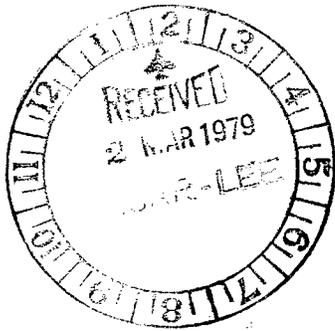


MAJOR SYSTEM ACQUISITIONS

A Discussion of the Application of OMB Circular No. A-109

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FOREWORD

This pamphlet has been prepared to assist interested persons in understanding the intent and application of the policy contained in OMB Circular A-109, Major System Acquisitions. It is not intended to be used in lieu of Circular A-109, nor is it intended to be all inclusive or to represent a binding interpretation by the Office of Management and Budget or the Office of Federal Procurement Policy.

The policy directives, regulations, procedures, and guidelines issued by the executive branch agencies responsive to OMB Circular A-109 shall be their official implementation documents.

A revision of this pamphlet is contemplated after review of agency implementation plans in October 1976. Therefore, recommendations for improvement of this pamphlet are solicited and should be forwarded to the Assistant Administrator for Systems Acquisition, Office of Federal Procurement Policy, OMB, New Executive Office Building, Washington, D. C. 20503.

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INTRODUCTION

On April 5, 1976, the Director, Office of Management and Budget (OMB) and the Administrator, Office of Federal Procurement Policy (OFPP), issued a new policy for the acquisition of major systems by all executive branch agencies. The new policy, OMB Circular No. A-109, is intended to effect reforms that will reduce cost overruns and diminish the controversy of the past two decades on whether new systems are needed.

The policy applies to such acquisitions as Federal office buildings, hospitals, energy demonstration programs, and transportation systems, as well as defense and space systems. From a budget standpoint, the policy governs the acquisition of hundreds of billions of dollars of future major system needs, and is compatible with the budget information required by section 601(a) of the Congressional Budget Act of 1974 (Public Law 93-344) which becomes effective with the FY 1979 budget.

The agencies may, as provided by the Circular, prescribe additional criteria and/or relative dollar thresholds for determining which agency programs are to be classified major systems. Further, the agencies may establish different criteria/thresholds for different types of major system acquisitions; for example, an agency may, for reasons of management attention, establish different criteria/thresholds for such categories as automatic data processing (ADP) systems and construction.

Circular A-109 does not necessarily apply to social programs. However, if implementation of such programs involves acquisition by an agency of hardware, equipment, software, construction, or improvements to real property, the Circular could be applicable to such acquisitions; for example, the acquisition of a major ADP system in support of the Social Security Program. Similarly, Circular A-109 does not apply directly to assistance through grant programs. However, the Circular and this pamphlet may prove

useful to grantees in their management of major system acquisitions.

The new policy is consistent with the unanimous recommendations of the Commission on Government Procurement and requires:

- Top level management attention to the determination of agency mission needs and goals.
- An integrated systematic approach for establishing mission needs, budgeting, contracting, and managing programs
- Early direction of research and development efforts to satisfy mission needs and goals.
- Improved opportunities for innovative private sector contributions to national needs.
- Avoidance of premature commitments to full-scale development and production.
- Early communication with Congress in the acquisition process by relating major system acquisitions to agency mission needs and goals.

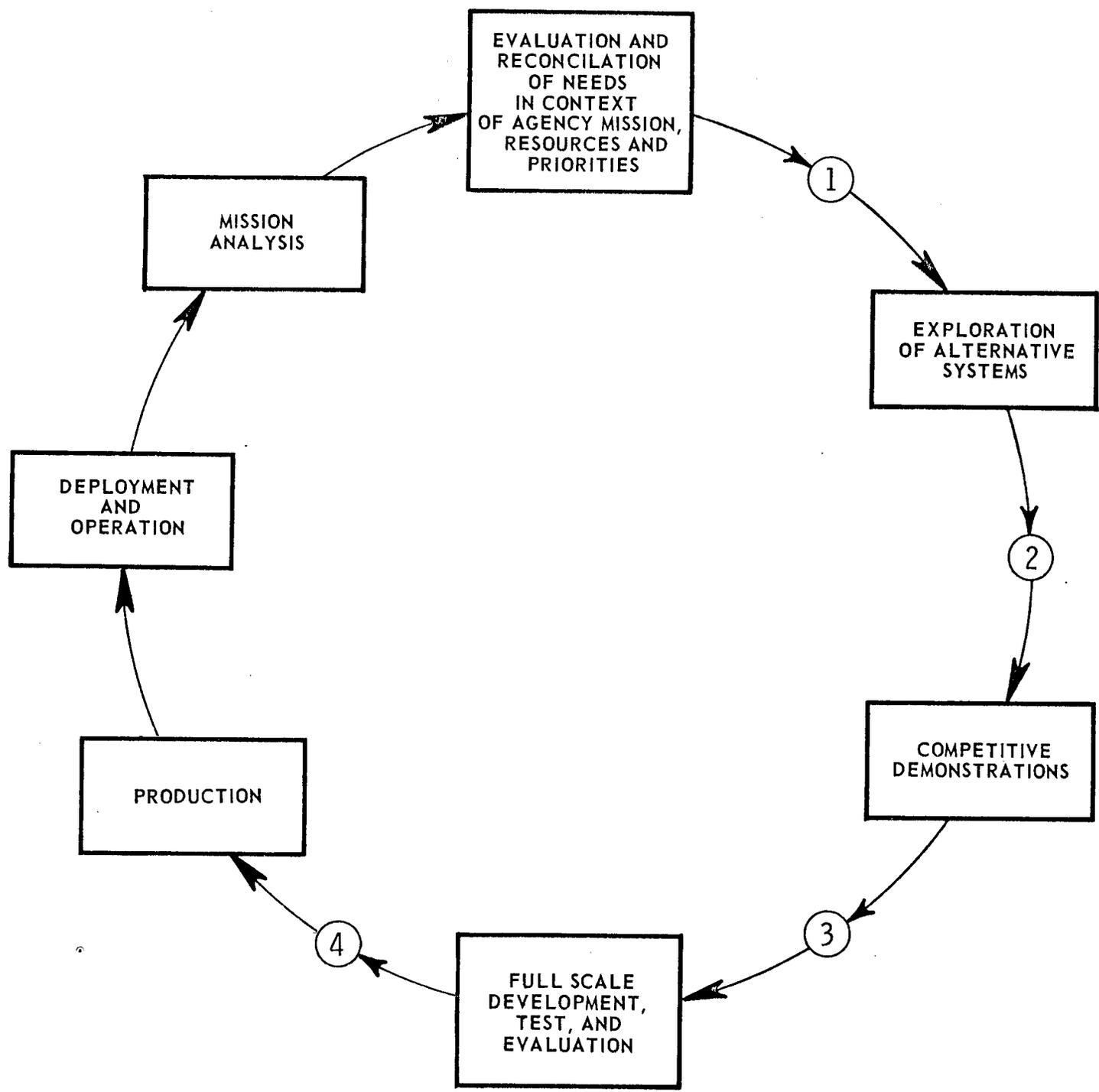
Circular A-109 specifies certain key decisions and outlines the logical sequence of activities in the major system acquisition process. It provides agencies with flexibility in determining how they will meet the requirements of the Circular and staff key decisions.

This pamphlet describes in a general way the application of Circular A-109. Specific implementation is being developed by each agency in cooperation with OFPP. Even so, the pamphlet should provide a fuller understanding of the Circular for all parties interested and involved in major system acquisitions and should be of value to agencies in developing their implementing policies and procedures.

For additional background on the Commission on Government Procurement recommendations and much of the policy set forth in Circular A-109, see Report of the Commission on Government Procurement, Volume 2, Part C, pages 69-187, dated December 1972.

FIGURE 1.

MAJOR SYSTEM ACQUISITION CYCLE



MAJOR SYSTEM ACQUISITION CYCLE

Each major system acquisition program has its unique features; no two are identical. Differences in time, cost, technology, management, and contracting approach must be recognized. However, despite the differences, the basic acquisition process is common to all programs. Figure 1 illustrates the basic process or cycle, with the boxes describing the types of activities involved, and the numbered circles indicating the major decision points requiring agency head approval.

The principal activities in the major system acquisition process are iterative. As more knowledge of needs, alternative solutions, actual capabilities, resources, and priorities is acquired, some steps in the overall major systems cycle may be iterated, as necessary, to permit decisions to be made in a total system context. It is difficult to graphically illustrate all of the possible iterations which might be involved.

The adaptation of the basic system acquisition process described in this section to the acquisition of ADP systems, construction, and demonstration projects is addressed in the section of this pamphlet entitled "Applications."

MISSION ANALYSIS

Each agency has one or more national mission responsibilities. Agency missions are defined by the Comptroller General of the United States in Budgetary Definitions, November, 1975, as:

"Those responsibilities for meeting national needs assigned to a specific agency. Agency missions are expressed in terms of the purpose to be served by the programs authorized to carry out functions or subfunctions which, by law, are the responsibility of that agency and its component organizations. (See Section 201 of the Budget and Accounting Act, 1921, as amended.)"

Additionally, Section 601(i) of the Congressional Budget Act of 1974 (Public Law 93-344) requires, beginning with FY 1979, some modification of the present budgeting information available from most agencies:

"The Budget...shall contain a presentation of budget authority, proposed budget authority, outlays, proposed outlays, and descriptive information in terms of--

- (1) A detailed structure of national needs which shall be used to reference all agency missions and programs;
- (2) Agency missions; and
- (3) Basic programs.

"To the extent practicable, each agency shall furnish information in support of its budget requests in accordance with its assigned missions in terms of Federal functions and subfunctions, including mission responsibilities of component organizations, and shall relate its programs to agency missions."

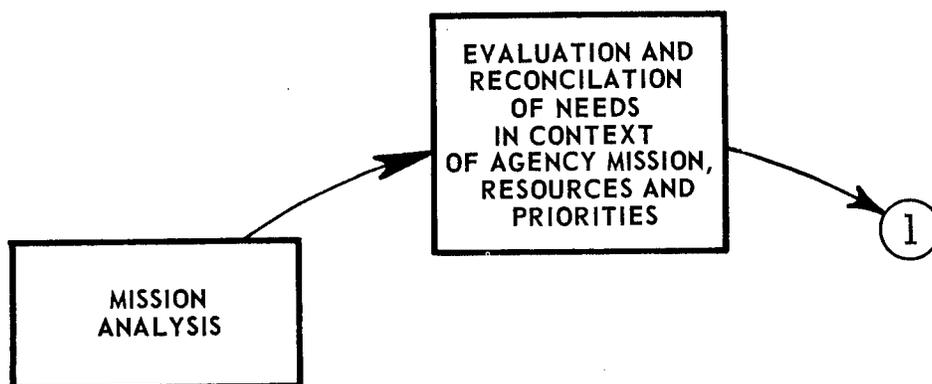
The requirements for the mission oriented budget data will be specified as part of the fiscal year 1979 budget guidance in OMB Circular No. A-11, forecast to be distributed in early spring of 1977. In order to submit meaningful mission oriented budget data for FY 1979, agencies are developing a mission structure consistent with their overall mission and goals.

OMB Circular No. A-109 requires a continuing analysis of current and forecasted mission capabilities, technological opportunities, overall priorities, and resources that are involved. When the analysis identifies a deficiency in existing agency capabilities or an opportunity to establish new capabilities in response to a technologically feasible opportunity, this will be formally set forth in a mission need statement.

The mission need statement includes the mission purpose, capability, agency components involved, time constraints, value or worth of meeting the need, relative priority, and operating constraints, and is not to be expressed in terms of equipment or other means which might satisfy the need. Mission needs may be determined by agency analyses or through studies directed by appropriate executive or legislative authority.

FIGURE 2.

MAJOR SYSTEM ACQUISITION CYCLE



The mission need statement is submitted to the agency head for approval, the first key decision (Circle 1, Figure 2). Once approved, the designated agency component(s) can move forward with the confidence of having a need recognized. The need is then normally communicated to Congress during the budget process in accordance with OMB Circular No. A-10, which provides guidance for such communication. This permits Congress to consider the major needs of all agencies and the decisions to initiate new acquisition programs on a comparative basis. The objective is to have any issues requiring debate by Congress regarding needs occur early in the major system acquisition process before the commitment of major resources and selection of solutions.

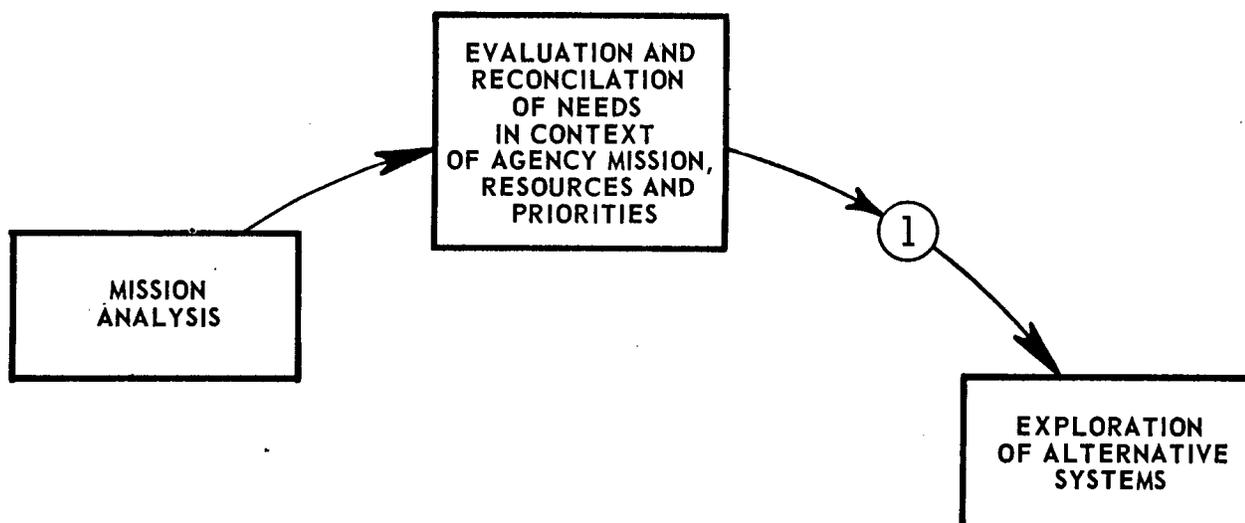
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EXPLORATION OF ALTERNATIVE SYSTEMS

Figure 3 identifies the next step in the process.

FIGURE 3.

MAJOR SYSTEM ACQUISITION CYCLE



Approval of the mission need starts the major system acquisition process by granting authority to explore alternative system design concepts. This initial approval and the establishment of a system acquisition program does not automatically mean that a new major system will eventually be acquired. With an approved need, designated agency component(s) may continue to analyze other optional means of satisfying the need in parallel with the exploration of alternative systems which may, as development proceeds, prove unacceptable. In DOD, for example, the mission need may be best satisfied by a change in doctrine, by deployment of additional personnel, by modification of existing equipment, by procurement of additional equipment already in production, by training, or by a new major system acquisition effort, to name a few.

An evaluation of the options, including the alternative system design concepts, provides the basis for subsequent key decisions in the major acquisition process.

Before discussing the exploration of alternative system design concepts, a discussion of the program manager and his acquisition strategy is appropriate. His role, the acquisition strategy, and the ensuing system acquisition plan encompass the entire system acquisition process.

Program Manager

A program manager should be designated for each major system acquisition program as soon as possible after the mission need decision to explore alternative system design concepts.

Program objectives are developed that set forth the capability (in mission need not equipment solution terms) cost, and schedule goals being sought in the system acquisition program. These objectives are required to be incorporated in a written charter, which defines the authority, responsibility, and accountability of the program manager. Such a charter can be equated to a contract between the program manager and the agency.

The program manager ideally should be a multidiscipline, experienced manager with sufficient tenure and interest in the program to provide continuity and to accrue personal accountability for his actions. An initial responsibility of the program manager should be to recruit a staff or identify a team with the requisite skills and experience to manage the assigned system. The organization and management level of the program manager should be consistent with the importance and scope of the program.

Acquisition Strategy

One of the program manager's first tasks will be to develop an acquisition strategy. The purpose is to get the program manager, with his team, to think through the acquisitions process and the myriad of individual considerations, and then join them to achieve his program objective in an economical, effective, and efficient manner.

In developing a system acquisition strategy considerable thought should be given to specific program goals and objectives. The approach should not be reduced to fill-in-blank formats or cookbooks.

The strategy should form the basis for the program manager's system acquisition plan. He should then use his plan to communicate with higher authority, his management team, interfacing government organizations, and industry. The plan should also provide the means to measure accomplishments and consider contingencies as the program progresses. At program initiation, it is neither possible nor desirable to address all considerations in detail. It is possible and desirable, however, to examine and schedule when decisions on each consideration can and must be made throughout the acquisition process and to refine the strategy and planning as the program proceeds.

The plan should encompass the entire system acquisition process with emphasis on the near term time phased actions. As the program proceeds and periodic reviews are made, the next increment of near term considerations should be emphasized. Such an approach minimizes the planning burden and provides a basis for program direction and for measurement of success against program goals and objectives.

Circular A-109 includes policies and some typical considerations that should be addressed in the development of a strategy and then reflected in a system acquisition plan. For example: the general policy to rely on the private sector in accordance with OMB Circular No. A-76; the use of contracting as a tool in the acquisition process and not as a substitute for management; the use of competitive parallel short-term planned dollar value contracts for well-defined work activities during exploration of system design concept alternatives; and preclusion of nonessential reporting procedure and paperwork requirements being placed on contractors.

There are many other necessary considerations not included in Circular A-109 that need to be addressed by a program manager. For example, the favorable and unfavorable lessons learned from similar acquisitions. Still others may be grouped in categories such as; system/product development, business management and program management.

Some system/product development examples include: recognition of and accommodations for risks and uncertainties that assures proper relationship of risk sharing between Government and contractors; the Government tailoring of specifications and standards in consonance with contractors' efforts and the time phased introduction of the

results into the acquisition process (the objective being to avoid nonessential constraints on either prime or subcontractors); the Government providing guidelines for contractor development of performance specifications for full scale development and product specifications for production; and the optimal use of government laboratories in furnishing technical direction to the contractors during system development.

Some business management examples include: obtaining and sustaining competition, including high cost subsystems which may be proposed; accommodating procurement lead times; precluding technical transfusions and "auctions" in the proposal evaluation, source selection, and negotiation process; and providing contractually for proposal submittals for the next planned increment in the acquisition process.

Some program management examples include: selection of a project management organizational mode such as vertical or matrix; the appropriateness and applicability of incremental approvals of contractors efforts throughout the acquisition process; and the applicability of Government policies for standardization and interoperability with systems of friendly countries.

In conjunction with the development and tailoring of an acquisition strategy, the program manager should establish an analysis structure and decision mechanism to handle both short-term considerations for system acquisition management.

Figure 4 illustrates the activities in this step of the process.

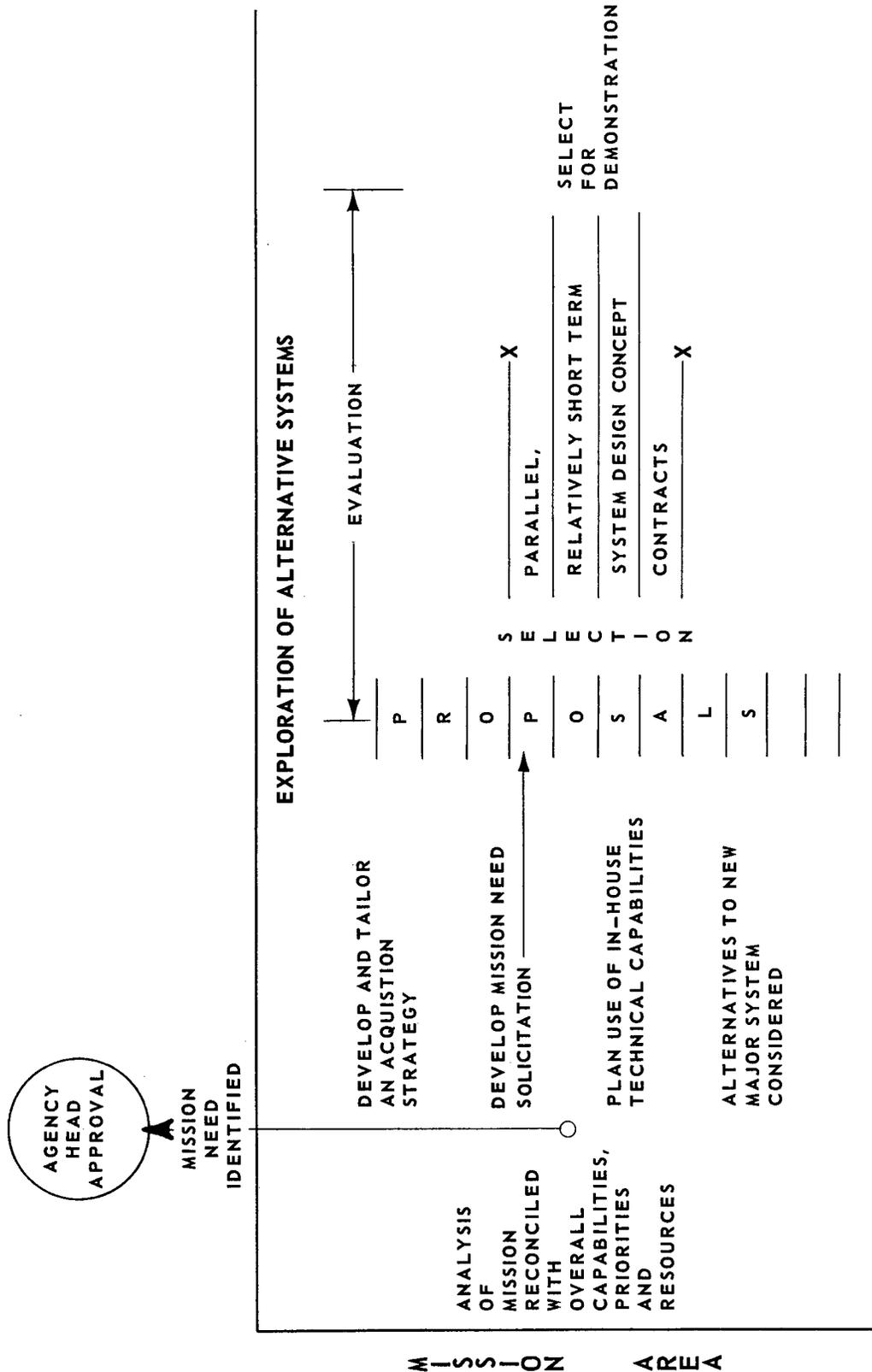
Solicitation in Terms of Mission Need

The solicitation in terms of mission need is a key action in the process since industry is to be formally requested to respond with their alternative system design concepts to satisfy the approved mission need. The contractors should be free to propose their own technical approach, main design features, subsystems, and alternatives to schedule, cost, and capability goals. The purpose of this type of solicitation is to gain the benefits of industry innovation and competition and not be constrained by preordained or prematurely selected equipment approaches.

The solicitation should explain the need in mission or capability terms (not equipment terms), schedule objectives and constraints, program (not unit) cost objectives, and

FIGURE 4.

EXPLORATION OF ALTERNATIVE SYSTEMS



operating constraints. It should provide background information on prior studies, constraints inherent in the need, and technology developed by Government laboratories or at Government expense. The accessibility of related Government information should be identified if the information is not provided as part of the solicitation. The solicitation should not restrict the contractors by specifying or referencing Government specifications and standards.

Agencies are encouraged to conduct orientation briefings for industry, and, where appropriate, allow industry to comment on a draft of the solicitation and the system acquisition strategy. The objectives are to remove inhibitors to innovative solutions in response to solicitations and to improve the approach to achieving program objectives.

Solicitations are to be sent to a broad base of qualified firms, and participation of smaller and newer businesses is encouraged. Concepts are to be primarily solicited from private industry. However, Government laboratories, Federally Funded Research and Development Centers, educational institutions, and other not-for-profit organizations may also be considered as sources for alternative system design concepts. Additionally, foreign technology and equipment may be considered. The widest range of alternatives to satisfy the mission need should be considered.

When Government laboratories, Federally Funded Research and Development Centers, educational institutions, and other not-for-profit organizations submit alternative system design concepts for consideration, care must be taken to exclude such proposers from the evaluation process. If further exploration of such an alternative system design concept is deemed appropriate, that concept should be made available to industry to propose on the continued development stages. Direct competition between industry and government laboratories must be avoided.

Proposal Evaluation

Proposals should be evaluated and the most promising system design concepts selected for further exploration. The selection should be based on a review by a team of experts, from inside and outside the organizations which are part of the program management technical support team. The review should consider:

- Capability of the proposed system to meet the mission need and program objectives, including resources required;
- Benefits to be derived by trade-offs, where feasible, among technical performance, acquisition costs, ownership costs, and time to develop and procure; and
- Relevant accomplishment record of the competitors and the competence of their key personnel.

Parallel Short-Term Contracts

Parallel short-term contracts are then awarded for those concepts selected for further exploration to expand on the concepts and reduce technical uncertainties present in each system. If initial efforts are successful, contracts are awarded to cover subsequent efforts as long as the approaches remain promising and the contractor's progress is acceptable. The challenge to each contractor is to identify risk areas and propose technical activities to effect risk reduction. During contract performance, emphasis should be on:

- Providing contractors, as necessary, relevant operational and support experience;
- Measures being taken to progressively reduce risks;
- Responsiveness of system design concepts to the mission need;

- Benefits of the system design concept to the Government;
- Continuous evaluation of the contractors' efforts to permit orderly elimination of the least attractive alternatives. Caution must be exercised not to constrain contractor innovation.

Information to be used in the evaluation of alternative system design concepts should be provided to the contractors to assist them in preparing for continued development stages and feasibility demonstration of their concept. This information will include demonstration test and evaluation criteria and life cycle cost factors.

COMPETITIVE DEMONSTRATIONS

When risks can be accommodated and progress indicates that a proof of concept demonstration is in order, the alternative system design concepts selected for consideration for competitive demonstration are submitted to the agency head for approval, along with other alternatives which were identified and evaluated. The other alternatives may have been evaluated in preceding steps or in parallel with the exploration of alternative system design concepts. This is in the second key decision (Circle 2, Figure 5) and includes a reaffirmation of the mission need and the program objectives.

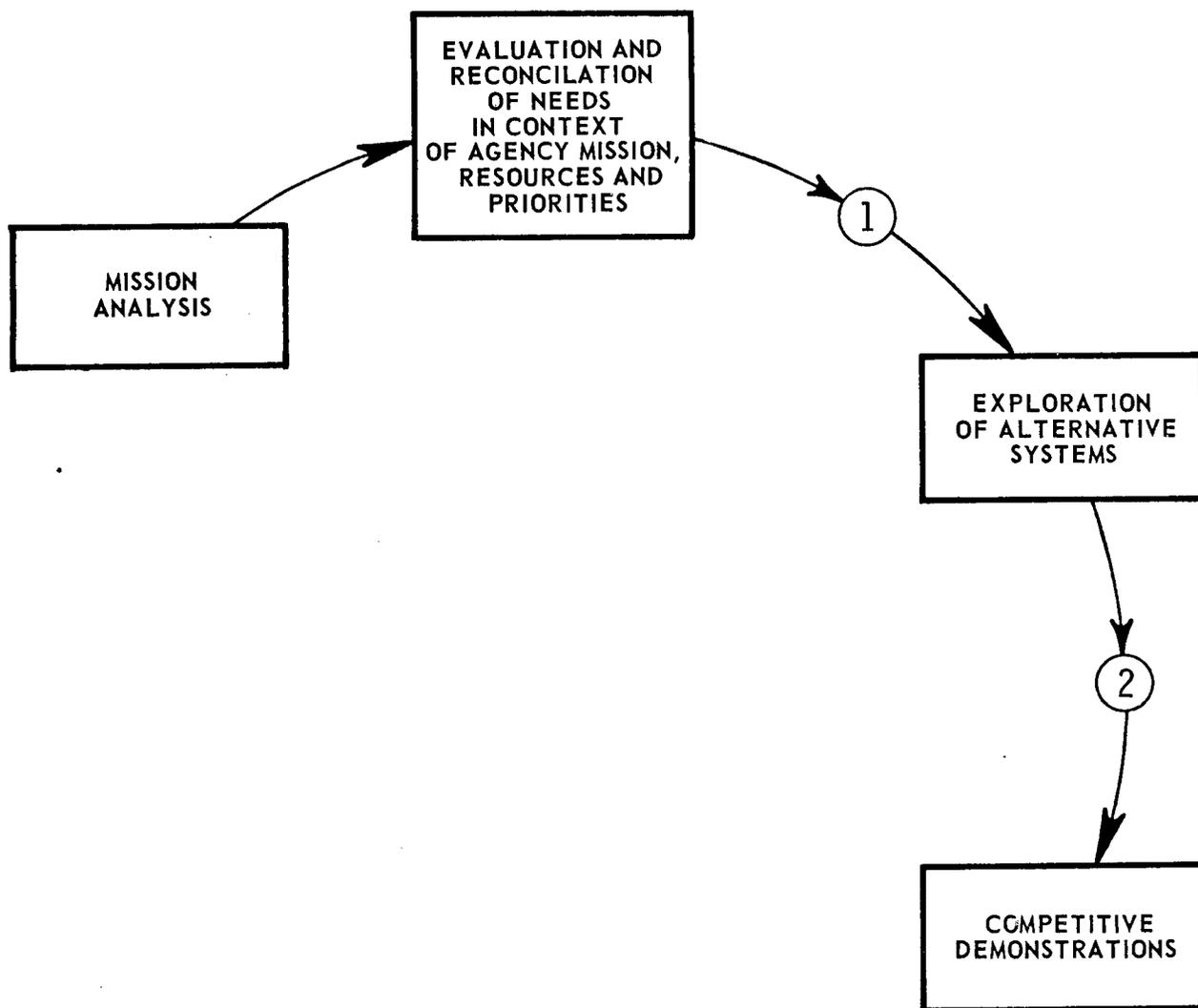
The program manager should assure that small or large firms selected for competitive demonstration have submitted an adequate plan for the necessary plant and equipment to accomplish full-scale development and production. The plan may involve purchase or lease arrangements, or teaming arrangements with companies which have the necessary plant and equipment.

Competitive demonstrations are intended to verify that the chosen concepts are sound, perform in an operational environment, and provide a basis for selection of the system design concept(s) to be continued into full-scale development. Such demonstrations normally involve some type of prototypes -- these may range from a principal end item or critical subsystem, to a limited and less than complete development model.

The winning concept(s) and contractor(s) of the demonstration evaluation may then move into full-scale development and initial production.

FIGURE 5.

MAJOR SYSTEM ACQUISITION CYCLE



The competitive demonstration contracts should provide for contractors to develop and submit proposals for full-scale development and initial production by the conclusion of the demonstration. The contractors should be furnished operational test conditions, mission performance criteria, and life cycle cost factors that will be used by the agency in evaluation and selection for full-scale development.

Contractors should be instructed to identify, tailor, and indicate time of application of the needed specifications and standards to be included in the full-scale development contract. Contractors should not be restricted by imposing arbitrary compliance with Government specifications and standards. Such may be referenced, but alternatives which might lead to a better system should be encouraged. They should also recommend tailoring of management systems requirements and propose the contract data list based on the program manager's stated needs. Contractors should prepare end item performance specifications which form the design requirements baseline if their concept is chosen for full-scale development.

FULL-SCALE DEVELOPMENT/INITIAL PRODUCTION

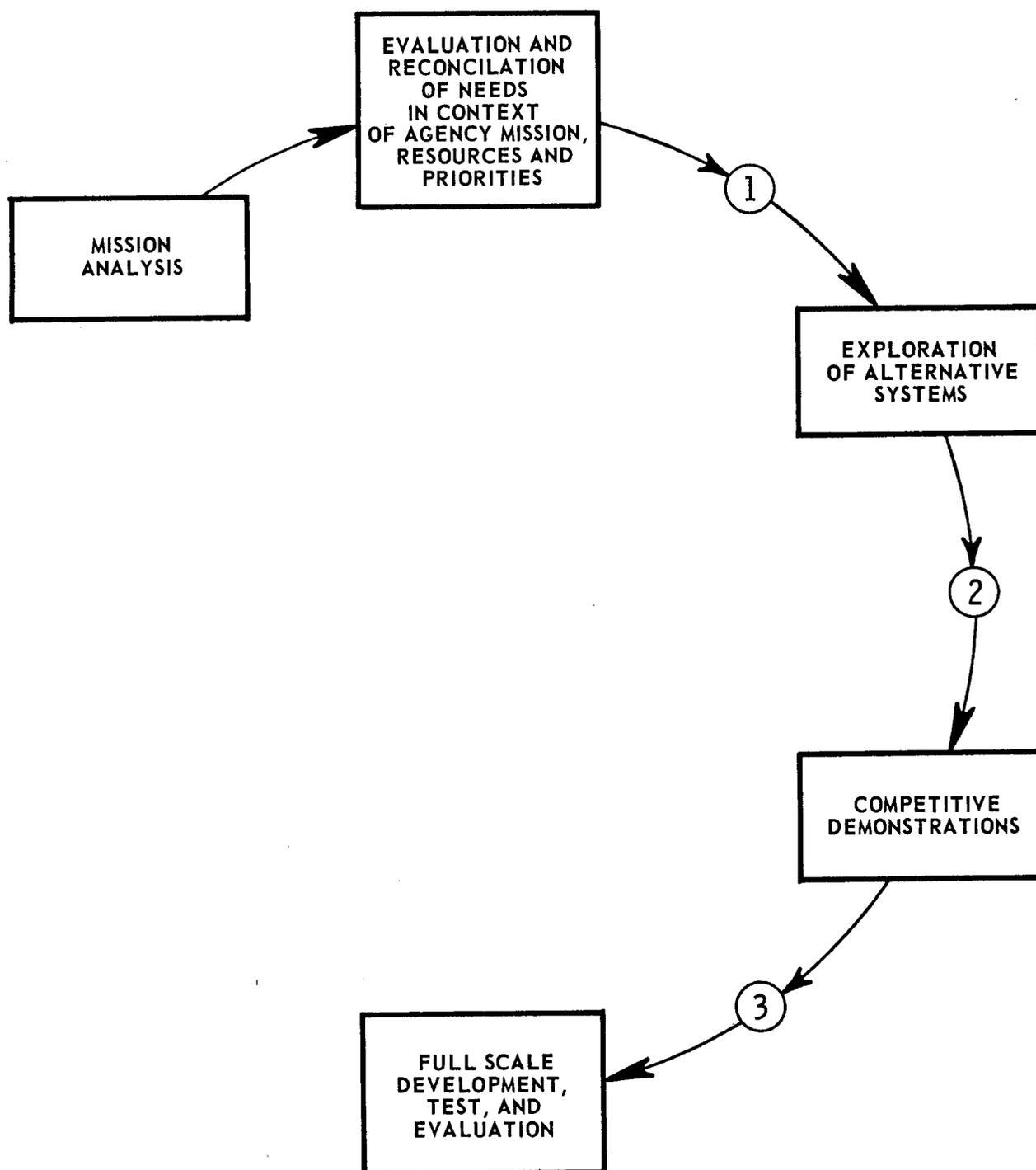
Once demonstration has verified that the chosen system design concept(s) is sound and the risks are acceptable -- competition between similar or differing system design concepts may be extended throughout the entire acquisition process whenever it is economically beneficial to do so. Thus, contractors who successfully demonstrate their design concepts may be awarded contracts for subsequent full scale development. When the mission need and program objectives are reaffirmed, the agency head may authorize full-scale development and initial production. This is the third key decision (Circle 3, Figure 6).

System(s) and contractor(s) selection for full-scale development should be made on the basis of:

- Essential system concept performance measured against mission need and program objectives;
- An evaluation of remaining risks and potential resolutions;
- An evaluation of estimated acquisition and ownership costs; and

FIGURE 6.

MAJOR SYSTEM ACQUISITION CYCLE



- Such factors as the contractor's demonstrated management, financial, and technical capabilities to meet program objectives.

The program manager is required to monitor program progress as well as contractor progress in fulfilling contract performance, cost, and schedule commitments. Significant actual or forecast variances from plan are to be analyzed and alternatives considered with resultant actions or recommendation for actions brought to the attention of the appropriate contractor or government management authority.

Initial production units are to be tested and evaluated in an environment that assures effective performance in expected operational conditions. Normally the testing is to be done independent of the agency's development and user organizations. Exceptions to independent testing may be authorized by an agency head under such circumstances as physical or financial impracticability or extreme urgency.

The full-scale development/initial production contract(s) should provide for the contractor(s) to develop and submit proposals for production. To facilitate the development of these proposals, the contractors should be furnished schedule data, provisioning requirements, etc., that will be used in making the production decision.

PRODUCTION

Following satisfactory test results and reconfirmation of mission need and program objectives, the agency head may authorize full production. This is the fourth key decision (Circle 4, Figure 7).

Figure 8 illustrates in linear form the major system process and the progressive narrowing of alternatives to the chosen solution of the established need. The figure also illustrates the progressive narrowing of participating contractors.

As production systems become available, they are deployed into operational use, thereby providing the capability originally identified in the mission need statement. This new capability then becomes a factor in the continuing mission analyses of the agency and the cycle continues.

FIGURE 7.

MAJOR SYSTEM ACQUISITION CYCLE

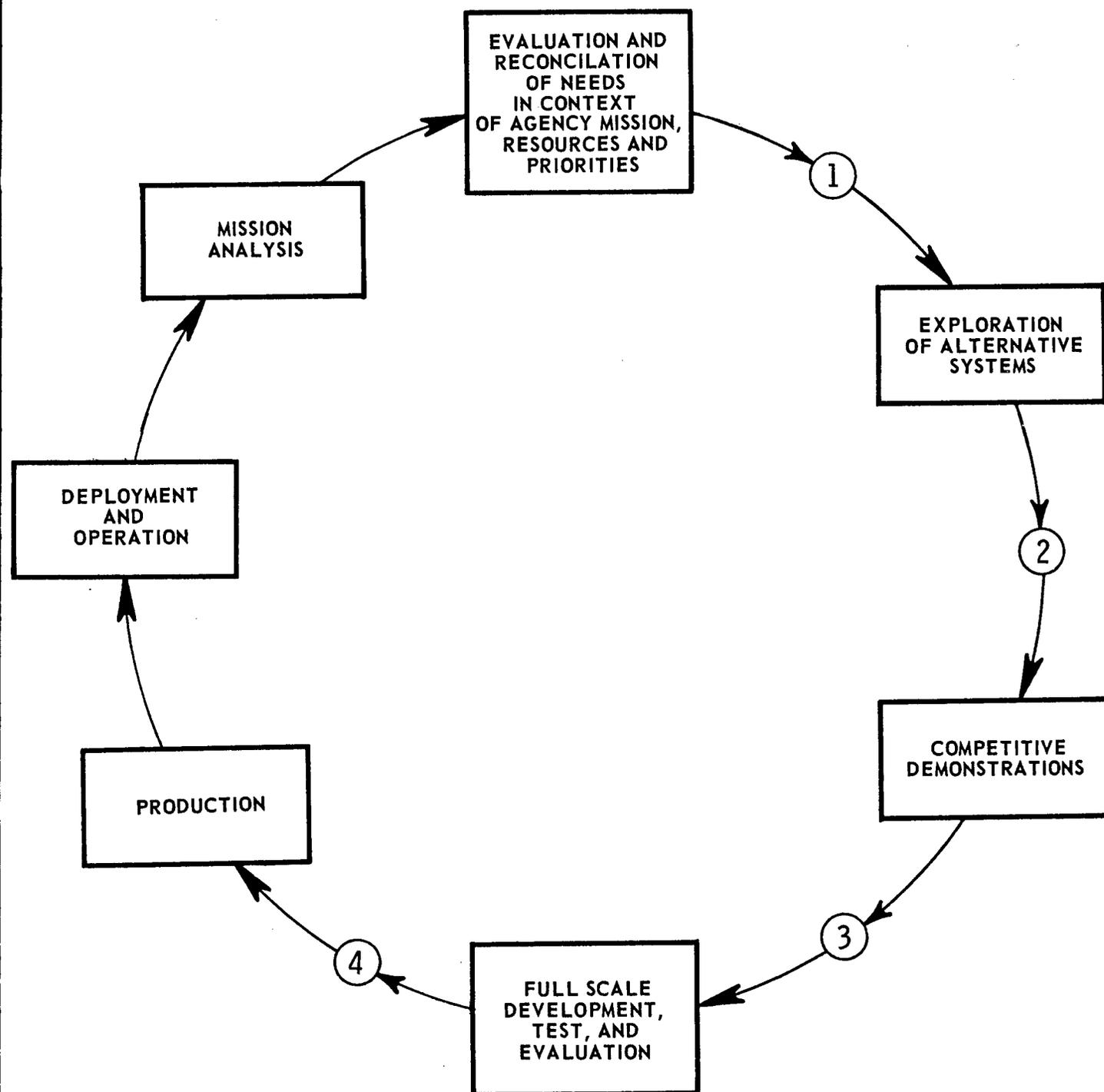
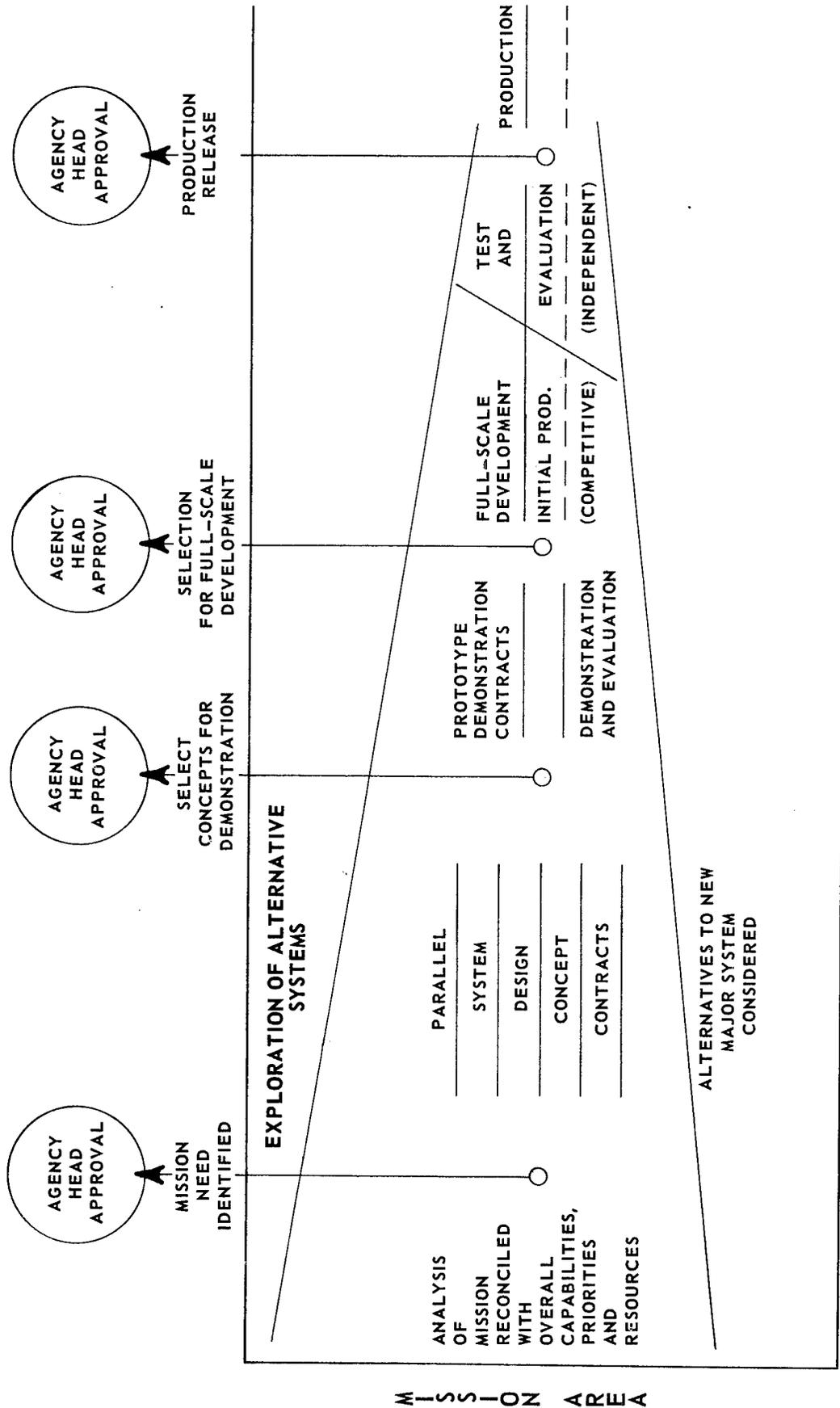


FIGURE 8.

MAJOR SYSTEM ACQUISITION PROCESS



APPLICATIONS

As noted in the Introduction, Circular No. A-109 applies to a wide variety of major acquisitions: Federal office buildings, hospitals, energy demonstrations, and transportation systems, as well as defense and space systems. The preceding section has described in a general way the application of the Circular to major systems which are acquired in production quantities and are operated by the Government, such as major weapon systems. This process applies to the steps applicable for each major system, recognizing that those systems which are produced in limited quantities do not normally involve the fourth key agency head decision since production quantities are not acquired.

In this section, application of the Circular to three different types of acquisitions are described -- ADP Systems, Construction, and Demonstration Projects. The descriptions are again general, recognizing that agency implementation of the policies will vary in detail and specific programs will have specific mission criteria but they should be uniform in fulfilling the basic provisions of the Circular.

Mission analysis, early identification of mission need, competitive exploration of alternatives, and the key agency head decisions are emphasized.

ADP SYSTEMS

The acquisition of ADP systems by executive branch agencies is conducted in accordance with established procedures which involve coordination and approval by the General Services Administration (GSA) and OMB. These procedures provide for GSA to act as the executive agent in the acquisition or to delegate acquisition to the using executive branch agency. The requirements of OMB Circular No. A-109 are consistent and compatible with these established procedures and apply only to those ADP

acquisitions which are designated by the agencies as major systems.

The application of Circular No. A-109 to ADP systems is intended to follow, as appropriate for such acquisitions, the process previously described. Figure 9 illustrates the application of the process in linear form to ADP systems.

After the mission need statement has been approved by the agency head, the analysis of alternatives should include such approaches as the modification or augmentation of existing equipment and contracting out for the needed capability, as well as acquiring new capability to be operated by the agency or a contractor.

When the decision to acquire a new capability is pursued, the agency should assign a program manager and follow the previously described process of the mission need solicitation and evaluation of alternative system design concepts.

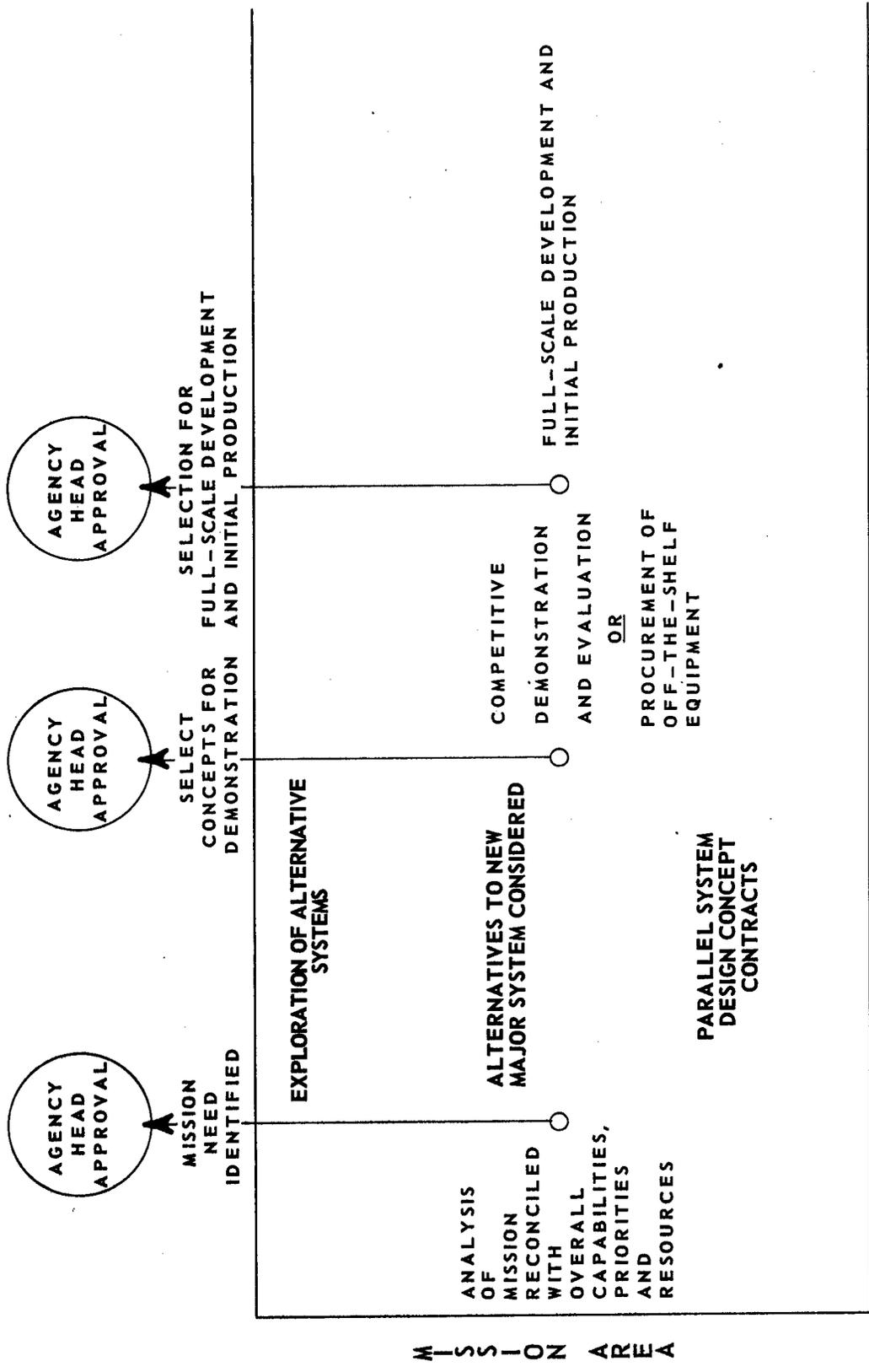
If the selection of a system design concept involves the procurement of off-the-shelf equipment, the second and third key agency head decisions may be combined as one decision.

With respect to an agency's interface with GSA in this process, the agency is responsible for that portion of the process which precedes the determination by GSA of executive agency responsibility. GSA may retain this authority or delegate it back to the agency, thus making the agency responsible for that portion of the process for which it is the executive agent. The resolution of responsibilities between an agency and GSA should be made at the outset of the acquisition process.

The fourth key agency head decision, approval for production, would not apply, except in the unusual case of a multiple quantity procurement of a newly developed ADP system.

FIGURE 9.

ADP SYSTEM ACQUISITION PROCESS



MISSION AREA

CONSTRUCTION

Several executive branch agencies have major construction projects -- Federal office buildings, hospitals, prisons, dams, power generating plants, mints, etc. In the case of Federal office buildings, generally, GSA acts as the executive agent for A&E services and construction.

The application of OMB Circular No. A-109 to construction is intended to follow, as appropriate for such acquisitions, the general process previously described. Figure 10 illustrates in linear form the application of the process to construction projects which are designated by the agencies as major systems. Because the construction is normally for a quantity of one, the fourth key agency head decision (approval for production) is not involved.

During analysis of mission, the agency should determine that the best economic use is being made of its property and whether it can fulfill its current needs by use of property under its jurisdiction.

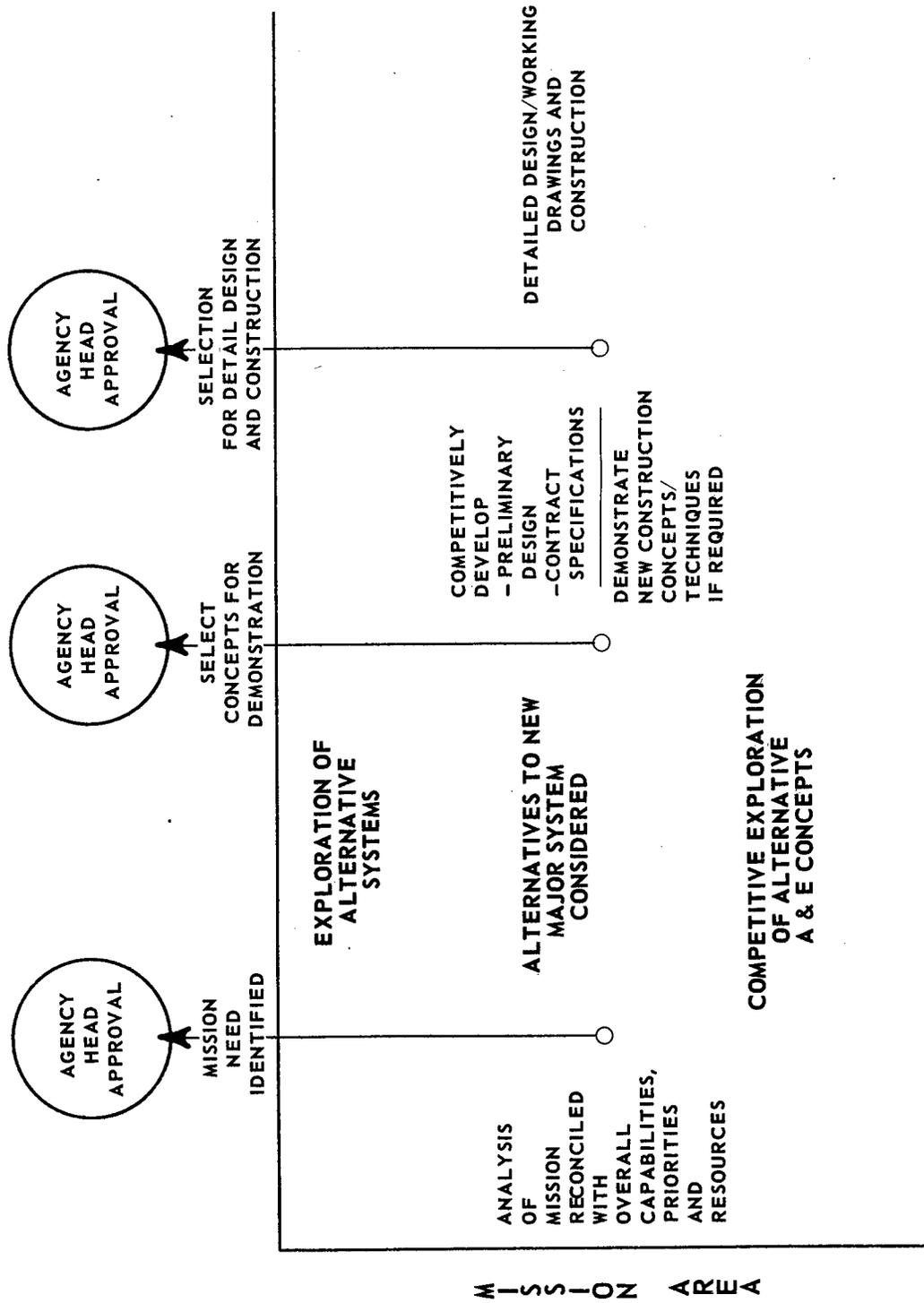
After the mission need statement has been approved by the agency head, the analysis of alternatives should include, for example in the case of Federal office space, such approaches as the use of excess or surplus space, joint use of existing Federal buildings, purchase of a non-Federal building, leasing of space, and construction of a new building.

A program manager should be designated as soon as possible after the mission need decision to explore alternative system design concepts to follow the described process of the mission need solicitation and evaluation of alternative system design concepts resulting from competitive A&E contractual efforts should be followed. It is envisioned that short-term contracts will be awarded to two or more A&E firms to competitively explore alternative design concepts and encourage innovation.

When alternative concepts have been selected for demonstration and agency head approval has been obtained for the second key decision, the selected A&E firm(s) should develop the preliminary design and contract specifications.

FIGURE 10.

CONSTRUCTION ACQUISITION PROCESS



If new untried concepts or construction techniques are involved, it may be appropriate to contract for scale models, full size modules, etc., to demonstrate the concepts or techniques.

When GSA or another agency is designated to act as executive agent, the requiring agency is responsible for that portion of the process which precedes transfer to the executive agent. Similarly, the executive agent would be responsible for the agreed portion of the process.

DEMONSTRATION PROJECTS

Some executive branch agencies sponsor activities through full-scale development and the production of one system, which will either be operated by a private concern with the design available for private sector use, or be used to demonstrate the feasibility of private sector application of new technology. Examples of agencies sponsoring such activities are the Energy Research and Development Administration (ERDA) and the Urban Mass Transit Administration (UMTA) of the Department of Transportation (DOT).

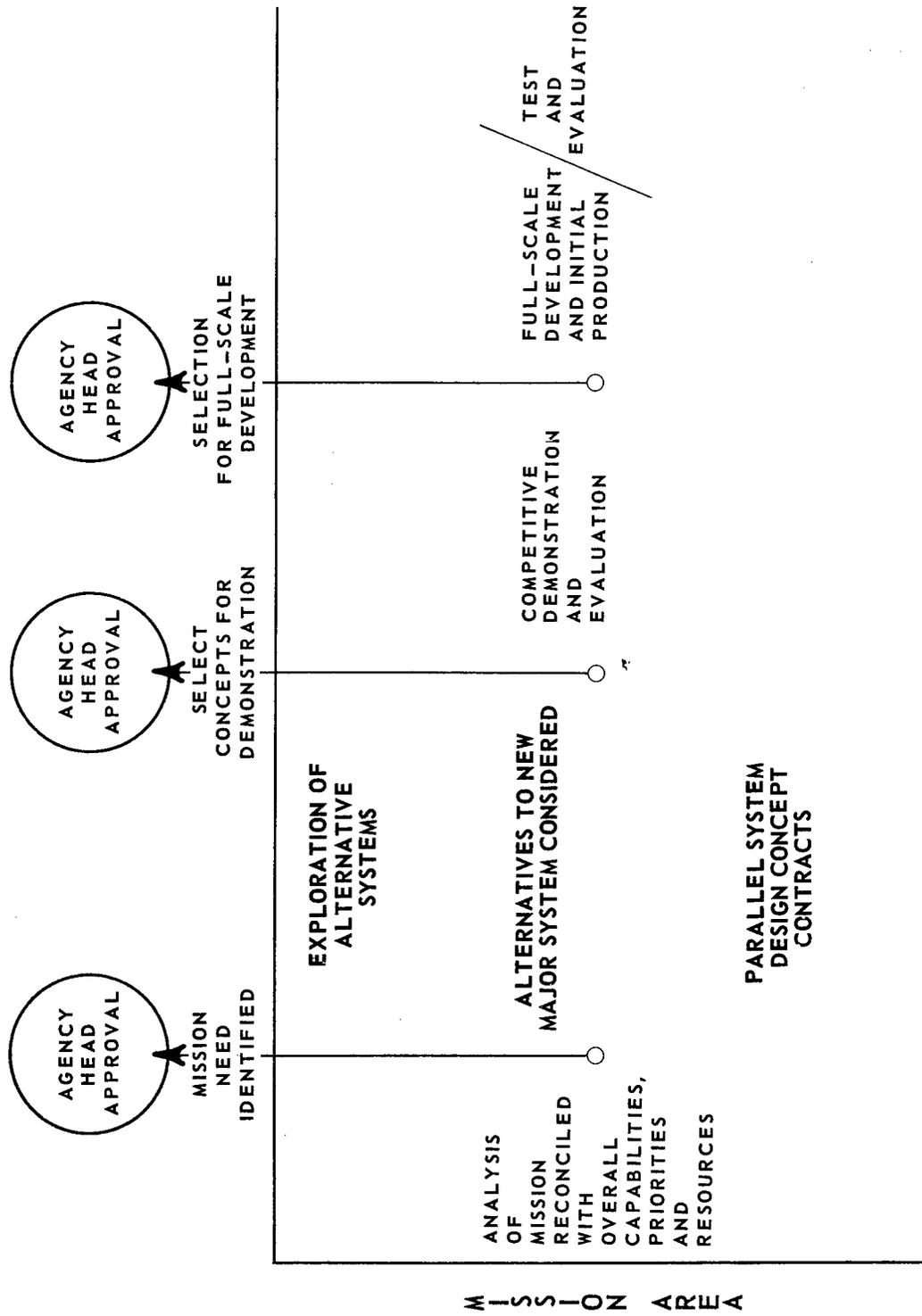
The application of OMB Circular No. A-109 to such demonstration projects as energy and transportation are intended to follow, as appropriate for such acquisitions, the general process previously described. Figure 11 illustrates in linear form the application of the process to major system demonstration projects.

The general process applies for demonstration projects with the exception of the fourth key agency head decision -- production. Any production would be undertaken by the private sector.

OMB Circular No. A-109 provides for an exception when competitive demonstration and evaluation is not required. However, some demonstration projects may terminate at the completion of the demonstration, of either a module or a pilot plant of a larger plant, for example, where the objective is to demonstrate the technology and alternative system design concept(s) rather than produce a completed system.

FIGURE 11.

DEMONSTRATION ACQUISITION PROCESS



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TECHNOLOGY BASE

Agency research and development activities in direct support of the agency's overall mission and goals are to maintain an adequate base of technology to be responsive to mission needs and available for consideration by private sector suppliers in responding to major system solicitations. This technology base involves effective utilization of both the private sector and Government laboratories and in-house technical centers in such activities as: research; exploratory system design concept studies; proof of concept work; exploratory subsystem development; tests and evaluations; and sufficient demonstration of promising technologies to permit application of the technologies and assimilation in solutions to meet mission needs.

Government laboratories have a primary responsibility in the maintenance of an agency's technology base through sponsorship of technologies in support of agency's missions. Laboratories' contribution to mission analyses are important to assure that relevant technologies are given appropriate consideration.

Government laboratories, having expertise in relevant technologies and which have not proposed alternative system design concepts, should support program management efforts in contractors' exploration of alternative systems to meet a specific approved mission need. Such support may involve:

- Preparation of mission oriented solicitation technical documentation.
- Evaluation of alternative system design concepts.
- Evaluation of innovative use of advanced technology to obtain maximum effectiveness in system acquisition programs and to minimize complexity and cost.
- Assessment of technical risk during the development stages.

- Evaluation of technical progress of contractors throughout the sequential steps of the system acquisition process.
- Independent test of alternative candidate systems.

SUBSYSTEM DEVELOPMENT

Subsystems that may be candidates for inclusion in a major system acquisition program are not to be fully developed until the subsystem is identified as a part of a system proposed for full-scale development (i.e., at the end of demonstration and evaluation). This restriction is neither meant to inhibit the demonstration of new and innovative technological advancements nor to inhibit the development and testing of components which will have a common applicability to several major systems. Agency heads may authorize an exception to the prohibition of full-scale development of subsystems if the subsystems are long lead time items that fulfill a recognized generic need (such as a quiet, more fuel-efficient jet engine) or if they have a high potential for common use among several existing or future systems. Contractors should be free to propose or not propose incorporation of such subsystems in their solutions to needs.

BUDGETS

Beginning with FY 1979, the budget will contain a presentation in terms of agency mission(s) in consonance with Section 201 of the Budget and Accounting Act of 1921 and the added requirements of Section 601(i) of the Congressional Budget Act of 1974. This will be done in accordance with OMB Circular No. A-11 which provides budget preparation direction for each fiscal year.

OMB Circular No. A-109 highlights this requirement and sets forth the need for agencies to identify research and development in the following three categories:

- General technology base in support of the agency's overall mission(s);
- Specific development efforts in support of alternative system design concepts to accomplish each mission need aggregated by mission; and
- Full-scale development of systems related to mission needs.

If desired, an agency may break these categories into smaller elements.

The additional display required by Circulars A-109 and A-11 for fiscal year 1979 will realign the R&D budgets into the above described categories.

Agency research and development budgets are currently broken down into subfunctions. Within these subfunctions are the various activities (tasks/projects/programs). The authorizations and appropriations committees examine these activities in varying degrees of detail on an individual agency basis.

The Commission on Government Procurement observed that: "Congress and its committees have become enmeshed at a detailed level of decisionmaking and review in attempting to fulfill their responsibilities. This disrupts programs,

denies flexibility to those responsible for executing programs, and obscures Congress' view of related higher-order issues of national priorities and the allocation of national resources." It is recognized that acceptance of any change in the presentation of the budget would take time but that Congress might more effectively deal in the future with research and development budgets broken down to separate the technology base, mission aggregates which collect exploration of new systems, and full-scale developments by mission.