initiated and submitted to the Government by a prospective contractor (offeror) without a solicitation by the Government, with the objective of obtaining a contract. Advertising material, commercial product offerings, contributions, or technical correspondence which are submitted to the BRMC shall not be considered to constitute an unsolicited proposal.

To be considered for formal evaluation an Unsolicited Proposal must contain the following characteristics:

1. Basic Information

    a. Name and address of offeror(s).

    b. Name and telephone of individual to contact for negotiation/evaluation.

    c. Identification of any proprietary data which the offeror intends the BRMC to use in its evaluation.

    d. Names of any other Federal, State, local agencies, or other parties receiving the proposal and/or funding the proposed effort.

    e. Date of submission.

    f. Signature of an official or authorized representative who can contractually obligate the organization.

g. Reference to the page number and title if proposal is being submitted for a need identified by the Topics Catalog.

2. Technical Information

a. A concise title and abstract (approximately 200 words) of the proposed effort.

b. A discussion stating:

(1) Objectives of the effort
(2) Methodology to be employed
(3) Anticipated results

c. The names and brief biographical information of the chief researcher and related staff who will actually be performing the effort.

d. The type of support, if any, the offeror requests of the BRMC, e.g., materials, literature searches, or personnel resources data.

3. Supporting Information

a. A proposed price or total estimated cost.

b. A cost estimate for the proposed effort sufficiently detailed by element of cost for meaningful evaluation.

c. The type of contract preferred, e.g., Firm Fixed Price, Cost Plus Fixed Fee.

d. Period of time which the proposal is valid (the BRMC requests a minimum of six months).

e. Proposed duration of effort.

f. Statements regarding cost sharing, organizational conflicts of interest, security clearance status, brief description of organization, previous work or experience in the field of the proposal, and any contractor facilities to be used in performance, e.g. unique computer capability.

g. Source of data to be used in research.

h. Any proprietary information marked or other restrictions must clearly be stated.

TRANSMISSION OF UNSOLICITED PROPOSALS

Unsolicited proposals should be submitted to:

Air Force Business Research Mgt Center/RDCB
Area B, Bldg 125, Room 2063
Wright-Patterson AFB, OH 45433

The BRMC will acknowledge receipt of unsolicited proposals within five workdays. This acknowledgment will state when the final evaluation will be completed and will give the name of the Research Manager and telephone number.

The BRMC staff shall, upon receipt, prior to a comprehensive evaluation, determine that the document contains sufficient technical and cost information to permit an evaluation and has been signed by a responsible official or authorized representative. If the BRMC has any questions in those areas, before proceeding, it will either attempt to contact the party and obtain clarification or return the documents to the offeror for clarification.

UNSOLICITED PROPOSAL EVALUATION PROCEDURES

The research manager will normally be responsible for completing the evaluation within 90 days after receipt. In evaluating the unsolicited proposal the research manager shall consider the following:

1. Unique, innovative, or meritorious methods, approaches, or ideas.

2. Overall scientific, technical, or socio-economic merits.

3. Potential contribution which the effort is expected to make to the BRMC mission.

4. Capabilities, related experience, facilities, or techniques the offeror possesses.

5. Qualification, capabilities, and experience of the proposed principal investigator and key personnel.

Upon completion of the comprehensive evaluation the research manager shall take one of the following actions:

1. Send a letter of rejection to the proposer stating that the BRMC cannot support his effort.

2. Send a letter to the proposer stating that the BRMC believes his unsolicited proposal has potential and that it will be considered by the BRMC staff at their next quarterly meeting.

The BRMC research managers meet quarterly to review on-hand unsolicited proposals. They rank proposals for potential funding based on priority of needs, merit, value, and cost.

After the quarterly meeting, the individual research manager shall notify the proposers that their unsolicited proposal is rejected, is being funded, or outside funds are being sought.

The Board of Advisors shall be briefed annually and their responses shall be utilized in ranking and funding proposals.

PROCUREMENT OF UNSOLICITED PROPOSALS

A negotiated, non-competitive procurement is permissible when an unsolicited proposal has received a favorable technical evaluation, unless it is determined that the substance thereof is available to the Government without restriction from another source, or a competitive procurement is otherwise appropriate.

The BRMC shall support a recommendation for a non-competitive procurement with:

1. A comprehensive evaluation of the proposal.

2. Facts and circumstances that operate to preclude competition, e.g., unique methodology, experience, or qualifications.

When it is determined that the subject matter of an unsolicited proposal is acceptable for award on a non-competitive basis, the unsolicited proposal will serve as the basis for negotiations.

Any questions regarding submittal procedures, or any information on BRMC objectives should be addressed to the address identified below or call the BRMC at 513-255-6221.

GENERAL INFORMATION

Researchers are encouraged to submit proposals that are accurate, clear, and sufficiently detailed to allow for a meaningful evaluation. Primary proposal emphasis should be placed on research scope and methodology.

As you read through the pages that follow, you may see research topics for which your organization can contribute to the achievement of a specific research objective. If such is the case, you are invited to discuss the topic further with the AFBRMC's project manager of that topic. Furthermore, you may have a new idea not considered in this document. We welcome any new concept which would improve the Air Force's capability.

It should be understood that this document is furnished for information and general guidance only; it is not to be construed as a request for proposals or as a commitment by the Government to issue a contract.

Comments or suggestions for improve the Research Topics Catalog or specific individual needs are encouraged. They should be directed to:

Air Force Business Research Management Center/RDCB (Mrs. McLaughlin)
Wright-Patterson AFB, OH 45433

MANAGEMENT OVERVIEW

MISSION

The Air Force Business Research Management Center (AFBRMC), established at Wright-Patterson AFB in July 1973, is the Air Force focal point, under Air Force Regulation (AFR) 20-5, for contracting/acquisition-related research studies. Operating under the functional guidance of the Director of Contracting and Acquisition Policy, HQ USAF, the AFBRMC matches acquisition problems with existing research capabilities, manages and monitors selected research efforts, test research results, and when warranted assists in implementing resulting recommendations for improvement. The AFBRMC also consults with management to help it use contracting and acquisition research results.

AFBRMC RESEARCH PROGRAM

In order to provide a framework for conceptualizing the contracting/acquisition process, the AFBRMC has defined the following "acquisition practices."

Requirements Management - Processes of establishing needs to be satisfied by acquisition from the private sector of our economy.

Business Relationship - All processes involving the establishment of business management plans, contractual relationships, and the alignment of specific Air Force functions involved in establishing a business relationship with the private sector.

Program Management - The processes of planning, organizing, and controlling internal Air Force activities to insure that contracted program needs are satisfied.

Acquisition Logistics - All processes related to the provision of life cycle systems support.

Business Environment - Those aspects of our contracting/acquisition process which are designed to permit us to accommodate conditions which arise externally and over which we have no direct control.

These research practices are divided into research areas and further subdivided into individual research topics throughout the catalog. For each area the objective and background statements are provided. The purpose of the area description is to provide a potential researcher with an understanding of the general environ- before he reviews the specific need. It is important, therefore, that each research area be reviewed before review of individual topics.

Each topic is presented with the objective and background statement.

RESEARCH ENVIRONMENT

ACQUISITION AND CONTRACTING PROCESS

The Air Force contracting and acquisition process and environment are considerably different from typical business approaches, therefore, this section is provided. This section briefly describes the acquisition and contracting process to provide the potential researcher a better understanding of the total research environment.

ACQUISITION PROCESS

The acquisition of major systems by the Department of Defense (DOD) constitutes one of the most crucial and expensive activities performed to meet national needs. Its impact is critical to technology, to the nation's economic and fiscal policies, and to the accomplishments of the DOD mission. The system acquisition process developed within the Government is a sequence of specified phases of program activity and decision events directed to the achievement of established program objectives. The acquisition process or life cycle has been described as consisting of five phases: conceptual, validation, full-scale development, production, and deployment. Throughout the acquisition process are major decision events called milestones.

Conceptual Phase: In the conceptual phase, the operational needs and technical inputs interact to determine a needed capability. The primary objective of this phase is to derive military, technical, and economic support as a basis to acquire a new system. Alternative plans are studied to determine the "best" system to meet the operational need. Detailed analysis and planning are accomplished to support a preferred approach which will be used later in the validation phase. Contracts are awarded to conduct technical feasibility studies.

Validation Phase: During the validation phase, the preliminary designs for the new system are tested and verified. The prime objective of this phase is to determine whether or not to proceed with the full-scale development phase. Several contracts may be awarded to perform validation phase efforts through the construction of prototypes. At the end of this phase, a decision is made either to proceed to the next phase or to re-evaluate the weapon system if further technical information is necessary. The optimal system is selected and then submitted for approval.

Full-Scale Development Phase: During this phase, the system is refined through the use of further technical studies and evaluations. The design of the system is solidified. Planning for production, logistical, and training support is accomplished. Engineering models and prototype equipment are fabricated and tested to determine expected operational effectiveness. Also, life cycle and design-to-cost requirements are evaluated to determine effectiveness in achieving cost objectives.

Production Phase: In the production phase, the system is manufactured for operational use. This phase includes the production of spares, support equipment, facilities, and training equipment. Also, any training or logistical plans delayed from the full-scale development phase are completed.

Deployment Phase: This phase begins when a unit receives the first operational systems; however, this does not mark the end of the production phase. The production phase continues concurrently with the deployment phase until all systems under a contract are produced.

CONTRACT PROCESS

Government contracting is guided by the desire to maximize completion, obtain reasonable prices, and assure accountability of public officials. These objectives must be managed along with problems of huge complex weapon systems, inflations, and far-reaching economic effects of Government purchase. The contracting process includes all the actions necessary to obtain goods and services required by the Air Force. The key steps or cycle of the process include: requirements, purchase request, solicitation/evaluation, contract award, and contract administration.

Interwoven in the acquisition process is the contracting process which impacts during all phases. In the early acquisition phases, the contracts are directed toward research and development contracts. In later phases, contracts may emphasize the delivery and supply of the major end items, spare parts or major system modifications.

This section has provided a simple description of the framework in which the research topics were formulated. Our basic objective is to improve the various aspects of these processes.

REQUIREMENTS MANAGEMENT

SUPPORT REQUIREMENTS
RESEARCH AREA

Objective: To improve the logistical support provided to major defense systems. The primary areas of concern include requirements generation, determination of type of support to be provided (organic vs commercial), standardization of support equipment (AGE/tools/test equipment), data, manpower, and training. Requirements generation includes, but is not limited to, provisioning, spares computation, depot repair computation, aerospace ground equipment (AGE), test equipment and special tools.

Background: The operational readiness of fielded systems is highly dependent upon support planning and decisions made as part of the acquisition process. Early decisions of level of maintenance, use of standardized items, use of commercial items, use of commercial logistical support, location of depots, leadtimes, basing locations, deployment concepts and War Readiness Spares Kits (WRSK), all affect requirements determination. The AF Logistics Command (AFLC) manages approximately $13.8 billion of inventory with over 800,000 line items. Automated models depending upon various types of computational techniques are used to reach optimal decisions within specific constraints of budget and readiness levels.

Increased emphasis has been placed by the Office of Federal Procurement Policy (OFPP) upon maximizing use of commercial products and support, where doing so is cheaper and wartime mission effectiveness is not degraded. Selection of basic commercial airframes for the C-9, E3A and KC-10 are examples of the application of this policy.

Sophistication of new systems has created additional support requirements. Included are built-in-test (BIT) and computerized shop test equipment, changed data and training requirements and special tools to repair new exotic materials. Design, acquisition and scheduling of these requirements must be keyed to the acquisition of the main system.

Topic: AIR FORCE ACQUISITION AND SUPPORT OF COMMUNICATIONS-ELECTRONIC-METEOROLOGICAL (CEM) SYSTEMS

Research Need: Under normal contracting and support procedures for new Base CEM systems, the Air Force requires acquisition of military specification, configuration management, reprocurement data, spares provisioning, etc. These procedures require a considerable length of time to determine and an extensive expenditure of resources to develop. It has been suggested that as an alternative to the current system the Air Force should centrally acquire the CEM facility/system and buy one-year spares, commercial data, necessary commercial training, etc. Follow-on support would be through contractor support channels. The anticipated result of this support system is to reduce initial acquisition costs by elimination of certain types of data (MILSPEC) and shifting the CEM support to MAJCOM.

Objective: To provide a comprehensive review and evaluation of the present procedures for contracting and supporting Base CEM equipment and compare with the proposed system. The study should encompass cost (acquisition, logistics support) and support (training, maintenance, spares, etc.) considerations in the evaluation.

Topic: DEMAND FORECASTING FOR NEW ECONOMIC ORDER QUANTITY (EOQ) INVENTORY ITEMS

Research Need: The Air Force Logistics Command uses a forecasting inventory system titled D062 to project requirements for non-repairable EOQ spares. A significant portion of existing D062 system backorders is associated with "new" items, items associated with weapons just entering the Air Force supply system. At present, manual methods are used to forecast demand rates for these items. These rates provide the basis for budget requests and associated estimates of support effectiveness.

Objective: Perform research to identify the causes for the relatively high frequency of backorders for new items. This research should include efforts to identify the accuracy of current forecasting methods for these items, and to identify improved methods for forecasting budgetary requirements and associated performance measures.

Topic: CONTRACTING PRIORITIES

Research Need: The contract/requirements computation priority system appears to be a fertile field for improvement. Under the current procedures, a high percentage of procurements are

issued to the Air Force Logistics Command (AFLC) Air Logistics Centers buying divisions as priority buys. The high percentage of priority Purchase Requests, over 50% in some buying areas, nullifies the benefits of a priority system. The distinction between routine and urgent can be lost in such circumstances. It would appear that the requirements computation procedure must have a built-in delinquency factor due to the nature of the operation if such a large number of Purchase Requests continue to generate as urgent. It is becoming increasingly difficult to process urgent requirements in an urgent manner because of the volume. An additional aspect to this problem is the impact of international logistics requirements upon contract priorities. All of these factors increase the cost of the procurement system.

Objective: Comprehensively review the contract priority system in order to determine its usefulnes and effectiveness. This would include recommendations for change if appropriate.

Topic: INVENTORY CLASSIFICATION FOR AIRCRAFT ENGINES

Research Need: The problems of increased lead times, reduced sources of supply, and the effect of inflation have led to a degradation of the support positions of many critical assets. For example, increasing lead times on engine spares have disrupted depot maintenance schedules. If inventory assets could be coded by materials contained or production processes, the necessary lead times could be updated for like items based upon current market experience. By Air Force Logistics Command (AFLC) being able to identify these assets, we could establish inventory levels based upon specific product factors. By doing this, there would be a greater potential for savings and/or improved support positions. For example, just having the capacity to identify and buy greater quantities of those items with relatively high first unit costs could in itself be significant.

Objective: Develop a taxonomy for aircraft engines to examine the feasibility of establishing codes to identify supply factors (price, lead time, source) and product factors (production techniques, materials), as well as demand factors of selected items.

Topic: REQUIREMENTS PROJECTIVES FOR AUTOMATIC TEST EQUIPMENT (ATE)

Research Need: The Air Force must ask a basic question in the development of automatic test equipment: How many items to provide each aircraft squadron? The quantity to buy is dependent on the number of aircraft to support, number and types of line replaceable units (LRUs) to support, mean-time-to-repair (MTTR) of each LRU, mean-time-between-failure (MTBF) of each LRU, test station MTBF, and test station spares quantities available. These factors contribute to test station availability, i.e.,:

$$A = \frac{MTBF}{MTBF \ \& \ MTTR}$$

However, this inherent availability is much higher than the achieved or operational availability. This is due to delays in availability of spares, manpower, tools, etc. A cost/benefit analysis model is required to determine where, in the limited funding environment, is the best expenditure of spares mix for LRUs or ATE.

Objective: Determine the most effective expenditure of funds for LRU or ATE spares based upon operational requirements.

Topic: INVENTORY ADJUSTMENT OF GOVERNMENT OWNED PROPERTY IN POSSESSION OF GOVERNMENT CONTRACTORS

Research Need: Government property administrators have no defined criteria on what is not acceptable or tolerated (industry practice or contractor's own policy) inventory shortage. Under certain circumstances a Government contractor may be contractually responsible for such inventory shortages, and Government property administrators need a more definable guideline under Defense Acquisition Regulation (DAR) Supplement 3 before relieving the contractor from responsibility where an inventory shortage is inexplicable. At present, contract clauses and DAR policy do not realistically assist Government property administrators in the performance of their duties in the area of when and how to place responsibility when inexplicable inventory shortages of Government property exist.

Objective: Review and assess contracts' clauses and DAR policy and recommend improvements to assist Government property administrators to determine responsibility for inventory adjustments.

Topic: IMPLIED DISCOUNT RATE OF AIR FORCE DECISIONS

"NEW" Research Need: In order to meet near-term budget constraints, decisions are often made in the Air Force to reduce programmed production rates of systems and subsystems. Production cut-backs which save near-term dollars almost always end up costing more in the long run for equal capability. Are these decisions justified from a business sense? AFR 178-1 specifies that a 10% discount rate should be used for Air Force economic analyses. However, production rate change decisions appear to imply a much higher time value of money to be operative in the Air Force.

Objective: A study of the Air Force's implied discount rate and its impact on our force capability would be helpful to all levels of Air Force decision makers.

SYSTEMS REQUIREMENTS

RESEARCH AREA

Objective: To establish a strategy for managing system acquisition requirements that will assure the achievement of acquisition objectives.

Background: The system acquisition requirements process has long been the topic of high level study and top management, including congressional, attention. It is no exaggeration to state that requirements management is one of the most difficult problems facing acquisition managers today. The difficulty is increased by the fact that the term "requirements" is not clearly defined in a system acquisition context. Consequently, emphasis has centered on two dimensions: (a) the sequence of activities in the acquisition process, and (b) the institutional arrangements, especially review and decision levels such as Defense Systems Acquisition Review (DSARC).

Recent efforts have resulted in improved understanding of the sequentially-oriented process. Top management's attention has been concentrated on refinements of organizational element roles in reviewing and evaluating acquisition requirements. The general flow of requirements has been judiciously charted. Directions and branches of flow have been established. Management controls and reviews have been defined and designed into the process like valves, gauges, and spigots in a pipeline. In total, these efforts have done much to clarify and establish control of the process.

However, the requirements process and related management controls need a better means of addressing the varied contents of the requirements pipeline if they are to realize their intended potential.

System acquisition requirements can be divided into the following categories: (a) mission requirements, (b) operating characterics, (c) design standards and specifications, (d) management system standards and specifications, (e) legal obligations, and (f) programming requirements. This categorization of requirements adds a third dimension to the requirements process flow--substance.

Defining and satisfying each requirement category clearly consumes both resources and time, and these costs should be estimated and compared with the benefits derived from each category of requirement.

Topic: DESIGN TO AFFORDABILITY

Research Need: The nation cannot fund (i.e., afford) development and production of all programs considered necessary by the services. Financial affordability decisions are made in terms of both demands upon the present budget and demands upon future budgets. Present decisions to pursue a particular research and development program have with them the accompanying decision to make follow-on decisions for production, operation, training, and logistics support budgets; but life cycle costing approaches tend to concentrate only on costs while accepting performance requirements as given.

The concept of design to affordability broadens the decision process such that an examination of both costs and benefits can be made. Financial affordability decision-making must consider what the nation can or cannot afford in terms of crew safety, environmental impacts, and perceived influences upon future readiness and mission capability. Defense program affordability decisions need to be made at two distinct levels and for two distinct reasons. They should be made within a system acquisition program to aid in making internal program alternative trade-off decisions. They should also be made when choosing among programs competing for national resources. The use of affordability to choose between programs must make clear to national decision-makers what opportunities are foregone if endorsement decisions are not made. That is, we must decide what we can afford to not endorse. It is within the context of limited budgets, lack of adequate past program acquisition practices, need for total program assessment, and trade-off between programs that the improved understanding and application of design to affordability is needed.

Objective: The objective of research in this area is to develop an effective framework for design to affordability decision-making on major system acquisitions. This framework should harmonize the methods and techniques to be used by the Department of Defense, military departments, and defense contractors. It should clearly delineate the application of the system acquisition process structure, contract structures, as well as identify which parts of design to affordability should be implemented: (a) by internal Department of Defense and military department management; (b) by public policy documents such as the Defense Acquisition Regulatory system; (c) in the contract process by contractual requirements.

Research Sub-Topics of Interest Include:

1. Harmonized acquisition affordability decision process. Acquisition affordability decisions are made in a management system composed of policy structure, decision criteria, organization structure, analysis techniques, contract requirements, and program documentation. The components of the acquisition affordability decision process must be identified with each component of the management system so they are harmonized to support front-end decision making and provide for program follow-through.

2. Differentiation and integration of affordability analysis tools. Life cycle costing, design-to-cost, reliability improvement warranties, failure mode effect analysis, system safety analysis, repair level analysis, and integrated logistics support analysis are a few of the techniques and tools that provide information to assist measuring certain aspects of affordability. There is a need to evaluate the application of this variety of tools to the measurement of affordability, the degree to which they should be integrated (combined), and the need for the development of additional ones.

3. Measures to affordability. There is a need to describe both quantitative and qualitative measures of costs (inputs) and measures of benefits (outputs) for system acquisition affordability decision making.

Topic: IMPROVING THE MODIFICATION PROCESS

Research Need: Substantial acquisition funds are spent in modifying existing systems rather than procuring new ones, but little research has been carried out in providing solutions to the many problems of modification programs. Some problems include:

a. Modification process too slow, cumbersome, and complex.

b. AFSC/AFLC management responsibilities unclear and outside of traditional boundaries.

c. Inadequate requirements definition and lack of master modification planning.

Improving modification management will entail an examination of organization, training, requirements definition, priority-ranking process, funding budgetary, programming linkage, and business practices.

Objective: The objective of this research will be to provide some answers to the problems of modification management noted above.

Topic: THE EFFECT OF COST BENEFIT ANALYSIS ON STANDARDIZATION VS TECHNOLOGICAL ADVANCEMENT

Research Need: There is a need to achieve a delicate balance between standardization/commonality and technological advancement. It is possible that requiring extensive formal cost benefit analysis in the conceptual/design phases of a program would lead to increased equipment standardization/commonality. However, another possible result is that innovation will be suppressed. The study needs to determine if increased utilization of formal cost benefit analyses would lead to more standardization/commonality. Have previously performed analyses led to the selection of standardized or common equipment, or have they been used to justify new technology? When formal analysis is extensively applied, is technological innovation suppressed to the extent that long term Air Force objectives are compromised? The result of the study should be a recommendation regarding the use of formal cost benefit analyses.

Objective: To use cost benefit analysis in achieving optimum long run trade-offs between standardization and technological advancement.

BUSINESS RELATIONSHIPS

CONTRACTOR MOTIVATION RESEARCH AREA

Objective: To improve our understanding of the motives which influence the actions of business institutions competing for and performing contracts involving unique products and services.

Background: A large segment of economic activity involves procuring unique products or services frequently involving long time spans and requiring significant technological or managerial innovation. The specialized nature of these one buyer-one seller situations has led to a growing realization that market theory economics is in some important respects an unsatisfactory guide for policy and actions. Although numerous approaches have been proposed to secure the advantages of competitive market behavior to the one buyer-one seller environment, many serious policy issues require more accurate understanding of contractor motivational patterns. This topic may be approached through a number of avenues such as contract incentives, capital investment policies, nonfinancial barriers to entry (e.g., red tape), and transaction costs. Related research areas include Life Cycle Performance Evaluation and Socioeconomic Considerations.

Topic: CALCULATION OF PROFIT ON NEGOTIATED CONTRACTS

Research Need: On negotiated contracts profits are largely calculated on the basis of production costs. Only ten percent of the profits total is based on contractor investment as specified in Defense Acquisition Circular 76-3 effective 1 September 1976. Cost Accounting Standard (CAS) 414 also excludes working capital from the base. Profits are, in part, a return on capital. If the necessary return on capital is to equal its opportunity cost, profits should be calculated on the basis of capital rather than costs. This should remove the incentive for contractors to raise costs and encourage them to make private defense investments. These assertions need further study and verification.

Objective: To evaluate the impact of computing profit on negotiated contracts based on total capital invested by the contractor to accomplish a project.

Topic: CASH FLOW AS A CONTRACTOR MOTIVATOR

Research Need: The impact of progress payments on a contractor's cash flow situation can be substantial and should be considered as a method for improving contractor performance. The ability to assess the response a contractor would have to changes in the level of progress payments is an important and much needed management capability.

Objective: To develop and validate a method for assessing the contractor's response to changes in cash flow payments during the major phases of systems acquisition.

Topic: THE COMPETITIVE MARKET ENVIRONMENT OF THE "DEFENSE INDUSTRY"

Research Need: There is need for an analysis of the competitive environment that the government deals in. If it can be determined that the Government is dealing with several distinct marketplaces (i.e., pure competition, monopoly, monopsony), then a different strategy can be designed for each market. Rather than just using profit as the primary motive for all contractors, perhaps other motives can be utilized that will be more effective and less costly than the present system. Finally, there is a need to determine the correlation between the Government's need, whether it be a major system acquisition, a service, or a supply need and the type of competition. If there is a strong correlation, then separate contract strategies could be developed for each type of Government need.

Objective: To identify the competitive market environment of the defense industry. The research effort should determine whether the Government is simultaneously dealing in several types of competitive environments. Further, it should be determined whether there is a correlation between the type of competitive market environment and the type of Government need (i.e., system acquisition, service, support, or supply).

Topic: EFFECTIVE UTILIZATION OF COMPETITION IN WEAPON SYSTEM DEVELOPMENT

Research Need: Acquisition and contracting policies relative to competitive versus sole source are sometimes not in the best interest of the Government in meeting acquisition objectives. For example, systems developed under a competitive prototype strategy often must comply with competitive contracting policies when low level production of items identical to the prototype are being sought. This practice is often restrictive and illogical. In many cases this situation would justify a single contract for a prototype with production option once units have passed qualification tests. This is prevented under present policy unless the production option can be exercised within three years. The use of competition at all stages of the acquisition process must be assessed. Focus should be on contractors attempting to meet the Air Force's need for new weapon systems identified as part of the Department of Defense's Defense Systems Acquisition Review Council (DSARC) decision process (e.g., those required to meet milestones 0, I, and II).

Objective: To assess acquisition and contracting policies that require competitive contracting on follow-on production contracts and to develop improved techniques for insuring reasonable price for production units in a single source environment.

Topic: MARKET ENVIRONMENT OF THE UNITED STATES DEFENSE INDUSTRY

"NEW" Research Need: The U.S. defense industry consists of several distinct markets composed of a large number of "multinational" firms which appear to be capable of influencing both the methods by which government products and services are acquired as well as the prices paid for them. This condition tends to restrict competition in defense business, thereby creating both an erosion of the U.S. defense industrial base as well as tendencies toward a "monopoly/monopsony" defense market structure.

A recent study of the market environment of the U.S. defense industry, using an Air Force Systems Command (AFSC) data base, found that the industry is composed of a select number of large multinational firms which tend to restrict competition in selected defense markets, and receive a higher negotiated profit rate than do firms which compete for U.S. defense business in the open market. It is unclear whether this finding could be extended to other populations of the defense industry, such as Air Force Logistics Command (AFLC) contractor, Air Force hardware contractor overall, etc. Further research into the composition and nature of the defense industrial base will give the Department of Defense acquisition planner a stronger foundation from which to cope with acquisition problems.

Objective: Duplicate the Runkle study referred to above, using an AFLC or USAF data base to determine the degree which competition might be restricted and to compare the negotiated profit rates of large multinational firms in the U.S. defense industry.

Topic: ASSESSMENT OF A PROFIT POLICY MODEL OF CONTRACTOR CAPITAL INVESTMENT

"NEW" Research Need: A continuing goal of acquisition policy has been the increase of contractor efficiency through encouraging contractor capital investment. A recent Industrial College of the Armed Forces (ICAF) study addresses the impact of Department of Defense (DOD) Profit Policy upon contractor capital investment. The ICAF report found little evidence that the current profit policy is a major factor in contractor investment decisions.

The ICAF study concludes that the profit policy regarding capital investment established following the "Profit 76" study has been only partially implemented; it suggests that Principal Contracting Officers (PCO's) are using the multitude of subjective weightings to "back into" a chosen profit objective. To correct deficiencies in the current profit policy, the ICAF study recommends a new structure for determining profit objective under Weighted Guidelines. This structure involves the factors of cost, contractor risk, and contractor investment but restricts subjective PCO judgements to two fundamental questions:

(a) How complex is the task, i.e., what is the risk of failure?

(b) How much of the risk of this undertaking is the contractor assuming vis-a-vis the Government?

Objective: To evaluate the proposed structure for DOD profit policy suggested in the ICAF report in increasing the efficiency of contractors, and to formulate practical methods for implementing the structure.

Topic: MEASURING PRODUCTIVITY OF DEFENSE CONTRACTORS

"NEW" Research Need: During the last decade, the productivity of U.S. industry has been declining, especially as compared with European and Japanese competitors. In order to provide a stronger defense industrial base, capable of supporting an effective military capability for the short and long run, the Air Force is taking a number of actions to reverse this trend. These actions include various contractual incentives to motivate contractors to improve productivity through increased investment in new capital equipment, manufacturing techniques and processes. With these ongoing initiatives, there arises a need to better understand what productivity is, and how it can be measured both at the industry and the firm levels. Unless the DOD can measure the relative productivity of a firm against other firms or industry averages and trends, it could dissipate scarce funds because of the inability to target the needed firms for productivity improvement, and measure the resulting changes. Since productivity can be a factor in determining contract profit, and in source selection, valid and simple measures of productivity at the level of the firm should be developed. More knowledge of the factors of productivity and any distinctions between these measures within different industries, such as engines, electronics, space systems, etc., would enhance insights into the productivity question.

A measure of productivity which has been suggested is Value Added Per Employee which is defined as (Sales minus Purchases) divided by the Number of Employees. In considering this or any other type of measure, the assumptions, parameters and data availability would have to be examined and evaluated.

Objective: Research should be conducted to achieve any or all of the following objectives:

a. Identify and understand the quantitative measures of productivity and the productivity trends for the U.S. aerospace industry.

b. Develop relatively simple, valid, reliable and inexpensive measures of productivity of the aerospace firm. The measures should address the firm below the corporate level (division, segment or plant level).

c. Develop productivity criteria and possible sources of data for use during source selection. This research should address the identifiable factors to be considered, the data sources available or necessary, and recommendations for using them in the process.

d. Using the findings of the "Payoff 80" (Manufacturing Technology Investment Strategy) Study performed by Air Force Systems Command, develop appropriate productivity incentives for use in Air Force contracts.

CONTRACTING

(TECHNIQUES AND MANAGEMENT)

RESEARCH AREA

Objective: To evaluate existing contracting techniques and procedures and to measure their effectiveness in achieving the overall contract objectives. To develop new and innovative techniques for improving the contracting process.

Background: Contracting includes those actions necessary to obtain goods and services required by the military. The contracting process can be divided into the major segments of; requirements cycle, purchase request cycle, solicitation/ evaluation cycle, award cycle, and contract administration cycle. This research area comprises projects designed to improve contracting techniques and management in these five cycles and to make contracting policies more efficient and effective.

Topic: SOURCE SELECTION PROCESS DECISION MAKING

Research Need: The source selection process is used extensively on major Air Force acquisitions. It is not always applied consistently and thus does not provide a means to establish a disciplined approach to decision making during the process.

Objective: To identify weaknesses in the present process resulting from inconsistencies in interpretation and application. Once these areas have been identified and described, available problem solving/decision analysis techniques will be selected that should provide for a more systematic disciplined approach to source selection. This will provide for more effective decision making in source selection and permit management to provide for improved training in the use of the source selection process. A review of the process used by the Kepner-Tregoe Company would be a good starting point for this study. This study will provide a comprehensive source selection guide and examples of source selection applications for training. It should provide an outline for the orderly development of an official training manual for the process.

Topic: COMPARATIVE ANALYSIS: GOVERNMENT AND COMMERCIAL SOLICITATION DOCUMENTS

Research Needs: Solicitation documents must be adaptable to a variety of different contract types and situations. A significant number of Government acquisitions involve either the construction of items or the selection of off-the-shelf items. Further, one might assume that profit-motivated commercial enterprises, in the interest of efficiency, would have developed solicitation methods that strike a balance between simplicity, adequacy, and reduce costs.

Objective: Research in this area would:

a. Identify previous existing studies on the subject.

b. Compare DOD and private industry solicitation by similar commodities, dollar thresholds, and contract type.

c. Identify areas for increased efficiency through use of commercial techniques.

d. Identify statutory and regulatory impediments to implementing commercial practices and recommend possible courses of action to resolve the impediments.

Topic: LEAD TIME INVOLVED IN CONTRACT AWARD

Research Need: Many large dollar value (i.e., $1 million plus) competitive acquisitions take in excess of eighteen months from receipt of program approval to contract award. These delays impact on user requirements and tie up personnel, decreasing mission effectiveness and productivity.

Objective:

a. Compare DOD versus industry lead times on similar commodities.

b. Identify and measure the impacts of the prolonged acquisition process on user requirements, program management and contracting function productivity.

c. Provide recommendations on how to streamline the competitive acquisition process based on the findings of a and b, and provide a comparative analysis of industry procedures.

Topic: QUANTIFYING THE IMPACT OF PERSONNEL ON CONTRACTING ADMINISTRATIVE LEAD TIMES (PALT)

Research Need: Currently there is no adequate uniform method or set of indicators for assessing the impact of gains and losses in personnel on overall and specific contracting administrative lead times experienced in base, research and development, and systems acquisition/ contracting activities, respectively. Each of these activities are unique as to numbers, types, dollar values, and complexity of contract actions processed. In addition, different processing systems are employed in each type of contracting activity. Hence, each type of activity may have to be studied separately, perhaps utilizing different methodologies and criteria in each case. Average or parametric and not linear relationships between personnel and PALT should be assumed because of the labor intensive nature of the contracting process.

Objective: Using an operation's research type approach, design separate PALT-human resource models and develop separate PALT-human resource organizational management indicators that can be generalized to base, research and development, systems and logistics contracting activities, respectively.

Topic: RAPID SYSTEM ACQUISITION MODEL/MANUAL

Research Need: There is no organized and prioritized statement of tasks to guide a program manager and contracting officer who are directed to acquire a weapon system for operational use on an urgent or expedited basis. Availability of research based guidance would improve contracting productivity and reduce acquisition time.

Objective: Develop a model or manual for use by System Program Office (SPO) and contracting personnel on how to accomplish the rapid acquisition of a weapon system. The end product is to be based on "lessons learned" from other programs.

Topic: INSURANCE EXPERTISE IN THE AIR FORCE

Research Need: In the initial phase of contracting the conflicting desires of the Government and the contractor often arise over the extent and nature of insurance. The Government is at a disadvantage since the contracting officer, unlike the contractor, does not have access to insurance agents versed in the nuances of coverage and familiar with the price of insurance. Thus, the Government may obtain less than optimal coverage, and may pay an excessive price for that coverage. This lack of Government expertise further manifests itself when a loss occurs which the Government believes should have been covered under the insurance. The Government is at a severe disadvantage in meeting the arguments of the contractor because of this lack of insurance expertise.

Objective: Define the extent of the problem and identify the appropriate method of supplying this expertise. Sample the experience of representative contracting and pricing activities to establish the specific areas of policy and pricing which must be addressed.

Topic: AIRFRAME MANUFACTURERS INSURANCE PROGRAMS COVERING THE LOSS OF GOVERNMENT PROPERTY IN THEIR POSSESSION

Research Need: Under Inspect and Repair as Necessary (IRAN) modification contracts there are occasions when airframe manufacturers misplace, lose, or damage salvageable parts while working on Government aircraft. Hence, new aircraft parts are installed at an increased cost to the Government.

There are currently no guidelines to assist Government property administrators and administrative contracting officers in assessing airframe manufacturer's responsibility where it is demonstrated that the loss/damage of Government property results from a prima facie inadequacy of the contractor's property control system.

The Air Force is having a difficult time holding Government contractors responsible for these type of losses within the meaning of alternate paragraph (g) of the Government property clause, Defense Acquisition Regulation (DAR) 7104.24(c). In order to be successful in court or before the Armed Services Board of Contract Appeals (ASBCA), the Government must demonstrate under the

clause, that airframe manufacturers do not customarily carry insurance or a reserve for self-insurance in accordance with the contractor's normal practice or the prevailing practice of the industry to cover lost/damaged parts when such losses/damages result from inept contractor's managerial inventory practices.

Objective: Determine the extent of coverage of alleged "all risk" insurance policies which includes a hangarkeeper's legal liability clause. Determine Government's responsibility to assure adequacy of contractor's property control system before and after receipt of Government property.

Topic: REVIEW OF DEPARTMENT OF DEFENSE (DOD) CONTRACT LANGUAGE

Research Need: As an offshoot of the contemporary "consumer movement," many firms are rewriting such legal documents as credit agreements and insurance policies in "plain English" formats. For identical reasons (i.e., increased communication and understanding) Government contract clauses may be subject to simplification and hence clarification.

Objective: To determine the feasibility and methodology of a contract terminology rewrite program. The objective of the second phase of this research project would be to develop, test, and validate prototype contracts written in plain English.

Topic: METHODS FOR INCREASING THE USE OF PREVIOUSLY DEVELOPED EQUIPMENT

Research Need: A recent study concluded that Department of Defense (DOD) buying activities tend to totally support a contractor's program approach at source selection, even if it is counter to Government policy on standardization and use of off-the-shelf equipment. In some cases, the contractor might develop new equipment when off-the-shelf items would do. A need exists to find ways to motivate the contractor to use as much off-the-shelf equipment as possible. The research should investigate the following representative areas:

a. Reasons for contractor failure to standardize or use off-the-shelf equipment.

b. Evaluation of the effectiveness of existing incentives to achieve DOD's goals.

c. Contractual and non-contractual incentives to achieve the DOD's standardization/off-the-shelf equipment goals.

d. New and innovative approaches to solve existing problems.

Objective: To investigate and analyze the feasibility of using contractual and non-contractual means for encouraging a contractor to use previously developed equipment in lieu of developing new designs.

Topic: FLOW DOWN ON FIRM FIXED PRICE (FFP) SUBCONTRACTS IN CONJUNCTION WITH FLEXIBLY PRICED PRIME CONTRACTS

Research Need: Many major weapon systems acquisitions are being placed as incentive-type contracts with prime contractors. Many of the prime contractors are subcontracting significant portions of the prime contracts using firm fixed price subcontract arrangements. The value of these firm fixed price subcontracts could encompass 30 to 40% of the prime contracts' target costs. It is very difficult to rationalize a Fixed Price Incentive (FPI) ceiling price being established as a percentage of target costs when it is known that a significant portion of those costs are attributable to FFP subcontract efforts. It would appear that a study should be initiated to determine the proper flow down contract arrangements with prime contractors. It is our opinion that we should not discourage the prime contractors from seeking FFP arrangements with the subcontractors. However, it may be feasible to structure the prime contract with a portion (primarily subcontractor effort) being placed as an FFP contract while the remaining portion of the technical effort (that being accomplished in the prime contractor's facility) being issued under the flexibly priced arrangement. This would assure that the cost incentive of the prime contract would apply only to that portion of the weapons systems appropriately regarded as effort susceptible to incentive provisions.

Objective: To determine the feasibility of structuring contract flow down arrangements in the above type contracts.

Topic: CONTRACT ADMINISTRATION SERVICE (CAS) AGENCY INVOLVEMENT DURING THE CONCEPTUAL PHASE OF ACQUISITION

"NEW" Research Need: Decisions being made during the conceptual phase of a major acquisition program often establish irreversible procedures for contracting and supporting that system. This is often done without the coordination of the CAS agency which will eventually administer the contract. This could and has led to administrative problems late in the acquisition cycle.

Objective: Develop a procedure to ascertain the effectiveness of early involvement by the CAS. Identify those areas which should be addressed during the conceptual phase.

Topic: THE RELATIONSHIP OF SOURCE SELECTION SENSITIVE DATA TO COMPETITION AND NEGOTIATIONS

"NEW" Research Need: Current DOD contracting directives and policies emphasize:

(1) Competition between system design concepts throughout the major system acquisition process, and

(2) Increasing off-the-shelf buys in order to decrease the cost of research and development.

This has resulted in increasing requests by the government for technical information at various stages of the acquisition process. Contractors have become reluctant to grant the Air Force certain rights in data because the requested data is felt to be sensitive and could cause them to lose a perceived competitive edge.

Objective: Investigate the contractors' reluctance to grant the government requested data rights. Is the competition and the time/cost of contract negotiation affected? Does this issue warrant further study?

Topic: CONTRACTING GUIDANCE COMPENDIUM

"NEW" Research Need: Currently contracting policy and guidance is fragmented and scattered through a number of publications. A cohesive compendium utilizing a systems approach is needed to catalog and offer guidance as to the location of different areas of Air Force contracting knowledge.

Objective: Develop a cohesive compendium of contracting policy and guidance utilizing a systems approach to afford users of a comprehensive, accessible guide to current contracting policy and knowledge.

Topic: AVERAGE PRICING IN SOURCE SELECTION

"NEW" Research Need: The competitive pressure involved in contract bidding often leads to underpricing of contracts with disastrous results for both contractor and the Air Force. A test of the concept of average pricing is needed to determine if use of this technique would alleviate the difficulties caused by underpricing contracts.

Objective: Perform a test of the concept of average pricing to assess its strengths and weaknesses and to determine its potential for solving the problems associated with contract underpricing.

Topic: DELINEATION OF CORRECTIVE ACTION IN FY FUND CITATION

"NEW" Research Need: Some Air Force Audit Agency offices have required that where fund citation errors are discerned, then all similar contractual documents for each fiscal year must be examined for all errors, and corrective action taken accordingly. The physical impossibility of accomplishing this additional review is evident in many cases, and at the least, the process is completely disruptive of normal routine contractual activity. The scope of this type of retroactive review and corrective action is apparently not limited by statute or regulation.

Objective: Develop a system for evaluating the need for and extent of further examination and corrective action where FY Fund Citation errors are discerned. The system should incorporate judgemental and/or statistical criteria and limit corrective action to material (important) errors. This study should propose a limit on the retroactive correction action to avoid "overobligation" of Air Force funds in violation of R.S. 3679.

Topic: DEFINING VALUE ENGINEERING CHANGE PROPOSALS

"NEW" Research Need: The current Defense Acquisition Regulation (DAR) offers little guidance as to what constitutes a Value Engineering Change Proposal (VECP). As a result contractors are submitting increasing numbers of proposals which have little legitimate connection with the engineering design/configuration or manufacture of a related item, yet are labeled as VECPs. The tendency to not enforce rigid standards has made the program largely unworkable and greatly diminished its value to the Government. A thorough study of this program is necessary in order to offer objective guidance to engineering, contracting, and legal personnel faced with decisions about acceptability of particular proposals.

Objective: Develop a clear, concise set of guidelines regarding criteria for qualification of a proposal as a Value Engineering Change Proposal, which could then be incorporated into the DAR.

Topic: AUTOMATIC DATA PROCESSING EQUIPMENT (ADPE) CONTRACTING

"NEW" Research Need: Because of problems encountered in organizational responsibility, the Air Force recently directed that contract support for ADPE acquisition be transferred from Air Force Systems Command to Air Force Communications Command. This move was part of a goal to improve the overall computer acquisition process.

Another objective of the effort to improve computer acquisition involves a revision of computer contracting methods and procedures. Some areas requiring attention are: best approach, negotiation versus advertising, special techniques, flexibility, AF/ACD involvement, life cycle cost models, and source selection.

Objective: Evaluate current Air Force ADP acquisition contracting procedures for effectiveness. Develop a complete reference for Air Force Contracting Personnel responsible for ADP purchase.

Topic: IMPROVED CONTRACTING FOR ENGINEERING SERVICES AND TECHNICAL SUPPORT

"NEW" Research Need: Engineering services and technical support is normally obtained via engineering services contracts, Contractor Engineering Technical Services (CETS) contracts or Contractor Field Team (CFT) contracts. Inability to accurately predict total annual manpower requirements and anticipated contractor level of effort has led to acquisition problems in utilizing these types of contracts. A general study of the procedures and terms used in these contracts is needed along with an effort to develop a standardized contract for engineering services and technical support.

Objective: Conduct a study of the specialized contracts presently used for engineering services and technical support in order to develop an improved standardized contract for this area.

Topic: ALTERNATIVE PROCEDURES FOR CONTRACTING FOR RESEARCH AND DEVELOPMENT (R&D)

"NEW" Research Need: A recently completed study documents the attitudes of Defense contractors toward the "Best and Final Offer (BAFO)" procedure listed in Defense Acquisition Regulation 3-805.3. The majority of companies who responded recommended that BAFO be eliminated while others suggested major changes. Most companies felt that a credibility gap exists, whether it be real or imagined which necessitates alternatives to BAFO. Among alternatives proposed but not evaluated were a) across-the-table negotiations, b) two step procurement and c) a formalized auction technique.

Objective: To identify and evaluate alternative methods to BAFO in light of industry's perceptions. Present a methodology for evaluating the advantages of other methods over BAFO and design a field or laboratory test of the procedures to gather objective data on the alternatives.

Topic: AN AUCTION TECHNIQUE FOR DEFENSE CONTRACTING

"NEW" Research Need: In the late 1960's, Colonel Gregory C. Frese, Jr. advocated the "Auction Technique" as an alternative method

of contracting. Though the Defense Acquisition Regulation expressly forbids use of any type of auction technique, there appear to be several advantages to both buyers and sellers in terms of ease of the administrative procedure and fairness of price, to name just a few. There is a need to conduct further research on the Frese Auction Technique to assess the advantages and disadvantages of it for defense contracting. Work must be conducted in both a laboratory setting and a field test environment to describe and analyze the technique in actual application. Replication of prior research conducted at the Air Force Institute of Technology, under varied conditions and controls, would increase knowledge of this technique immeasurably.

Objective: To conduct further descriptive research and laboratory studies of the Frese Auction Technique for application to Defense contracting.

Topic: CONTRACTOR INTERNAL REWARD SYSTEMS

"NEW" Research Need: Previous research on contractor motivation has dealt primarily with motivation at the corporate level and considering the motivation of the company as an entity unto itself. Little research has been done on the incentive relationships between the corporate level and the operating division/profit center within the corporation. The relationship between formal and informal incentives between these differing parts of the company, and the effectiveness and perceptions of the individuals affected are key considerations. Within the company, certain incentive programs may cause employees to behave differently from the way that they would at the corporate level. Increased knowledge about the types of internal contractor incentive/reward systems could provide Government personnel with a better insight into contractor motivation which could allow for more effective negotiation.

Objective: The objective of this research is to identify all types of internal contractor reward/incentive systems used at the profit center or operating division level, and to assess their relative effectiveness at motivating operating managers.

INDUSTRIAL BASE RESEARCH AREA

Objective: To maintain appropriate and efficient industrial capability consistent with current and projected national defense requirements.

Background: The ability of the industrial base to support Department of Defense (DOD) requirements is an important aspect of national defense. An improved understanding of the character and extent of the Defense Department's requirements for the national industrial base is needed. Research in this area can be directed into several basic dimensions: (1) industrial production capability, and (2) materiel resource requirements for national defense purposes. The industrial production capability is concerned with research/development, plant/equipment, and manpower (skill and training) capabilities of industry to meet DOD requirements. DOD policies and practices relating to industrial reserve facilities, Government furnished property, Government-Owned/Contractor-operated facilities, and industrial preparedness planning are of specific interest. The materiel resource dimension is concerned with identifying and assessing potential shortages of raw materials and energy resources required for the production and operation of military equipment and actions that could help alleviate such problems.

Topic: CONTRACTOR MANAGEMENT OF GOVERNMENT PROPERTY

Research Need: Acquisition and contracting managers often face problems relative to Government property being used by defense contractors. These problems vary in severity but, in most cases, result in substantial costs to the Government in terms of lost or damaged property and management time spent addressing such problems. Losses and damages to Government property are also the subject of frequent, costly investigations and form the basis of severe criticism of the Department of Defense and Air Force by Congress and various sources in the civil sector. Therefore, a study needs to be conducted to identify and develop management approaches and techniques to minimize loss and damage to Government property used by defense contractors. For example, suggested topics for study are use of the award fee for Government property management and treating contractor management of Government property as a direct contract cost element. Each approach identified should be considered for its potential costs and benefits to the Government.

Objective: Identify and develop management approaches for use by acquisition and contracting managers to minimize loss and damage to Government property being used by defense contractors.

Topic: COST EFFECTIVE CAPITAL EQUIPMENT MODERNIZATION RATE

Research Need: The Air Force depends upon industry to provide effective weapon systems and support equipment. Weapon system acquisition strategies have used a variety of techniques and initiatives to assure that procurement costs are minimized. However, one characteristic of acquisition has not been changed. Major weapon system acquisition is priced on a cost basis and conducted in a bilateral monopoly. Costs to produce weapon systems are paid to contractors within legal limits of allowability, allocability, and reasonableness. One hypothesized reason that production costs of weapon systems cannot be lowered is that a high proportion of capital equipment used is outdated and inefficient. A study is needed to determine if the hypothesis can be supported.

Objective: To determine if the industrial plant and equipment used in weapon system production is outdated and inefficient. Also determine what is the optimum modernization expenditure rate for both Government and industry to lower total costs to the Government. Also outline an approach to modernize industrial plant equipment and lower production costs on future production of weapon systems and follow-on support.

Topic: AN ANALYSIS OF THE EFFECTIVENESS OF PLANT EQUIPMENT PACKAGES (PEPs)

Research Need: The purpose of PEPs is to identify and retain Government-owned

industrial plant equipment (IPE) (i.e., capital equipment) which is essential to the production of mobilization requirements assigned to contractors. The IPE included in PEPs should be the total amount needed to support industrial preparedness planning (IPP) mobilization requirements less that equipment available in private industry to fill such mobilization requirements. Possible research questions to consider are: (1) if all reviews and approaches required to establish PEPs are beneficial to the quality of the end product, (2) if existing procedures and practices contemplate the use of an appropriate portion of contractor capability on production of consumer items concurrent with mobilization requirements, (3) if the methods used to identify and retain special tools and special test equipment for special purposes, such as IPP, could be partially or wholly used as an alternate to PEPs, (4) if there is a better way than the use of PEPs to assure retention of the industrial base essential to meet mobilization requirements, and (5) if inspections and audits could be effectively used to assure the necessary industrial base is being retained and excess equipment is not retained.

Objective: The objective of the research would be to analyze current methods to determine if plant equipment packages are effective and worth the cost. Therefore, the above referenced research questions need to be addressed.

COST ESTIMATION AND ANALYTIC METHODOLOGIES RESEARCH AREA

Objective: To improve the validity and reliability of weapon systems cost estimates and to provide acquisition managers with improved knowledge about the purpose and nature of cost estimates and how they are generated.

Background: Cost estimation problems can be categorized into two general areas. First, institutional considerations regarding responsibility for generating cost estimates during each phase of the acquisition process. Various organizations generate estimates for the same system, but these estimates are frequently different resulting in the problem of selecting the proper estimate for decision-making use. Second, application problems exist where estimating methodologies are used incorrectly or improved methods are required. Acquisition managers need to improve their understanding of the overall process of how and why cost estimates are developed and the relationship of each estimate to the acquisition process. Further, new methodologies are needed to address known technical deficiencies that impact cost of weapon systems.

Topic: TECHNOLOGICAL UNCERTAINTY AND COST GROWTH DURING WEAPON SYSTEM DEVELOPMENT

Research Need: Weapon systems development programs continue to experience cost growth. A major factor of cost growth during development is the technological uncertainty about particular systems when initial development cost estimates are prepared. Most of the methods used to prepare these costs do not include consideration for technological uncertainty. A recent series of studies indicate that the use of an entropic cost model may be used to forecast growth due to such uncertainty about development program outcomes.

Objective: Evaluate/validate the entropic cost model and its application to forecasting cost growth due to technological uncertainty about weapon system development.

Topic: IMPACT OF CONTRACT CHANGES ON COST GROWTH

Research Need: Air Force contracts change in several ways during the performance period. Changes in scope, prices, delivery schedules, product design, and numerous other items ultimately cause cost growth. To manage this cost growth requires detailed information. Studies are needed to address this issue.

Objective: Study and analyze cost growth caused by changes in contract scope, prices, delivery schedules, and product design.

Topic: APPLICATION OF LINEAR FILTERS TO COST/ECONOMIC DATA

Research Need: Discrete linear filtering techniques and methods are applied to many physical feedback and control systems such as radar systems. Quite often these systems are subject to noise and interference caused by external conditions and internal malfunctions that require discrete data to be smoothed or filtered. Cost/economic data are often affected by events that cause fluctuations in data used for analysis and forecasting costs. Most cost estimating methods are based on traditional time series or regression models. These methods are sensitive to fluctuations in data and often provide questionable results.

Objective: Determine utility of discrete linear filtering techniques to analyze cost/economic data.

Topic: APPLICATION OF FORMAL UNCERTAINTY AND RISK ANALYSIS TECHNIQUES DURING SYSTEM ACQUISITION

Research Need: Department of Defense and Air Force acquisition management directives require that risks be continually addressed throughout development of major weapon systems and that risks be minimized before the decision is made to enter full production. However, no formal guidance exists to help acquisition managers conduct formal risk analysis during acquisition.

Management tools such as Cost/Schedule Control Systems and network analysis are in common use, but the concepts often fall short of management's decision-making needs and fail to address technological uncertainty in programs.

Minimizing risk requires a similar or proportional reduction of technological uncertainty about a system. Technological uncertainty before and during development is a major factor when cost growth is considered. This uncertainty and related risks should be addressed at each milestone and/or major decision point during development and before full production is approved. Techniques such as DELPHI can be used to address qualitative concerns and their attributes, assess technological uncertainty, and formulate a baseline for measuring risk during development.

Other techniques such as portfolio analysis, bayesian and classical statistics, network methods, and/or combinations of such methods can be used to formally track and measure uncertainty and risk. Research needs to be conducted to identify and catalog formal uncertainty and risk analysis concepts and translate those concepts into practical guidance for acquisition managers who continually face decisions that involve technological uncertainty and risk.

Objective: The objective of this project is to develop a handbook for use by acquisition managers and their staffs to assess technological uncertainty and analyze risk associated with weapon system development.

Topic: COMPUTER SOFTWARE DEVELOPMENT COST ESTIMATION

"NEW" Research Need: A great deal of study and analysis of computer resource acquisition and management has been accomplished in the past. Advances in project planning and organization techniques, design methodologies, coding and testing practices, use of programming support tools, documentation standards, and configuration management procedures and practices hold promise for ultimately reducing Air Force expenditures on computer software. However, one area which has not received as much emphasis is the area of software resource estimation (i.e., size, cost, manpower).

Objective: The Air Force requires quantitative information about the effects of current programming practices on software development resource requirements. At the present time, there are a number of estimating techniques that are alleged to result in increased software resource estimation reliability. A continuing repository and data collection system combined with a standardized estimation methodology and procedure would assist in resolving the difficulties encountered in obtaining reliable software development cost and schedule estimates. This would encourage Air Force contractor and in-house development agencies to employ standardized recording and estimating practices. Specific objectives would be:

(1) Define the Economic Analysis.

(a) What is its primary purpose?
(b) When should it be prepared?
(c) How should it be prepared?
(d) At what intervals should it be reviewed?

(2) Cost Estimate

(a) Differentiate the Economic Analysis from the cost estimate.
(b) When should the first cost estimate be prepared, by whom, and for what purpose?
(c) How should cost estimates be prepared, keeping in mind the users need to understand them?
(d) Under what conditions should the cost estimate be updated?

(3) Prepare a bibliography of cost estimating tools such as models.

Topic: COST OF IMPLEMENTING GEOGRAPHIC DISTRIBUTION DEFENSE ACQUISITION REGULATION (DAR) CLAUSE

"NEW" Research Need: As a result of initial inclusion in the FY 78 appropriations bill, the DAR presently contains a requirement that DD Form 2139 be completed by contractors within five working days after placement of each subcontract over $10,000. This reporting requirement relates to "Geographic Distributions of Defense Subcontract Dollars." It is required by the DAR but is no longer mandated in the FY 81 appropriations bill. The cost of administering this reporting requirement has been considered to be as high as $125,000 on a $24 million contract. A thorough cost study would demonstrate to the DAR council the costliness of administrating this DAR reporting requirement.

Objective: To perform a cost study to demonstrate to the DAR council the cost impact of complying with the DAR reporting requirement concerning "Geographic Distributions of Defense Subcontract Dollars."

Topic: COST ESTIMATION FOR SOFTWARE MAINTENANCE

"NEW" Research Need: The Phase IV Program is in the process of replacing all base level computers including Burroughs and UNIVAC equipment. At the same time, all of the standard base level systems are being transitioned to COBOL 74. A part of the contractor effort will be to maintain all of the transitioned software until final system acceptance of both hardware and software. During the cost estimating stage there was much difficulty in finding a satisfactory method or factors to estimate the cost of the contractor software maintenance.

Objective: A reliable cost estimating tool is required in contracting for software maintenance. What model and/or cost factors can be used to develop such a tool?

ACQUISITION STRATEGY
RESEARCH AREA

Objective: To improve our understanding of the interaction between the marketing and economic situation of prospective suppliers, their actual and anticipated financial condition, and the estimated production economics of intended system and subsystem acquisitions.

Background: Acquisition of major systems and subsystems takes place in a complex environment involving series of interactions between the marketing, technical, financial, and production capacity parameters facing the prospective contractors and the needs of the acquiring agencies. The increasing complexity of the acquisition environment and the resultant specialization of firms have greatly increased the need for the U.S. Government to understand and appropriately consider the basic business "facts of life" facing its potential suppliers. Growing leadtimes necessitate that the strategic aspects of acquisition be addressed early in the acquisition cycle and that means be developed to facilitate acquiring timely and usable information for the acquisition manager. Among the issues which may be studied are: directed licensing, concurrency, prototyping application and refinement, phased acquisition procedures, and similar strategic concerns.

Topic: RELIABILITY IN THE ACQUISITION PROCESS

"NEW" Research Need: The increased cost of weapon systems coupled with a tightening defense budget highlight the need for increased emphasis on weapon system reliability. Currently, there is no strategy guidance that offers effective methods and procedures for dealing with reliability prior to the production phase. It is felt that meaningful direction provided in the early stages of the acquisition cycle will improve reliability results.

Objective: Develop an acquisition strategy that will lead to an improvement in the reliability of future weapon systems. The cost effectiveness of the recommended approach should be addressed.

Topic: SIMPLIFICATION OF THE ACQUISITION PROCESS

"NEW" Research Need: The Acquisition System continues to be a main area of concern to those who desire a simple, more efficient process. Program Management Responsibility Transfer (PMRT) has been criticized as creating duplicate functions and increasing the number of disciplines required by each command. A reorganization of the acquisition process by looking at basic needs and desiring to separate command responsibilities by firm boundaries is an often discussed topic. However, PMRT and its associated problems remain.

Objective: An evaluation of PMRT is needed to assess the degree to which it causes increased command responsibilities outside of traditional industrial lines of disciplines, increased number of disciplines needed by each command, and increased overall manpower needed to get the job done. Recommendations for a more effective, simplified acquisition process would be appropriate.

Topic: IMPROVED STANDARDIZATION IN ACQUISITION

"NEW" Research Need: There is much concern about the effects of standardization on the efficiency of weapon system acquisition. The importance of how the Air Force structures competitive procurements and maintains competition for equipments in the face of increasing standardization cannot be overemphasized. Situations currently exist where only one supplier is providing hardware to the Air Force and there is no continuing competition for these items. Also, it is thought that the use of multi-year procurements would benefit both the contractor and the Air Force. This procurement method would result in effective implementation of standardization specifications. Other considerations in improving Air Force standardization policy include distinction between specialized and generalized technology, and adequacy of attention to standardization within the System Program Office (SPO).

Objective: Evaluate the impact of current Air Force standardization policy on efficiency in the weapon system acquisition process. Primary considerations are the effects of standardization policy on competition and the potential effects of using multi-year procurements. Recommend an improved standardization procurement procedure.

PROGRAM DOCUMENTATION AND REPORTING SYSTEM RESEARCH AREA

Objective: To improve documentation and reporting systems used by program managers to plan, organize, and control acquisition programs.

Background: Program managers use various plans, reports, reviews, and analyses to make decisions, initiate program activities and accomplish program objectives. Each weapon system acquisition requires various types of documentation systems to assemble and transform data into meaningful management information about program status. Documented information is used to make program decisions, therefore, continuous evaluation of established documentation requirements is necessary. Reporting systems are used to satisfy management needs across a variety of programs and multiple layers of decision makers. Documentation and reporting systems can be either formal or informal. Formal systems are often criticized because of their inflexibility and the amount of effort required to effectively apply them. Informal systems are often not officially recognized, however, they are often very effective. Research is needed to identify such informal systems, encourage their use, and study their strengths to improve existing formal systems. Cost/benefits of both these types of systems should also be continually reviewed to assure efficient use by acquisition managers.

Topic: DETERMINATION OF COST (TO CONTRACTOR) OF C/SCSC VALIDATION

"NEW" Research Need: Since Cost/Schedule Control System Criteria (C/SCSC) were imposed by the Government, defense contractors have used various direct and indirect allocation techniques for costs incurred to support C/SCSC. Existing studies on cost effectiveness of C/SCSC should be researched and compared to current cost of C/SCSC application to reevaluate C/SCSC cost effectiveness. Contractors doing business with Air Force Systems Command should be queried as to the marginal cost of C/SCSC. The research results should point out weak areas of application that need attention and identify strengths that can be used in other programs.

Objective: Reevaluate cost effectiveness of C/SCSC by researching completed studies and comparing the results with current marginal cost of applying C/SCSC.

PRODUCTION/MANUFACTURING MANAGEMENT RESEARCH AREA

Objective: To improve production/manufacturing management policy, procedures, and practices.

Background: Production is the transformation of resources into goods and services. Production/manufacturing management is defined as the "art and science of properly and efficiently using men, money, machines, materials, and processes to economically generate goods and services." In practice, production/manufacturing management is a blend of operations research, industrial engineering, economics, and behavioral science. Successful management during the production phase of the acquisition cycle requires development of sound production and manufacturing objectives before production go-ahead and assurance that these objectives are accomplished during production. Research is needed to provide management with the tools and knowledge to improve the policy framework and procedures that support decisions to produce weapons systems that meet costs, schedules, and quality requirements.

Topic: PRODUCTION/MANUFACTURING MANAGEMENT APPROACHES AND TECHNIQUES

Research Need: Since 1971, there have been several Department of Defense (DOD) and Air Force efforts to emphasize the importance of production and manufacturing management as part of the acquisition and contracting environment. The Air Force has implemented concepts such as Manufacturing/Management Production Capability Reviews and Production Readiness Reviews to assess and determine contractors' capability and readiness to meet weapon system production requirements. Also, there have been strong efforts in the Air Force to revitalize the Manufacturing Technology Program to explore and promote advances in the methods, processes, and materials used to produce weapon systems and subsystems. These initiatives have resulted in significant improvements to the acquisition process; however, it has also been recognized that the use of new management concepts and techniques needs to be tailored to acquisition programs in a variety of settings (e.g., stable follow-on production, transition from prototype to full-scale development, major modifications of existing systems, and acquisition of commercial "off-the-shelf" systems). Further, consideration must be given to the type of product or system being acquired. For example, flight simulators, munitions, and major modification programs all have unique production characateristics. The nature of the product and the manufacturing technologies required to produce it should be major factors in determining the approaches and techniques to be used to manage its production. Further, existing systems such as the cost schedule control system (C/SCSC) and network based systems often fall short of management's qualitative and quantitative needs to effectively plan and manage a program during production.

Objective: The objective of this study is to develop a comprehensive guidance document for Air Force production/manufacturing managers to plan, execute, and control production and manufacturing requirements during acquisition of weapon systems and modification of existing systems. This document will fully describe each approach or technique to be used for given sets of acquisition program characteristics and objectives and provide examples to help managament understand the strengths of each approach in given situations.

Topic: LONG AND SHORT RANGE COSTS AND BENEFITS OF MAKE-OR-BUY POLICY

Research Need: Department of Defense acquisition and contracting policy requires that acquisition of weapon systems includes make-or-buy considerations in contracts for systems and products that meet certain criteria outlined in the Defense Acquisition Regulation (DAR). These criteria are based primarily on dollar thresholds, product complexity and type of program. There is no guidance that requires the contractor to perform a cost and benefit analysis when arriving at a make-or-buy decision. Therefore, a study needs to be conducted to assess situations where make-or-buy policy has been required and those where it has not been used. Such a study should be directed toward long and short term costs and benefits of using make-or-buy policy.

Objective: Develop criteria and guidelines for program managers to use in determining when to apply make-or-buy evaluations by contractors.

Topic: PRODUCTION/MANUFACTURING COST DRIVERS

Research Need: Many key decisions are made during early planning for weapon systems that eventually impact cost during production/ manufacturing of a system. Due to a widespread assumption of the American "can-do" attitude, planners and decision-makers often fail to explicitly address production/ manufacturing cost drivers. This attitude causes processes and productive systems to "optimize" costs with given constraints. It is quite possible these "optimum" costs could be lowered if constraints were restructured by treating requirements explicitly during early planning phases. There is a need to identify and describe key decisions and operating constraints that drive production/manufacturing costs of weapon systems. Also needed are techniques for explicit identification of decision inputs by both Air Force and industry production/manufacturing manager.

Objective: Identify and describe key decisions and operating constraints that drive production/manufacturing costs and identify explicit inputs required by the Air Force and industry that have a direct impact on such costs.

Topic: RELATIONSHIP BETWEEN MANUFACTURING YIELDS AND FIELD FAILURE RATES

"NEW" Research Need: Air Force electronics contractors often compromise on low process yields instead of installing automated methods. Low order quantities do not justify investment in new equipment. The contractors find it more economical to "brute force" (i.e., rework/retest failed equipment as many times as necessary) their products through acceptance test, rather than improve manufacturing processes. This decision causes poor quality parts to be accepted. Better controlled processes or automated procedures might be initiated if process yield requirements are made a part of the Government's acquisition requirements (SOW, PRR).

Objective:

1. Determine the correlation between a) factory yields and operational reliability and b) operational reliability and product complexity.
2. If there is significant correlation:
   a. Establish guidelines for manufacturing yield and rework rates. Set productivity goals through yield rates.
   b. Define process control limits.
   c. Set up statistical indicators for Production Readiness Reviews or Risk Assessments.

FOREIGN MILITARY BUSINESS RESEARCH AREA

Objective: Identify, define and examine the issues of foreign military business (FMB) on the U.S. defense acquisition process. Provide ideas and recommendations for management policies and procedures used to cope with Air Force involvement with FMB.

Background: FMB consists of foreign military sales (FMS), international cooperative programs, and grant aid. The major issues spanning these three areas are:

a. Conflict Resolution Process. The thrust of this topic is managerial in nature (i.e., the objective is to manage conflict). The major issue concerns negotiations involving memoranda of understanding, price and availability data, and letters of offer and acceptance.

b. Impact of FMB on Acquisition and Contracting Policy and Procedures. Organization for effective contracting support where international participation is involved is a major issue under this topic. Other issues include the application of various statutes, Defense Acquisition Regulation (DAR) provisions, etc., to FMB situations; acquisition planning when requirements other than those of U.S. forces are included.

c. Management of International Programs. Many major issues fall under this topic: coproduction and codevelopment; interoperability/standardization; offset management (incorporating acquisition from foreign sources); technology transfer and foreign disclosure; and binational, multinational, or consortium management efforts.

d. Logistics Support. Inevitably, each of the three aspects of FMB results in a requirement for logistics support. Thus, a major issue is the cooperative logistics support system maintained by the Air Force Logistics Command (AFLC). Elements of this issue include support alternatives, financial management, and such things as transportation and communication. Also involved is the area of Air Force Systems Command (AFSC)/AFLC interface, product support and the engine Component Improvement Program (CIP).

Topic: FOREIGN MILITARY SALES (FMS) CUSTOMER UNIQUE LOGISTICAL SUPPORT

Research Need: Under FMS, the sale of major weapon systems typically includes both the end item and follow-on logistical support. Since many weapon systems are configured to meet the requirements of individual countries, added logistics support burdens are placed on the U.S. For example, nonstandard replacement parts are being introduced into our inventory but appear to be administered and tracked in the same way standard parts are tracked.

Objective: The following questions should be investigated. Are U.S. logistical organizations and resources capable of effectively supporting standard U.S. and nonstandard foreign government requirements when one or both countries are involved in a war? How do nonstandard parts affect the unit costs of standard parts, sources of supply, and the ability of the U.S. to replenish spares especially during wartime? Are the costs of managing and distributing nonstandard parts commensurate with the fees charged foreign governments? Are nonstandard part stock levels adequate to meet a foreign country's (or countries') real or perceived threat? Over what time span?

Topic: THE FOREIGN MILITARY SALES (FMS) PROCESS: U.S. POLICY VERSUS PRACTICE

Research Need: Many unique and unprecedented FMS arrangements and agreements are made between the U.S. and foreign governments which are not addressed in the Defense Acquisition Regulation (DAR), Department of Defense (DOD) Directives, or policy guidance. The reason for these widely varying FMS arrangements and agreements; the environments that generate them; their impact on foreign and national policy objectives; and DOD acquisition management, as well as their legality within existing laws, need to be researched and documented.

Objective: Evaluate the need for changes in existing laws and policies that effect FMS and in developing new policy that more closely reflects the environment.

Topic: ADMINISTRATIVE AND JUDICIAL FORUMS FOR FOREIGN MILITARY SALES (FMS) ACQUISITIONS

Research Need: In relation to constitutional, statutory, and regulatory law, research is needed to provide procedures for effective breach remedies and a judicial forum to review claims arising out of FMS.

Objective: To study and analyze the merits of:

a. An Armed Service Board of Contract Appeals (ASBCA) empowered to hear bid protests when direct-cite (foreign) funds are used.

b. In direct-cite contracts, recognize a single federal district court (preferably the Federal District Court for Washington D.C.) as the forum for judicial review of administrative board decisions.

The study should also include proposed changes to Defense Acquisition Regulations (DAR), existing laws, and Department of Defense directives.

Topic: LIABILITY OF THE U.S. GOVERNMENT UNDER FOREIGN MILITARY SALES (FMS) CONTRACTS EXECUTED PURSUANT TO THE ARMS EXPORT CONTROL ACT (AECA)

Research Need: For many FMS programs, contracts are executed direct-cite funding only upon receipt of a foreign customer's "dependable undertaking" to pay the full amount of the contract. There are growing concerns that the U.S. would be liable if the foreign country defaults and that the Executive Department lacks the authority and the funds to pay the contractor without litigation. This situation is cumbersome and unsatisfactory to the U.S. and its FMS contractors. Additionally, the language of the unique direct-cite funding procedures for FMS appears to unduly limit the actions the U.S. may take to protect itself or the customer nation after the customer nation defaults. In that event, the only possible avenue available may be termination without recourse to other appropriate business solutions.

Objective: Research is needed to develop alternative methods to the existing procedures and make recommendations for statutory changes to the AECA to correct the confusion.

Topic: DEPARTMENT OF DEFENSE (DOD) MANPOWER CEILINGS FOR SUPPORT OF FOREIGN MILITARY SALES (FMS) BY U.S. GOVERNMENT ORGANIZATIONS

Research Need: Management of contracting and logistics to support our military allies is growing in importance and volume. This increasing volume of FMS programs requires the support by a large number of military and civilian personnel in various activities including contracting, program management and materiel management. We presently do not have an effective means to assess the impact of FMS support on DOD manpower. The current manpower ceilings and civilian high grade limitations act as a restraint to providing support to both FMS and domestic programs.

Objective: To identify and evaluate the impact of FMS workload on Air Force organizational manning.

Topic: FOREIGN GOVERNMENT INVOLVEMENT IN THE U.S. ACQUISITION PROCESS

Research Need: Foreign Governments and their national firms are becoming more involved in the Foreign Military Sales (FMS) acquisition process itself which was previously performed by Department of Defense (DOD) and U.S. contractors. Unprecedented business arrangements have impacted laws, regulations, organizational structure, and the Air Force acquisition and contracting process.

Objective:

a. Investigate relationships between foreign governments and their national firms.

b. Identify common foreign international and cooperative business practices and arrangements.

c. Determine best types of contracts for various programs such as offset and coproduction agreements; and

d. Apply the above findings to improve current DOD and Air Force cooperative international arrangements.

Topic: ASPECTS OF COMMERCIAL CHANNEL FOREIGN MILITARY SALES (FMS) VERSUS DEPARTMENT OF DEFENSE (DOD) CHANNEL

Research Need: With the exception of sales to NATO and a few other designated countries, all sales of defense items over $25 million must be handled through the DOD instead of directly through commercial channels. Because of this, the Department of Defense (DOD) may find it difficult to obtain certain compensations for the tremendous FMS workload now being handled, e.g., exemptions from manpower ceilings for personnel involved in FMS activity.

Objective:

a. Determine the feasibility of commercial logistics support to include (1) assessment of contractors' willingness to provide direct service and (2) comparison on such matters as price and availability.

b. Compare Air Force cooperative logistics support to support provided by commercial corporations on large scale aircraft or equipment systems.

c. Analyze foreign buyers' viewpoints on availability, price, delivery, and variances in policies between Government and commercial sales.

d. Identify difficulties in switching from FMS to commercial sales.

e. Identify the differences in impact of FMS or commercial sales on the defense industrial base.

Topic: AN ANALYSIS OF THE ROLE OF INDUSTRY IN INTERNATIONAL COOPERATIVE TECHNOLOGY PROGRAMS

"NEW" Research Need: The United States and its allies are performing more weapons developments and cooperative technology programs jointly. Over the past ten years the number of such programs has risen steadily. Exploratory studies have examined the history of NATO collaboration and the actions of the U.S. program managers in the conduct of the program, and the factors associated with success and failure in such programs. There is a need for examination of the role, actions, and impacts of industry in international technology programs.

Objective: To identify the role, actions, and impacts of industry in recent international cooperative technology programs and to assess their degree of contribution to the success or failure of the program.

Topic: MEASURES OF SUCCESS IN INTERNATIONAL PROGRAMS

"NEW" Research Need: A recent study of military managed international joint research, development and production programs identified factors which distinguished successful programs from less successful programs. By examining over 90 past and ongoing programs, this exploratory research study produced valuable insights which could contribute to the improvement of international program management. Further work on the factors of success is needed to reach conclusions which can impact policy.

Objective: To investigate dichotomized, ordinal and/or multidimensional success measures in military managed international joint research, development and production programs.

TECHNICAL DATA MANAGEMENT RESEARCH AREA

Objective: To provide the functional acquisition manager with the knowledge and tools needed to increase the effectiveness of functional experts on major system acquisitions. Research efforts including but not limited to the following technical data areas: engineering, contracting/ manufacturing, integrated logistics support, legal, configuration management, test and evaluations; and program/project control are of concern in this research area. The focus of this research area is upon the technical functions such as laboratories, engineering, and tests that must support a variety of programs.

Background: Program management is central to the acquisition of weapons systems in the Air Force. The system of technical/ data management exists to assure that technical knowledge is available to support weapon systems that are in all phases of the weapon system life cycle--operation, production, development, or concept formulation. In addition, technical data management have a responsibility to assure the development of a leading edge technology base for possible application to the next generation of weapon systems. Technical managers outside the mainstream of weapon system program management need to balance their responsibilities between advancing the state-of-the-art within a given technical area and providing problem-solving support and technical assistance to specific weapon system programs. On the one hand, for example, they are responsible for managing a specification and standards program for the entire industrial base; and, at the same time, they are responsible for performing specification tailoring for a given weapons system. Where a program manager needs to balance resources applied to a single program, the technical/functional manager needs to allocate resources among many presently ongoing programs and possible future programs. Over emphasis upon current programs and technology can lead to a severe shortage of technology and technical management skills in the future. Research into this area can lead to improved methods for technical data management. Some of the research questions are: how can technical resources be allocated between near and long term needs; how can repositories of "technical lessons learned" be managed; what management information systems are required by technical managers; and what organizational structures are appropriate to facilitate project support, minimize conflict, and assure long term resource availability?

Topic: VALUE ENGINEERING

Research Need: Value Engineering (VE) provides the tools for reduced acquisition and life cycle costs, improved productivity, increased standardization, and conservation of resources. However, VE receives little management attention and seldom reaches its potential in accrued benefits. Either the current VE program or its application by management is inadequate.

Objective:

a. Determine why VE is not realizing its full potential and what changes should be made in the program to increase its effectiveness.

b. Determine whether VE clauses can be effectively managed to prevent increased research and development (R&D) budgets.

Topic: IMPROVED USAGE OF FORMAL GOVERNMENT DATA BASES

Research Need: An AFBRMC sponsored study reviewed the equipment selection decision process in weapon systems acquisition. Specifically, the study asks how do Air Force managers determine whether to design new equipment or to use previously developed equipment. An important segment of the decision process is the source of information used for the decision. It was found that "use of information sources in the decision process was inversely related to the formality of the source." The least important information sources were formal Government data bases (i.e., Government Industry Data Exchange and Defense Documentation Technical Information Center). The most important information sources were gained through personal experience and contact (e.g., specialty engineers and contractors).

Why aren't formal data information sources in the equipment decision process? What are the major problems? Perhaps these data bases were not designed for this particular decision process. What changes would be required to improve the use of formal data bases? Would the potential benefits, if any, of changing the system be worth the investment cost? How could the system be kept up-to-date on an efficient and effective basis?

Objective: To determine the reasons why formal data bases are normally not used when researching previously developed equipments, and based upon the findings, to determine a reasonable course of action to follow.

Topic: VALUE ENGINEERING CHANGE PROPOSALS (VECPs)

"NEW" Rearch Need: Contractors are submitting, in increasing numbers, proposals labeled as VECPs, but which have little, if anything, to do with the actual engineering design/configuration or method of manufacture of the item in question. While previous versions of the Armed Services Procurement Regulation (ASPR) contained some guiding language in this area, the current Defense Acquisition Regulation (DAR) has deleted all but the most general descriptive language concerning what qualifies as a VECP.

The extremes of proposals are easily dealt with. For example, a proposal to modify the actual design specifications of the deliverable end item clearly qualifies for a change in the method of procurement (e.g., competitive versus sole source) is clearly not worthy of consideration, although it must be recognized that the regulatory language, itself, contains no firm basis for rejecting even this type proposal. There are, however, those ostensible VECPs which, while appearing to advocate the elimination or modification of cost contributors, hardly seem to propose a change in the method of performance (as opposed to method of procurement) of the particular contract in any way which would traditionally be viewed as Value Engineering.

An "anything goes" attitude toward Value Engineering Change Proposals tends to make the program unworkable and serves only to diminish the ultimate benefit to the Government.

This research should result in (a) suggested DAR amendments and (b) guidance to engineering, contracting, and legal personnel, which will be helpful in making objective decisions regarding a proposal's acceptability for consideration as a VECP.

Objective: Development of an adequate definition of Value Engineering and a comprehensive set of criteria for determining the acceptability of Value Engineering Change Propoals.

Topic: DATA ELEMENT DICTIONARY -- A NECESSARY PRODUCTIVITY TOOL FOR SOFTWARE BUILDERS?

"NEW" Research Need: Recent continuing concern over declining productivity rates in American business and Government, point to lack of modern equipment and facilities as the culprit. A bright spot in this productivity problem is the proper use of computer technology for processing paperwork, controlling machinery and automating assembly lines. Consequently, the demand for software is on an exponential increase. The question arises -- how can software builders increase their productivity? The problem is there are conflicting stories as to the benefits of installing a Data Element Dictionary software subsystem. Sales personnel from vendors recommend highly its benefits and increased productivity potential. On the other hand some government experts feel the front end work is not worth possible future productivity gains.

Objective: Determine through independent research the validity of the contractor's or government expert's claims. This research will be used to assist management in making a sound decision on the usage of a Data Element Dictionary.

Topic: DETERMINING THE COST OF TECHNICAL DATA

"NEW" Research Need: Realistic cost estimating for data to be acquired on Department of Defense (DOD) contracts has been an area of concern for many years. The chief problem with costing technical data is the lack of interest in and knowledge of data on the part of most individuals involved in the acquisition process for the DOD. Since estimates of DOD data acquisitions are usually no less than $2 billion per year, all involved individuals must perform a highly professional and thoroughly proficient analysis on each data item sequence number specified on the DD Form 1423.

A practical methodology for determining the cost of technical data (including software and software documentation) does not exist today. Different types of technical data may require different techniques to build an accurate cost estimate. For example, a technique that lends itself to estimating the cost of computer software may not be appropriate for estimating the cost of technical manuals. In addition, a host of variables must be considered in any estimating methodology.

Objective: Develop an improved methodology for determining the cost of technical data which addresses all variables affecting data costs. These include, but are not limited to, the following:

a. Completeness and adequacy of the data requirement definition.

b. Availability of input data.

c. Degree of quality expected.

d. Complexity of this data.

e. Format of the data.

f. Skill level of the user for certain data.

g. Size of paper specified.

h. Number and complexity of revisions.

i. Number of copies required.

j. Leadtime to required submitted date.

k. "Price-Group" from DD Form 1423 that the data falls into from the contractors standpoint.

In addition, any such methodology must have practical application on a day-to-day basis in the acquisition environment.

PROGRAM INTEGRATION TECHNIQUES
RESEARCH AREA

Objective: To develop and improve management techniques and tools for program activity integration. Techniques such as PERT, system engineering management, configuration management, linear responsibility charts, C/SCSC, etc., can enhance the acquisition manager's ability to manage major program acquisitions. Research in this area will attempt to clarify the proper application of these techniques. Problems such as duplication, overlap, and sufficiency will be investigated.

Background: Acquisition programs require tailored management approaches. The identification and integration of the activities of functional area experts and organizations must be accomplished for each program. This requirement is often overlooked; but, even if recognized, it is difficult to accomplish because of the complexity of systems acquisition. The number of functional experts (engineering, quality, production, safety, testing, etc.) and organizations (headquarters, divisions, contractors, commands, etc.) involved in the acquisition process continues to increase. The responsibilities, tools, techniques, and capabilities of these participants must be identified and integrated by program managers. The degree to which these participants should be involved on each program must be determined. To accomplish these tasks, management integration techniques must be identified, evaluated, and improved. This research will increase the ability of management to integrate functional areas and organizational activities in system program acquisitions. It should assist in improving schedules, decreasing conflict, and lowering the costs of acquisition activities.

Topic: RECONCILING JOINT SERVICE PROGRAM COST DIFFERENCES

"NEW" Research Need: Operating and support cost definitions and policies are not uniform in the different armed services. This has created budget and funding problems in joint service acquisition and logistics. These procedural and policy differences need to be identified, analyzed, and highlighted for effective reconciliation by program managers.

Objective: Identify, analyze, and develop a reconciliation program for divergent operating and cost policies and procedures encountered by joint service program managers.

ACQUISITION LOGISTICS

RELIABILITY MANAGEMENT RESEARCH AREA

Objective: To realize system/equipment reliability that minimizes life cycle cost (LCC) and achieves the required level of system effectiveness.

Background: Reliability is one of the most important characteristics of Air Force equipment. Reliability affects operational readiness, inventory levels, acquisition quantities, and maintenance resources. The technical, business, and logistics dimensions of reliability are important to the acquisition process. The technical dimensions must consider the design, test, and prediction factors which impact upon demonstrating weapon system reliability. The business dimension deals with the cost/benefit analysis for reliability improvement, contractual specification for reliability, and the administration of contractual reliability requirements. The contracting technique of reliability improvement warranty (RIW) is being introduced to improve system reliability. The logistics effects dimensions are concerned with inventory/supply management, maintenance, and transportation considerations.

There is an important need to reduce support costs for military systems to levels which are consistent with funding limitations. The dimensions discussed above are important parameters of system life cycle cost and operational effectiveness, and they can provide fruitful areas for research.

Several of the general research goals in this area are:

a. Identify the appropriate, valid reliability prediction models for application to Air Force systems acquisitions.

b. Describe the causes of reliability growth and how these causes can be used in the structuring of incentives to yield reliability improvement.

c. Identify a methodology that can be used to identify equipment which should undergo redesign to improve reliability.

d. Describe information and administration systems required to effectively manage systems reliability and how these vary for warranty and non-warranty situations.

Topic: RELIABILITY IMPROVEMENT WARRANTY EVALUATION

Research Need: The commercial airline industry has long used warranties for acquisition of equipment (especially avionics). This experience led to the use of a "Failure Free Warranty" in the late 1960's and, more recently, the Reliability Improvement Warranty (RIW) concept in the early 1970's. Enough field experience is being realized that a current evaluation of the benefits and costs of RIW application is merited.

Objectives: Evaluate the recent performance of RIW's on DOD contracts. Make recommendations concerning their continued use and any changes in the guidelines governing their use. Parameters to be considered in RIW evaluation may include:

a. Field administrative practices for RIW programs;

b. Reliability growth - mean time between failures guarantee;

c. Simplicity/complexity of contract terms;

d. Review levels and decision authorities;

e. Requirements for contractor reporting;

f. Inventory levels and throughput/turnaround time;

g. Warranty periods;

h. Field representative failure reports;

i. Packaging and transportation;

j. Technical order requirements;

k. Exogeneous effect of engineering changes; and

l. Potential problems in transitioning from warranty to non-warranty environment, such as technical manuals, provisioning, support (test) equipment, and training.

Topic: AIR FORCE RELIABILITY PERSONNEL

Research Need: A recent BRMC reliability (and maintainability) study suggested that one probable weakness in Air Force reliability programs is the availability, training, and motivation of working level reliability personnel. A comprehensive survey of reliability personnel is desired.

Objectives: To sample appropriate reliability personnel such as those identified with R&M specialties and/or graduates over the last decade of the Air Force Institute of Technology and other reliability programs. Such a survey would identify such factors as:

a. Specific prior training in reliability and its perceived adequacy for subsequent assignments.

b. Nature of subsequent assignments.

c. Perception of career opportunities in the reliability field (and actual history).

d. Effective use of trained personnel.

e. Identification of roadblocks to effective performance.

f. Understanding of reliability at managerial levels.

g. Managerial level support of reliability specialists' initiatives and decisions.

Topic: RELIABILITY PROGRAM FUNDING AND SCHEDULING

Research Need: A recent AFBRMC reliability (and maintainability) study reported some consensus among leaders in USAF reliability management that reliability funding was both too little and too late (and applied inefficiently). An in-depth study of the reliability history in specific programs is indicated to support or refute these feelings.

Objectives: To develop case studies of the reliability activity within selected acquisition programs. Aspects studied would include: (a) funding and schedules recommended and approved; (b) staffing levels, qualifications, and reporting dates planned versus those experienced; (c) perceptions of reliability and command personnel regarding actual and potential influence of reliability activity on the program; and (d) realistic assessment of benefits (if any) that should have accrued had the reliability program followed along ideal lines.

Topic: RELIABILITY GROWTH

Research Need: Reliability should be expected to improve during the development and early deployment of a new system. Ability to predict the extent of this improvement is important in cost-effective achievement of reliability goals.

Objective: Develop better understanding of reliability growth, including:

a. Concise expression of the nature and causes of reliability growth.

b. Identification, comparison, improvement, and validation of models of reliability growth.

c. Guidelines for taking advantage of reliability growth in managing system development.

d. Relationship of normally expected reliability growth to incentives established for reliability improvement.

Topic: EVALUATION OF AIRLINE USE OF COMMERCIAL WARRANTIES ON AIRCRAFT

Research Need: A need exists to gain a better understanding of the differences in approach used by commercial concerns in obtaining warranties on items they procure. The Defense Acquisition Regulation (DAR) provisions on warranties (Section 1-324) contain guidance on the use of correction of deficiency and warranty clauses for supplies and services, but except for acquisition of standard commercial items, where acceptance of a commercial warranty may be appropriate, the DAR guidance does not discuss the "commercial world" concept of warranty coverage.

Objective: Examine the experience of commercial airlines in obtaining warranties on aircraft and equipment installed thereon, including engines and avionics equipment. Obtain answers to the following questions:

a. What type of commercial warranties would be applicable to Government acquisition of major items like aircraft, engines, and avionic equipment?

b. What costs do the commercial airlines incur for their warranties?

c. What experience do the commercial airlines have in regard to enforcement of their warranties?

d. Is it realistic to equate military aircraft usage with that of commercial aircraft?

e. What kind of commercial warranties are obtained on items not manufactured by the airframe contractor nor designed to an airframe manufacturer's specification? If all that is obtained on these items (e.g., commercial items) is whatever the vendor will furnish, is this adequate for Government purposes?

f. On items like engines can the Government generate and maintain the type of data that is required under a commercial warranty covering engines?

g. Is it possible/practical for the Government to adopt a commercial warranty approach that covers items that are not tracked by serial number--e.g., down to nuts and bolts. This raises the issue as to just exactly what parts are actually covered under a commercial warranty.

h. What is the relationship between a warranty covering conformance to specifications, design, material, workmanship, installation, and data for a fixed period of time (no adjustment in price for corrective actions taken) and a service life warranty that involves payment of additional monies for repairs according to a predetermined pricing formula? Can or should these two types be combined?

i. Who should enforce vendor warranties? If the commercial practice is to have the buyer do it, is this a practical approach for the Government to adopt?

j. If a vendor refuses to comply with his warranty (and it is a pass-thru type), is it reasonable for the Government to require that the prime contractor assume the warranty obligations?

k. Is it a good practice to get a separate price for the warranty coverage, or is it better strategy to have it priced into the end item and then after proposals are in ask the contractor what the price would be if warranty coverage were deleted?

l. How should the warranty provisions (including service life provisions) interface with other contractual requirements covering reliability/maintainability -- or sometimes referred to as logistic support cost guarantee? Should the reliability/ maintainability provisions have their own "enforcement" (avoid use of term "penalty") scenario or do we revert to the warranty provisions for corrective action to be taken; as a related item what disposition should be made of failures which are within the limits of a reliability provision, but constitute a "defect" under the warranty clause if it applies?

m. What difference, if any, exists in the way warranties are administered in the commercial world versus that of the Government? Recommend for Air Force consideration specific language to incorporate into the DAR and (where appropriate) other documents that can be used to implement appropriate warranty coverage.

n. Can we really adopt "commercial" warranty practices without also turning over the logistic support function to a contractor?

Topic: RELIABILITY CONTRACT REQUIREMENTS

Research Need: Reliability program requirements may be written into contracts by specifying compliance with certain military specifications and data items. Often these contract requirements are included without real understanding of the cost to the contract or the benefit to be gained in terms of better design, performance, logistics supportability, and life cycle cost.

Objective: Develop a methodology on when and how to apply reliability program requirements to contracts. Find means to tailor the scope of the reliability program to size and other attributes of the acquisition program. Point out areas where military specifications and Data Item Descriptions (DID's) can be improved. Provide cost data to aid in the general decision-making process.

QUALITY ASSURANCE RESEARCH AREA

Objective: To identify quality assurance methodologies that effectively and economically contribute to customer satisfaction in the acquisition environment.

Background: With the exception of needs having to do with quantity and location, the satisfaction of customer needs is the objective of acquisition quality assurance. In a military environment, this satisfaction contributes directly to force readiness and ultimately to mission effectiveness. In a broad context, two dimensions of quality that contribute to customer satisfaction are design quality and conformance quality. In system acquisition, design quality is normally achieved through the research, development, test and engineering (RDT&E) process.

Supplementing the RDT&E process and continuing throughout the disposal phase of a weapon system is the traditional application of quality assurance which includes the use of quality control and inspection techniques concentrating upon conformance quality. Measures of quality over extended time periods are accomplished through reliability disciplines. Although basic contracting quality assurance policies are prescribed by the Defense Acquisition Regulation (DAR) and functional directives, the approaches/strategies for quality assurance used by acquisition managers vary depending upon the nature of the contract.

Typical categories of contracting are: (1) research, development, test, and evaluation (RDT&E) of major weapon systems; (2) production of major weapon systems; (3) replenishment acquisition of components and piece-parts; (4) renewal, modification, or refurbishment of major systems/subsystems; and (5) the acquisition of services and support functions. In any selected acquisition environment, six primary elements of acquisition quality assurance need to be balanced: (1) the management of internal quality assurance programs and resources--staff, program office, contract administration office, and maintenance; (2) the selection of contract quality requirements--product and management; (3) managing interface disciplines--reliability, system safety, manufacturing, configuration management, etc.; (4) the evaluation of supplier/contractor performance; (5) the measurement of customer (i.e., using command) satisfaction; and (6) the acceptance of products/services including the identification of critical characteristics which require direct Government inspection/verification.

Topic: SELECTION OF QUALITY ASSURANCE MANAGEMENT INFORMATION ELEMENTS

Research Need: Quality assurance (QA) has customer satisfaction as an overriding goal. This goal requires the definition of several key factors:

a. Who are the customers in a large scale, complex organization such as the Air Force?

b. What measures are:

(1) Needed, and

(2) Available, obtainable, or creatable to evaluate the level of customer satisfaction/dissatisfaction with the product?

c. Who, in position of authority, needs the information in order that corrective action can be taken?

d. What levels of dissatisfaction require the establishment of economical corrective action programs?

These QA management information needs vary according to the development status of the item, the number of customers and producers, and the management environment in which the QA decisions are being made. Although the formal literature cites, in general, the type of information to be used in the management of the QA function, these have not been synthesized and integrated with the Air Force acquisition context.

Objective: To identify practical, significant information elements necessary to accomplish QA management for major system, subsystem, component, and service acquisitions during development, production, and use.

Topic: ACQUISITION QUALITY FEEDBACK SYSTEM

"NEW" Research Need: Quality Assurance (QA) is being recognized as an essential element of the weapon system acquisition process. Objectives of QA include prevention of performance failures and satisfaction of user needs.

Objective: Design an information data base which will establish objectives to measure success of the overall quality program. What kinds of information should be used by the QA Manager in each System Program Office (SPO) to measure quality of a specific project? To what extent are data generated by AFR 66-1 and TO 00-35D-54 useful for this purpose? What kind of quality information system could be established to enhance decision making in system acquisition?

Topic: CONTRACTOR RESPONSIBILITY FOR PRODUCT PERFORMANCE

"NEW" Research Need: Most systems and equipment that the Air Force acquires are developed under specifications that the Air Force prepares. Prior to production the system and equipment are subjected to tests to verify that they meet the requirements of the specification. When the items are placed into production, a Warranty of Supplies clause as authorized by the Defense Acquisition Regulation is used in the contract to provide coverage for defects in material and workmanship. Coverage is normally provided for one year after delivery of each unit. The test programs that are conducted during research, development, test, and evaluation (RDT&E) are of limited duration, therefore, possible defects in design or materials that affect the life of the system/equipment, or components thereof, are often not discovered until the production unit fails. Many of the failures are based upon usage rather than time passage, therefore the Warranty of Supplies clause has not provided the desired protection.

Objective: Develop a method that can be used to hold contractors responsible for the performance of the product after it is put into use by the using agency.

LIFE CYCLE PERFORMANCE EVALUATION RESEARCH AREA

Objective: To realize desired system/equipment performance effectiveness levels while achieving Design-to-Cost (DTC) and Life Cycle Cost (LCC) goals. The sub-objectives are twofold: first to develop and/or evaluate the various methods and techniques to achieve and reduce design and life cycle support costs (e.g., reliability improvement warranty) and second, to improve methods to identify, measure, and evaluate primary LCC drivers during the acquisition process.

Background: The purpose of DTC is to maximize system performance subject to given cost constraints (or cost target) with stated quantity and schedule requirements. The establishment of the cost target is done early in the acquisition process and requires tradeoffs among cost, performance, schedule, and quantities for alternative system design concepts and alternative preliminary designs.

The objective of LCC is to reduce ownership costs by considering both acquisition and logistics support costs in decisions made during acquisition. Three LCC needs must be emphasized: (1) consider operations and support (O&S) cost in the design process, (2) generate management awareness and visibility, and (3) implement O&S in the contract. In order to realize the needs listed above, we need to improve techniques to measure and evaluate LCC.

The availability and accuracy of cost data normally increase from the time the requirement originates. Therefore, it may be necessary to use different techniques to evaluate LCC during various time frames depending on the availability of LCC information. Early in the cycle, it is desirable to identify the cost drivers and make tradeoff decisions between the requirement and the LCC. As the requirement becomes firm, LCC becomes more of a criteria to evaluate the best source among competing firms. Later in the cycle, it is necessary to incorporate the factors which indicate the need for equipment repair or replacement (e.g., flying hours, operating hours, landings, age, and extent of exposure to environmental conditions). More knowledge is needed of the changing nature of data requirements, cost drivers, and cost projection techniques if the LCC concept is to be of maximum assistance.

Topic: ORGANIZATIONAL IMPLEMENTATION OF HARMONIZED DESIGN-TO-COST GOALS

Research Need: Design-to-Cost is a management technique used to provide assurance that cost is an important decision parameter in the development and acquisition of defense systems. Optimally, the design-to-cost goal will be established based on the objective of minimum total life cycle cost for the system. Life cycle cost includes the total acquisition and ownership costs for the system. Acquisition cost includes development, test, and production cost elements. Ownership cost includes costs for training, operation, and support for the system. Due to situational variables, a variety of strategies are used to implement the design-to-cost concept. In some cases, the implementation strategy selected may result in the selection of acquisition cost goals that compete with ownership cost goals. Although research has yet to establish a clear relationship between acquisition cost elements and ownership cost elements, there is a need to establish a decision framework which causes acquisition cost goals and ownership cost goals to be harmonized when the implementation strategy for design-to-cost is selected.

Economic models can be used to establish the quantitative harmony; however, these economic models need to be translated into a management system that considers variables of management structure, budgetary and fund control processes, and responsibility evolution in order to achieve optimal life cycle cost objectives.

Objective: Based upon the existing Air Force organization structure, describe a program management system for design-to-cost programs that provide for harmonized goals for acquisition and ownership costs.

Topic: SOFTWARE LIFE CYCLE PROCESS SIMULATION

Research Need: Lack of reliable data on key cost factors of a software Life Cycle Process has hindered the development of a software cost estimating methodology simulation.

A working computer simulation model of the software development process is described in an Electronic System Division (ESD) Technical Report, "Cost Reporting Elements and Activity Cost Trade-Offs for Defense System Software."

Research over the past decade has failed to result in the development of reliable software cost estimating models. One reason for this failure appears to be the inadequacy of standard analytical techniques (e.g., regression) in defining a highly dynamic and complex process such as software development. A need exists to develop more sophisticated modeling techniques, such as process simulation.

The simulation might treat the software development process as a queuing situation in association with various computer program configuration items.

Topic: VISIBILITY AND MANAGEMENT OF OPERATING AND SUPPORT COSTS SYSTEM II (VAMOSC)

"NEW" Research Need: Operating and support (O&S) costs have grown until now over the life of a system, they usually exceed the acquisition cost. As a result increasing emphasis on O&S costs is being made in selecting new systems approving design changes and defending budget requests. VAMOSC is being developed to meet the need for highly credible O&S cost data for weapon systems.

Objective: VAMOSC is weapons system oriented but draws from 50 existing USAF functionally oriented data systems. The accuracy of these feeder data systems will directly affect the accuracy of the VAMOSC outputs. The objective of this study will be to validate the accuracy of feeder systems or establish their inaccuracy and recommend improvements. This study can be broken into several smaller studies.

INTEGRATED LOGISTICS SUPPORT RESEARCH AREA

Objective: To develop methods and techniques which will improve the overall logistics support of Air Force weapon systems.

Background: The integrated logistics support (ILS) concept is concerned with the definition, optimization, and planning, implementation, and management of logistics support resources throughout the system life cycle. The concept is realized through the proper integration of logistics support elements with each other and through the application of logistics considerations to the decisions made on the design of the hardware system and equipment as a part of the system engineering process (AFP 800-7). In order for the ILS concept to be fully realized, the proper applications must be used during the acquisition process that can integrate the various support elements (test and support equipment, spares and repair parts, personnel and training, technical data, facilities, transportation, handling and maintenance). The overall goal is to develop systems that meet performance requirements and which can be supported economically throughout the life cycle. Research in this area will consider the improvement and validity of techniques such as: logistics support analysis, life cycle cost models, logistics tests, design for maintainability, etc., which can help achieve our overall goal.

Topic: REPROCUREMENT DATA PACKAGES

Research Need: In the Air Force acquisition of a unique military system the Air Force contracts not only for system hardware but also acquires important engineering data on the system. The engineering data has many purposes including contracting of spares, modification kits, and engineering services. Air Force has a policy directed to increase competition. A key element of any competitive effort is the availability of reprocurement data. Such data is expensive and can be compromised in any financial tradeoff made during the design and production of hardware. Inadequate guidance exists relative to the purchase of reprocurement data packages. Often packages are procured but never utilized in a competitive situation. Inadequacy of the data procured, proprietary restrictions, design changes, etc., are some problems that result in sole source versus competitive procurements. A study is needed that will improve the methods for selection of the essential data and, if possible, reduce data costs.

Objective: Review and evaluate the present reprocurement data management procedures to insure that the data contracted for is: (1) minimum essential, (2) usable (technically adequate), (3) actually used, and (4) worth the cost of preparing.

Topic: LOGISTICS/SUPPORT DELINEATION

"NEW" Research Need: Currently both the terms "logistics" and "support" are used interchangeably by the Air Force without being specifically defined, and there exists no total base lined supportability concept. A working definition which reconciles these two terms and which will encompass total base lined supportability requirements is needed.

Objective: Develop a working definition of "logistics supportability" encompassing supportability base line criteria and measuring techniques.

Topic: LOGISTICS SOURCE DATA FOR MANPOWER ESTIMATING IN NEW WEAPON SYSTEM ACQUISITIONS

"NEW" Research Need: Recent Department of Defense (DOD) Directives (5000.1, 5000.2, and 5000.39) require evaluation of new weapon manpower requirements through comparison with previous systems.

Objective: Identify data sources, their applicability to the manpower assessment requirement, and suggest changes to enhance compatibility of data sources, collection techniques and the analysis process.

BUSINESS ENVIRONMENT

COST INFLATION
RESEARCH AREA

Objective: To improve contractual methods and facilitate program budgeting techniques, effective planning, and contracting approaches for acquiring systems, supplies, and services during periods of rapidly changing price levels.

Background: Air Force contracting officers are responsible for making acquisitions that will meet defense mission needs through effective contracting methods. In today's economy, it has become increasingly difficult to meet mission support requirements while supporting stated Governmental policy of encouraging fair profits and economic growth. Inflation causes problems in both the acquisition planning process and the contracting process which must be managed effectively by the Air Force. Since current budgeting and contracting methods may not adequately deal with rapidly escalating prices, improved approaches need to be developed. Within the inflation spectrum, four interest areas have been identified: (1) the economics of inflation, including causes and the prediction of inflation rates; (2) the development, usage, and effects of Economic Price Adjustment (EPA) clauses; (3) the development and use of price indices; and (4) payment policy under terms of EPA clauses.

Topic: ECONOMIC PRICE ADJUSTMENT (EPA) BASED ON BUREAU OF LABOR STATISTICS (BLS) VERSUS ACTUAL CONTRACTOR COSTS

Research Need: EPA clauses are sometimes used in Government contracts to provide a method for sharing the risk of abnormal contractor price fluctuations. The effective use of such clauses requires careful analysis of the expected behavior of productive factor input prices. Normally one of the national BLS price indices, Consumer Price Index (CPI) or Wholesale Price Index (WPI), will be used as a basis for adjustments to contract payments. If the actual prices experienced by the contractor differ greatly from the BLS index, windfall profits or unjustified losses may result. A technique based on using the lesser adjustment based on the BLS computed adjustment and the actual contractor price experience has been proposed. Properly applied, this technique should adequately compensate the contractor for any unanticipated price changes, as well as guard against windfall profits due to unexpected and unrelated BLS index fluctuations. Research is needed to investigate the feasibility of this technique, accurately describe its application, identify the information needed for proper implementation, and evaluate the impact of the technique.

Objective: Develop an assessment of the techniques for identifying the contract payments based upon EPA clauses. The evaluation should be conducted by comparing BLS index-indicated price changes and actual contractor cost experience.

Topic: ANTI-INFLATION CERTIFICATION REQUIREMENT IMPACT EVALUATION

Research Need: As the anti-inflation certification program is implemented, noncompliance can result in withholding of contract awards and debarment from future awards. These actions and the certification process combined will present acquisition personnel with new challenges. These new requirements must be effectively and efficiently incorporated in the acquisition process. Particular emphasis should be focused on the direct impact on acquisition and contracting and the number of vendors available to the Government contracting process.

Objective: Provide a current policy assessment of the new anti-inflation program and assure that the effects of the program on the acquisition process are accurately documented.

Topic: DEFENSE ACQUISITION REGULATION (DAR) THRESHOLD INDEXING

Research Need: Numerous thresholds are set in the DAR and used to key certain contracting actions. For example, DAR 3-203.1 allows negotiation of purchases of less than $10,000 under small purchases. If the small purchase is for less than $500, an award can be made without competition if the price is considered reasonable. These thresholds do not reflect the constant real value in an inflationary economy. A study

should be accomplished that would review all the present thresholds and determine the impact of applying to thresholds indices based on an acceptable price index to permit the thresholds to reflect real values in today's environment.

Objective: Identify the impact of specific thresholds used in the current DAR and evaluate the impact of applying a price index adjustment to these thresholds.

Topic: AN ANALYSIS OF AIR FORCE USE OF ECONOMIC PRICE ADJUSTMENT CLAUSES

"NEW" Research Need: Risk uncertainty in inflation cost creates an unfavorable impact on the contracting environment. Spiraling costs may motivate the contractor to cut corners and produce a product which does not meet Government expectation in durability, material, or workmanship. Frequent use of economic price adjustment clauses could severely impact the Government's goal in eliminating excess cost, and create additional problems in previously budgeted items. An analysis is needed to evaluate the impact of economic price adjustment clauses on contractor motivation, and to assess the results in actual programs. Information to be obtained would include the specific conditions under which the economic price adjustment was used, and an analysis of the actual costs incurred and profits received under programs using economic price adjustment. The analysis should examine the extent of use of economic price adjustment clauses to determine if they are being used effectively to reduce cost risk in the contracting environment, for both the Government and the contractor, and to assess the advantages/disadvantages to the Government in widespread use of these clauses.

Objective: This research should determine the advantages/disadvantages of the current usage of economic price adjustment clauses in the contracting environment. The findings should help minimize risk in forecasting and budgeting future acquisition costs thereby identifying potential problems which could impair the mission.

IMPACT OF SOCIOECONOMIC PROGRAMS
RESEARCH AREA

Objective: To analyze the socioeconomic aspects of DOD acquisition with particular attention to the impact of socioeconomic and special interest programs on the DOD budget.

Background: Quantitative analysis is meager in studies concerning the additional cost and/or time required to comply with laws and executive orders that pertain to various socioeconomic objectives not directly related to the military mission of the Air Force. Development of figures associated with the support of such programs would assist the Air Force in determining the net mission-related purchasing power of fiscal year budget dollars. In this regard, methodology to be used in the study of socioeconomic programs must be addressed. Specifically, obtaining accurate data on man-hours expended, costing administrative effort and/or delay, and devising a method of keeping current on actual prevailing local usage rates (as opposed to Department of Labor furnished rates) are subjects requiring research. The specific socioeconomic programs involved are:

a. Small Business Set-Asides.
b. Section 8(a) Awards.
c. Davis-Bacon Act.
d. Service Contract Act.
e. Equal Employment Opportunity.
f. Labor Surplus Area Set-Asides.
g. Buy American Act.
h. Balance of Payments Program.

Topic: IMPACT OF FREEDOM OF INFORMATION ACT ON AIR FORCE ACQUISITION

Research Need: The Freedom of Information Act (FOIA) is having a direct impact on Air Force acquisition and contracting. The Air Force requires adequate disclosure of proposal information and active participation by contractors in submitting proposals to meet its contract process needs. The FOIA affects contractors willingness to provide information and actively seek Air Force business. Air Force requests for proposals do not clearly present the current Air Force policy concerning FOIA.

Objective: To provide a complete explanation of the procedures used by the Air Force to manage the information provided by contractors in solicitations. The study should also clearly identify the acquisition and contracting problems that have resulted from the FOIA and suggest ways to improve present practices to alleviate the problems.

Topic: PROTECTION OF INDUSTRIAL BREAKTHROUGHS

Research Need: Effective source selection and new technology application make it necessary for the Air Force to obtain the latest industrial techniques and products from contractors. These products and techniques are usually proprietary and it is very important to the contractor that they be protected. The Government needs to develop a consistent, credible method to protect this type information.

Objective: Research studies on this topic will address the problem of protecting contractor/proprietary information. In order to improve our ability to protect contractors competing for Government contracts, it will be imperative that present policies and practices be evaluated. Research can provide wider dissemination of good practices, and it can also identify those practices and policies that cause the most severe problems. Research will include evaluation of the Freedom of Information Act, which directly impacts this problem of information security.

Topic: INDUSTRIAL IMPACT OF ENVIRONMENTAL PROGRAMS

Research Need: American industry is being forced to alter its production processes and facilities in order to comply with environmental quality criteria which are being or have been established by the National Environmental Policy Act (NEPA) and the Occupational Safety and Health Act (OSHA). Management is curtailing production, discontinuing production of some products, making a shift in product mix, and making large capital expenditures for pollution control processes in order to meet these federal requirements. As a customer for large volumes of certain products, the Air Force needs to know the impact of these environmentally-related availability and cost factors on acquisition costs.

Objective:

a. Identify Air Force suppliers and market segments who face or expect to encounter significant environment-related production impact on product availability and price.

b. Identify and estimate impact of selected suppliers' production changes on the Air Force acquisition process.

c. Estimate and/or document cost in terms of lead time, transaction costs, higher prices, substitute products, etc., of identified price and availability changes.

Topic: RESPONSIBILITY FOR CONTRACTOR CERTIFICATION OF SMALL BUSINESSES

Research Need: Before awarding a contract to a Small Business firm, the Department of Defense (DOD) contracting officer must determine that the business is capable of completing the work. In those situations where doubt of competency exists, the Small Business Administration (SBA) can issue a Certificate of Competency under Defense Acquisition Regulation paragraph 1-705.4. It has been suggested that the DOD should transfer a portion of the contract responsibility to the SBA. This action is similar to that taken under the 8(a) set-aside procedures where we contract with SBA as the prime contractor. Under current procedures, SBA retains little responsibility for the performance of the contractor they have certified. Proper responsibility and the effects of the present policy need to be evaluated.

Objective: To evaluate the methods being used and identify the criteria applied to small businesses when the certificate of competency is awarded. To assess the appropriateness of this present method and criteria and make recommendations for changes if justified.

Topic: A CASE ANALYSIS OF SUCCESSFUL MINORITY CONTRACTORS

"NEW" Research Need: The stated policy of the U.S. Government to give a fair share of contracts to small businesses also supports contracting with a special subclass of small businesses - the socially and economically disadvantaged small business. Since this subset is a special case of the overall small business community, and includes a larger number of obstacles, due to the disadvantaged nature of the contractors, the rate of success on Air Force contracts to disadvantaged firms has been erratic. In order to increase the overall knowledge of the small business community, further descriptive research on "successful" disadvantaged contractors must be completed. This study should attempt to identify "successful" disadvantaged contractors; describe the actions of both the company itself, and the cognizant government acquisition offices; and explore the cause-effect relationships between the firms' characteristics, its actions in completing the project, and the role of the government acquisition office in the success of the contractor.

Objective: To conduct case studies and analysis of successful disadvantaged small business contractors.

Topic: ANALYSIS OF THE SMALL BUSINESS DEFENSE BASE

"NEW" Research Need: The United States long has had a national objective and policy fostering small business activity, e.g., portions of military acquisitions are "set-aside" for the express purpose of awarding contracts to small businesses. Recently, the President has reaffirmed his commitment to the small business community. It is likely that continued and perhaps increased efforts will be made by the Air Force to insure that small business receives its fair share of Government contracts. An evaluation needs to be conducted to determine patterns and movements of the small business industrial base for research and development. Is the base stable, expanding, or contracting? What are the reasons for current movements and patterns? Can the small business industrial base be further expanded to meet potential needs of the Air Force? What do small business persons perceive as major problems with Government procurement and what impact does this have on the small business industrial base for the short and long term? What recommended actions would solve existing problems?

Objective: To determine the relative size of the current small business industrial base for research and development, to determine movements and patterns of the small business industrial base, and to project the potential for increasing the size of the base.

Topic: DEVELOPING THE CAPABILITY OF SOCIALLY AND ECONOMICALLY DISADVANTAGED SMALL BUSINESSES

"NEW" Research Need: The Federal Government supports the use of small businesses in the acquisition of goods and services. Public Law requires that a specific type of small business, the socially and economically disadvantaged business, be awarded Government contracts on a non-competitive basis. This program supports the socioeconomic programs legislated by the Congress. It is a constant challenge for Department of Defense (DOD) buying activities to find a sufficient number of capable disadvantaged firms who can provide the required goods and services. In the field of high technlogy research and development, it has been an especially acute problem. The Small Business Administration has been charged with providing business development costs which can be used to develop the existing firms into viable contractors for the Government's needs, but is often unable to provide funds, thus preventing the award to the small business firm.

A great deal of work has been done at the state level to develop small businesses into viable competitors through assistance from the state agencies. Research needs to be done to investigate methods for small business development which have been developed by various state governments, and to assess the feasibility of adopting such methods in the Department of Defense.

Objective: Identify small business development methods at the state level and determine the usefulness of similar methods for use by DOD in developing sources for high technology research and development firms from economically and socially disadvantaged small businesses.

Topic: COST OF SOCIOECONOMIC PROGRAMS IN AIR FORCE ACQUISITION PROGRAMS

Research Need: Numerous socioeconomic programs are implemented through the contracting process used to acquire weapons systems and support. Some examples of these programs include small business contractor legislation, economically and socially disadvantaged small business contractor programs, minimum wage laws, awards to labor-set aside firms, blind and prison industries, Davis-Bacon Act, Service Contract Act, to name just a few. Though there is no doubt as to the benefits of these programs to American society, there is a cost associated with the implementation of them. The costs of these programs have not been clearly identified. Each of them requires some additional effort, training, or resource expenditure by Government acquisition or contractor personnel.

In the past, there have been attempts to assess the net additive costs of implementing the various socioeconomic programs in the acquisition of Department of Defense (DOD) weapons systems and support. Because of conflicting findings on the costs associated with implementation, there is a need to more rigorously assess the actual impacts and associated costs. A recently completed doctoral dissertation by Richard Hampton has identified the major impacts of most socioeconomic programs on the federal acquisition process, and has devised a methodology for assessing the costs of these programs.

Objective: To apply the Hampton methodology to a specific acquisition program or programs, or to apply it at a macro-level to Air Force/DOD/Federal level to determine its validity.

Topic: STRUCTURING OF INCENTIVE CLAUSE ARRANGEMENTS FOR SUBCONTRACTING TO SMALL BUSINESS AND SMALL DISADVANTAGED BUSINESSES

"NEW" Research Need: Public Law 95-507 encourages federal agencies to provide incentives to increase subcontracting opportunities to small and small disadvantaged businesses. Defense Acquisition Regulation implementation of the law recognizes that various approaches may be used in the development of incentives ranging from a milestone payment structure to an award fee arrangement based upon subjective criteria.

Any incentives are to be based upon the goals set forth in the required small business subcontracting plan and will normally be negotiated after agreement on the subcontract plan by the Government and the contractor.

At present, it is difficult to adequately evaluate the subcontract goal and the means for achieving it. What is an adequate subcontracting goal for the small or small disadvantaged business market? How extensive is this type of market for the services or commodities required? What factors in the subcontracting plan will determine the probabiity of success of meeting the prime contractor's goals? How does the contracting officer determinne the probability associated with specific goals? How should the new program requirements interact with make-or-buy requirements? What expertise is available to assist the contracting officer in evaluating the subcontract plan and incentive goals? What are reasonable "implementation" cost factors the prime contractor needs to bear when "implementing" the new program? How does the consideration for "dual sourcing" enter into the structure of the incentives?

Based upon the characteristics of the instant contract, the contracting officer must determine the type of incentive arrangement to maximize the contractor's performance, and the structure of the incentive. A model for evaluation of the subcontracting goals and means of achievement leading to selection of the most effective type of incentive arrangement could facilitate the learning in the use of this new policy initiative.

Objective: To determine the factors which influence the effectiveness of a small business subcontracting plan and to assess the probability of achieving the small business subcontracting goals under varying acquisition environments. Develop a model for selecting the most effective incentive arrangement. Develop a plan to evaluate the effectiveness of the model in an actual service test.

LEGAL SYSTEM INFLUENCES RESEARCH AREA

Objective: To identify, document, and evaluate the extent and directions which the legal system (e.g., statutory law, common law, court decisions, and rulings by the Comptroller General and the Armed Service Board of Contract Appeals (ASBCA)) has shaped the acquisition and contracting process.

Background: Every aspect of the contracting process has been, to varying degrees, specified, defined, and interpreted through legal processes before various tribunals. While the precedence and propriety of extensive legal influence over the contracting process are not contested, the evasive nature of the legal role and its interrelationship with decision making, where acquisition matters are involved, are subjects requiring additional understanding. A number of concerns involving both pre-award and post-award policies and procedures may be addressed under this research area.

Topic: HOW TO MAKE TERMINATION FOR DEFAULT ACTIONS STICK

Research Need: Many contract termination actions initiated because of contractor default are subsequently executed at the convenience of the Government. This conversion of termination actions from default to convenience results in the waiver of Government rights to claim recoupment for damages resulting from contractor failure to fulfill contractual obligations.

Objective: Identify terminations for convenience which were initiated as default actions. Those actions so identified should be researched to determine the reasons the conversions were made. After reasons are identified, formulate criteria and procedures to avoid future occurrences.

Topic: LEASE OF ITEMS TO THE AIR FORCE

"NEW" Research Need: There is confusion and lack of clear guidance on what authorizes or prohibits the lease of items to the Air Force. In certain cases there is either a financial savings to the Government or ability to procure within limited funding, if a lease arrangement is authorized.

a. The furnishing of personal property to the Government other than through an outright sale (passage of title) has caused problems in certain procurement situations. A major problem area involves the authority or lack of authority to lease aircraft. This is the reverse situation from the one where the Air Force leases its aircraft to private firms, which is authorized by statute--10 U.S.C. 2667.

b. The annual Department of Defense (DOD) Appropriation Act provides authority to use current fiscal year funds for leasing of personal property up to a period of one year. The Act does not provide authority to enter into a longer term arrangement, such as through the use of options.

c. The procurement of certain items like aircraft require Congressional "authorization." However, certain procurement situations arise where it would be desirable, either from a funding or requirements standpoint, to merely lease aircraft to satisfy an existing need.

d. Under statutes like the Brooks Act (Public Law 89-306) Government agencies have been given the authority to enter into innovative contractual arrangements covering the acquisition of automatic data processing equipment (ADPE), including long term leases with options to purchase.

Objective:

a. Survey selected AF procuring activities, concentration on "central" type procurements involving major programs, to ascertain needs and problems encountered.

b. Investigate practices of other DOD agencies like the Navy and Army.

c. Ascertain whether there are any "case histories" of the leasing problem, including GAO reports or congressional studies.

d. Develop any proposals for new legislation required to authorize the long term leasing of items like aircraft, with an option to purchase later. There is no existing authority or precedent to cover such a procurement.

Topic: EFFECT OF "DEREGULATION ON THE ACQUISITION OF BASE COMMUNICATION SERVICES"

"NEW" Research Need: The Carter phone decision of 1968 brought about a revolution

in telecommunications terminal equipment acquisition. Users were permitted to acquire their own terminal equipment from a source other than the locally franchised carrier, provided the equipment would not have a deleterious effect on the service. Recent Federal Communications Commission (FCC) rulings and hearings indicate that by March 1982 carriers must "disenfranchise" the equipment from the service. The FCC is once again encouraging competition in telecommunications. This trend is noteworthy, but several problems are inherent in the competitive acquisition of telecommunications equipment for the Department of Defense (DOD).

Objective: Study and detail the alternatives available to acquire telecommunications service considering:

a. Using one year Operating and Maintenance funds for multi-year contracts (5-10 years).

b. The effect of the Anti-Deficiency Act on (a) above.

c. Comptroller General decisions concerning multi-year contracting, guaranteed revenues and Basic Termination Liability/ Charges.

d. FCC rules and regulations concerning tariffs and charges.

Topic: APPROPRIATION OF FUNDS. CONTINUING RESOLUTION AUTHORITY (CRA).

"NEW" Research Need: One of the cardinal rules governing Government contracting is that any contractual obligations involving payment of appropriated funds must be grounded on an Appropriation Statute. The U.S. Constitution states at Article I, Section 9, Clause 7, that: "No money shall be drawn from the treasury but in consequence of appropriations made by law."

If the fiscal year ends without Congress having passed a Continuing Resolution Authority or an appropriation act, the Attorney General has stated that all contracting functions and programs depending on a new appropriation act cannot be implemented. The Attorney General decided that there is no existing legal authority to obligate the Government where there is neither a CRA nor an Appropriation Act. However, as a matter of using common sense and with the specific knowledge of Congress, Department of Defense (DOD) and other departments of the Government have continued to obligate the Government for the things required to keep them in operation and for items considered to be essential to mission requirements. To date, there has been no prosecution of the individuals creating such obligations. Instead, such obligations have consistently been subsequently ratified by Congress and paid for after passage of an Appropriation Act.

In the case of CRA there is a lack of clear guidance flowing down to the contracting officer level. There are generally many limitations imposed on obligating funds based on a CRA -- e.g., (1) Can only obligate for those supplies and services representing continuing projects or activities which were conducted in the previous fiscal year and at rates of operation not in excess of the current rate or the rate provided in the budget estimate, whichever is lower and more restrictive; (2) if the House and Senate are in disagreement on a program, contracting is limited to the more restrictive approvals given to date, pending final action of the Appropriation Act.

Objective: Conduct a review of the DOD and Air Force Budgeting Process. Develop additional guidance to cover procurement actions that may or may not be taken in the case where Congress has not passed a new Appropriation Act or has only passed a CRA.


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