NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FULL COST INITIATIVE

AGENCYWIDE

IMPLEMENTATION GUIDE

February 1999

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Acronyms

CDDF	Center Director's Discretionary Fund
CFO	Chief Financial Officer
CofF	Construction of Facilities
CPO	Consolidated Payroll Office
C/S	Civil Service
CSRS	Civil Service Retirement System
DoD	Department of Defense
FERS	Federal Employees Retirement System
FTE	Full-Time Equivalent
FTR	Functional Technical Representative
G&A	General and Administrative
GPRA	Government Performance and Results Act
HEDS	Human Exploration and Development of Space
HIT	Health Insurance Tax
IFMP	Integrated Financial Management Project
IPO	Institutional Program Office
IR&D	Independent Research and Development
JSC	Johnson Space Center
L&FB	Leave and Fringe Benefits
MPS	Multi-Program Support
MSFC	Marshall Space Flight Center
NACC	NASA ADP Consolidation Center
NASA	National Aeronautics and Space Administration
NOA	New Obligation Authority
OMB	Office of Management and Budget
OSMA	Office of Safety and Mission Assurance
PMS	Program Mission Support
POP	Program Operating Plan
R&D	Research and Development
ROS	Research Operations Support
R&PM	Research and Program Management

SAT	Science, Aerospace, and Technology
SCS	Space Communication Services
SMA	Safety and Mission Assurance
SR&QA	Safety, Reliability and Quality Assurance
SOMO	Space Operations Management Office
TSP	Thrift Savings Plan
UPN	Unique Project Number
ViTS	Video Teleconference

EXECUTIVE SUMMARY

The National Aeronautics and Space Administration (NASA) plans to implement new full cost practices during the next few years to improve the cost effectiveness of mission performance. This initiative includes policy and practice improvements in the accounting, budgeting, and management areas and is expected to provide complete cost information for more fully informed decision making. NASA plans to associate all Agency costs (including Civil Service personnel costs) with major projects and to budget, account, report, and manage these activities from a full cost perspective.

NASA's "full cost" initiative integrates several fundamental accounting, budgeting, and management improvements. The planned improvements include: accounting for costs as direct, service, and general and administrative (G&A) costs, budgeting for full project costs, and managing such projects from a full cost perspective. Briefly stated, direct costs are costs that can be obviously and/or physically linked to a particular project, service costs are costs that cannot be readily or immediately linked to a project but can subsequently be traced to a project, and G&A costs are support costs that cannot be linked to any specific project in an economical manner. Under full cost practices, service costs will be "charged" or assigned to a project based on project-controlled use of, or plans for the use of, the service; and G&A costs will be allocated to projects in a consistent, logical manner based on a metric that indirectly relates G&A costs to projects.

All costs will continue to be controlled and managed within NASA. Under full cost management, however, project managers, who have the most direct mission responsibility and intimate project knowledge are expected to continue to control direct costs but also are expected to have greater control/influence over service and G&A costs. Such control/influence is not unconstrained. At the same time, Enterprise and Center management is expected to continue to guide Center capabilities consistent with strategic imperatives.

NASA's full cost initiative also will support "full disclosure" related to NASA activities and will improve matching of costs with performance. In that regard, this initiative is also consistent with sound business practice and recent legal and administrative guidance, including the 1990 Chief Financial Officers Act, 1993 Government Performance and Results Act, 1993 National Performance Review, 1995 NASA Zero Base Review, and 1996 Federal Financial Management Improvement Act.

Background

NASA initiated its full cost effort in 1995 in response to direction from the Administrator, emerging Federal cost accounting standards, and evolving management information requirements. This initiative has been managed by a team that included Headquarters and Center managers with support from public accounting and academic experts. The initiative has been pursued in phases: (1) Concept Phase (1995), (2) System Requirements Phase (1995/6), (3) Prototype Phase (1996), (4) Agencywide Test Phases (1997/9), (5) Implementation Phase (1999/0) and (6) Operational Phase (2001).

Progress

During 1995, the full cost team visited with industry representatives and other Federal agencies and developed a concept and approach for implementation of full cost practices. This concept and approach were reviewed by Senior Management and approved by the Administrator in early 1996, thus completing the concept phase.

During early 1996, NASA also completed the System Requirements Phase. The full cost team identified basic cost accounting, budget and management requirements to support the full cost initiative. These requirements were integrated into the ongoing Integrated Financial Management Project (IFMP) in early 1996. (The IFMP is a system initiative designed to acquire and implement an integrated system to support critical Agency information requirements, including full cost practices.)

Also during 1996, a reconstituted full cost team directed ongoing prototype testing activities, which involved evaluating the full cost concept and approach at three Centers and at Headquarters. To achieve the objectives of the prototype test, each of the four prototype locations recast its FY 1995 cost data into a full-cost format. This activity demonstrated analytically using cost finding techniques those full-cost practices could be implemented in NASA. It was also clearly demonstrated that current systems cannot support full-cost practices efficiently and that the IFMP system is a prerequisite for implementing operational full cost practices across the agency.

The interval between completion of the prototype phase and the implementation of the IFMP system provides an opportunity for testing full cost budgeting and accounting at all Centers. In the first year (1997) of the Agencywide test phase, efforts were focused on (1) testing full-cost budgeting by recasting the FY 1999 budget into a full cost format; (2) testing full-cost accounting by applying cost finding techniques to six months of FY 1997 accounting data to determine program/project costs; and (3) identifying issues which needed to be resolved before full cost implementation. During the second year (1998) of the Agencywide Test Phase, NASA continued to refine full cost practices and developed estimated agencywide full cost accounting statements using refined cost funding techniques. These statements are required for external financial reporting and have been audited by NASA's Independent Public Accountant.

In September 1998 NASA undertook a full cost management/budget simulation to specify key management issues that must be finalized to support the effective integration of new standard full cost practices into key agency management processes and practices. The purpose of this simulation was to continue NASA's ongoing training in full cost concepts by specifically "training" NASA Executives and Managers in both full cost budgeting as well as in full cost management practices.

The management/budget simulation involved Centers applying full cost concepts/ principles to the FY 2000 budget as submitted to the Office of Management and Budget and creating a full cost FY 2000 budget. The simulation also took into account other NASA activities related to facilities and human resources planning. The results of the

simulation were presented to the Capital Investment Council that reaffirmed NASA's commitment to implement full cost practices in FY 2001.

Plans

During 1999 and 2000, NASA plans to implement IFMP to support implementation of full cost management, budgeting, and accounting practices. During late 2000 and 2001 (Fiscal Year 2001) NASA plans to operate in a full cost mode. The targeted FY 2001 operation is contingent upon the timely implementation of the required IFMP system and the attainment of certain prerequisite budget/appropriations flexibilities that are required to support timely, effective, efficient, and safe operations in a full cost environment. (See subsequent sections for additional details.)

The full-cost initiative has evolved considerably during the preceding phases as issues arose, alternative approaches were developed and evaluated, and solutions were chosen. Similarly, full-cost concepts and practices are expected to evolve during the remainder of the Agencywide test and during the subsequent implementation phase. This document, hereinafter referred to as the "Guide", provides guidance for Agencywide testing and implementation of full cost practices during the next phases. In-depth reviews of test results and lessons learned will be conducted at periodic intervals during subsequent activities. The Guide will be updated as required and subsequently will be modified to serve as a reference source for full cost operations as part of the NASA Financial Management Manual.

1.0 Introduction and Implementation Overview

This chapter provides a general explanation of NASA's "full cost" initiative and its implementation across the Agency.

NASA's full cost initiative consists of three parts, namely, managing, budgeting, and accounting on a full cost basis. Accounting and budgeting support the basic management decision-making process **(see Figure 1).** The overall objective of the Full Cost Initiative is to improve the way NASA achieves its mission by implementing new, improved management, budgeting, and accounting policies, practices, and procedures.

1.1 General Overview

In its simplest terms, the concept of full cost ties all Agency costs (including Civil Service personnel costs) to major activities. There are no "free" resources. All costs must be associated with an activity, commonly referred to as a cost objective. Based upon experience gained in the Prototype Phase of the full cost initiative, NASA plans to use "projects" as cost objectives for managing, budgeting, and accounting. In the context of NASA's Full Cost Initiative and hereafter in this document, a project refers to any activity specified within the Project Level in the Full Cost budget structure. (See related Appendix for details.)

NASA plans to manage, budget, and account for costs on a project basis. In contrast to the current approach in which Civil Service personnel costs and certain other costs of an institutional nature are not tied to projects, under the full cost approach all costs will be associated with projects. No costs will be "left over".

While costs may be categorized in many ways, NASA's full cost approach separates costs into three categories:

- **Direct Costs** – Direct costs are costs that are obviously and physically related to a project at the time they are incurred and are subject to the influence of the project manager. Examples of direct costs include contractor-supplied hardware and project labor, whether provided by Civil Service or contractor employees.

- **Service Costs** – Service costs are costs that cannot be specifically and immediately identified to a project, but can subsequently be traced or linked to a project and are assigned based on usage or consumption. Examples of service costs include automatic data processing and fabrication.

- **General and Administrative** (**G&A) Costs** – G&A costs are costs that cannot be related or traced to a specific project, but benefit all activities. Such costs are allocated to a project based on a reasonable, consistent

FULL COST INITIATIVE

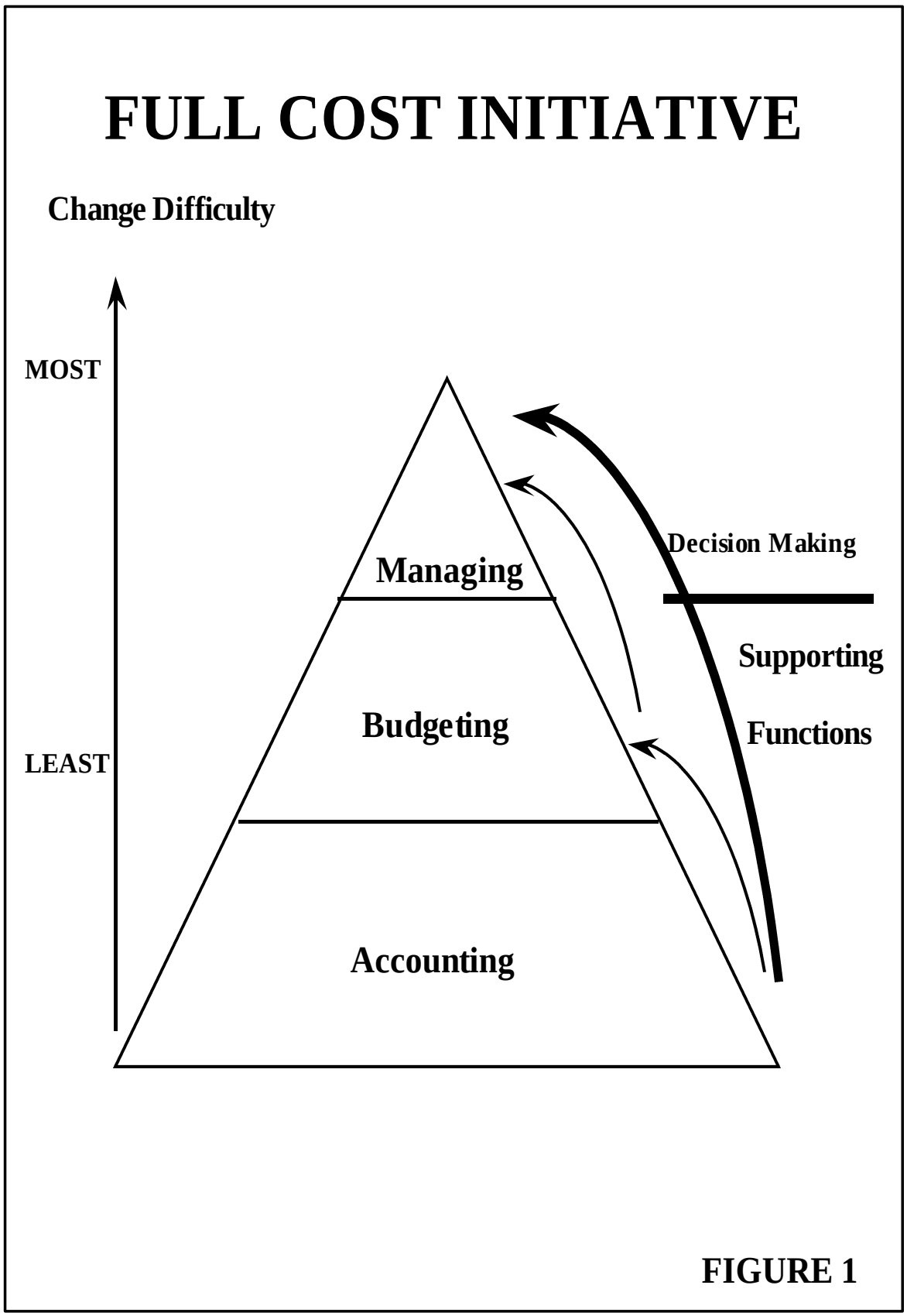


FIGURE 1

basis. Examples of G&A costs include costs associated with financial management, procurement, security, and legal activities.

The full cost of a project is the sum of all direct costs, service costs, and G&A costs associated with the project.

Because service and G&A costs, by definition, cannot be immediately and directly identified with a specific project, service activity costs and G&A cost pools will be used to accumulate costs of similar purpose. Several methodologies will be used to distribute costs to projects. In the case of service costs, usage or consumption data will be used to assign costs to a benefiting project. Center G&A costs will be allocated to projects based on project-direct labor (Civil Service and on-site contractor workforce).

The different categories of costs, the number and content of service activities, and the content of G&A pools are defined in the Appendices and discussed in detail in Chapters 3 and 4.

1.2 Purpose of Full Cost Initiative

The overall objective of the full cost initiative is to enhance cost-effective mission performance by modifying the way NASA does business so that managers are provided with information which supports better plans and decisions. Currently, costs directly related to programs and projects, Civil Service personnel and infrastructure, are managed, budgeted, and accounted for separately. These costs are not routinely combined in a systematic fashion to arrive at the total resources consumed in the successful completion of a project. Moreover, there is considerable variance in the extent to which project managers control different types of costs. Project managers have considerable control over project costs such as contractor-supplied hardware and contractor labor. Project managers have a measure of control, or at least some influence, over the number and type of Civil Service personnel assigned to their projects, but they do not have control, nor are they often aware of, the cost of assigned personnel. Project managers typically have virtually no control over, nor any data on, G&A and institutional infrastructure costs related to their projects.

As discussed in detail in Chapter 2, under NASA's new full cost practices, project managers must assume a new role as they strive to manage or influence the total costs of their projects. Full cost management supports more control by Enterprises, program managers, and project managers over costs related to their activities. However, the use of full cost management, budgeting, and accounting does not, in and of itself, change the infrastructure; rather, it more clearly discloses infrastructure costs, and their relationship to projects, while facilitating the decision-making process. Such disclosures and refined decision-making processes, over time, can and should lead to project and mission cost efficiencies, including service and G&A “infrastructure” efficiencies.

A number of benefits can be expected from the use of full cost information for management purposes. These benefits include:

- Improved, cost effective, mission performance, through the use of better information for plans, decisions, and disclosure;

- Strengthened ties between NASA's missions, its programs and projects, and its budget requests;

- Obtaining maximum program content within constrained budgets;

- Providing an effective tool for project managers to better manage;

- Consistency and compliance with sound business practice;

- Compliance with recent legislative and administrative guidance, including the Chief Financial Officers Act, the Government Performance and Results Act, Federal Financial Management Improvement Act of 1996, the National Performance Review, and NASA's Zero Base Review.

1.3 Full Cost Initiative Phases

Operations under full cost practices are targeted for October 1, 2000. This target is contingent upon a variety of activities, most important of which is the completion of the Integrated Financial Management Project (IFMP). This project, also scheduled for a related key implementation milestone on October 1, 2000, is designed to include accounting and budgeting system capabilities which will support NASA's new full cost practices.

1.3.1. Agencywide Implementation Plan

The work required for complete full cost implementation has been divided into the following phases:

- Concept Phase (Fiscal Year 1995)
- System Requirements Phase (Fiscal Years 1995/1996)
- Prototype Phase (Fiscal Year 1996)
- Agencywide Test Phase-1 (Fiscal Year 1997)
- Agencywide Test Phase-2 (Fiscal Year 1998)

  Agencywide Test Phase-3 (Fiscal Year 1999)
- Implementation Phase 1 (Fiscal Year 1999)

  Implementation Phase 2 (Fiscal Year 2000)
- Operational Phase (Fiscal Year 2001)

The Concept, System Requirements, Prototype Phases and the second year of the Agencywide Test Phase were completed as of September 30, 1998. Results achieved in these phases included:

- Development of an approved concept and approach for full costing;
- Identification of the basic full costing requirements to be satisfied by IFMP;
- Development and testing of full cost management, budgeting, and accounting models at four prototype locations: (Goddard Space Flight Center, Lewis Research Center, Marshall Space Flight Center, and Headquarters);
- Development of NASA's Full Cost Initiative Agencywide Test Implementation Guide for use in the Agencywide Test Phase;
- Introduction of Full Cost Budgeting (for FY 1999) across the Agency;
- Introduction of full “cost finding” accounting Agencywide; and

- Simulation of full cost budgets and related management practices agencywide.

The history and status of the full cost project is discussed in more detail in **Appendix 2**. The remainder of this chapter focuses on the Agencywide Test Phases of the full cost implementation effort.

1.4 Agencywide Test Strategy

The overall test strategy is based on lessons learned in the previous phases of the full cost effort.

The overall approach to Agencywide testing of full costing is based on the following factors:

- Current systems cannot support full cost budgeting and accounting. IFMP must be operational in order for NASA to fully and efficiently operate under full cost practices. Because IFMP will not be operational until October 1, 2000, NASA has available a multi-year period to test full cost management concepts, budgeting, and accounting across the Agency before it becomes operational.

- On October 1, 2000, NASA plans to begin systematically accounting on a full cost basis. For funds control and related purposes, the FY 2001 budget must also be on a full cost basis. For this reason, the multi-year test is expected to be more than an exercise in that the budget for FY 2001 will have been developed on a full cost basis.

- In the absence of IFMP, testing of full cost budgeting and accounting will be based on cost finding, a proven technique which produces satisfactory results, but which often encounters problems with timely data production, and, therefore, is not satisfactory for operational purposes across NASA.

In the first two years of the Agencywide test phase, the efforts of Centers and Headquarters were focused on (1) testing full-cost budgeting by recasting the FY 1999 Budget into a full-cost format; (2) testing full-cost accounting by applying cost finding techniques to six months of FY 1997 accounting data and to the entire FY 1997 to determine program/project full costs; and (3) identifying issues which need to be resolved before full cost implementation.

The initial testing activities demonstrated the need for additional development work regarding service activities and G&A pools. In the second year planned full cost practices were reevaluated in light of recently disclosed IFMP system capabilities. In that regard, NASA continued to evaluate mechanisms needed to capture consumption data and to link consumption and cost data in order to develop cost per unit of service consumed. Relative to G&A pools, there is a need to develop approaches for obtaining

FTE data for on-site direct civil service and contractor personnel to serve as the basis for G&A cost distribution.

In addition to developing solutions to these issues, future testing is expected to continue to focus on implementation of full cost accounting and budgeting as a integral part of the IFMP implementation effort and on facilitating training of financial management personnel and data recipients such as project managers and general managers.

1.5 Implementation Steps and Schedule

Key dates related to continuance of the Agencywide test in FY 1999 include:

- Guidelines issued for Agency's FY 2000 Full Cost Budget Simulation — Oct. 1998
- Evaluation of NASA's Full Cost Management/Budget Simulation — Dec 1998
- Guidelines issued for Agency's FY 2001 Budget Formulation — Mar. 1999
- FY 1998 accounting data in full cost format (derived by cost finding) — Feb. 1999
- Initial Center FY 2001 POP Full Cost Budget submissions — May 1999
- Revised Center FY 2001 POP Full Cost Budget submissions — June 1999
- Enterprise/Program Office Full Cost Budget submissions to Code B — July 1999

1.6 Policy and Related Requirements

This Guide serves as the basic policy document for the Agencywide test and implementation phases of the full cost initiative. Upon completion of testing, the Guide will be modified to reflect final policy on full cost. Final full cost accounting policy and procedures will be published in the NASA Financial Management Manual.

2.0 Managing in the Full Cost Environment

NASA plans to implement full cost management to improve (1) decision making and management in support of NASA missions, (2) program budgeting and justification, and (3) understanding of project and program costs. This chapter outlines the basic management elements of NASA 's full cost initiative and the related roles and responsibilities for full cost management in NASA.

Simply stated, NASA's concept of full cost management empowers program and project managers to use cost information to make informed decisions regarding resources management to optimize cost effective mission performance **(See Figure 2)**. The concept also anticipates a balancing of project-specific mission performance with Center, Enterprise, and functional requirements and capabilities for long-term institutional health.

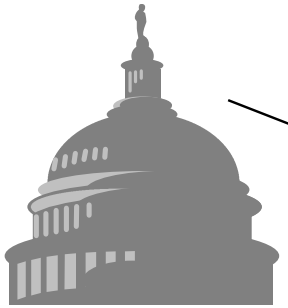
Effective implementation will enable management to better understand the full cost of NASA's projects, including the related institutional support. This will help justify program and project budget requirements for the Agency. Institutional funding requirements will be included in the budget for each program and project. Budget estimates for a given project will be subdivided into direct, service, or G&A costs. In that regard, program and project managers will use full cost accounting and budget information to improve project control, accountability, and performance. NASA's full cost management concept is also consistent with NASA's evolving management structure and related Federal performance and streamlining initiatives.

2.1 Placing Responsibility for Funding at Point of Decision Making

The full cost concept is based on the tenet that the cost effectiveness of purchase and other decisions is improved when the actual customer of a produced item or service is given responsibility and authority to the extent possible, for choosing the source of that item or service, while being directly accountable for the use of the funds needed to make the purchase. In this way, the detailed knowledge of the customer regarding what he or she needs and can afford is linked to the decision process. Therefore, under the full cost concept, the cost of government-managed capabilities that could be assigned or assessed to a project will need to be reviewed with the responsible project managers, or individuals representing such managers, prior to key decisions and during cost pool/budget formulation. Prior to full cost, cases existed at NASA where these types of cost comparisons, prior to a purchase of an item or service, were not made. Services supplied by the government to a project were "chosen" because they were available at no visible cost to the project (use of the service was either funded by the Center from a separate institutional budget, or the project was already charged a fee for services based on a factor other than actual usage) and not as the result of a cost comparison of alternative suppliers. There were also cases where the cost of the government-managed services did not include the related Civil Service workforce and Center institutional costs, making the government-supplied service look cheaper than a non-government source, even though it wasn't.

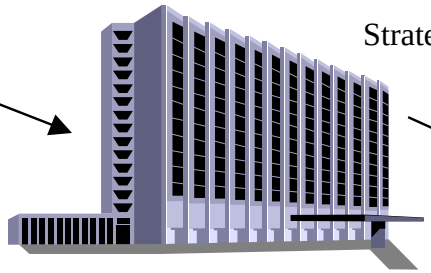
Management

Congress



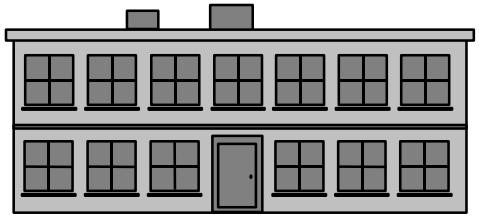
Guidance

NASA Headquarters



Strategic Guidance

Center Management

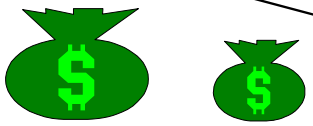


Agency “Corporate” G&A Pool

Center G&A Pool

Strategic ProgramGuidance

Program Manager

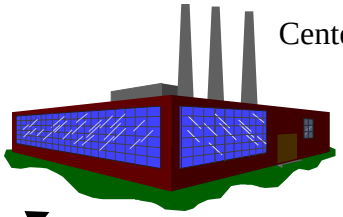


ProgramBudget

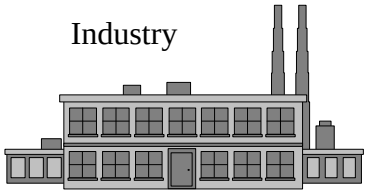
Project Manager

Agency & Center G&A

S E R V I C E P O O L S

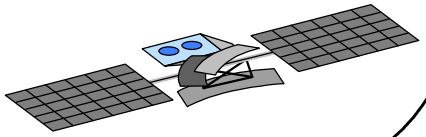


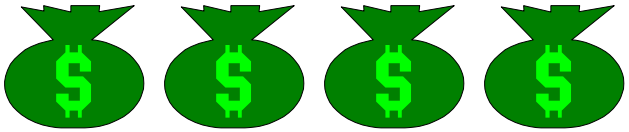
Center



Industry

Product





= $14Billion

Agency Budget

2.2 Increased Association of Institutional Costs with NASA Projects

The full cost concept increases the relationship or linkage between suppliers and customers' demand. Services that are not in demand by customers may indicate unnecessary institutional capabilities and or capabilities that are better supplied by non-governmental sources rather than a government-maintained source. Such decisions could help streamline institution capabilities the government has typically managed in favor of lower cost alternatives from outside the government. Using this approach can also increase credibility in NASA's budget submissions, since OMB and Congressional sources would know that a process to increase the cost effectiveness of decision making for NASA's projects and institutions was employed, and that there was a greater probability that a programmatic need could be demonstrated for institutional services maintained by the government.

2.3 NASA Management Framework

The full cost management concept is consistent with emerging NASA management roles, responsibilities, and organizational structures as described in the "NASA Strategic Management Handbook." The basic evolving framework includes Agency, Enterprise, Center, and program and project management (**See Figure 3**). Agency and Enterprise management occurs primarily at Headquarters; Center and program and project management occur primarily at Centers.

Headquarters (in this context, Agency and Enterprise management) is primarily "policy-making" in nature. Its responsibilities include Agency stewardship, management across Enterprises, and establishment of Agency strategies; including planning (the "what," "why," and "for whom" of NASA activities). Headquarters also serves as the principal interface with NASA stakeholders, including the Administration and Congress.

Centers are responsible for implementing NASA plans and activities. Their responsibilities include program and project management (determining how programs and projects are accomplished), institutional infrastructure (maintaining and enhancing human and physical resources and capabilities), and Agencywide leadership in key designated areas as Centers of Excellence. NASA's emerging management structure is detailed in the NASA Strategic Management Handbook.

Figure 3

FULL COST MANAGEMENT STRUCTURE

PERFORMING ENTERPRISE/IPO	ALL CENTERS	LEAD CENTERS	PROGRAMS	PROJECTS	CENTERS
Lead Business Lines and Guide Center Capabilities Allocate Resources for the Full Cost of each Program Approve Center Service and G&A Budgets	Center Director Lead Programs and Manage Center, including Center Core Capabilities	Full Program Management Responsibility/ and Authority	Program Manager Manages Program	Project Manager Manages Project	Carryout Assigned Program/ Project Responsibilities

1. The Office of the Administrator provides overall strategic direction for the Agency. This guidance provides the programmatic goals for the Agency through the established Enterprise Offices.
2. The Office of Headquarters Operations serves as the Center Director and support for the overall Headquarters organization.
3. Enterprise Offices, identified for each of NASA's primary missions, develop, approve, and promote programs to fulfill the goals and objectives of the NASA Strategic Plan. The Enterprise Offices issue policy and guidance to the Centers, which are responsible for program implementation. Enterprise Offices also include an Institutional Program Office (IPO) role. The IPO focuses on Center institutional matters and performs an integration and coordination function where a Center supports multiple Enterprises.
4. Functional Offices are required for overall legal, administration, and management compliance. They provide necessary policy guidance and support to help the Agency operate effectively within legal and regulatory constraints.

2.3.1 Headquarters Structure

NASA's full cost Initiative will have significant impact on Headquarters' management processes. Headquarters can be viewed as four basic groups: (1) the Administrator and immediate staff, (2) the Office of Headquarters Operations, (3) the Enterprise Offices, and (4) the Functional Offices.

2.4 Full Cost Management at Headquarters

NASA's full cost concept treats NASA Headquarters like the private sector treats its company headquarters activities. A company's Headquarters activities are typically treated as general and administrative (G&A) costs. In a similar manner, most NASA Headquarters activities will be treated as G&A activities and budgeted, accounted for, and managed as such. (Certain limited activities that occur at Headquarters involve

programmatic activities and such activities, if material may retain their program direct cost classification.)

The costs of many Headquarters activities, such as the Administrator and his immediate staff, Enterprise management, Headquarters Operations management and Functional management, except for certain service activities that may be required, will be managed through a Corporate G&A pool. This pool will be coordinated by the Headquarters "Center" Director, the Associate Administrator (AA) for Headquarters Operations. It will be justified by the included Headquarters organizations through the annual budget process, including the Capital Investment Council, as required, and approved by the NASA Deputy Administrator. Corporate G&A costs will be allocated to NASA projects through a reasonable and consistent basis. **(see Chapter 3 for details).**

2.5 Management of Agencywide Services

Management streamlining and consolidation efforts within the past several years have resulted in a number of services being provided across the Agency by a single provider. These services are both institutional and technical in nature. Examples of current institutional services include the NASA ADP Consolidation Center (NACC) and the Consolidated Payroll Office (CPO), both housed and managed by personnel at the Marshall Space Flight Center (MSFC). Each provides service to all Centers. While these services are housed and technically managed at one Center, the function they represent is sponsored by a designated Functional Office at Headquarters. The Office of the Chief Information Officer is functionally responsible for the NACC and the Office of the Chief Financial Officer is functionally responsible for the CPO.

Funding for Agencywide services such as the NACC may be provided through Agency-level service activities. Projects will be charged an appropriate amount based upon the cost of services requested/ received. For efficiency, certain small dollar service activities, like the CPO, may be included in the Corporate G&A pool and allocated to all NASA projects.

Technical services may be provided to multiple projects that reside within several Enterprises. As an example, the Space Operations Management Office (SOMO), centrally managed at Johnson Space Center (JSC), will provide services via a single, integrated contractor to a host of users.

- The services that are provided to the individual program/projects are expected to be determined via formal customer service agreements.
- The cost of the services is expected to be determined by SOMO and the Human Exploration and Development of Space (HEDS) Enterprise with customer concurrence.

Other Agencywide services are also expected to be managed by designated Centers. For example, NASA is currently pursuing a consolidation of supercomputer management at one Center. These and other Agency-level services are expected to

evolve. Such services will be evaluated as likely candidates for Agency-level service pool approaches.

2.6 Management Roles at NASA Centers

Centers are responsible for providing management and technical capabilities necessary to fulfill the objectives of the NASA Strategic Plan. The focus of the Center is product oriented; for example, developing a technical expertise, spacecraft, research effort, or tracking capability.

Figure 4

FULL COST MANAGEMENT ROLES
ELEMENT OF COST

POSITION/ ORGANIZATION	TOTAL COST	DIRECT	SERVICE POOL	G&A	CAPITAL INVESTMENT
CIC	Balance Between Enterprises			Approve Corporate G&A	Establish Priorities, Cross-Cut Requirements
ENTERPRISE AA	Balance Between Programs		Concur w/IPO	Concur w/IPO	Concur w/IPO Ctr Total, Direct Fund Activities
ENTERPRISE/IPO			Validate Requirements, Concur on Rates w/Center Director	Approval Pool	Approve Total, Establish Cross Center Priorities
LEAD CENTER DIRECTOR	Approve Program Budget				
PROGRAM MANAGER	Propose Program Budget, Trade-off Between Projects				
PERFORM CENTER DIRECTOR	Approve Project Budget	Allocate Center Resources	Establish Policy, Approve Rates	Establish Policy, Approval Total	Propose Activities and Priorities
PROJECT MANAGER	Propose Project Budget, Trade Cost/ Requirements	Negotiate Cost, Schedule Requirements w/In and Outside Center	Establish Requirements, Trade Cost w/ Requirements	Fund Per Policy	Identify Needs
SERVICE POOL MANAGER			Manage Pool, Propose Rates, Sourcing		Propose Activities w/In and Outside Pool
G&A MANAGER				Manage Pool, Prioritize Requirements	Propose Activities w/In and Outside Pool

Program and project management processes at NASA Centers will be adapted to maximize the benefits of full cost management. Full cost management will affect all management activities, including approval, decision making, and advisory functions **(See Figure 4).** The identification of all costs related to the accomplishment of project goals, including institutional support and civil service, will provide management with an accurate comparison between competing options and a better understanding of the true cost of project activities. This improved insight will facilitate cost-effective decision-making and provide a better defense for Agency projects, programs and institutional infrastructure.

The objectives of the Strategic Plan are fulfilled through a collection of program efforts, each of which is comprised of numerous project efforts. For the full cost concept, the definition of program vs. project is important. The proper structuring of projects within program efforts will help provide some of the flexibility needed to lessen the impact of potential agency budget reductions. The structuring of projects and programs will also help define the appropriate level of budget control at each management level and the reasonable level to which the three elements of cost should be tracked. The program/project structure is also an important part of the budget formulation process, since the program budget now reflects institutional funding for not only projects, but the associated Centers and Corporate G&A as well. Program managers will ensure the effective integration of all costs in the achievement of an overall objective, while project managers ensure delivery of the specific products needed to achieve those objectives.

Management functions at NASA Centers are performed by lead Center directors, program managers, performing Center directors, and project managers. Each of these management levels is responsible for the classic duties of planning, organizing, executing, and reporting. Incorporation of full cost management concepts will affect the basis and methodology of decision making.

Each Center should develop and implement the necessary organizational mechanisms to assist the Center Director and Center CFO in providing guidance and oversight for service and G&A pool activities. A manager may be required for each service activity and the G&A pool. In the case of the Center G&A pool, participation by Center functional managers in budgeting and cost monitoring is particularly important because the G&A pool will be the mechanism by which most Center functional activities will be funded. The Center Director may appoint an oversight organization of high level managers which can, among other things, review the rates proposed by service and G&A pool managers and, after their questions and concerns are adequately addressed, recommend the proposed rates for approval by the Center Director and subsequent approval by Enterprise/IPO's as necessary. Further, the pool oversight organization should also monitor pool cost performance and review pool managers' explanation of variances from budget.

2.6.1 Center Management

With few exceptions (certain research program decision-making), program offices and program management responsibilities have been transferred from Headquarters to Centers, many with related lead-Center designation. In that regard, program management responsibilities will be conducted at the Lead Center. These responsibilities include ensuring that project-funding requests are appropriately integrated into the program budget request. The focus of the Lead Center and the corresponding program manager will be on total budget levels proposed for all projects that comprise a program.

Management of multi-Center programs is the responsibility of Lead Center Directors. Consistent with Agency guidance, such management is carried out through designated program managers. These program managers are charged with overall program management and integration, policy, goals, organization, and budgets. Under full cost management, program budgets and cost accounting reports will include the applicable service and G&A costs from Agency, Headquarters-level and Center-level activities in addition to direct program civil service and contractor costs. Lead Center Directors and assigned program managers are responsible for formulation of guidelines and submissions for all programs under their cognizance. However, to avoid any conflict of interest at the Centers where institutional and programmatic responsibilities exist concurrently, potential issues concerning service activity or G&A budgets from participating Centers may be referred to the appropriate Enterprise.

Lead Center Director

Cost Category	**Activity**
Direct	- Approves program budgets, including FTE levels, by Center, for submission to Enterprise
Service	- Presents issues to Enterprise
G&A	- Presents issues to Enterprise

Center Directors are responsible for the management of all activities resident at their Center. This includes the provision of personnel and facilities necessary to implement programs as well as the review and approval of all programs unique to that Center (i.e., non-Lead Center programs). Each Center Director is charged with the efficient operation of the infrastructure. In this capacity, he/she approves the content of Center service activities and G&A cost pool along with service activity distribution methods. Such contents and methods must be consistent with Agency guidance and approved by related Enterprise/IPO, as necessary.

Assisting the Center Director in these tasks are program, project, and Center functional managers who implement, on a daily basis, the detailed tasks that result in the provision of institutional services, technical expertise, and delivery of products that are essential to program goals. Therefore, in accomplishing these tasks, the Center Director authorizes program resources to the appropriate managers so that they can

exercise their expertise and judgment in helping the Center Director implement programs.

Center Director

Cost Category	Activity
Direct	- Approves non-Lead Center budgets for submission to Lead Centers & Enterprise & Center FTE usage for submission to Enterprise
Service	- Approves Service cost levels and cost assignment method (Approach must be consistent with Agency/Enterprise guidance)
G&A	- Approves G&A Pool levels (Approach must be consistent with Agency Enterprise guidance)

2.6.2 Associate/Performing Center

In accordance with the lead Center concept, program managers may interact with their project managers who resides at a different associate/performing Center. Project managers will have the responsibility for ensuring that the proposed project budget appropriately reflects the estimated direct costs and the Center-level service and G&A costs. It is especially important that the full cost of these project efforts be considered since the project budget request will be integrated into a program budget request. Similarly, the program manager has a responsibility to ensure that the project effort is sufficiently funded.

2.6.3 Lead Center vs. Associate/Performing Center Roles

Under full cost management, institutional and programmatic responsibilities at Centers will be linked closer together. Institutional decisions will be made only in the context of the fulfillment of program goals. Projects will rely upon program offices at various Centers for their budget and appropriate funding levels. Such interdependencies are likely to lead to potential conflict of interest.

Considerations for Associate/Performing Centers in regard to the formulation of budget requirements and the determination of fund distribution include the following:

- Funds for projects and supporting service organizations will be distributed in accordance with the approved annual operating plan.
- Project budgets are to be submitted identifying direct, service, and Center G&A estimates to the program office. Projects are responsible for providing realistic obligation and cost plans.
- The program office will be responsible for approving the project level annual operating plans along with the appropriate funding levels for the projects and their associated Centers.
- Issues concerning service or G&A charges that cannot be resolved through discussions with the Lead Center will be referred to the appropriate Enterprise.

2.6.4 Program Manager

The program manager's responsibilities include integrating all project efforts that pursue the program goal, which has been defined by the Enterprise. Total program cost is the primary focus for NASA's management, budget development and submission, and for identifying all funding requirements.

The program manager develops the mechanism for achieving the Agency's goals, including specification of the end-item products and services for NASA's customers. The program represents the lowest practical level that NASA may identify in the official NASA budget submission to Congress. Program budgets will display all cost elements, including contracted effort, Civil Service staff, service activity support, and G&A. (NASA is continuing to evaluate alternate higher level accumulations of programs as potential external full cost budget structures.)

Program manager responsibilities include: (1) the program's organizational structure, including identification of specific projects, (2) development of the work breakdown structure, (3) selection and oversight of contracted activities, and (4) definition of requirements for all project resources. Under full cost management, the program manager must plan and review all program costs. In formulating the budget, he or she reviews and approves an integrated program submission composed of the various projects. Each program will be reviewed from a full cost perspective; complete with contracted effort, Civil Service, service activity costs, and G&A costs.

The program manager will oversee technical progress, schedule, and cost performance in order to maximize output. When resource redistribution is required, the program manager is authorized to adjust project-operating plans as necessary. Such redistributions must be appropriately integrated and reconciled with related Center constraints. This integration must be a collaborative effort involving the related Center Director staffs to ensure that adequate funding is available at each Center. Revisions in service activities will be reflected in the reported actual costs.

Program Manager

Cost Category	**Activity**
Direct	- Develops/recommends program budgets & FTE levels with Center Director
Service	- Includes costs for projects in program budget. Defines requirements for program office
G&A	- Includes costs from projects, Headquarters & Centers in program budget

Integration of Project Funding Requirements and Agency/Headquarters G&A Requirements

– The program manager is responsible for the development of the total program budget including integration of multiple project budgets with all three categories of

costs, including the program's share of the Agency/Headquarters G&A. For the program manager, the greatest control is over "direct" program funds, with least control over G&A funds. It is important that integration of all these costs occur at the program level. The program manager will be required to support the full cost of the program budget, including all associated service activity costs and G&A costs.

Program Manager's Responsibility for Mitigating Impact of Budget Reductions

– The program manager will also help mitigate the possible impact of budget adjustments that occur when appropriated funding levels do not match the original budget request using the flexibility that exists within the full cost program/project budget structure. Institutional funding requirements are often less flexible than programmatic requirements. The ability to redistribute funds among project efforts may be the best method for mitigating the immediate impact on institutional capabilities when a particular Project's funding level is reduced or eliminated. Therefore, the program manager will be responsible for the redistribution of resources among projects that occur as budget levels are readjusted.

Determining the Cost-effective Workforce Mix

– Within the approved personnel guidelines and practices for NASA and with the help of the appropriate financial and personnel organizations at the Centers, it is the responsibility of the program manager to find the most cost-effective mix of contractor and/or Civil Service technical and expert workforce that works at the program level. Such responsibility requires detailed program knowledge linked with the related responsibility for program funds. This activity may be limited to the scope of the immediate program office activity in that the workforce for the project effort is expected to be the responsibility of the project manager.

2.6.5 Project Manager

The project manager is the central figure in day-to-day full cost management. The lowest level of full cost planning, accounting, and reporting is expected typically to be the project. The project manager will determine the level of support required from service activities and negotiate with service activity managers to establish the budget. G&A charges are allocated to the project and must be accommodated within the project's available budget.

The project manager defines project goals with a focus on deliverable products and services, and establishes the organization to accomplish the goals and ensure management accountability. A full cost budget must be developed for all project elements, including Civil Service labor costs, direct project contracted effort, other direct costs, support provided via service activities and, finally, all G&A costs.

Civil Service levels are estimated by Center representatives and by project personnel for the project. Organizations at implementing Centers develop their Civil Service

workforce estimates based on task agreements with the project office. The project manager is directly involved in all direct labor assigned/charged to his/her project. Such direct Full Time Equivalent (FTE) levels are either reviewed and approved or negotiated and revised by the project manager. When complete, the project office incorporates FTE cost using rates as provided by the Center Chief Financial Officer (CFO). The project manager is also interested in other labor costs charged to his project. With regard to service and G&A labor, the project managers' principle focus is on the total cost of the support being provided.

The project office is responsible for selection and management of project contracts. Full cost management should not change existing budget development and management processes for contracted effort and other direct costs.

Project managers also have a new role with respect to institutional support. Prior to full cost management, institutional services were provided to Center projects and budgeted separately. Under NASA's full cost concept, the level of these services will be requested and funded by the benefiting projects. Project managers will become vested participants in institutional activities and gain an improved understanding of the cost impact to Agency projects. The costs of these services become an integral part of the project's budget.

G&A costs for Corporate-level activities and Center functions are also included in the project budget. These costs are provided to the project manager by the Center CFO and added to the project budget. Disagreements concerning Agency-level G&A costs or allocations are an Corporate-level issue that must be addressed by the Associate Administrator for Headquarters Operations, the Agency CFO, and other Headquarters executives, as appropriate. Any disagreements concerning the Center G&A that cannot be resolved by the Center Director may be referred to the Enterprise or a related Center management council.

Project Manager

Cost Category	**Activity**
Direct	- Reviews and submits all contract requirements in budget to program manager & determines level of direct FTEs required & includes in project budget
Service	- Defines all requirements and negotiates service levels with Service Activity manager. Submits budget.
G&A	- Includes appropriate G&A charges in project budget.

Role In Detailed Selection of Providers of Goods And Services

The project manager is responsible, while integrating appropriate procurement practices, policies, and assistance, for deciding which "goods and services" and which providers are most appropriate for cost effective production of the final product. The project manager is responsible for managing all project funding.

The project manager has the greatest amount of control over “direct” items, with lesser, but fundamental, control over service cost requirements and minimal control over and limited influence on G&A costs. (The project manager’s control over direct civil service labor is not necessarily unconstrained and may be exercised within the existing constraints of Center workforce practices.) The project manager’s control over “service” costs is determined by the level of service the project manager requests from the service activity. Project managers' needs for services should be a critical factor in developing service activity capabilities.

Project Manager Requirements Used to Size Institutional Capabilities

- The input of the project manager in specifying the level of need for services from service activities is an important tenet of the full cost concept. User need is a means for defining the amount of institutional capabilities to be maintained at a Center. Institutional capabilities at a Center for which there are little, if any; project need should be carefully reviewed by Center management.
- There may be cases where Center management decides that certain in-house capabilities are required to be used due to quality or security concerns. Similarly, certain outside non-Government suppliers may also be designated for use to enable the Government to obtain lower costs through higher volumes of purchases for multiple project efforts. These considerations will be implemented in accordance with policies and approvals of procurement officials who will guide the project manager to ensure that the most cost-effective purchase decision is made.

Determining a Cost-effective Mix of Project Workforce

- Within approved personnel guidelines and practices for Headquarters and the Centers and with the help of the appropriate financial and personnel organizations at the Centers, it is the responsibility of the project manager to find the most cost-effective mix of contractor vs. civil service technical and expert workforce that works at the project level.

- The challenge in developing the full cost budget structure will be to organize project efforts within a program to allow adequate visibility for Congress and OMB, while providing adequate flexibility to deal with budget adjustments. This flexibility is especially important under the full cost concept, since changes to the institution (workforce and facilities) are much less flexible than program efforts, and changes to a program budget will have a simultaneous impact on programmatic and institutional funding.

2.7 Center Service Activity Management

Primary responsibility for the management and structure of service activities will reside with Centers. Each Center Director will determine the number of service activities, the content and funding levels of each activity, and the cost assignment method to be used for each activity, but such determination shall be made within Agency guidelines/

parameters. In that regard, Centers must obtain NASA CFO approval for their basic Center service activity structure, and in particular, any required service activities that differ from NASA's standard service pools/accounts and estimating bases. Center service activities/funding are also reviewed and approved by Enterprises/IPO's. Issues regarding the cost of Centers' service activities may be raised to higher management through the program and project review processes.

Service activity management has three main areas of responsibility: technical content oversight (including contract management), budgeting, and assignment of service activity costs.

Broad policy and procedural management responsibilities for some institutional functions may reside with other Center managers. These functional managers ensure Center compliance with applicable laws and regulations, establish internal procedures, which are consistent with Agency policies, and advise Center management on functional concerns. In cases where these responsibilities are separate from service activity management, both managing entities are expected to work closely on service activity processes.

While functions within each service activity are determined by Center management, support levels required from each service activity are determined through discussions between the service activity and project managers. Although this dialog is ongoing, the Centers are expected to formalize such discussions/agreements through the Program Operating Plan (POP) process.

During the POP process, project managers will negotiate with service activity managers to determine requirements for future support and the associated cost. This process may require some mediation, since project managers are weighing project milestones against infrastructure support requirements and capabilities, while service activity managers are attempting to recoup all costs required to maintain their activities' functional capabilities and to satisfy all project support requirements. (Note that the cost for many service activities also includes costs associated with civil servants performing service functions.) The Center Director will make final decisions on Center budget submissions for projects and service activities during the Center POP review process.

Cost assignment methods used for service activities are determined within the Center, consistent with Agency guidelines. Each method should result from measurements, which can be used to reasonably relate service use with costs. For example, costs should be assigned on the basis of direct usage (e.g., number of documents printed for a project). These methodologies will be used during the POP and operating plan negotiations, as well as to distribute actual costs to projects during an operating year.

2.7.1 Center Service Activity Budget Implementation

Abbreviated negotiations between project and service activity managers may occur at the beginning of each fiscal year, as short-term requirements are finalized and as

approved Agency appropriations are distributed to Centers. (If the Agency appropriation is not in place at the beginning of an operating year, budgets established within the last POP are expected to serve as interim operating plan levels.) Agency decisions to rephase a fiscal year's operating plan can also result in negotiations for mid-year adjustments to service support required by projects.

Throughout the operating year, service activity managers will monitor actual service costs against planning levels contained within the Center's operating plan. This includes regular analyses/reports of variances to the Center CFO. Periodic adjustments, if necessary, will be performed to redistribute savings or overruns to the projects.

Service activity managers are responsible for communicating the amount of, and reasons for, adjustments to project managers. These adjustments will be taken into account by service activity managers during any operating plan rephasing, and in development of future budget estimates.

2.7.2 Center Service Activity Funding

Funding for service activities is expected to be distributed directly to service activity managers. However, each project's actual cost reporting will include its assignment of actual service costs, along with direct costs and its allocation of G&A costs (addressed in the next section). Note that in addition to projects, service costs may also be assigned to other service activities and to G&A.

2.8 Center G&A Management

Responsibility for the management of Center G&A will reside with the Centers. Each Center Director will determine the content and funding levels of G&A, consistent with Agency CFO guidance and with the approval of Enterprise/IPO's. Program and project managers issues regarding the cost of Centers' G&A may be raised to higher levels of management through the program and project review processes.

G&A management have three main areas of responsibility: technical content oversight (including contract management), budgeting, and management of G&A costs.

Broad policy and procedural management responsibilities for some institutional functions may reside with other Center managers. These functional managers ensure Center compliance with applicable laws and regulations, establish internal procedures, which are consistent with Agency policies, and advise Center management on functional concerns. In cases where these responsibilities have been separated from G&A management, both managing entities are all expected to work closely on G&A support processes.

During the POP process, G&A management assess G&A levels required to support operations of the Center and to provide a basic infrastructure for resident projects. This assessment includes development of budget estimates (i.e., planning rates) for all

G&A functions. (Note that G&A estimates also include costs associated with civil servants performing G&A functions, and reflects any service costs assigned to G&A.) The G&A rate developed from these budget estimates are provided by the Center CFO to project managers for incorporation into their overall project budget planning.

During Center POP reviews, project managers may contest the G&A rate by questioning the appropriateness of G&A function support levels. The Center Director will consider these concerns as the proposed G&A budget level is reviewed. However, project managers must recognize that the Center Director possesses the final center-level decision-making authority on the Center G&A budget submission, which generates the G&A rate.

2.8.1 Center G&A Pool Budget Implementation

Adjustments to the G&A rate may occur at the beginning of each fiscal year, as short-term requirements are finalized and the approved Agency appropriation is allocated to Centers. (If an Agency appropriation is not in place at the beginning of an operating year, budgets established within the last POP are expected to serve as the interim operating plan levels.) Agency decisions to rephase a fiscal year's operating plan can also result in mid-year adjustments to the G&A rate.

Throughout the operating year, G&A managers will monitor actual G&A costs against the budget levels contained within the Center's operating plan. This includes regular explanations of variances to the Center CFO and/or Center management. Periodic adjustments, if necessary, may be performed to reallocate savings or overruns to projects. G&A managers are responsible for communicating the amount of and reasons for adjustments to project managers. These adjustments will be taken into account by G&A managers during operating plan rephasing, and in development of future budget estimates and G&A rates.

2.8.2 Center G&A Pool Funding

Funding for G&A will be distributed directly to G&A managers. However, each project's actual cost reporting will include its allocation of G&A costs, along with direct costs and assigned service costs. Note that G&A costs will normally only be allocated to projects. (In certain instances, certain Center G&A costs may be allocated to Agency-level functions that are being managed by designated Centers for the agency as a whole.)

2.9 Civil Service Management

All Civil Services (C/S) salary funding previously justified through a separate Mission Support appropriation will now be included in NASA program and project budgets. The full cost concept is based on the assumption that the cost-effectiveness of purchase decisions is improved when actual customers are given the responsibility and authority to choose the source of the service or skill, while being directly accountable for the cost. For example, services or skills that are not in demand may indicate capabilities that are not needed or better supplied by a non-governmental source. Under full cost, it is the responsibility of the program and project manager to find the most cost-effective mix of

contractor versus Civil Service workforce. Full cost planning will provide managers with the information needed for informed decisions concerning the use, cost, and skills of Civil Service effort.

C/S FTE and salary planning is expected to occur in an integrated manner. Although C/S manpower planning is part of the budget formulation process, communication between the programs and projects requiring C/S support and organizations providing it should be ongoing. By working in this manner, differences between C/S availability and requirements should surface and be resolved prior to submission of the budget. **(see Chapter 3)**

3.0 Budgeting in the Full Cost Environment

NASA plans to pursue full cost budgeting as an integral component of its full cost initiative. This Chapter provides additional/detailed information on full cost budgeting. Simply stated, full cost budgeting includes budgeting all direct, service, and G&A costs for each NASA project. Full cost budgeting also integrates Agency, Enterprise, and program budget structure changes related to funds control and oversight, such as the pursuit of a single appropriation and funding flexibilities.

3.1 Concept

The full cost budget concept integrates a single (or a few) NASA appropriation(s), Enterprise-level budget-line items, and program groupings of NASA projects -- NASA cost objects for full costing purposes. All costs are budgeted/linked to projects and NASA plans, manages, and controls funds based principally on a project perspective. Other functional and service-oriented budget perspectives are also anticipated.

3.1.1. Budget Model

The Agency plans to pursue a single appropriation structure under the full cost concept. **Figure 5** depicts the Agency's budget structure with four Enterprises under the full cost concept. The basic theory is that all costs will be budgeted against projects that are part of a program within an Enterprise. All Center costs will be associated with projects, including direct, service pools, and G&A. In addition, Agency, Headquarters and Enterprise (“Corporate”) G&A and any Agency-level service pools will be allocated or assigned as appropriate.

Figure 6 uses the HEDS Enterprise as an example at the program, project, and performing Center levels. Thus, using the example, Space Station Project B could have multiple Centers providing support to the project. Each Center's direct costs, service costs, and G&A costs will be included in Project B as well as a portion of Corporate G&A and use of any Agency service activities. The Lead Center has been purposely omitted from the chart since, in some cases, the lead Center is at the program level; in others it is at the project level.

3.1.2 Assumptions and Guidelines

The following assumptions and guidelines were developed during the Concept and Prototype Phases. They are intended to be general to allow for flexibility, yet specific enough in some cases to achieve consistency across the Agency.

3.1.2.1 Assumptions

Programs and projects will be "linkable" to the Agency's Strategic Plan.

The total cost of projects will be reflected in each Enterprise.

The transition to full cost will be budget neutral.

FIGURE 5

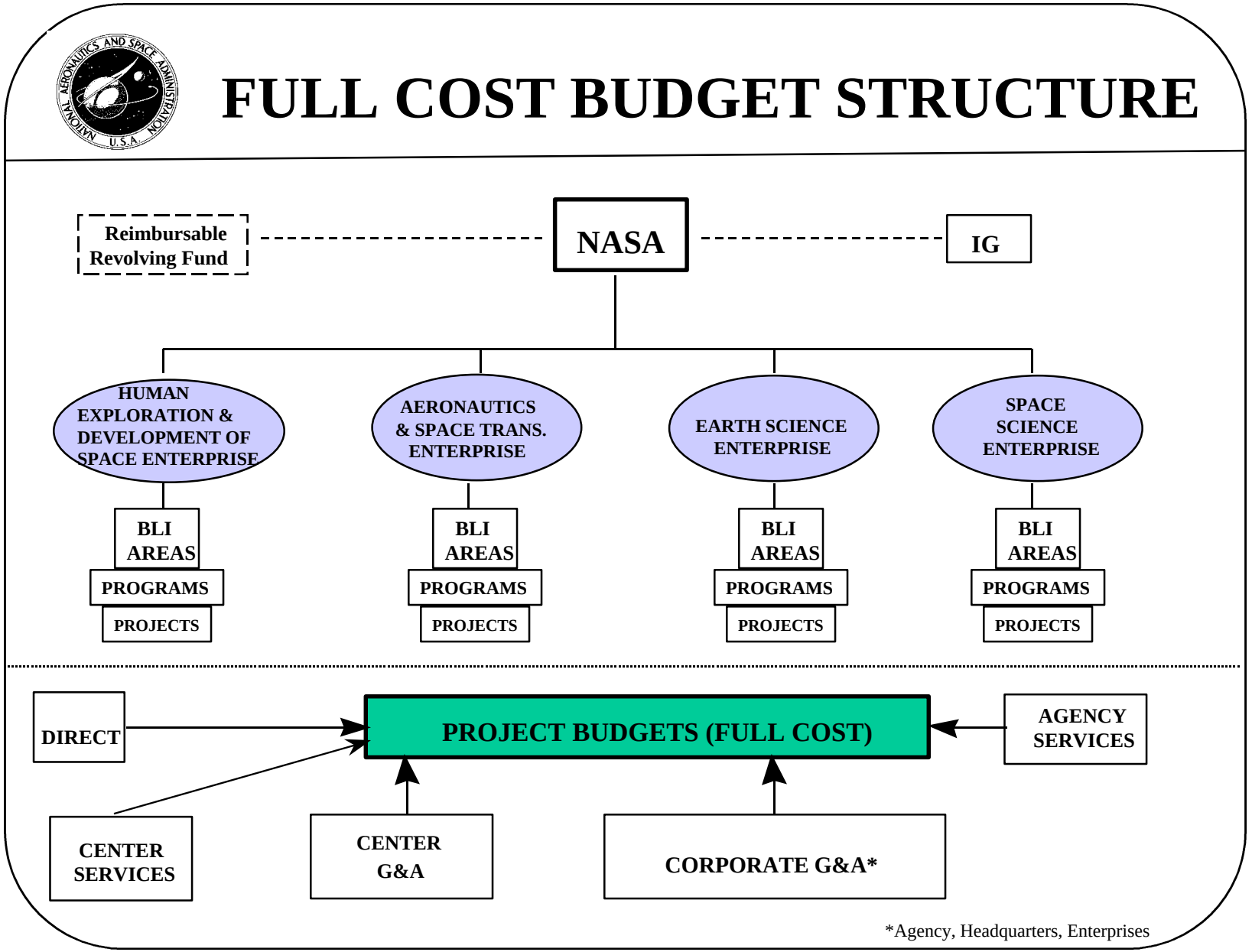
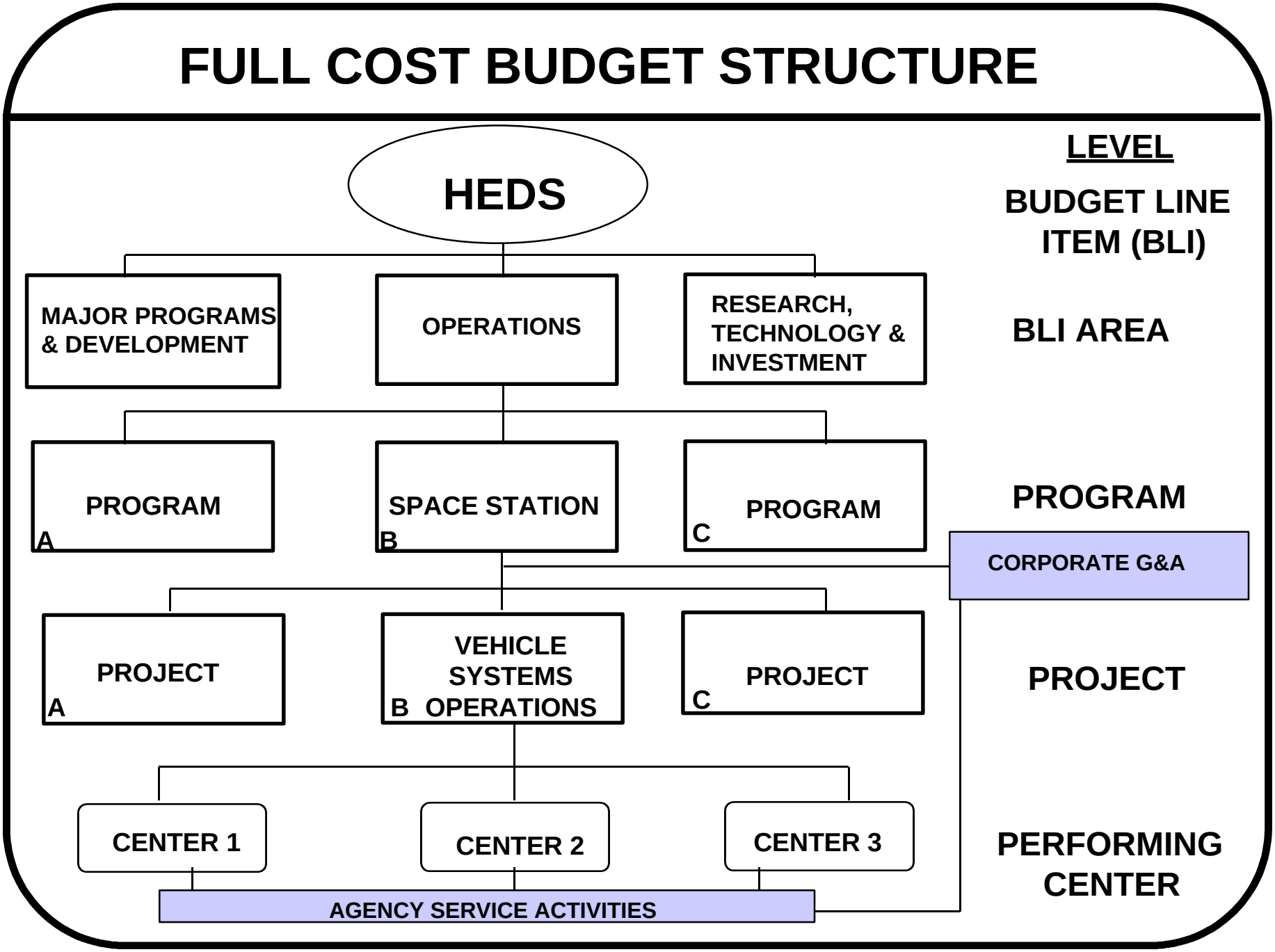

FULL COST BUDGET STRUCTURE
Reimbursable Revolving Fund
NASA
IG
HUMAN EXPLORATION & DEVELOPMENT OF SPACE ENTERPRISE
AERONAUTICS & SPACE TRANS. ENTERPRISE
EARTH SCIENCE ENTERPRISE
SPACE SCIENCE ENTERPRISE
BLI AREAS
PROGRAMS
PROJECTS
BLI AREAS
PROGRAMS
PROJECTS
BLI AREAS
PROGRAMS
PROJECTS
BLI AREAS
PROGRAMS
PROJECTS
DIRECT
PROJECT BUDGETS (FULL COST)
AGENCY SERVICES
CENTER SERVICES
CENTER G&A
CORPORATE G&A*
*Agency, Headquarters, Enterprises

FIGURE 6


FULL COST BUDGET STRUCTURE
HEDS
LEVEL
BUDGET LINE ITEM (BLI)
MAJOR PROGRAMS & DEVELOPMENT
OPERATIONS
RESEARCH, TECHNOLOGY & INVESTMENT
BLI AREA
PROGRAM A
SPACE STATION B
PROGRAM C
PROGRAM
CORPORATE G&A
PROJECT A
VEHICLE SYSTEMS B OPERATIONS
PROJECT C
PROJECT
CENTER 1
CENTER 2
CENTER 3
PERFORMING CENTER
AGENCY SERVICE ACTIVITIES

Capital authorities are expected to be employed at the Agency and Center levels for investment decisions.

Center review boards will be established for full cost oversight and related processes, as appropriate.

Center G&A pools will have generally consistent content across the Agency and will be allocated on the basis of on-site direct labor (C/S and contractor) FTEs.

Canceled programs need to ensure that internal termination costs are covered.

3.1.2.2 Guidelines

The Center Director's Discretionary Fund (CDDF) and other Independent Research and Development (IR&D) will be included in the installation G&A pool.

Costs at the Enterprise level will be included with Agency and Headquarters operations in a “Corporate” G&A account. However, further review of the content of this account may result in additional costs being designated as direct or service costs.

Centers must ensure that FTE staff allocations are totally funded.

Planned subauthorizations and reimbursable agreements must be budgeted based on current agreements. Any differences between full cost recovery and full cost accounting must be budgeted against a project or included in the G&A pool.

Pre-Program Operating Plan (POP) processes for Civil Service workforce planning, service activity costs, and G&A should be conducted prior to the receipt of the formal POP data call.

3.1.3. New Considerations for NASA Managers

The implementation of the full cost concept will require Center management and program and project managers, as well as internal service providers and functional managers to plan and manage all of the resources under their control. From a project perspective, the majority of the cost planning that is done today will not be changed. However, there will be fundamental changes that affect almost all projects. The most significant changes will be the inclusion of Civil Service salaries, travel, and other items that are currently considered to be "institutional" as part of project budgets. This will require project managers and those who support them to plan in a more formal and perhaps detailed manner. Project managers will have to plan and manage the direct civil service labor that is required to accomplish their project, which is different than the current workforce planning approach which, in some cases, includes leave and indirect time. Project managers will plan and manage all travel costs associated with a project regardless of the traveling organization. Center (or Agency) service providers may need to modify their planning processes to ensure that their customers are involved in sizing the level of support that is required and in the rate development/approval process.

The next section outlines the steps that are required to develop a budget at the project level and focuses on what will be different. It is anticipated that each Center will have an oversight board that will establish and coordinate the service and G&A cost rate development process. Headquarters offices are expected to use a similar budget development processes as the Centers. Thus, throughout this section reference will be made to "Centers" which refers to Headquarters as well as Centers.

3.2 Budget Development Process

Within the framework outlined below, considerable flexibility exists for unique or special application of the full cost concept to budget formulation at a NASA Center or within a particular program or project. However, it is important to note that the general framework provides a standard approach which will, in the end, yield budget data that has a common foundation and will thus contribute to more effective program and project decision making in the future. Another important distinction to keep in mind when considering these guidelines is that there may well be subtle and, in some cases, distinct differences between budget development for the POP process to support the Agency's budget submission to the President and the Congress and budget development for purposes of budget execution (better known as the Phasing Plan). For the most part, this guide focuses on the POP process, with Phasing Plan specifics added when appropriate.

3.2.1. Development of Project Level Budgets

Project level budgets represent a key foundation for NASA's full cost budgeting practices. In that regard a complete, full cost budget will only "officially" be maintained at the Project level within NASA's budget classification structure. **(see Appendix 3 for a current list of the NASA projects.)** In practice, this means that, at key interface points in the budget formulation process (e.g., Center submit, Enterprise submit, etc.), the level of the submission will be at the project level. A key consideration, therefore, is a decision which must be made at each Center relative to the level (within the budget classification structure) at which budgets are developed in support of the official project level submissions. In addition, the level of budget development (within the budget classification hierarchy) may very well vary within a project or Center depending upon the type of cost being considered. For example, labor costs may be developed at a higher level within the project than the costs associated with direct purchases (contracts, grants, etc.). In any event, these are the types of decisions and policies that need to be established within each Center to ensure consistent budget estimates are provided to the next higher management level for consideration.

Elements of the Full Cost Project Level Budget:

Direct Purchases: This is the area most familiar to project managers prior to moving to full cost. It includes contracts, grants, and other direct purchases directly funded by the project, and, in fact, comprises the largest portion of the funds that existed in the R&D appropriations prior to NASA's move to full cost. Consequently, the development of this portion of the budget should not be much different for project

managers. The level of detail required in this portion of the budget submission is also likely to remain the same, including, in addition to New Obligation Authority (NOA) and Cost, such items as prime and support service/performance based contractor workforce estimates, support to universities, small and disadvantaged business, etc.

Direct Labor (Civil Service): This is, by far, the area, which involves the largest change in approach as the Agency moves towards Full Cost Budgeting and Management. (**See Section 3.2.2** of this guide for a more in-depth treatment of Civil Service Labor budgeting**.**) In the budget planning process, the first order of business must be that the project manager develops an estimate of the direct workforce required to accomplish the work of their project. This type of estimate has been described in several different ways in the past, particularly as it has related to the contractor workforce. These have included Equivalent Personnel (EP's) and Productive Workyears. Basically, it is a measure of the number of direct hours (productive FTE's) of work needed to complete the job. Once this has been estimated, the project manager then needs to price out the salary dollars required to support this direct workforce. Typically, the Center's CFO will provide standard pricing rates for each fiscal year under consideration that the project manager should use in pricing Civil Service labor requirements.

Labor Benefit Costs: Once a project manager has determined and priced direct Civil Service labor requirements, it then will become necessary to include in the project budget submission the costs associated with the personnel benefits (retirement, health insurance, life insurance, leave and holiday pay, etc.) for the direct workforce working on each project. This will be accomplished using standard rates and factors provided by the Center's CFO. It should be noted that in NASA's approach to full cost, these costs would be included in the direct category, even though they will be estimated separately for visibility purposes.

Service Costs: Prior to the actual budget formulation process, each project manager will need to reach agreement with each of the service providers at the Center on the level of service/support that the project manager will receive in each fiscal year being considered in the POP. This agreement will need to be stated in terms of units of usage. The usage levels will then be priced out in the project budget estimate utilizing standard rates for each service activity which have been developed and agreed upon at the Center level, typically by a Center level oversight board. (For additional information on service pool costs, **see Section 3.2.4**)

Other Direct Costs: In addition to the direct purchases and direct labor costs associated with a project, all other direct costs need to be estimated and accumulated as part of the total cost of the project. These types of costs would include direct project related travel. The project manager needs to estimate the amount of direct project related travel which will occur in each fiscal year under consideration in the POP. In this regard, it is important to note that since program/project travel will now be budgeted in the appropriate program and project, it is very important that project managers engage in meaningful dialogue with supporting organizations to develop meaningful estimates for organizational support to NASA programs and projects. With regard to travel budgets, especially in the year of execution, it may be necessary

to re-think how travel budgets are allocated at Centers. In the past, travel budgets have normally been allocated by organization as opposed to project. In the full cost environment, some sort of combination technique may be necessary.

General and Administrative Costs: After all of the above costs have been calculated, a subtotal of all project costs will have been derived. The final step in the development of a full cost project budget will be to add the G&A costs utilizing a standard factor developed and provided by the Center's G&A manager in conjunction with any Center oversight authority and the Center CFO. (**See Section 3.2.5** for a discussion of the process for the development of the G&A factors.)

3.2.2. Estimating Direct Labor and Salaries

Estimating Civil Service labor in the three major categories of direct, service activities, and G&A will, in some cases, be a significant change from the approach used today. Estimated direct project labor will be based on projected time card charges of all employees that support the particular project. Since most Centers operate in a matrix mode, labor estimates for all performing organizations, including certain service activities and, in some cases, G&A, must be taken into consideration. All indirect time (other then leave) of civil servants will be charged to either a service activity or G&A. Thus, our estimating process must be consistent with that approach.

Direct project labor estimates should be developed based on project requirements for each fiscal year under consideration. Project managers must work closely with all supporting organizations (e.g., Science and Engineering, Fabrication, Test Support, Safety, Reliability, and Quality Assurance (SR&QA), Procurement and Budget) to reach agreement on the level of support required and available. Keep in mind the estimates should be stated in terms of direct labor hours or productive FTE's (direct labor hours/2080). Leave will be estimated separately and indirect time will either be part of a service activity or included in G&A. The average civil servant will expend approximately 15% of their paid hours on leave and holidays. Each location should develop its own estimate to be used for budget development purposes. Thus, each project manager will have to estimate the portion of their workforce that will charge directly to the project, leave and holidays and any indirect time that should be budgeted as G&A (e.g., management of multiple programs, transition labor, etc.).

Service activity and functional managers will use a similar process. Their indirect labor will be budgeted as either a service activity cost or as G&A depending on the function performed.

Forecasted direct labor rates can be developed using a number of different methods. Rates can be developed on an hourly basis or per FTE. They can be stated in terms of rates by project or rates by performing organization. The final decision should be based on Center specific circumstances. It is assumed that the Agency will continue to have

FTE and ceiling limits. Each Center will receive a FTE ceiling from its Enterprise. Thus, it is imperative that each Center and Headquarters insure that FTE's are properly planned and that salaries and fringe benefits are within the appropriate limits.

The following examples groups all project and technology organizations, functional organizations, and administrative funded activities together for demonstration purposes. It is assumed that organizational FTE allocations have been determined and that the projected standard salary per organization has been developed. As stated above, project managers must work with all supporting organizations to communicate their requirements and to negotiate levels of support (productive FTE's). This activity will result in a matrix plan of project and organizations for productive FTE's and a plan by organization for productive FTE's, indirect time, and leave and holidays.

Figure 7

EXAMPLE OF PROJECT/ORGANIZATION MATRIX FOR PRODUCTIVE FTE'S AND ASSOCIATED SALARY ESTIMATES
Direct Labor

	FTE's				
	Project & Technology Orgs	Functional Orgs.	Admin. Orgs.	Total FTE's	Total Salaries ($000)
Project #1	400	285	15	700	40425
Project #2	50	48	2	100	5740
Project #3	150	45	5	200	11725
Project #4	170	122	8	300	17310
Project #5	30	____	___	30	18000
Totals	800	500	30	1330	77000

Figure 8

EXAMPLE OF TOTAL ORGANIZATION FTE PLANS AND ASSOCIATED SALARY ESTIMATES

	FTE's				
	Project & Technology Orgs	Functional Orgs.	Admin. Orgs.	Total FTE's	Total Salaries ($000)
Direct	800	500	30	1330	77000
Service Activities		350		350	19250
G&A	50		225	275	14250
Leave & Holidays	150	150	45	345	19500
Total FTE's	1000	1000	300	2300	130000
Projected Avg. Salary/FTE ($000)	60	55	50		

The Center’s CFO should coordinate projections of average salary rates by organization and validate relative accuracy of total salary estimates.

3.2.3 Development of Leave and Fringe Benefit Rates

Leave and fringe benefits (L&FB) include the following cost elements:

- Contributions to Retirement Plans
  - Civil Service Retirement System (CSRS)
  - Federal Employees Retirement System (FERS)
- Health Insurance Tax (HIT)
- Health & Life Insurance Premiums
- Workman's Compensation
- Thrift Savings Plan (TSP) Matching Contributions
- Leave and Paid Holidays

When estimating L&FB, special consideration should be given to an increasing FERS population and the impact of the Agency's contribution to retirement plans and TSP. Congress continues to debate how to maintain the financial integrity of the CSRS plan which will eventually result in increased contributions from employees and departments and agencies. The projected L&FB pool is divided by estimated salaries (less leave and holidays) to determine a rate. The rate is then applied to estimated direct salaries for projects, service activities, and G&A. This allocation is made prior to the assignment of service activities and allocation of G&A to projects.

The following example demonstrates the development of an L&FB rate for one fiscal year. It was assumed for this example that 40% of the workforce are covered by CSRS and 60% by FERS and that the Government's contributions to those plans is 9% and 19% (which includes Social Security taxes), respectively.

Figure 9

LEAVE AND FRINGE BENEFIT RATE

Example

	$000
Retirement (Including HIT)	
CSRS 9% of salaries (40% of workforce)	4680
FERS 19% of salaries (60% of workforce)	14820
Health & Life Insurance	5500
Thrift Savings Plan	2500
Workman's Compensation	500
Leave and Paid Holidays	19500
Total Leave and Benefits	47500
Total Estimated Salaries Less Leave	110,500
Rate	43%

Figure 10

ALLOCATION OF L&FB TO COST CATEGOGIES

Example

	Salaries	L&FB Rate	Allocate L&FB
Direct Projects	77000	43%	33100
Service Activities	19250	43%	8275
G&A	14250	43%	6125
Total	110,500		47,500

3.2.4 Service Activity Cost Development Process

This section describes a basic plan for projecting, equitably assigning, and preparing a statement of cost for the services and commodities required by the various programs/projects and user organizations. A commodity is used to describe a specific product, which is handled, processed, and delivered by the activity. The unit of measure for each commodity is generally consistent with the units of measure used in private industry. Services are defined as all functions provided by the activity. Each activity manager is responsible for providing the user with a complete and accurate list of the commodities and services available from that activity.

A Pre-POP call will be issued to the programs/projects and the service activities. This call will include the following: (1) preliminary guidelines (2) service activity commodities/services (3) service activity rates (4) pricing guidelines (includes service activity operating process and appropriate Rules of Engagement) (5) workforce assumptions by program and project and staff organizations (6) preliminary G&A guideline estimates.

At this point, negotiations with the Center CFO, the program/ projects, and the service activities will occur. The goal is to eventually establish a “preliminary” task agreement including scope of work, schedules, milestones, service activity requirements, and workforce requirements - basically, everything the program/ project needs to successfully accomplish its assigned task or mission. After a “preliminary” task agreement has been established, it will be submitted to the Center CFO where all requirements will be integrated (programmatic/functional/ institutional) and the resultant analysis of “Supply and Demand” will either require (1) oversight Board intervention, (2) service activity rate revision, (3) modification of levels or types of services provided by service activities, or (4) modification of Workforce Disposition.

If necessary, these task agreements will be returned to the appropriate entities along with visibility, direction, and rationale, provided by the Center CFO, for further negotiations. When these issues are resolved, the “contract” or task agreement will be submitted once again to the Center CFO. These “second preliminary” agreements are expected to be reviewed by an Oversight Board.

The next step is for the Center to receive formal POP Guidelines. At this point, the Center CFO will issue guidance (including a G&A Guideline requirement) to programs, projects and service activities. This guidance will focus on any variances from the previously issued internal Pre-POP Guidelines.

When the task agreements are finalized, the program/projects/service activity budgets will be submitted to the Center CFO for integration. Final management review will occur and the POP will be formally submitted.

3.2.4.1. Service Activities.

The service activity costs will be assigned based on the use of the commodity or service. Some typical bases for assignment of costs includes number of hours, labor hours, square footage, etc. As mentioned above, sufficient workforce planning to determine deployment of Civil Service labor is mandatory for service activities in the development of their rates. For example, an Engineering Services activity must know how many engineers it has to offer or "sell". The number of personnel coupled with the tasks assigned will be the major drivers in determining the rate for this particular activity.

The service activity budget development encompasses several basic steps, including the following: (1) identification of commodities/services to be offered by the service activity, (2) formulation/development of service activity rates, (3) cost statement, (4) policy, operating procedures, and rules of engagement for the activity. After service activity personnel have completed these steps they will be able to answer the following: what services, commodities, or functions does the activity provide or offer to the Center? What will the activity charge for the commodities/services/functions it offers? How will the activity capture operating revenue (i.e., how will it bill its customers)? How will the activity operate (policy, procedures, and rules of engagement)? These are mandatory questions that each activity must answer.

3.2.4.2 Identification of Commodities/Services

The term commodity or service is used to describe a specific product, which is handled, processed, and delivered by a specific service activity. These items should be published and distributed throughout the Center or Agency so that potential customers will know what functions each service activity performs.

3.2.4.3 Service Activity Rate Formulation/Development

The goal of the rate development process is to recoup the costs of operating a service activity. The basic assumption is that all costs associated with a service activity operation must be covered. On an annual basis the service activity manager is expected to present to an "Oversight Authority/Board" the proposed rates which will include all costs of doing business. This Board, appointed by the Center Director, may be comprised of high level managers. However, it is important that each customer have some level of representation on the Oversight Board thus ensuring adequate representation when the proposed rates are reviewed. The Board will review the rationale, which provides the basis for the rates, and either accepts, modify, or reject them. If rejected, the service activity manager will revise the rates based on guidance from the Board and resubmit the new rates to the Board for further review.

3.2.4.4 Service Activity Cost Plan by Project

To the extent possible, all cost elements will be identified in the assigned service activity costs. Cost information will be segregated by the program and project offices and the service activities that comprise the consumers of the services and commodities that are

offered. The cost plan should contain consumption rates for each service or commodity, and the total cost for the particular service activity support. Using this information the program and project manager can ascertain current cost and better estimate future budget demands.

3.2.4.5 Policy, Operating Procedures, Rules of Engagement

Each service activity should issue a “Management Plan” which incorporates the policies, operating procedures, and rules of engagement for the specific service activity. Based on the “Budget Development Process” discussed above, a typical plan for a service pool would likely address the following matters:

After identifying the commodities/services the service activity will provide, rates will be formulated/developed using such data as workforce deployment, service operations cost, and potential “demand” for commodities and services that the service activity offers. Elements of cost will be established as well as the method for which the service activity costs will be reported.

Through negotiations between "customers" (project managers) and "providers" (service activity managers), agreement will be reached on services to be provided and rates to be charged. Agreements will then be forwarded to the Center CFO and reviewed by applicable Oversight Authorities/Boards. However, it should be noted that small variances should be handled within the Service Activity rate structure. Also, Center customers may be required to utilize service activity products/services for a transition period, 2 - 3 years. After this period, service activity rates should become sufficiently competitive to justify the existing service activity to remain operational. It is the responsibility of the service activity manager to ensure that these rates are comparable to possible alternative suppliers, such as in certain instances, the commercial market. In addition, as noted above, unless an emergency situation arises, it is expected that rates will be adjusted on an annual basis at a minimum.

After receipt of formal POP Guidelines from Headquarters, the Center CFO will issue guidance (including a final G&A requirement) to the programs and projects and service activities. Task Agreements will be finalized and all budgets will be submitted to the Center CFO for final integration and formal POP submittal during the May-June timeframe.

3.2.4.6 Agency Service Activities

These are administrative or technical services, managed as a unit by a single Center, which support other NASA installations. Presently these consist of the NASA Administrative Computer Center (NACC) managed by MSFC and the Space Operations Management Office (SOMO) managed by JSC. Other agency service activities that may be established include; the Consolidated Supercomputing Management Office (CoSMO), the NASA Information Systems Network (NISN), and consolidated payroll services.

These services should be priced on a full cost basis, including civil service and contract labor, support from center service activities, and the performing center's G&A costs if material in nature (i,e., $1,000,000 or over). Costs charged to installations receiving services should be based on units of consumption of services. Operations costs and charges to respective centers are established through the budget formulation process. Generally, funding for operations costs will be allocated directly to the performing center with subsequent adjustments for cost variances between estimates and actual services provided.

3.2.4.7 Service Activity Cost Development Example

The following example demonstrates the above discussion and assumes that the Center has three service activities. This example emphasizes the need for a consumption plan for each product or service detailed by customer (program/project, other service activity, or G&A functional activity) based on an estimate of the cost of providing each commodity and the number of units required by the customers. Products or services provided to other service activities and/or to G&A functional activities should be taken into consideration prior to finalizing the cost assignment to projects.

Figure 11

SERVICE ACTIVITY COST ESTIMATES
BASED ON CUSTOMER REQUIREMENTS
($000)

	Information Technology	Facilities	Fabrication
Civil Service Labor	12,000	4,250	3,000
Labor-Fringe Benefits	5,160	1,825	1,290
Contracts	1,000	8,000	2,000
Materials	2,000	4,000	500
Equipment	5,000	1,200	500
Travel	100	50	25
Subtotal	25,260	19,325	7,315
Service Activity to Service Activity Charges	200	-700	500
To G&A		-3,875	
Total	25,460	14,750	7,815

Figure 12

PRODUCTS/SERVICES AND BASIS OF ASSIGNMENT

Information Technology

Service or Product	Qty	Rate	$000
Workstation Maintenance	5000	$500/WS	2,500
Application Programming	100000	$80/HRs	8,000
Computer Usage	29920	$500/CPU/HR	14,960
Total	25,460		

Facilities
(Based on $25 Per Square Foot)

	Square Feet (000)	$000
Information Technology	8	200
Fabrication*	20	500
G&A	155	3,875
Projects	590	14,750
Total	773	19,325

*Fabrication
(Based on $15 per direct labor hour)

Figure 13

ASSIGNMENT OF SERVICE ACTIVITY COSTS TO PROJECTS
INFORMATION TECHNOLOGY SERVICES

	Workstation Maint.	Applications Programming	Computer Usage
Project #1			
Qty.	500	10,000 Hrs.	4,900 CPU Hrs.
$000	250	800	2,450
Project #2			
Qty.	1,000	50,000 Hrs.	15,000 CPU Hrs.
$000	500	4,000	7,500
Project #3			
Qty.	2,000	10,000 Hrs.	5,000 CPU Hrs.
$000	1,000	800	2,500
Project #4			
Qty.	1,450	10,000 Hrs.	1,920 CPU Hrs.
$000	725	800	960
Project #5			
Qty.	50	20,000 Hrs.	3,100 CPU Hrs.
$000	25	1,600	1,550
Total	2,500	8,000	14,960

	Facilities	Fabrication
Project #1		
Qty.	200 sq. ft.	75 000 hrs.
$000	5,000	1,125
Project #2		
Qty.	115 sq. ft.	3,000 hrs.
$000	2875	45
Project #3		
Qty.	150 sq. ft.	250,000 hrs.
$000	3,750	3 750
Project #4		
Qty.	75 sq. ft.	185,000 hrs.
$000	1,875	2,775
Project #5		
Qty.	50 sq. ft.	8,000 hrs.
$000	1,250	120
Total	14,750	7,815

3.2.5 Development of G&A Budgets

A significant change inherent to the full cost budgeting approach is the creation of a G&A pool at each Center. The content of the G&A pool will largely be comprised of project requirements, which were previously included under the Mission Support (MS) Appropriation. Additionally, based on circumstances at each Center, project requirements that were previously funded under the Human Exploration & Development of Space (HEDS) and the Science, Aeronautics and Technology (SAT) Appropriations may transfer to the G&A pool. These requirements could include IR&D activities such as under the CDDF project and academic or public affairs activities included in existing projects. Once the G&A content have been determined, its costs will be allocated to each project using a reasonable and consistent method. In this regard, Agency Management has decided to adopt a standard approach, which allocates Center G&A costs to projects using an on-site direct labor (Civil Service and contractor) FTE basis. The assessed G&A content, pool level, and allocation factor will be determined by the Center's G&A manager who is designated by the Center Director. The G&A manager will be supported by the Center CFO. The G&A pool and rate will be reviewed and approved by appropriate Oversight Authority/Boards and by Senior Management. The Enterprise will be required to concur on the Center G&A rates established during the POP Process and ensure support from all applicable Enterprise Offices.

3.2.5.1. Elements of the G&A Pool

Under full cost, the plan will be to eliminate the MS appropriation and the current content will be transferred to direct, services and G&A categories as appropriate. The MS appropriation is composed of Research and Program Management (R&PM); Research Operations Support (ROS); Construction of Facilities (CoF); Safety, Reliability and Quality Assurance (SR&QA); and Space Communication Services (SCS). A general description of content which is expected to transfer to G&A is included below and in **Appendix 5.**

R&PM - The Civil Service workforce who is not identified directly to a project or a service activity should be budgeted for under G&A. This workforce should support the general administrative and institutional requirements, as well as all other functional content covered within the G&A pool (e.g., IR&D). Additionally, all student program FTEs and funding should be included under G&A. Estimating the salaries and payroll additives/fringe benefits for the FTE's should be completed in accordance with the procedures previously described. The G&A pool should also include the travel in support of the administrative and training activities. At this point, the G&A pool becomes vastly different than the direct projects and service pools because it includes all remaining personnel-associated costs for awards, training, permanent change of station, unemployment, lump sum, and security investigations. It was determined that these costs were not feasible in most cases to plan as direct charges during the budget development process.

A final consideration to be made in recasting the R&PM budget is the creation of a transition FTE fund to accommodate certain decisions regarding direct FTEs (i.e.,

cancellation of a program or downsizing by a program manager). Since the transition to full cost is budget neutral and there is little hope of getting larger budgets in the near future, it is important that each Center consider development of an equitable process to ensure contingency civil service labor/benefits funding is available within the G&A pool to accommodate real-time problems.

ROS - It is anticipated that a significant portion of the ROS content will transfer to the G&A pool. The current ROS content is defined in the Congressional Budgets to include 21 administrative and institutional functions under the broad categories of facility services, technical services, and management and operations. The G&A pool will include content that transfers directly from the ROS budget such as security, fire, and mail. It will also include ROS content, which may transfer to a service activity (e.g., facility operations and maintenance, or information systems) and then be distributed back to the G&A pool based on institutional customer consumption.

CoF - Since FY 1994, major discrete projects have been funded within the program budgets. The remaining projects within the MS appropriation cover facility planning and design, environmental remediation and minor repair, rehabilitation, and construction activities. Those projects, which benefit a direct project, will be transferred to the program budgets. Those projects which are multi-program or institutional in nature would be transferred to the G&A pool.

SRM&QA - Agency wide activities are managed by the Office of Safety and Mission Assurance and are included in Agency G&A. Specific program/project SRM&QA activities are direct costs; institutional SMA (e.g., facility or industrial safety) may be included in a service activity or in G&A as appropriate. **Appendix 4** should be referred to for additional guidance.

SCS - This content will transfer to the appropriate direct projects or service activities and will not be included in G&A.

The remaining G&A pool content will come from the current program budgets under HEDS and SAT. It is the responsibility of each Center to review the G&A content in **Appendix 5** to ensure that all identified requirements which are not directly and obviously linked to a program or service activities are funded within the G&A pool under the full cost model. In some cases, entire former project UPN's will be transferred to G&A such as CDDF. Other G&A content may include cost currently within the Centers Program Mission Support (PMS) or Multi-Program Support (MPS) budgets such as library, administrative aircraft, or environmental services.

An objective in moving to full cost budgeting is to ensure a high level of consistency in G&A content across the Centers. It is recognized that unique situations exist at Centers, which allow direct charging of dedicated institutional services (e.g., janitorial, security, training & PCs) to the program or project. Except for these circumstances, all administrative/institutional support services identified in **Appendix 5** should be included within the G&A pool. Such content standardization will support basic cross Center G&A

comparisons. Such comparisons are inevitable and should focus on differences in mission and physical characteristics rather than content discrepancies.

3.2.5.2 Distribution Methodology of the G&A pool

Agency Management has decided that the allocation of G&A will be based on project direct labor (civil service and onsite contractor direct labor) as the standard for the Agency.

3.2.5.3 POP Development Process for the G&A Pool

The implementation of G&A pools under full cost budgeting will require a significant change in the process for developing the POP submission. The institutional G&A budget will become a subset of the program and project budgets without a distinct identity (i.e., unique project number) external to the Agency. This change will necessitate extensive pre-POP planning activities to support project managers in a timely and accurate manner during the POP process. The major Center players involved in the development of the POP G&A budgets will be the G&A manager as designated by the Center Director, the G&A functional technical representatives (FTR), the Center CFO, supported by a Center budget activity, appropriate Oversight Authority/Board(s), and the Center Director. Externally, the Center will interface with the IPO for approval and coordination of G&A budget activities. A discussion of Pre-POP and POP planning activities are provided below.

3.2.5.3.1 Pre-POP Planning Process

Under the full cost budget model, a pre-POP process to develop the preliminary G&A pool and allocation factors would be accomplished prior to the official POP cycle. The G&A pre-POP process should coincide with the schedule of the service activity and workforce pre-POP activities. The three major stages in the G&A pre-POP process are: I. Requirements generation and assessment; II. Allocation factor determination; and III. Management approval.

Stage I would begin with the issuance of guidelines and marks by the G&A manager to the FTRs. Under a constrained budget environment, the G&A total pool levels would, at best case, remain constant and most probably Centers would be challenged to reduce G&A. It would be the responsibility of the G&A manager to evaluate the “right size and content” of the G&A pool, the Center G&A priorities, and the functional mark levels. The FTRs would represent logical divisions of the G&A by organization or by task at the Center. The FTRs will be required to develop projections to a mark level, identify impacts to proposed funding levels, and propose new initiatives/upgrades. The Center CFO, with the support of the Center budget activity, would be responsible for integrating the G&A pool budget, assessing impacts and over guideline requests, and developing a budget recommendation package in conjunction with the G&A Manager.

Stage II requires calculating the G&A allocation factor based on direct workforce. The Center budget activity would be responsible for coordinating internally with the projects

to determine the most recent direct funding mark and related FTE estimates. This step is critical to the process to preclude significant adjustments as described in the POP planning process which follows. The project estimates would include the typically budgeted work, as well as, the subauthorized, reimbursable and non-budgeted work performed at the Center and included in the G&A distribution formula. Additionally, the Center budget activity would coordinate with the service activity managers to collect the appropriate project estimates for these services. After the project direct and service data is integrated, the G&A rate can be calculated and an analysis completed explaining rate changes.

Stage III involves the G&A manager seeking the approval of the Center and Enterprise concerning the G&A rates. The Center's approval would initially come from an appropriate Oversight Authorization/Board with final approval by the Center Director. An Oversight Board may include the Center CFO, the G&A manager, the service activity managers, and project representatives. The Oversight authority will review, modify, and concur on all G&A and service cost rates and content to ensure proper agreements are reached and understood at the project level. After completion of the Oversight authority activities, the G&A manager will review the G&A pool content and rates with the Center Director and Senior Staff for their approval. Upon the Center Director's approval, the G&A rates would be forwarded to the Enterprise/IPO for approval and inclusion in the POP guidelines as preliminary planning data only.

3.2.5.3.2. POP Planning Process

The official POP cycle for the G&A pool would focus on extensive coordination and communication with the project managers, refinement of the G&A pool and rate, integration of the Center submission and approval of the official POP G&A rate. The primary responsibility for conducting these activities is expected to reside with the Center CFO supported by the Center budget activity on behalf of the G&A manager. In general, the POP process will follow the typical cycle which includes: the issuance of guidelines; the internal development and review of Project Office requirements; the submission of Project Office budget data to the Center CFO; and the review of POP data with the Center CFO and Center Director.

The POP cycle is essentially unchanged, but becomes more complicated with the addition of a G&A pool. When the guidelines are issued from Headquarters by the Enterprise, it will be extremely important that the project marks are inclusive of all the Enterprises which perform budgeted work at the Center. The Center CFO will need to perform a quick comparison of these project marks to the preliminary project marks generated during the pre-POP planning exercise. As required, adjustments will be made to reflect the most accurate G&A rate based on the guidelines. The Center CFO will then issue a consolidated POP call, which will include general process guidance and specific program and project direction and marks. The program and project marks will be distributed with a subtotal for the direct/service funding level and a subtotal for the G&A funding level within the total mark. The program and project offices will conduct their own assessment of direct requirements and service requirements in conjunction with the service activity managers **(see section 3.2.4**). It should be understood that, concurrent

to the program and project requirements development stage, there might be a need to reassess the G&A pool level.

The program and project offices will be required to submit data to the Center CFO without the G&A funding. The Center CFO will reiterate the steps in Stage II of the pre-POP planning process to develop the final G&A rate factor and document explanations for the changes from the preliminary G&A rate. The G&A manager will again seek the approvals of appropriate Oversight Authorities and the Center Director on the final G&A rate. Upon approval, the Center CFO will complete integration of the POP submission and provide feedback to the program and projects on their total submit including G&A. The final step is to review the program and project data with the Center CFO and Center Director and to transmit the POP submission to Headquarters and the Lead Centers. The transmittal letter should include the final G&A rate for Enterprise approval.

Figure 14

3.2.5.4 G&A Rate Development Example

	Workforce	$000
Functional Labor	195	10,500
Student Programs	30	750
Transition Pool	15	900
Mgmt. Of Multiple Projects FTE	35	2,100
Subtotal, Civil Service FTE/Salaries	275	14,250
Leave and Fringe Benefits @ 43%	54	6,125
Overtime/Holiday Differential		578
Travel		500
Centerwide Other FS-41		4,350
Awards		1,000
Training		3,000
PCS/HHG		100
Lump Sum		200
Security Investigations		50
Subtotal, Civil Service & Related	329	30,153
Facility Services Usage	368	23,920
Security		75
Fire		45
Janitorial		96
Technical Services	85	6,150
ADP Services Usage		50
Library		10
Industrial Safety	20	1,000
Other Services (Graphics, etc.)	5	300
Management & Operations	205	19,100
Administrative Comm	40	3,000
Print & Reproduction		1,100
Admin. Aircraft		950
Other Transportation	50	3,250
Medical	25	1,750
Environmental	20	3,000
Center Mgmt. & Staff Office		1,500
Supply/Other Support Services	70	4,550
Subtotal, Center Operations	888	69,846

3.2.5.4 G&A Rate Development Example (Continued)

	Workforce	$000
CoF Projects Subtotal		10,350
SR&QA RTOP's Subtotal		1,600
IR&D Subtotal		900
Other General Support Subtotal		750
Total G&A	1,217	113,599

Figure 15

G&A RATE

Total project direct labor (Civil service and onsite contractor direct labor) equals 3,000 FTE.

$$\text{G\&A RATE} = \frac{\text{Total G\&A Cost}}{\text{Total Project Direct Labor}} = \frac{\$113{,}599}{3{,}000} = \$37{,}866/\text{FTE}$$

Total Project Direct Labor consists of:

- Civil Service direct labor, that is, any civil servant who charges a project directly, and
- On-site contractor direct labor.

3.2.5.5 G&A Costs and Intercenter Work

In the full cost environment, each program/project is assigned to a Lead Center for management purposes. The actual implementation may be accomplished at the Lead Center and/or one or more Performing Centers.

During budget formulation, the lead and performing Centers determine their respective full costs for implementing program/project elements as above. The full costs of the program/project are negotiated between lead and performing Centers with final agreement determined for funding levels at each Center and subsequently reviewed and approved at various management levels as defined by the POP process (including Enterprises/IPOs, NASA Office of the CFO, and the Administrator). This same process finalizes the funding allocations for lead and performing Centers for each program/project.

During budget execution, budget authority is allocated by the NASA Office of the CFO to the lead and performing Centers at the levels developed in the budget formulation process, thereby reducing substantially the need for inter-center transfers of funds.

However, there may be subsequent events that may occur which will require changes in a Center's assigned/planned work. When work initially planned at one Center (old performing Center) is determined by the initiating Center to be more appropriately executed at another (new performing) Center, these changes may require funding adjustments between or among centers and may involve the use of inter-center funds transfers. In this instance, the new performing center determines the full cost of the work. Center G&A costs would be expected to be applied if material in nature, with the new performing Center evaluating and defining the level of materiality.

3.3 Development of Corporate G&A Budget

This cost category reflects the business operations costs of Headquarters as a Center. It excludes any direct program and project costs such as contracts or grants that are funded by Headquarters organizations. The process used to develop these plans should be similar to that previously described under Development of Center G&A Budgets. All organizations will be required to budget for Civil Service salaries, fringe benefits, travel, contract support, and operating supplies. The Headquarters Office of Operations (Code C) will coordinate the budget development process and an Oversight Board may be established.

Corporate G&A encompass agency level functions that are G&A in nature, which are required or provide benefit to the entire agency. These include: (1) costs associated with the management, operation and support of the Headquarters installation (e.g., Automated Data Processing/Information Technology services, rents, security, etc.) and (2) staff office personnel, functions and services performed at Headquarters, or, as directed, at NASA Centers. In addition, there are several agencywide G&A functions assigned to, and managed by, NASA installations. Examples of these include, but are not limited to, Scientific &Technical Information (LaRC), Independent Cost Assessment (LaRC), Occupational Health (KSC), and NASA's automated security program (ARC).

Code C will be responsible for integrating and coordinating the process for formulating the Corporate G&A budget. The process would begin with the Agency Functional/Staff Office Managers, Enterprise mangers, and Code C establishing the scope of proposed activities to be accomplished and associated estimated funding requirements for the relevant budget years. Subsequent to anticipated review and approval by the NASA Capital Investment Council (CIC), this information will become the basis for the guidance included in the overall POP guidelines provided to Code C and, through the Enterprises/Institutional Program Offices (IPOs), to NASA Centers.

Centers determine funding requirements based on full cost principles for Functional/Staff Office activities conducted at the respective installations, including applicable service costs. Center G&A costs should be applied only if the costs are material. (Separate Code C G&A will not be developed for activities managed by Code C. Rather, these costs will be included in the total Corporate G&A.

Enterprises/IPOs are responsible for collecting performing Center level cost estimates for Agency G&A activities and for providing them to the appropriate Functional/Staff Offices for their review. These offices are expected to be responsible for justifying and defending these budget requirements to the Deputy Administrator, the CIC, the CFO and the Administrator as will Code C for Headquarters installation operations. Final G&A funding levels are expected to be approved by the Deputy Administrator and if necessary by the Administrator with the support of the CIC, Senior Management Council and the CFO.

Code C will establish the overall Corporate G&A budget (pool) by integrating the approved Headquarters operations and Functional/Staff Office G&A budgets and allocating the costs across all agency programs and projects based on the total Agency direct civil servant FTE's. This will determine the Corporate G&A rate, which will be applied to all programs/projects.

3.4 Summary

The basic flow of the budget development process is depicted on **Figure 5**. The build-up of the budget begins at the performing Center level with all costs, including Center G&A, and being identified to projects. Clearly more than one Center can be working on various aspects of a project. Consolidation of project costs will normally take place at the lead Center but could also occur at the Headquarters level. The Corporate G&A will be assigned based on direct civil servant FTE's after this consolidation. It will be the responsibility of the Enterprise resources office to ensure that the approved Corporate G&A costs are applied to all Enterprise projects and that all project managers are informed of the total plan that is being submitted to OMB and Congress. Below is an example of the derivation of the Corporate G&A rate.

Figure 16

CORPORATE G&A RATE

Example

Planned Expenses	$M
Salaries & Benefits	125
Travel, Training & Awards	7
Facility Costs	25
Agency Training/PDP/CDP/Fellowships	27
Contracts and Purchases	50
Other Support	66
Total	300
Total Project Direct Civil Service Labor (FTE)	15,000

Agencywide G&A Rate = $\frac{\$300,000,000}{15,000}$ = $20,000/Direct Civil Service FTE

Completion of the above steps will result in a plan by project and element of cost as reflected in **Figure 17**. In addition to cost elements, and, assuming that the Agency has an FTE ceiling, each performing Center will be required to summarize Civil Service FTEs by project. This would include all direct FTE's as well certain FTE's associated with certain service activity assignments i.e., all science type labor that is expected to be charged directly to projects. This is a major change from the current practice of displaying "indirects" and other than full-time permanents separately on the labor data report (918). **Figure 17** also represents the level that information will be communicated to lead Centers and to program managers.

3.5. Hierarchy of Budgetary Approval

Center Directors will be responsible for the development and initial approval of Center service activities. They are also responsible for the development of a Center G&A pool consistent with their Center's workload. Enterprises will have oversight and approval of Center G&A and service pools rates.

It is anticipated that there will be a number of Agencywide service providers. The Center responsible for the service will develop a proposed rate structure to be reviewed and approved by an Enterprise(s) and/or customer oversight authority.

The development of the Corporate G&A pool will be the responsibility of the AA for Headquarters Operations and the Agency CFO. Centers are expected to have insight into the rate development process.

Figure 17

SUMMARY OF PROJECT FTE'S AND COSTS ($000)

	Projects					
	#1	#2	#3	#4	#5	Total
Civil Service FTE's	1,084	261	441	434	80	2,300
On-Site Contractors	108	26	44	43	8	229
Total Direct Workforce	1,192	287	485	477	88	2,529
Direct CS Salaries	54,200	13,050	22,050	21,700	4,000	115,000
Leave & Fringe Benefits	23,306	5,611	9,481	7,331	1,720	47,449
Service Costs	3,625	5,920	4,800	3,135	2,545	20,025
NASA Service Activities	5,000	2,000			7,000	
Contracts, Grants, Purchases & Travel	157,500	33,989	40,500	43,000	12,000	286,989
Subtotal	243,631	58,570	78,831	75,166	20,265	476,463
Center G&A @ $37,866 /Direct FTE	45,136	10,868	18,365	18,062	3,332	95,763
Total Center Cost	288,767	69,438	97,196	93,228	23,597	572,226
Agencywide G&A @$ 20,000/CS FTE	21,680	5,220	8,820	8,680	1,600	
Total Project Cost	310,447	74,658	106,016	101,908	25,197	

4.0 Accounting in the Full Cost Environment

All NASA costs will be tied to or associated with NASA's projects. In applying this principle, certain assumptions have been made regarding the structuring of costs, cost accumulation and distribution methodologies, and necessary systems support.

NASA's Full Cost Model, **(see Figure 18)** like most other accounting fundamentals, is based on a simple formula:

Full Cost = Direct Cost + Service Cost + G&A Cost

The model **(Figure 18)** contains three major components that are defined as follows:

- **Direct Cost -** Costs that are obviously and physically related to a project at the time that the costs are incurred and are subject to the control/influence of the project manager. Examples of direct costs include contractor-supplied hardware and direct project labor, whether provided by Civil Service or contractor employees.

- **Service Costs -** Costs that cannot be specifically and immediately identified to a project, but which subsequently can be traced or linked to a project and are assigned based on usage or consumption. Examples of service costs include automatic data processing and fabrication.

- **G&A Costs** - Costs which cannot be related or traced to a specific project, but which benefit all activities. Such costs are allocated to a project based on a reasonable, consistent basis. Examples of G&A costs include costs associated with financial management, procurement, and legal activities.

G&A cost will have two components: a Center-level G&A and an Agency-level (i.e., Corporate) G&A.

4.1 Accounting Assumptions And Guidelines

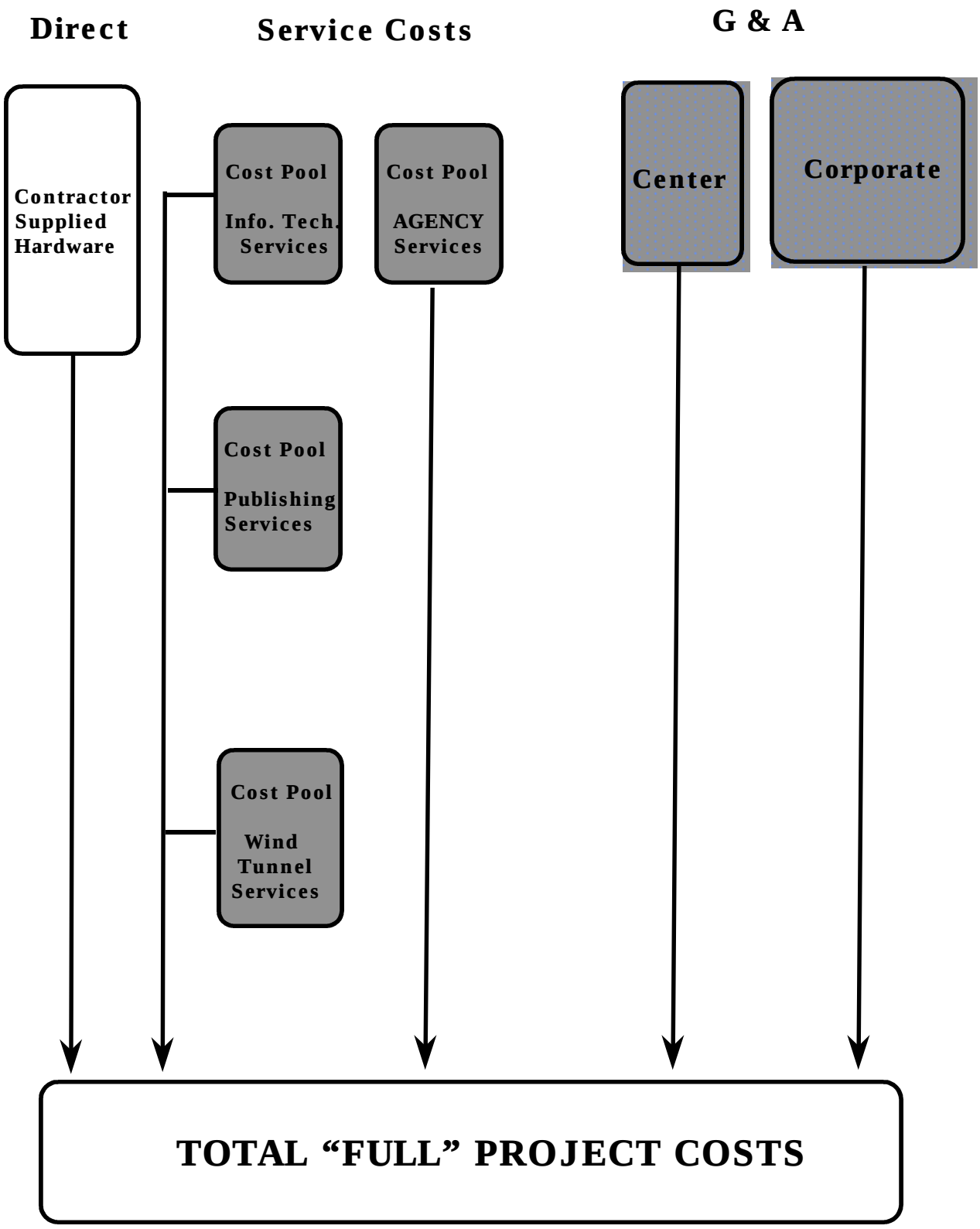
All NASA costs will be tied to or associated with projects. The costs will be identified in three cost categories: direct, service, and G&A. Direct costing (often referred to as direct charging) will be used to the maximum extent feasible.

Full cost accounting should take the simple approach, complicated only as necessary for usability and equity. The information should be available and useful and have a positive impact on decision making. Full cost accounting should be amenable to implementation in the near term through IFMP, be accepted as an integral management philosophy, and meet all statutory and related requirements.

Pools (service activities and G&A pools) will be set up by NASA organizations to meet management needs. All pool characteristics and operations will adhere to NASA standards (**see Appendices 4 & 5**).

Figure 18

Full Cost Accounting Model



Standard rates should be developed for charging costs to benefiting projects. Rates will be formulated at each Center by a full cost committee or similar organization, approved by the Center Director with Enterprise/IPO concurrence

The basis for calculation of G&A rates will be evaluated and tested during Agencywide testing. Cost pool to cost pool charging should be limited.

Certain issues, such as the treatment of depreciation, which were deferred for further study, are expected to be revisited. Depreciation will continue to be used for pricing user charges and reimbursable agreements in accordance with FMM 9090.

The introduction of cost accounting pools and cost accounts are essential element of NASA's full cost accounting model. Cost pools, or accounts that accumulate costs, represent an important component of any cost accounting system. NASA's full cost model integrates a variety of service activities (pools) and G&A pools. This section highlights the basic principles to be used in specifying Center full cost accounting practices.

4.2 Pools And Pooling

Pools are an accumulation of similar costs and cost types that are distributed to projects by an assignment or allocation methodology that best represents the types of costs that are in the pools. Pools will be used for service costs and G&A costs. The pools should be established with the idea that they are of material amounts, set up to provide useful management information, set up to allow ease of administration, and will continue to be viable and stable over the long term. The benefits received from each pool should outweigh the cost of establishing and maintaining that pool.

4.2.1 Standard Service Activities

If Centers have such activity, each Center will operate and/or account for service activities using the following standard service activities:

(1) Facilities and Related Services
(2) Information Technology Services
(3) Publishing Services
(4) Science/Engineering Services
(5) Fabrication Services
(6) Test Services
(7) Wind Tunnel Services (For Centers that have such facilities)

A Center must use the standard service activities, unless it provides no services whatsoever in a service activity. The contents of the standard service activities are defined in **Appendix 4**.

Costs related to service activities can be treated using either of two methods: service pools and service accounts. Under the service pool methodology, costs are accumulated in a cost pool and assigned to benefiting projects (or G&A) based on consumption. The use of various consumption bases for assigning costs are discussed below. The service account methodology provides an approach for assigning costs to benefiting projects in the absence of consumption data. Under this approach costs would be assigned to projects and G&A using another assignment mechanism. In the case of service accounts, Centers are expected to use the same allocation bases used for G&A allocation, namely direct civil service full-time equivalent employees and direct, on-site contractor employees. If consumption data are available, the service pool methodology should be used.

It is important to note that the objective is not to attempt to standardize Centers' organizational structures and approaches to delivering services. Rather, the objective is to achieve standardization in how Centers budget and account for these Services. Thus, regardless of the organization and approach used by a Center to provide a service, such as publishing, the Center will account for publishing service costs using either a service pool or a service account methodology. This approach is intended to achieve consistency among Centers in budgeting and accounting for like activities, without disturbing Centers' organizational structures and approaches to actual service delivery. If, after reviewing its service activities, a Center desires to add or delete a service activity, it should consult with the NASA CFO.

Assignment of service pool costs to projects and to G&A cost pools is to be based on consumption. Although there can be many ways to measure consumption and, therefore, assign costs, the key criteria for selection of a basis for cost assignment is the adequacy of the linkage between cost incurred and the benefiting party. Based on an evaluation of current Center service pools distribution bases and keeping in mind the objective of standardization, the following will be the bases for assigning the cost of each service facility.

Service	Basis
Facilities and Related Services	Square Footage
Information Technology Services	
Telephone	Lines
Desktop Computing	Seats/Workstations (WS)
Computing Services	Machine Hours/Center Processing Units (CPU)
Other Information Technology Services	Direct Labor Hours
Publishing Services	
Products	Catalogue Prices
Services	Direct Labor Hours
Science/Engineering Services	Direct Labor Hours
Fabrication Services	Direct Labor Hours
Test Services	Direct Labor Hours
Wind Tunnel Services	Direct Labor Hours

Work orders are also an appropriate basis for assigning service pool costs, provided that work orders consistently are based on full costs.

Centers have been evaluating two different approaches to labor charging by employees of a service activity. In some instances, if a service employee can identify the specific project, which benefits from their work, the service employee will charge the project directly. Other costs incurred in the service activity would be accumulated and eventually charged to the benefiting project based on a work order or other basis. The service employee's time would be clearly identifiable as a direct project cost. In other instances, all costs of a service activity, including an employee's time, would be accumulated in the service activity and eventually be charged to the benefiting project based on a work order or other basis.

Four service activities - science/engineering services, fabrication services, and test services, and wind tunnel services - are labor intensive and, accordingly, where possible, service activity labor should be charged directly to benefiting projects or G&A. For the three remaining service activities, labor should not be charged directly to benefiting projects or G&A, but instead should be included in the service activity rate.

4.2.2 Service Activity Content

If they have such activity, each Center should establish each of the standard service activities. It is recognized that some Centers may need one or more service activities, in addition to the standard activities to reflect mission and/or organization differences. Such additions and/or potential alternative approaches must be approved by the NASA CFO. Elements of costs in the service activities may include, but not be limited to, the following:

- Civil Service labor
- Support service contractor charges
- Travel
- Benefits
- Purchases
- Stock and supplies
- Service activity management
- Contract administration
- Non-program related travel
- Utilities
- Maintenance

The above costs are not intended to be an exhaustive list but rather a starting point for consideration. From an accounting perspective, all service activity costs will be assigned as they are identified, either to a specific project, to another service activity or to a G&A activity.

4.3 Contents of G&A Cost Pools

The G&A pools will be a compilation of elements that represent Centerwide and/or Agencywide activities. (see **Appendix 5**).

4.3.1 Center G&A

The contents of G&A should include the broad cost categories of Civil Service salaries, benefits, travel, support service contractors, etc. Training and awards are also considered a G&A category. The following is a partial list of administrative areas that will be included in G&A.

- Center management
- Finance/budget
- Procurement
- Human resources
- Library
- Legal
- Program Management
- Janitorial
- Mail
- Fire
- Security
- Public relations
- Industrial safety
- Transition Labor

A complete list is provided in **Appendix 5**.

4.3.2 Corporate G&A

Agency-level G&A cost items will be accumulated in one pool and allocated to individual projects. (This amount is not controllable at the Center level.) These costs will be applied to the projects based on direct Civil Service workforce. Agency-level G&A costs will include all non-direct, non-service, and non-Center G&A costs that occur.

APPENDICES

Implementing the NASA Full Cost Initiative at a Center

The following summarizes the process used by a prototype Center to develop its approach to implementation of full cost practices. This information provides a useful guide for preparing for full cost implementation.

Formation of a Full Cost Committee

The first step in the process is to form a Committee or group and designate the Chairperson. Since full cost has major implications to technical managers throughout the Center, it may be appropriate to have a senior project manager, or equivalent, chair this Committee. This will give the Committee a high degree of credibility since the technical community will have to manage within the framework that each Center develops for full cost implementation. Personnel from the following disciplines should be considered for membership on the Committee: resources, accounting, institutional management, project management, procurement, science, and engineering. With this cross-section of personnel, all viewpoints and opinions will be raised, enabling the Committee to make the most informed decisions possible. The diversity of the Committee will also help achieve "buy-in" throughout the Center. The Committee should be able to develop a Center approach to full cost within a 2-month timeframe and obtain Center Director approval at the end of the process, prior to submission of the planned service and G&A structures to the respective IPO and to the NASA CFO for approval.

Ground Rules

The first task the Committee should undertake is the establishment of basic ground rules. The rules should ensure that:

- All costing techniques for direct, service, and general and administrative (G&A) costs are reviewed and validated.

- The proposed practices are flexible: simple, useful, practical, user-friendly and contribute to improved management.

- Costs are identified as direct to the maximum extent possible.

- Each proposed implementation approach is subjected to a cost-to-benefit test. For example, a service pool should not be created where the cost of developing and maintaining the service pool would represent a significant percentage of the annual expenses of the pool. One of the basic tenets in implementing full cost practices is to maximize management effectiveness while minimizing complexity.

Basic Premise

The Committee should operate under the following premises:

- Full Cost Management and related cost-effective mission performances are the ultimate goals of any implemented system/practices.

- No resources are free.

    - Every service or activity has an associated cost.
    - All costs must be captured and appropriately managed.
    - All costs will be identified as direct, service or G&A.

- Center core institutional costs should be minimized but also should be sufficient to properly maintain the institutional base.

- The Center budget at the total level does not change; the mission support appropriation will no longer exist, thereby requiring the cost for personnel compensation and benefits, travel, research operation support (ROS), and construction of facilities (CoF) to be added to the Science, Aerospace, and Technology (SAT) and Human Exploration and Development of Space (HEDS) appropriations, or (optimally) to a single NASA appropriation.

- When developing the budget for full cost, the existing New Obligation Authority (NOA) for each Unique Project Number (UPN) will be adjusted upward for:

    - Direct salaries and associated leave/benefits
    - Direct travel
    - Current institutional costs (funded by other than Research & Development (R&D) UPNs

After establishing the ground rules, the Committee should begin a detailed review of the Center's budget. First, review all direct funding to UPNs to validate that all funding is in fact "direct". Next, (this will require the most effort), concentrate all analytical activity on Personnel Compensation and Benefits, Travel, ROS, Multi-Program Support (MPS), service activities, and CoF. Each function within the above areas should be reviewed to determine the appropriate categorization of costs (direct, service, or G&A).

Personnel Compensation and Benefits

All costs will be identified as either direct, service, or G&A.

To ensure the accuracy of the Center personnel compensation requirements under full cost, the Center budget should be developed in the Center CFO's office in coordination

with the Human Resources organization. Once the total budget is developed, it will be necessary to distribute the salary budget by UPN. In order to make this distribution; a Civil Service workforce database for the budget year and 5 additional years is required. This workforce database is essential for the "pricing", by UPN, of the Civil Service workforce.

Pricing/costing of salaries may be developed at either the 3 or 5-digit UPN level (commensurate with the level at which 506 resource authority and NOA guidelines are received).

The distribution of salaries by UPN will, in all probability, be applied on the basis of some type of average salary. Before finalizing a decision on the Center position, it is suggested that various approaches be examined. As an example, the following can be used:

- Center average salary x FTE's for each UPN
- Directorate average salary x FTE's for each UPN
- Average salary by major NASA skill category x FTEs for each UPN

By testing the various approaches and comparing the results to prior year actuals, a reasonable approach can be found for the salary distribution by UPN.

Note: As a “sanity check”, the Committee should ensure that when the entire pricing for all UPNs (including indirect) is completed, the totals for salaries agree with the previously determined salary budget for the Center. Without making this check, there can be no assurance that the requirement for Center salaries is covered.

General and Administrative Salaries

This category will include costs not associated directly with any specific UPN. In addition to functions typically included in G&A, the following salary cost categories should be considered for inclusion in the Center’s total G&A salary pool:

- IR&D salaries -

    - Bid and proposal activity - This category can be used for both estimating and charging Civil Service labor that is being expended toward the development of proposals in response to such things as NASA Announcements of Opportunities.

-Scientific advancement - This category, if appropriate, could be used to collect the small amount of time used by scientists for contemplation and forward thinking. This activity would be used for work other than that under approved NASA UPNs such as projects or science research and analysis programs.

-Technological advancement - This category, if appropriate, could be used to collect the small amount of time used by engineers for contemplation and forward thinking. This activity would be used for work other than that under approved NASA UPNs such as projects or Engineering Technology programs.

The above discussion of IR&D salaries illustrates the types of activities that may be included as G&A under full cost. Inclusion of this type of activity to the extent allowed by NASA standards, with appropriate policy direction, should be approved by the Center Director.

- Transition Pool Salaries -

- Under full cost, personnel can no longer charge their time to just any job order; they will be required to charge the job upon which they are working. With this basic premise in mind, a transition pool can be created as a temporary “home” for those personnel who cannot charge a direct UPN. This pool would have a specific UPN established to identify activity and accumulate costs.

- A short-term pool (maximum of two to four pay periods) may be used for those personnel completing one job and in the process of being assigned to another. For example, if a project or a specific activity of a project is complete, personnel need to be reassigned to other work. This is a normal ebb and flow of project work.

- The long-term pool, however, presents a different challenge. Personnel charging to this pool have not found a "home" for a variety of reasons. Management will need to become involved to ensure that these personnel can be productively employed. Actions such as retraining may be required to enhance the marketable skills of the employee or personnel reassignments may be necessary.

While this management challenge has always existed, it will become more significant under full cost; UPN managers will not be inclined to accept charges from personnel not working on their programs.

Institutional Budget (ROS, MPS, CoF)

Under full cost, there will still be a need to develop institutional (G&A) budgets for each Center. It is presumed that Center management will determine the size of the institutional budget, with appropriate Enterprise/IPO involvement, which would then be distributed among the appropriate Center organizations.

The Full Cost Committee should conduct a detailed review of all functions within each Center directorate to determine if any function would be more appropriately identified as either direct or a service activity. The remaining budget would be included in the G&A pool.

Recast Center FY Cost Data in Full Cost Format

Once the Center full cost approach is developed and approved by Center management and the service activity and G&A structures are approved by the Enterprise/IPO, the next step in the process can involve a recasting of FY cost in the full cost format.

The following approach may be used:

Direct Costs

In recasting direct costs, the following types of costs should be addressed:

- R&D - These costs, by UPN, will be as presently identified in the accounting system for the HEDS and SAT appropriations.

- Salaries - Obtain Fund Source 41 costs, at the UPN level, as identified in the financial system.

- Leave and Benefits - This amount will be the value of paid leave and fringe benefits attributed to the direct salaries identified to the various projects.

- Travel - Obtain Fund Source 42 costs, at the UPN level, as identified in the financial system.

The above items should comprise the total direct cost under full cost.

Service Activities

For those service activities, which are already in existence and will not change, costs have already been collected and identified in the financial system. Such costs and related practices should be related to ensure appropriate consumption matrices are being used for cost management. If a new service activity is being developed as part of full cost implementation, appropriate adjustments will need to be made to reflect FY costs which would have been included in that service activity.

G&A

In recasting G&A costs, the following types of costs should be addressed:

- Salaries - Obtain Fund Source 41 costs, at the functional level, as identified in the financial system.

- Leave and Benefits - This amount will be the value of leave and fringe benefits attributed to salaries associated with functions identified as G&A activities.

- Other Fund Source 41 Supporting Costs - This category covers items such as awards, training, lump sum payments, permanent change of station and household moves, and security investigations.

- Indirect Travel - Obtain the Fund Source 42 costs, at the functional level, as identified in the financial system.

- Institutional Costs - (ROS/MPS/CoF) Obtain these costs as identified in the financial system.

The above items should comprise the total G&A cost under full cost. The Center G&A rate are calculated by dividing total G&A costs on a direct FTE basis.

Background - Full Cost Management

During 1995, the National Aeronautics & Space Administration (NASA) began a multi-phased initiative to introduce full-cost practices into NASA. This appendix summarizes the background and of the full cost initiative.

Purpose

The purpose of the full-cost initiative is to develop and implement full-cost accounting, budgeting, and management practices in NASA. (For brevity, these practices are herein collectively referred to as full-cost management and/or full cost practices.) The purpose of implementing such full-cost management is to support cost-effective mission performance through timely reliable financial information and practices. Simply stated, full-cost management can be expected to help to ensure optimum mission performance with the minimum essential resources. In that regard, full-cost practices are expected to:

- support more cost-effective mission performance
- motivate managers to operate efficiently
- support economic decisions for appropriate resource allocations
- support the reporting of consistent information (internally & externally)
- help justify NASA's budget on a program/project basis
- support analysis and management decision-making regarding full-project cost
- support analysis and decision-making regarding NASA services/provided to others (reimbursable activities)
- support benchmarking of NASA service activities with other similar services, and
- support strengthened accountability regarding NASA's effective and efficient use of tax dollars to achieve NASA missions.

NASA is pursuing full-cost management at this time because NASA requires related full-cost information to more effectively manage within the current and anticipated future financial environment. This environment includes constrained budgets and increased expectations regarding oversight and accountability. In addition, the current pursuit of full-cost practices also supports compliance with several recent, related legislative and administrative mandates (laws and standards). This guidance indicates that agencies should focus on full-cost practices to achieve improved performance, reporting, and accountability.

Background

NASA's full-cost management initiative began in 1995 in response to guidance from several NASA and Federal authorities. While the initiative was undertaken in direct response to a specific management initiative of the NASA Administrator, the project also responded to guidance indicated in NASA's Zero Base Review and to mandates in several key Federal financial and performance laws and related standards.

In early 1995, the NASA Administrator requested information regarding overhead in NASA and at each NASA Center. In this context, overhead referred to all costs that were not direct costs. Direct cost were costs that could be obviously and/or physically related to a project at the time they were incurred. In pursuing the Administrator's request, the NASA CFO confirmed that NASA's nonstandard, decentralized, accounting systems did not capture information on overhead in a consistent, rigorous, reliable or usable manner. Shortly after the overhead analysis was attempted, the full-cost initiative was begun in April 1995.

During 1995, NASA also completed a Zero Base Review that involved a comprehensive analysis related to streamlining NASA activities. This review also highlighted several weaknesses related to the inconsistent recognition of the total costs of certain NASA activities and the related analytical complications of inconsistent cost information. The Zero Base Review team indicated that NASA should improve cost information and pursue full-cost management.

During 1995, Federal accounting standards setting organizations also completed key initiatives related to cost accounting. These organizations approved a new managerial cost-accounting standard, including a specific standard on full-cost accounting. This standard (and other Federal accounting standards) evolved from recent Federal financial and performance legislation.

Recent financial and performance legislation highlighted key Federal cost accounting and reporting requirements. This legislation included the Chief Financial Officers (CFO) Act of 1990 and the Government Performance and Results Act (GPRA) of 1993. In addition, more recently the Federal Financial Management Improvement Act of 1996 highlighted and specified other key full-cost accounting requirements. (A precursor bill was introduced during 1995.) NASA's full-cost initiative evolved from these internal NASA initiatives, as well as, several related Governmentwide initiatives.

Traditional Full-Cost Management

The basic concept of full-cost management is often associated with the private sector and the economic imperative that mandates that all costs must be recovered to ensure economic survival. (A cost can be defined as the monetary value of resources used or

sacrificed or liabilities incurred (such as money owed) to achieve an objective. An objective would include the acquisition of a good or the performance of an activity or service.) In the private sector, companies incur costs that become expenses in the pursuit of revenue/profit. (Revenue can be defined as the price of goods sold and/or of services rendered to customers. Expenses are the outflow or other "using up" of resources (and/or incurring of liabilities) that benefit an entity's operations for the current accounting period, but do not extend to future periods.) Revenues must exceed expenses to produce profits, which are required for long-term economic survival.

In pursuing economic goals, private sector organizations regularly use cost information in various decision-making processes. These include planning for profits by means of budgets, controlling costs, measuring periodic profit, (including inventory valuation) assisting in establishing selling prices and pricing policies, and providing relevant cost data for analytical processes to support decision making.

Private sector organizations also often apply a variety of cost classifications or categorizations. These classifications focus on the use of the related cost data. For example, costs are often classified by the nature of the item (natural classification), by the accounting period to which the cost applies (capital/expense classification) and by the tendency of the costs to vary with volume (fixed/variable classification).

The natural classification of costs focuses on the nature of the cost item. In this classification structure, the total operating costs of an activity can be classified into manufacturing costs and commercial costs. Manufacturing costs include all direct materials and direct labor, as well as, factory overhead. Such factory overhead costs include indirect materials (such as factory supplies & lubricants), indirect labor (such as supervision and inspection) and other indirect costs (such as rent, insurance, and utilities). Commercial expenses include marketing expenses (such as advertising, printing, and sales salaries) and administrative (general and administrative (G&A)) expenses (such as administrative office salaries, rent, and legal expenses).

Manufacturing companies incur costs by purchasing materials, by using manufacturing labor to make products from such materials, by using supervisory labor at the factory to oversee operations, by advertising products for sale, and by using administrative labor to oversee company-wide activities. These costs become expenses. Purchased materials, manufacturing labor, and factory supervisory labor become cost of goods sold expenses when the products are sold and delivered, advertising costs become marketing expenses as they are incurred and administrative oversight labor costs become administrative expenses as they are incurred. Each of these expenses is deducted from company revenues to report on company performance. Companies must ensure over time that revenues are greater than expenses.

The traditional accounting discussion of "absorption" or what is also occasionally referred to as "full costing," typically focused on manufacturing operations and related

inventory and product costing. In that regard, the approach involved accounting for the direct material and direct labor costs related to manufacturing a product and included assigning a share of other indirect costs, such as factory supervisory labor and utilities to the product. In this context, the cost objective or cost object was the product. (In this regard, indirect costs typically referred to any factory-level costs that were not direct costs.)

Federal cost-accounting requirements focus on issues that are similar to private sector issues but also involve key differences. The private sector accounting model starts with revenue (income), subtracts expenses ("used up assets/costs") to derive income before taxes. Taxes are then deducted to arrive at net income or profit. Profit is the primary goal. Companies price their products in the competitive marketplace to maximize profits. In the Federal government, the counterpart financial model integrates the appropriation of funds "income", the expenditure of resources, which become expenses and reduce available appropriations, to provide services to Agency constituencies. The primary goal of Federal agencies is service. While the basic models are similar, the private sector and Federal models retain fundamental differences. The private sector is pursuing profits and the Federal government is pursuing service. Despite this fundamental difference, cost information serves similar purposes in the Federal and private sector and can be expected to strengthen Federal financial management as the basic concepts and approaches evolve.

While the private sector has a long history of activity in the cost-accounting area, the Federal government's involvement historically focused on cost-accounting standards for private sector contractors who perform work for the government. During the past several years, the Federal government enacted significant legislation in the financial management area and provided related guidance, including recent guidance in the managerial cost-accounting area. Managerial cost accounting is a branch of accounting that is specifically designed for internal management. As such, a wide variety of management concepts, techniques, and approaches have evolved and can be expected to further evolve.

Federal Guidance

NASA's full-cost initiative is responsive to a variety of internal and external guidance. In addition to internal NASA management requirements, NASA's full-cost initiative also responds directly to recent Federal legislative and administrative guidance. As such, the NASA full-cost initiative is expected to serve internal and external requirements for financial information improvements, as well as, to support enhanced cost-effective mission performance.

Legislative Guidance

Full-cost management is consistent with recent legislative initiatives designed to improve the management of Federal programs. The legislation included the Chief Financial Officer's (CFO's) Act of 1990, the Government Performance and Results Act (GPRA) of 1993 and the Federal Financial Managment Improvement Act of 1996. Each of these statutes highlighted several key Federal financial management initiaitves. These initiatives directly and/or indirectly integrated improved cost information, including full-cost information, as a key element of required Federal financial management improvements.

CFO Act

The CFO Act not only highlighted the requirement for cost information, but also indicated the important linkage to agency budgets and to the measurement of performance. Cost information is often a key metric that can be used to evaluate and report on the economy and efficiency of agency programs/projects.

The CFO Act of 1990 stated the following:

> "An agency Chief Financial Officer shall...develop and maintain an integrated agency accounting and financial management system, including financial reporting and internal controls, which...provides for...(i) complete, reliable, consistent, and timely information which is prepared on a uniform basis and which is responsive to the financial information needs of agency management; (ii) the development and reporting of cost information; (iii) the integration of accounting and budgeting information; and (iv) the systematic measurment of performance."

GPRA

The GPRA also highlighted a variety of Federal management initiatives. This law focused on Federal management and accountability and included a shift from a preoccupation with inputs and processes to a greater focus on outcomes achieved. The Act requires that each agency submit an annual program performance report to the President and the Congress and provide feedback to managers, policymakers, and the public on actual accomplishments for the resources spent--costs incurred. In certain key respects, the preparation of a meaningful annual performance report is predicated on the availability of cost data on a program/project basis and the ability to link costs to measurable program outputs and/or outcomes.

The GPRA stated the following:

> "The Congress finds that...Federal managers are seriously disadvantaged in their efforts to improve program efficiency and effectiveness, because on insufficient articulation of program goals and inadequate information on program performance..."
>
> The purposes of this Act are to...improve Federal program effectiveness and public accountability by promoting a new focus on results, service quality, and customer satisfaction...help Federal managers improve service delivery, by requiring that they plan for meeting program objectives and by providing them with information about program results and service quality...improve congressional decision-making by providing more objective information on achieving statutory objectives, and on the relative effectiveness and efficiency of Federal programs and spending; and...improve internal management of the Federal Government."
>
> "...The head of each agency shall submit...a strategic plan for program activities. Such plan shall contain...a description of how the goals and objectives are to be achieved, including a description of the operational processes, skills and technology, and human, capital, information and other resources required to meet those goals and objectives."

GPRA focuses on the effectiveness and efficiency of Federal programs. Efficiency metrics typically measure inputs (resources/costs) and outputs. Program/project spending and related resources required to meet agency goals and objectives are often subsequently measured as program/project costs. Full cost information is a key element of many agencies' efficiency performance metrics. In that regard, the NASA Performance Plan integrates a variety of such cost-based metrics into key Agency and Enterprise measures.

Federal Financial Management Improvement Act

Recent legislation also highlighted related Congressional interests in improved cost accounting/information. During late-1996, the Federal Financial Management Improvement Act specified that Federal agencies were required to implement Federal accounting standards expeditiously, including managerial cost-accounting standards. This law also highlighted the requirement for full disclosure, including full-cost information. Key quotes from the Act follow.

> "The purposes of this Act are to...require Federal financial management systems to support full disclosure of Federal financial data, including the full costs of Federal programs and activities, to the citizens, the Congress, the President, and agency management, so that programs and activities can be considered based on their full costs and merits..."

> "Each agency shall implement and maintain financial management systems that comply substantially with Federal financial management system requirements, applicable Federal accounting standards, and the United States Standard General Ledger at the transaction level."

Administrative Guidance

In addition to recent legislative references/inferences regarding full-cost, Federal organizations also highlighted a variety of administrative initiatives regarding full costs. For example, the 1993 Governmentwide National Performance Review (NPR), NASA's 1995 Zero Base Review, and the NASA 1995 Federal Laboratory Review each indicated that management decision-making could be significantly enhanced by the availability of full-cost data on a program/project basis. A similar conclusion was reached by the Federal Accounting Standards Advisory Board (FASAB) and the Office of Management and Budget (OMB) in recently-issued standards on managerial cost-accounting.

Managerial Cost-Accounting Concepts & Standards

The managerial cost-accounting standard highlighted a variety of uses of cost information. These include budgeting and cost reduction/control, performance measurement, price or fee setting, program evaluation (authorization, modification and discontinuance) and making economic decisions (make or buy decisions and other changes in methods of production.) Cost information is also often critical in financial and capital planning (lease/purchase determinations) and in basic financial reporting and accountability (reporting operational results.) Traditionally, cost accounting also has been a key ingredient in establishing inventory valuations for external reporting.

The July 1995 Managerial Cost Accounting Concepts and Standards for the Federal Government established basic full-cost accounting guidance. Consistent with the basic tenant that managerial cost accounting should be management driven; the standards allow appropriate flexibility in implementation. The standards also specify that reporting entities (agencies) should report the full cost of outputs in general purpose financial reports. While certain flexibility is allowed, the standard indicates that the full cost of an output is expected to include the costs of all resources consumed that directly or indirectly contribute to the output, including the cost of identifiable supporting services provided by other segments (components) of the reporting entity and such services provided by other entities.

Key quotes from the standards follow:

> "Reporting entities should report the full cost of outputs in general purpose financial reports. The full cost of an output produced by a responsibility segment is the sum of (1) the costs of resources consumed by the segment that directly or

indirectly contribute to the output, and (2) the costs of identifiable supporting services provided by other responsibility segments within the reporting entity, and by other reporting entities."

"The full cost of a responsibility segment's output is the total amount of resources used to produce the output. This includes direct and indirect costs that contribute to the output, regardless of funding sources."

"Entity management can decide on a case-by-case basis whether full cost is appropriate and should be used for internal reporting and special purpose cost studies."

"Direct costs are costs that can be specifically identified with an output. All direct cost should be included in the full cost of outputs."

"Indirect costs are costs of resources that are jointly of commonly used to produce two or more types of outputs but are not specifically identifiable with any of the outputs. Typical examples of indirect cost include costs of general administrative service, general research and technical support, security, rent, employee health and recreation facilities, and operating and maintenance costs for buildings, equipment, and utilities. There are two levels of indirect costs:"

"(a) Indirect costs incurred within a responsibility segment. These indirect costs should be assigned to outputs on a cause-and-effect basis, if such an assignment is economically feasible, or through reasonable allocations."

"(b) Costs of support services that a responsibility segment receives from other segments or entities. The support costs should be first directly traced or assigned to various segments that receive the support services. They should then be assigned to outputs."

"A reporting entity and its responsibility segments may incur general management and administrative support costs that cannot be traced, assigned, or allocated to segments and their outputs. These unassigned costs are part of the organization costs, and they should be reported in the entity's financial statements (such as the Statements of Net Costs) as costs not assigned to programs."

This Federal standard also highlights specific terminology and principles that should be followed in implementing managerial cost accounting in Federal agencies. Several key quotes in this area follow:

"The term "cost assignment" refers to the process that identifies accumulated costs with reporting periods and cost objects. The assignment of costs to time periods is to recognize costs either as expenses or assets for each reporting

period....The word “assignment” used in this document includes various methods of attributing costs, such as direct tracing, cause-and-effect basis, and cost allocations.

“The term “cost object” refers to an activity or item whose cost is to be measured.”

“In principle, costs should be assigned to outputs in one of the methods listed below in the order of preference:

(a) Directly tracing costs wherever economically feasible;
(b) Assigning costs on a cause-and-effect basis; and
(c) Allocating costs on a reasonable and consistent basis.

“The method of direct cost tracing usually relies on the observation, counting, and/or recording on the consumption of resource units...”

“For the costs that are not directly traced to outputs, it is preferable that they be assigned to them on a cause-and-effect basis.”

“The preferred presentation of the relationship between the pooled cost and the benefiting cost objectives is a measure of the activity (input) of the function or functions represented by the cost pool.”

“Sometimes, it might not be economically feasible to directly trace or assign costs on a cause-and-effect basis.”

“These supporting costs can be allocated to segments and outputs on a prorated basis.”

“The cost allocations are usually based on a relevant common denominator such as the number of employees, square footage on office space, or the amount on direct costs incurred in the segments.”

The Federal managerial cost standard establishes the basic framework within which NASA and other Federal agencies must establish agency full-cost policies. The Federal guidance also reflects a related perspective from traditional private sector cost accounting/management concepts.

Phased Implementation

NASA is pursuing the implementation of full-cost management through a deliberative phased process. This phasing is required based on (1) the complexity of the fundamental changes inherent in full-cost management when compared with NASA’s historic practices and (2) the needed NASA system changes required to support full-cost

management with standard integrated financial cost-system capabilities. NASA plans to acquire the required system capabilities during the next few years through the ongoing NASA Integrated Financial Management Project (IFMP) systems initiative. NASA's phased full-cost management initiative is also expected to coincide with the new system implementation.

The Full-Cost Management initiative is being managed through several phases. The phases and the planned timing follow.

Concept Phase	(FY 1995)
Requirements Phase	(FYs 1995/1996)
Prototype Test Phase	(FY 1996)
Agencywide Test Phase	(FYs 1997/1999)
Implementation Phase	(FYs 1999/2000)
Operation Phase	(FY 2001)

Concept Phase

NASA is pursuing its full-cost initiative through a team approach. In early-1995, NASA established a small team of financial and program managers to pursue full-cost management in NASA. This team consulted with industry and other Federal organizations. The team included members from several NASA organizations representing a variety of functional and programmatic areas.

The following list highlights the initial full-cost team representation.

Organization	**Area**
Headquarters Code B	(Financial & Resources Management)
Headquarters Code J	(Facilities)
Headquarters Code M	(Space Flight)
Headquarters Code O	(Space Communications)
Headquarters Code S	(Space Science)
Headquarters Code R	(Aeronautics Center Representative
Headquarters Code U	(Life & Microgravity Sciences & Applications)
Headquarters Code Y	(Earth Science)
Goddard Space Flight Center	(Center Program Management)
Langley Research Center	(Center CFO)
Marshall Space Flight Center	(Center Resources/Program Management)
Kennedy Space Center	(Center Resources Management)
Stennis Space Center	(Center CFO)
Johnson Space Center (JSC)	(Center Management)
Space Shuttle/JSC	(Program/Resource Management)

The full-cost team visited/contacted a variety of organizations during 1995 to determine approaches pursued by several private companies and Federal agencies with regard to cost management.

The organization lists follow.

Private Sector Organizations
Boeing
Lockheed Martin Astro Space Division
TRW, Civil & International Systems Division, Space & Electronics Group
Rockwell Aerospace (contact)

Federal Agencies
Department of Commerce, National Institute of Science & Technology
Department of Defense (DoD) Army Material Command
DoD, Naval Air Warfare Center Weapons Division China Lake
DoD, Edwards Air Force Base
Phillips Laboratories (contact)

Goddard Space Flight Center
Lewis Research Center
Ames Research Center
Marshall Space Flight Center
Johnson Space Center

Jet Propulsion Laboratory

Based on information obtained from team visits and contributions from team members, as well as, supporting experts, the full-cost team developed a detailed concept and approach for implementing full-cost management in NASA.

The full-cost team provided a variety of briefings on full-cost accounting, budgeting, and management to NASA groups during late-1995 and early-1996, including NASA's senior management group. During the senior management group presentation, the Administrator indicated that NASA should continue to pursue full-cost management as described by the full-cost team. The full-cost team subsequently finalized a detailed paper on the concept and planned approach. This paper was coordinated through all Headquarters organizations and key suggestions were incorporated into the final paper. After receipt of this February 1996, paper, entitled "Full Costing in NASA," the Administrator directed the CFO to proceed expeditiously with the implementation of this full-cost management concept and approach in NASA.

Concept

The NASA concept for full-cost accounting, budgeting, and management was developed based on traditional cost and management principles and practices followed in private sector businesses. NASA plans to implement new practices during the next few years to improve the cost effectiveness of mission performance. This initiative includes policy and practice improvements in the accounting, budgeting, and management areas and is expected to provide complete cost information for more fully informed decision making. NASA plans to associate all Agency costs (including civil service personnel costs) with major activities and to budget, account, report, and manage these activities from a full-cost perspective. NASA's programs and projects, are the primary activities upon which full-cost information is expected to be developed and used.

NASA's full-cost concept integrates several fundamental accounting, budgeting, and management improvements. The planned improvements include accounting for all NASA costs as direct costs, service costs, or general and administrative (G&A) costs, budgeting for all appropriate program/project/initiative/("project") costs, and managing such "projects" from a full-cost perspective. (The term project is used to represent NASA's final cost objective or object. The term encompasses single project programs, projects and initiatives as well as certain specified activities.)

Briefly stated, (1) direct costs are costs that can be obviously and/or physically linked to a particular project, (2) service costs are costs that cannot always be initially, readily and/or immediately linked to a project but subsequently can be traced to a project (optimally based on service consumption) and (3) G&A costs are support costs that cannot be linked to a specific project in an economical manner. Such cost are typically allocated to cost objects (or projects) on a reasonable, consistent basis.

Consistent with Federal standards, NASA plans to assign costs to cost objectives by directly tracing costs when economically feasible, assigning costs on a cause-and-effect basis and allocating costs on a reasonable and consistent basis. Under full-cost management, service costs are expected to be "charged" or assigned to a project based on project-controlled use of the service. G&A costs are expected to be allocated to projects in a consistent, logical manner based on a metric that indirectly relates such G&A costs to NASA projects. The G&A allocation basis are expected to be the most relevant common denominator that indicates a causal relationship between the G&A costs and the related NASA projects. (After evaluating several allocation bases, NASA has decided to use direct full time equivalent (FTE) labor as the standard G&A allocation basis because G&A costs exhibit the strongest, cause/effect relationship with labor as compared with other bases.)

All costs will continue to be controlled and managed within NASA. Under full-cost management, however, project managers (with the most direct mission responsibility and most intimate project knowledge) are expected to continue to control direct costs but are also expected to have greater influence over service and appropriate awareness of G&A costs. Project management control/influence, however, is not unconstrained. At the same time, NASA Enterprise and Center management is expected to continue to guide expenditures related to Center capabilities consistent with strategic imperatives.

NASA's full-cost initiative is also expected to support more complete "full disclosure" of NASA activities and improved matching of costs with performance. As a consequence, NASA's full-cost initiative also is expected to support full disclosure and full accountability for all NASA resources. In that regard, this initiative is also consistent with sound business practice and with recent legal and performance guidance, including the 1990 CFO Act, 1993 GPRA, 1993 National Performance Review, and the 1996 Federal Financial Management Improvement Act.

Requirements Phase

The effective and efficient implementation of full-cost management in NASA requires key cost management system capabilities. Without such capabilities, detailed cost accounting support becomes extremely labor intensive. Such labor is not, and is not expected to be, available. While certain, after-the-fact cost finding techniques can be used to establish a minimal level of cost accounting capability for analytical purposes, such techniques cannot support NASA full-cost accounting, budgeting, and management in an operational setting. As a consequence, NASA has determined that the timely and efficient implementation of full-cost management in NASA requires new standard system capabilities. NASA plans to acquire such capabilities from the private sector marketplace through the IFM initiative.

The requirements phase of the full-cost initiative occurred concurrently with the concept phase and culminated with the submission and refinement of basic cost accounting, budgeting, and management requirements information into the NASA IFM initiative in early 1996. Key requirements were derived from Federal managerial cost accounting and system guidance from a variety of sources, as well as, input from NASA's full-cost team and IFM team representatives. These requirements were subsequently integrated into a comprehensive IFM Request for Proposal (RFP) that was released, in June 1996, for competitive proposals from the private sector. In addition to specific requirements, the RFP included the entire February 1996 paper on Full Costing in NASA to ensure that proposing vendors received NASA's most up-to-date representation of the anticipated concept and approach to full-cost management.

As with other functional areas that are expected to be supported by NASA's new integrated system, the anticipated NASA approach to full-cost management is expected to be adjusted to adapt to available commercial system costing capabilities. (NASA's

full-cost concept and approach may require further refinements to match the recently acquired IFM system capabilities.) Such further full-cost management refinements are expected to occur as NASA implements the standard system selected as the best available commercial solution to NASA's integrated financial management program requirements. NASA awarded a multi-year contract for its new system in late 1997. Ongoing system and process refinements are underway. The full-cost effort has been, and will continue to be, fully integrated into the IFM initiative.

Prototype Phase

The full-cost prototype test phase involved the further development of the concept and approach through the testing of the concept at selected NASA locations. In early 1996, the NASA Chief Financial Officer (CFO) requested that interested Centers volunteer to act as prototype locations to test the concept and approach. Three representative Centers were selected. The Centers were the Marshall Space Flight Center (MSFC), the Lewis Research Center (LeRC) and the Goddard Space Flight Center (GSFC). These Centers and Headquarters established separate, local full-cost teams and actively developed operational approaches to full-cost management during 1996.

During the prototype test phase, the NASA full-cost team was reconstituted and enlarged to include a basic working group, a policy group and a senior executive steering group. These groups were established to ensure that the prototype activities reflected key NASA-wide issues and to assist in the communication of the evolving concept and approach throughout NASA.

The working group included representatives from Headquarters, each of the prototype Centers as well as key managers from the full-cost team that operated during the concept phase. The policy group included representatives from each Headquarters organization, as well as representatives from each Center. The steering council included senior executive representatives from each NASA enterprise, as well as, senior executive representatives form several Centers and Headquarters organizations. (Consistent with recent NASA nomenclature changes for similar groups; the former council recently was retitled as a steering group. Code U was represented on the steering group by Code M.)

Prototype Test Results

Testing of the full-cost concept at four NASA locations demonstrated that full-cost practices can be implemented in NASA, provided that NASA's financial systems are enhanced to accommodate timely, detailed cost data and processes. Further, the full-cost concept evolved during the prototype phase and can be expected to evolve further during the Agencywide test phase.

Approach

To achieve the objectives of the prototype test, each of the four prototype locations was asked to recast its FY 1995 cost data into a full-cost format. Each location formed a full-cost team, consisting of finance, resource management, project management, and Center management personnel. At each Center, the CFO either led the full-cost team or played a very major role in team leadership. While there were differences among the Centers in terms of the details of their approaches to recasting FY 1995 cost data, each Center:

- Reviewed its FY 1995 costs and reclassified them as direct, service, or G&A;
- Analyzed the nature of its FY 1995 activities and determined (1) the content of its general and administrative (G&A) cost pool and (2) the number and basic contents of its service pools;
- Determined the bases/approaches it would use for (1) allocating G&A costs to cost objectives and (2) assigning service pool costs to cost objectives;
- Prepared schedules comparing total Center costs in both the traditional and recast full-cost formats; and
- For selected programs and/or projects, prepared schedules comparing costs in traditional and full-cost formats.

Results

The prototype activity demonstrated analytically that full-cost practices could be implemented in NASA. A summary of certain data drawn from the full-cost recasting process serves to demonstrate the type of information that would be available routinely when the full-cost initiative is fully implemented.

In FY 1995, NASA costs totaled $13, 871 million (excluding $14 million for the Office of the Inspector General). On an Enterprise basis, the full cost of NASA activities were:

	FY 1995 Costs (Dollars in Millions)	
	Traditional	Full Cost
Human Exploration and Development of Space	6,849	7,157
Space Science	1,955	2,654
Earth Science (MTPE)	1,390	1,826
Aeronautics*	826	1,442
Space Access and Technology*	662	792
Mission Support	2,189	- 0 -
Total	13, 871	13,871

***** The Space Access & Technology Enterprise was subsequently disbanded/integrated into new Aero-Space Technology Enterprise.

Also noteworthy is the distribution of costs by type. FY 1995 costs for Headquarters, GSFC, LeRC, and MSFC totaled $7.0 billion. Analysis of the costs showed that costs were broken down as follows:

Cost Type	Costs
Direct Costs	$5.8 billion
Service Costs	0.6 billion
G&A Costs	0.6 billion
Total	$7.0 billion

The noted information was developed analytically using cost finding techniques, a proven approach that produces satisfactory results, but that often encounters problems with timely data production, and, therefore, is not satisfactory for operational purposes across NASA. The prototyping activity clearly demonstrated that current systems couldn't support full-cost budgeting and management, and/or an operational full-cost accounting

capability. The IFM system must be operational in order for NASA to fully and efficiently operate under full-cost practices.

The basic concept of full-cost developed in the concept phase of the full-cost initiative evolved considerably during the prototype phase as issues arose, alternative approaches were developed and evaluated, and solutions were chosen. The full-cost concept is expected to continue to evolve during the Agencywide test phase.

Agencywide Test Phase

The interval between the completion of the prototype phase and the implementation of IFM provides the opportunity for testing full cost budgeting and accounting at all Centers. In view of the extension activities involved in implementing NASA's new integrated financial management system, the Full Cost Agencywide Test Phase is expected to occur over a multi-year period. In the first year of the Agencywide test phase, the efforts of Centers and Headquarters were focused on:

- testing full-cost budgeting by recasting the FY 1999 budget into a full cost format;

- testing full-cost accounting by applying cost finding techniques to 6 months of FY 1997 accounting data to determine program/project costs;

- identifying issues, which need to be resolved before full cost implementation.

Further, Centers were encouraged to begin applying full cost principles to day-to-day management activities with a view toward more extensive application, as appropriate.

During the second year of NASA's Agencywide Full Cost Test, NASA focused on integrating the full cost initiative with the NASA-related IFMP initiative. Subsequent full cost test activity is expected to continue through related IFMP activities until the new system is implemented and operational.

Agencywide Test (Year 1) Results

Overall, testing confirmed that the IFM was necessary for full cost budgeting and accounting. Cost finding techniques proved to be extremely resource-intensive and could not produce needed data in a timely fashion. The results of recasting FY 1998, 1999 and FY 2000 budgets into a full cost format were:

	1998	1999	2000
HEDS	$ 7.2	$ 7.0	$ 6.7
Space Science	2.5	2.4	2.5
Earth Science	1.8	1.8	1.8
ASTT	2.1	2.0	1.6
TOTAL	$13.6	$13.2	$12.6

Costs were broken down as follows:

Direct	$10.9	$10.5	$ 9.9
Service (inc. SOMO)	1.4	1.4	1.4
G&A	1.3	1.3	1.3
TOTAL	$13.6	$13.2	$12.6

Further, the lack of automated budget formulation tools presented problems. Recasting of the FY 1998-2000 budgets from the traditional format to a full cost format was a resource-intensive, manual effort. To attempt to develop two budgets -- a traditional version and a full cost version – would have been prohibitive in terms of time and cost.

Testing also demonstrated the need for additional development work regarding service pools and G&A pools. In the case of service pools, mechanisms are needed to capture consumption data and link consumption and cost data in order to develop cost per unit of service consumed. With regard to G&A pools, there is a need to develop approaches for obtaining FTE data for on-site direct civil service and contractor personnel to serve as the basis for G&A cost distribution.

During this phase a number of key full-cost implementation policy issues were also identified and resolved. A summary of these issues can be found in **Appendix 6**.

In addition to developing solutions to the issues discussed above, future testing will focus primarily on implementation of full cost accounting and budgeting as an integral part of the IFM implementation effort.

Agencywide Test (Year 2)

During FY 1998, NASA fully integrated the full cost initiative into NASA's ongoing Integrated Financial Management Project (IFMP) initiative. These closely related initiatives had been fully coordinated during the past few years but from a practical and implementation perspective were fully merged in FY 1998. In this regard, the full cost initiative has been largely subsumed within the broad IFMP initiative. NASA also initiated two closely related full cost activities during FY 1998. These activities involved new Federal financial/cost reporting and an internal NASA full cost management simulation activity.

Full Cost Integration into IFMP

During FY 1998, NASA merged its full cost and IFMP initiatives. The integration of the IFMP and full cost initiatives is particularly appropriate for several reasons. The IFMP covers all business areas and includes process reengineering and process standardization and improvements in all key accounting, budgeting and management areas. NASA's full cost practices cover the same business processes and require new system capabilities to be effectively and efficiently implemented and operated. NASA's full cost concepts and practices have matured to the point that NASA plans to introduce these practices, in conjunction with the IFMP system, into ongoing NASA operations within the next few years. Like several other IFMP functional areas, NASA's full cost practices represent fundamental new, standard financial and business management practices. These full cost practices permeate all of the IFMP system functional areas. In addition, IFMP system capabilities are an essential prerequisite for implementing full cost practices in NASA.

During FY 1998, NASA focused its primary full cost initiative activities into the IFMP. Key activities included matching IFMP system capabilities with planned full cost practices and processes and ensuring that the IFMP process team integrated full cost concepts into ongoing IFMP system configuration activities. In that regard, the prior practice of convening separate full cost working and oversight groups was largely discontinued in FY 1998. Instead, full cost activities became one element of the broader IFMP activities/meetings.

The full cost initiative planned future activities/schedule was revised in FY 1998 to mirror updated IFMP plans. During early FY 1998, NASA anticipated that agencywide testing of full cost practices would occur in FY 1997 through FY 1999 and that, during such time, NASA would acquire, configure, test and implement a comprehensive new integrated financial management system (IFMP). During FY 1998, the IFMP system schedule shifted from an earlier plan to implement key components of the system, with related full cost capabilities, for FY 2000 to a revised plan for FY 2001. The schedule change occurred because the system contractor could not meet the originally scheduled delivery of software to NASA. The new IFMP schedule led NASA to reschedule the planned full operation of full cost practices from FY 2000 to FY 2001.

Interim Full Cost Reporting

During FY 1998, pursuant to Federal standards & financial statement reporting requirements, NASA tested key full cost concepts by restating NASA's FY 1997 financial statement (cost report) into an interim full cost format. This restatement involved after-the-fact cost finding techniques designed to estimate the full cost of NASA's enterprises and major programmatic activities. Such reporting is required by Federal standards and legislation for FY 1998. While NASA had developed similar restatements with accounting and budget data during earlier phases of the full cost initiative, such

analyses were not required to be directly tied to and verifiable with NASA's official accounting records.

During FY 1998, using FY 1997 data, NASA followed a rigorous auditable series of steps and restated its FY 1997 expenses into a full cost format. NASA's analysis also followed all of the key tenants of its full cost initiative. NASA also internally reviewed the approach and results and provided the analysis to NASA's independent public accountant. After such review NASA applied the verified cost finding techniques to FY 1998 data for NASA's required FY 1998 Net Cost Statement.

Full Cost Management Simulation

In September 1998, NASA undertook a full cost management/budget simulation to specify key management issues that must be finalized to support the effective integration of new standard full cost practices into key agency management processes and practices. The purpose of this simulation was to continue NASA's ongoing training in full cost concepts by specifically "training" NASA Executives and Managers in both full cost budgeting as well as in full cost management practices.

The management/budget simulation involved Centers applying full cost concepts/ principles to the FY 2000 budget as submitted to the Office of Management and Budget to create a full cost FY 2000 budget. The simulation also took into account other NASA activities related to facilities and human resources planning.

The simulation resulted in:

- the identification of full cost management issues and the development of proposed solutions/guidance;
- the Centers' successful formulation of a FY 2000 full cost budget;
- the Centers' integration of full cost management processes into the budget formulation activity; and
- the publishing of final guidance on full cost management issues.

The results of the simulation were presented to the Capital Investment Council, which reaffirmed NASA's commitment to implement full cost practices in FY 2001.

Project Coordination

During the initial and ongoing phases, the full-cost team briefed numerous NASA organizations and periodically briefed other Federal organizations regarding the NASA full-cost management concept and approach. The following provides a partial list of such organizations.

NASA Organizations

Senior Management Group
Administrative Issues Group
Full-Cost Steering Council & Policy Group
IFMP Steering Council & Teams
Senior Executive Service Training Program
Centers & Headquarters Facilities Managers
Centers & Headquarters Human Resources (Personnel) Officers
Office of Space Flight (Code M) Headquarters & Centers Managers/Executives
Program Project Management Training Program
Ames Research Center (Managers & Staff)
Dryden Flight Research Center (Managers & Staff)
Johnson Space Center (Financial & Resources Management Managers & Staff)
Langley Research Center (Managers & Staff)
Lewis Research Center (Managers & Staff)
Goddard Space Flight Center (Full-Cost Team)
Headquarters (Full Cost Policy Group)
Kennedy Space Center (Financial, Resources & Project Control Managers)
Marshall Flight Research Center
Stennis Space Center

Other Organizations

Jet Propulsion Laboratory
Federal Interagency Cost Working Group
Department of Transportation (Federal Aviation Administration)
Department of Defense (Office of the Secretary of Defense)
Office of Management & Budget
Association of Government Accounts Conference

LIST OF PROGRAMS AND PROJECTS

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The following is an overview of NASA's full cost budget structure/framework:

Structure	**Application**
Agency	NASA
Budget Line Item	Enterprises
Budget Line Item Area	Major Programs and Development; Operations; Research, Technology, and Investment
Program Level	Programs Plans
Project Level	Projects Plans

The following list of programs and projects is a draft and is expected to be revised.

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SPACE SCIENCE BUDGET LINE ITEM

BLI AREA	**PROGRAM LEVEL**	**PROJECT LEVEL**
Major Programs & Development	AXAF Program GP-B Program HST Development Program SOFIA Program TIMED Program SIRTF Program	AXAF Project GP-B Project HST Development Project SOFIA Project TIMED Project SIRTF Project
	Payloads	Rosetta Astro-E Cluster II Other International Payloads Spartan
	Explorer Program	MIDEX Project FUSE Project HETE II Project Small Explorers STEDI Project UNEX Project Future Explorer Projects

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	Mars Surveyor Program	Mars Network Project Mars 98 Orbiter/Lander Project Mars 2001 Orbiter/Lander Project Micromissions Project Future Surveyor Projects	
	Discovery Program	Lunar Prospector Project Stardust Project Genesis Project Contour Project Future Projects	
Operations	Operating Missions	HST GRO ISTP Galileo Explorers Cassini Pioneer Voyager AXAF	Mars Surveyor GP-B Ulysses TIMED Discovery SIRTF Other Mission Operations
Research, Technology & Investment	R&T	Core R&T Focused R&T Flight Validation (New Millennium) Research & Analysis Data Analysis Suborbital Research	
	Investment	Facilities and Capital Investment Education Minority University Research & Education Environmental Activities	

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EARTH SCIENCE BUDGET LINE ITEM

BLI AREA	**PROGRAM LEVEL**	**PROJECT LEVEL**	
Major Programs & Development	Earth Observing System Program	AM-1 Project PM-1 Project Chemistry Project Special Spacecraft Projects EOS Follow-on Projects EOSDIS Project EOS Algorithm Development Project Quikscat Project Landsat Project	
	Earth Probes Program	TOMS Project TRMM Project ES Science Pathfinders Projects Lightsar Project Lewis & Clark Project Experiments of Opportunity TRIANA	
Operations	Operating Missions	UARS TOPEX	TOMS TRMM Space Laser Ranging Earth Sciences Minor Missions
Research, Technology & Investment	R&T	Research & Analysis Information Systems Airborne Research GLOBE HPCC-Earth Remote Sensing Technology Infusion (New Millennium) Mission Science Teams Studies UAV Science Data Purchase Commercial Remote Sensing	

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Research, Technology & Investment	Investment	Facilities and Capital Investment IFMP Project Education Minority University Research & Education Environmental Activities

AERO-SPACE TECHNOLOGY BUDGET LINE ITEM

Major Programs & Development	Reusable Launch Vehicle Flight Demonstration	X-33 Project X-34 Project Future-X Pathfinder Trail Blazers
	High Speed Research Program Advanced Subsonics Technology Program Aviation Systems Capacity Aviation Safety Technology Program HPCC Program HPCC – Efficient Engine Program	High Speed Research Project Advanced Subsonics Technology Project Aviation Systems Capacity Aviation Safety Technology Project HPCC Project Ultra-Efficient Engine Project
Research, Technology & Investment	Advanced Space Transportation Program	Focused Project Core Project
	Future Space Launch Studies Program	Architecture Studies Shuttle Upgrade Studies Reusable First Stage Studies Five Segments SRB Study Future Space Launch Studies Interdisciplinary
	Future Space Launch Development Program	Future Space Launch Development Project

Research, Technology & Investment	Aeronautics R&T	Airframe Systems Propulsion Systems Aviation Operations Systems Flight Research Information Technology Intelligent Synthesis Environment Rotorcraft Aeronautics Research and Technology Facilities Construction
	Commercial Technology Program	Commercial Construction Projects Technology Transfer SBIR Industry Outreach SBIR Small Business Technology Transfer
	Investment	Facilities and Capital Investment IFMP Project Education Minority University Research & Education Environmental Activities

HUMAN EXPLORATION & DEVELOPMENT OF SPACE BUDGET LINE ITEM

Major Programs & Development	International Space Station	Vehicle Operations Capability Research Projects Crew Return Vehicle US/Russian Cooperation Russian Program Assurance
Operations	Space Station Operations	Vehicle Systems Operations Ground Systems Operations Utilization & Research Operations
	Space Shuttle Program	Program Integration Ground Operations CLCS Project Flight Operations Flight Hardware

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Operations	Payload and Expendable Launch Vehicle (ELV) Support	Payload Carriers and Support ELV Mission Support Spacelab
Research Technology & Investment	Life & Microgravity Sciences and Applications	Advanced Human Support Technology Biomed Research & Counter-measures Gravitational Biology & Ecology Microgravity Research Space Project Development Health Research Mission Integration
	Investment	Facilities and Capital Investment IFMP Project Rocket Propulsion Testing Education Minority University Research & Education Environmental Activities Advanced Projects

INSPECTOR GENERAL G&A Costs Associated with IG Should be Allocated Among All Center Projects and Not Allocated to this Account

CORPORATE GENERAL & ADMINISTRATIVE (G&A ACTIVITIES)

Office of the Administrator
Office of the Chief Financial Officer
Office of Headquarters Operations

NASA Full Cost Initiative
Standard Service Activities

Service Activity	**Content**
Facilities and Related Services	Rental Of Real Property Maintenance Operations Mods & Rehab Design / Engineering Calibration Utilities Environmental Water Sewage Electricity Natural Gas Fuel Oil Other Energy Source
Information Technology Services	Desktop Computing Super Computers Data Reduction Data Services Applications Support Video Teleconference System (ViTS) Voice Teleconferencing Services (VOTS) Facsimile (FAX) Audio/Video Telephone
Publishing Services	Photo Printing & Reproduction Graphics Reduced Instruction Set Computer (RISC)
Science/Engineering Services	Drawing Files Computer Aided Design (CAD) System
Fabrication Services	Contract Services Repair Tooling & Supplies Equipment Replacement

NASA Full Cost Initiative
Standard Service Activities

Activity	**Content**
Test Services	Thermal Vibrations Testing, etc.
Wind Tunnel Services (Ames, Langley, and Lewis Research Centers)	Aerodynamics and related services

Bases for Assignment of Service Costs

Assignment of service costs to projects and to G&A cost pools is to be based on consumption. Although there can be many ways to measure consumption and, therefore, assign costs, the key criteria for selection of a basis for cost assignment is the adequacy of the linkage between cost incurred and the benefiting party. Based on an evaluation of current Center service pool distribution bases and keeping in mind the objective of standardization, the following shall be the bases for assigning the cost of each service activity:

Service	**Basis**
Facilities and Related Services	Square Footage
Information Technology Services	
Telephone	Lines
Desktop Computing	Seats/Work Stations
Computing Services	Machine Hours/Central Processing Units (CPU's)
Other Information Technology Services	Direct Labor Hours
Publishing Services	
Products	Catalogue Prices
Services	Direct Labor Hours
Science/Engineering Services	Direct Labor Hours
Fabrication Services	Direct Labor Hours
Test Services	Direct Labor Hours
Wind Tunnel Services	Direct labor Hours

Work orders are also an appropriate basis for assigning service pool costs, provided that work orders consistently are based on full costs.

Four service activities -- science and engineering services, fabrication services, test services, and wind tunnel services -- are labor intensive. Accordingly, service activity labor, in instances where it can be, should be charged directly to benefiting projects or G&A. If service activity labor is charged directly to projects, the hours charged are included as "direct labor" in the calculation of "G&A Rate/Cost per FTE". For the remaining service activities, labor should not be charged directly to the benefiting projects or G&A, but instead should be included in the service activity rate. Such remaining service activity labor should not be included in the calculation of the G&A rate/cost per FTE.

Roles and Responsibilities Related to Service Activities

The following individuals/organizations have responsibility for the development, operation, and supervision of service activities.

Position/Organization	Role/Responsibilities
Service Activity Manager	Manage service activity Propose rates Identify/arrange for sources of services
Project Manager	Establish service requirements
Performing Center Director	Establish service policy Approve rates
Enterprise/Institutional Program Office	Validate requirements Concur on rates with Center Director
Enterprise Associate Administrator	Concur with Institutional Program Office

NASA Full Cost Initiative
Contents of General and Administrative (G&A) Pool

Administrative and Operational Areas Include:

Center Management
Finance/Budget
Procurement
Human Resources
Library
Emergency Management
Environmental
Traffic Management
Janitorial/Custodial
Mail
Fire Protection
Security
Security Investigations
Academic Research
Administrative Aircraft
Industrial Safety
Legal
Public Relations
Logistics
Medical Services
Innovative Research
Reactor - Plumbrook
Program Management
Employee Awards
Outreach Programs

Basis for Allocating G&A Costs

G&A costs are allocated to projects based on a Center "G&A Rate ", or Cost per Full-Time Equivalent (FTE).

$$\text{Center G\&A Rate is: } \frac{\text{Total G\&A Cost}}{\text{Total Project Direct Labor}}$$

Total Project Direct Labor consists of:

- Civil Service direct labor, that is, any civil servant who charges a project directly, and
- On-site contractor direct labor

As noted earlier, four service activities -- science and engineering services, fabrication services, test services, and wind tunnel services -- are labor intensive. Accordingly, service activity labor, in instances where it can be, should be charged directly to benefiting projects or G&A. If a service activity labor is charged directly to projects, the hours charged are included as "direct labor" in the calculation of "G&A Rate/Cost per FTE".

Roles and Responsibilities Related to G&A Pools

The following individuals/organizations have responsibility for the development, operation, and supervision of G&A pools.

Position/Organization	Role/Responsibilities
G&A Pool Manager	Manage pool Prioritize requirements Propose G&A total and rate
Project Manager	Fund per policy
Performing Center Director	Establish G&A policy Establishes G&A total and rate
Enterprise/Institutional Program Office	Approve G&A total and rate
Enterprise Associate Administrator	Concur with Institutional Program Office

Key Issues

A number of issues have been identified and resolved during the recent phases of the full-cost initiative. Summaries of several such key issues follow.

1.0 Full-Cost Management Structure

Full-cost practices involve a variety of considerations related to NASA's management. NASA's basic management structure has been established and documented in recent strategic management guidance. NASA's full-cost management approach and the related roles of key participants are expected to operate efficiently within this broader strategic management structure.

1.1 Issue

What role does the lead program manager have in negotiating/obtaining budget estimates from performing centers? Center (lead & performing) G&A rates? Service pool rates? Service pool activity levels?

1.2 Resolution

The lead program manager has full authority to negotiate the total cost/budget and deliverables being obtained from a performing Center. (Center Directors are responsible for resolution of any disputes.)

Negotiating G&A – While an allocation of performing Center G&A costs are included in the total cost/budget support of the projects that compose a program, the program manager does not negotiate the performing Center G&A rate or G&A cost elements.

Negotiating Service Pool rates – The program or project manager does not negotiate service pool rates.

The performing Center management, with input from representatives of the Center's customers (program managers, project managers, and external customers) on requirements, establishes the Centers service pool rates. The Enterprises, under the IPO leadership, validate the collective requirements, service pool levels and selected standard Agency charging mechanisms.

Negotiating Service Pool Activity – Service pool activity is established based on customer input. The principal source of this input should be from the individual program and project managers establishing requirements, receiving benefits and paying for the services.

Program Cost Caps – How do program and project managers operate under cost caps for long-term projects?

In the case of capped programs, program and project managers must budget for (1) the effects of inflation and (2) adequate reserves for contigencies.

1.3 Issue

What authority do program/project managers have with respect to selecting individuals to work on their programs/projects?

1.4 Resolution

The Center Director is responsible for the overall workforce, civil service and contractor, at the center. The assignment of people to a program or project should be a good faith negotiation between the program or project manager and the appropriate center organization. Program/project managers do not select specific individuals. Center management makes specific arrangements. The program or project manager can adjust requirements and seek alternative methods to satisfy their requirements.

Program/project managers' primary objective is ensuring their projects are completed. However, they also have an interest in ensuring that the appropriate skills are obtained to achieve their project objectives. In that regard, program managers may seek alternatives to initially planned performing Center support. Center Directors and Enterprises will resolve any disagreements.

1.5 Issue

What authority do program/project managers have with respect to sourcing/outsourcing for required goods/services?

1.6 Resolution

Program and Project managers have significant latitude on sourcing decisions for activities funded as direct cost to the program or project. Their decision authority diminishes for service costs and does not apply to G&A activities.

1.7 Issue

How/When does the lead program manager solicit budget information from supporting Centers?

1.8 Resolution

The lead program manager solicits budget information from supporting Center project managers through supporting Center management as part of the annual budget formulation process that is initiated in the February – March time frame.

1.9 Issue

How/When does full cost accounting affect Program and Project management/ information under the provisions of 7120.5A?

1.10 Resolution

Full cost information should consistently be used throughout NASA management, including evaluations completed pursuant to Program and Project Management guidance under 7120.5A. Full cost data should be collected and reported against program/project plans from its beginning to its completion. This information should be used internally by the program/project manager and should be used externally by the manager in reporting status to others, including the Program Management Council (PMC).

2.0 Full-Cost Budget Structure

NASA has decided to integrate full-cost accounting, budgeting, and management changes and practices to optimize the anticipated cost-effective mission benefits of its full-cost initiative. Full-cost accounting is required by Federal legislation and related guidance. Full-cost budgeting and management are indicated in Federal legislation and related guidance. The strength and benefits of NASA's full-cost practices are optimized by the integration and synergy of changes in each area. Full-cost accounting by itself, over time, would likely lead to gradual budget and management improvements. However, concurrent changes to full-cost practices in the accounting, budgeting, and management areas can be expected to ensure that NASA optimizes improvements in each area, as expeditiously as possible.

Full cost information will become readily and expeditiously relevant for strengthened budget and management practices. Full-cost budgeting supports full disclosure and full-accountability for NASA budget resources. Full-cost budgeting highlights the important linkage between NASA's service and G&A costs and its projects and programs. Full-cost budgeting also highlights the full project specific investments required to achieve mission outputs and outcomes. As such, full-cost budgeting is also directly supportive of the Government Performance and Results Act (GPRA) and related Federal performance management guidance. Full-cost budgeting also enhances budget allocations and decision-making processes by providing more complete information on programs and projects.

Full-cost management integrates the empowerment of project managers to make key project decisions thereby helping to ensure that NASA optimizes mission performance from available

budget resources. The synergy between the changes in each area support improved mission performance as well as timely, proactive compliance with related legislative guidance. As a consequence, NASA has decided to pursue key budget changes as part of its full-cost initiative.

2.1 Issue

What will be NASA's basic budget and control structure in a full-cost environment?

2.2 Resolution

The basic full-cost budget and control structure anticipates external and internal controls. The planned internal budget control structure (the structure NASA continues to pursue) follows.

Structure	**Content**	
Appropriation	1 Appropriation	All NASA, except IG
Budget Line Item	4 Budget Line Items	4 Enterprises (Codes M & U together)
Budget Line Item Area	11 Budget Line Item Areas	Major Programs and Development Operations Research, Technology, and Investment
Program Level	30 Programs	Programs May Occur In More Than One Budget Line Item Area
Project Level	120 Projects and Projects/ Initiatives	Projects Fall Within Programs

NASA plans to seek an external budget and control structure with the Office of Management and Budget (OMB) and the Congress that provides management with flexibility regarding project and program changes that are likely to occur as NASA's highly technical research and development (R&D) projects and programs evolve.

The planned external budget control structure proposal follows.

1 Appropriation (Separate Appropriation for IG)
4 Budget Line Items (BLI)*

*With related staffing transfer flexibility within the appropriation across BLI (See staff flexibility for details.)

The planned budget structure will provide significantly greater flexibility to manage the budget than the current structure. The current and planned structure follows.

	Current	Planned *
Appropriations (excludes IG)	3	1
Budget Line Items	16	4
Budget Line Item Areas	80	11
Programs	50	30
Projects	200+	120

- A detailed list of NASA's programs and projects is provided as **Appendix 3**; additional refinements are anticipated**.**

In addition, NASA's current appropriations include a variety of fund terms (1-year, 2-year, and no year after first dollar is obligated within 3 years). These appropriations and/or related Congressional/OMB guidance also include other controls related to certain types of expenditures (travel) and to the number of Full Time Equivalent (FTE) staff. The planned proposal is expected to focus on cost based guidance and to eliminate such travel, FTE, and term restrictions. Retention of NASA's current staffing flexibility is an important consideration that NASA plans to continue to pursue.

2.3 Issue

Should NASA maintain two different program/project structures, one structure for management of programs and projects and a separate, albeit similar, program/project budget structure?

2.4 Resolution

White it would often be optimal from a communications perspective to maintain one program/project list/structure, NASA, to this point, has not established a single list/structure of NASA programs and projects that could be used for both management and budgeting purposes. In certain respects, the difficulty in achieving and maintaining a single list/structure is tied to the inherently political nature of the budget process and the related determinations by Congress and the Administration regarding the degree of specific oversight and visibility they require into NASA's budget/activities.

3.0 Technical Base

Some NASA managers perceive that in a full-cost environment in which all costs are associated with projects, it will be difficult to budget for non-project-specific costs such as the maintenance of a Center's technical base. Several program and project officials have expressed the concern that the foregoing circumstances, coupled with a no-growth

budget environment, will make it very difficult to maintain a Center's technical base, thereby, potentially putting the Center into a slow, but inexorable decline.

3.1 Issue

How can the risks to a Center's technical base be reduced?

3.2 Resolution

Three approaches can be used to address this concern -- include the technical base costs in a Center/Agency service pool, include the technical base costs in a Center's G&A pool, or NASA G&A pool, or create a separate technical base project at the Center.

4.0 Capped Programs

The costs of certain programs/projects have been capped through a variety of formal or informal mechanisms. Predating the full-cost initiative, the capped costs did not include cost elements such as civil service payroll and benefits and G&A costs. When the aforementioned costs are included, certain individuals may perceive that such programs may have exceeded the prior capped amount.

4.1 Issue

How should full costs associated with capped programs be presented?

4.2 Resolution

NASA plans a straightforward approach. First, it is important to create the proper frame of reference by explaining the background and purpose of the full-cost initiative, the various types of costs, and how all costs are being associated directly or indirectly with projects. It is also important that the original cap is recognized and then a build-up from the capped amount to the full-cost amount is explained. One potential presentation approach follows.

Traditional costs	= Capped Amount
(Basically most non-Civil Service direct costs)	
	+ Direct Civil Service Payroll/Benefits
	+ Service Pools Costs
	+ G&A Pool Costs
	= New Full Cost

5.0 Cost Versus Price

Cost and price are two different but related matters. The measure of cost (full cost), in this instance, represents the monetary value of resources used or sacrificed or liabilities incurred (such as money owed) to achieve an objective. An objective would include the acquisition of a good (such as a product) or the performance on an activity or service. Price is the monetary value required by a seller to be paid by a purchaser for a good or service. In establishing prices for good and services companies and agencies often analyze the cost of such goods or services to help to ensure that costs can be recovered through the sales (price) over the long-term. Many variables go into pricing decision beyond costs. In the Federal government, statutes guide many agency-pricing decisions. These include the Economy Act and related OMB guidance. NASA has specific statutory authorities that are highlighted in the Space Act and related internal NASA guidance, including the NASA Financial Management Manual (Section 9090).

5.1 Issue

What authority do Centers have to price at other than full cost (internally, externally)? If pricing occurs at other than full cost, how do we account for the difference?

5.2 Resolution

External pricing – The NASA CFO establishes NASA external pricing policy and related waiver processes. The policy is prices should generally equal the full costs of the activity but is not required to equal full costs. If prices do not equal full costs, the CFO (NASA CFO for international and Center CFO's for other activities) must determine and document that the difference between full costs and price is in the best interest of NASA and the performance of its missions. If the price is lower than full cost, a sponsoring program must be identified to cover the difference.

Internal Costing/Pricing – In the case of transactions among NASA organizations, all transactions are to be accounted for on a full cost basis, i.e., the cost to the recipient organization will be the full cost incurred by the providing organization, thereby avoiding the issue of potential differences between costs and charges.

6.0 Cost Object

A cost object or cost objective is an activity, output, or item whose cost is to be measured. In a broad sense, a cost object can be an organizational unit, a function, task, product, service, or a customer. Many companies, particularly manufacturing concerns, establish products as their basic or final cost objective. A final cost objective is the lowest unit to which cost is expected to be accumulated. This is in contrast to intermediate cost objects, or objectives that accumulate costs that are subsequently

further assigned to final cost objects. With regard to full cost accounting, budgeting, and management, NASA evaluated several alternative cost objectives.

6.1 Issue

What will be NASA's basic cost objective/object?

6.2 Resolution

NASA has determined that the basic cost objective will be a single project program, a project, or project/initiative. As discussed earlier, the term "project" will be used to represent NASA's final cost objective. For full costing purposes, a NASA project is defined as an element of a program that is separately managed, separately budgeted, and uniquely identified within the NASA budgeting and accounting system. Further, a project is generally the lowest level at which a performing Center will budget and account for its direct costs and service costs, and allocates its G&A costs. Cost will also be accumulated at the program, budget line item area, Enterprise, and NASA levels, as well as by NASA Centers.

7.0 Capital Items

Capital items are assets that benefit the current accounting period and one or more future accounting period(s). Because of this future benefit, basic accounting (in an attempt to match expenses and revenue in appropriate accounting periods) indicates that the costs of capital items should be distributed over the benefiting accounting periods. In addition, the cost of capital items, such as property, plant, and equipment which is not program-specific, e.g. an addition to an engineering laboratory at a Center, should be accounted for in such manner that a portion of the acquisition cost is assigned or allocated to projects that benefit. Recently issued Federal accounting standards also require agencies to calculate depreciation for general purpose property, plant, and equipment, and to include depreciation in (1) the agencies' financial statements and (2) cost of operations. NASA is faced with the challenge of developing an approach, which satisfies these and other requirements in a cost-effective manner.

7.1 Issue

How should capital items be treated in the full-cost environment?

7.2 Resolution

A capital items issue team, under the leadership of Headquarters, Code J, studied this matter and issued a draft report in June 1997. In the report, the team recommended that:

- A Total Capital Program Area be established in each Enterprise;
- An Agency Capital Plan be developed to cover (1) functional staff office leveraging funds, (2) Enterprise Capital, such as information technology hardware, equipment, and facilities, and (3) very expensive Agency capital items;
- An Agency Service Pool should be established for very expensive capital items.

After considerable discussion and analysis, it was decided that NASA would adopt the following approach to treatment of capital in the full cost environment:

- Direct project capital items will be budgeted and accounted for in project budgets;
- Service Pool capital will be integrated into service rates through the use of depreciation-like charges;
- G&A Pool capital will be integrated into G&A rates; and
- Other capital items Service Pool or G&A Pool capital that materially impacts Pool Rates may be budgeted as separate projects/initiatives in the Research, Technology, and Investment budget line item area.

Processes – How are capital investments proposed? Who approves capital investments? How are funding sources determined? How do overruns/underruns get handled (vis a vis funding sources)?

At the center level, all long-term investments should be approved using a separate process that is conducted similar to the Enterprise/IPO G&A rates approval process described earlier. It is important that all Enterprises associated with a center participate in the process since the funding source will be determined based on a benefiting Enterprise basis. Selection of the individual tasks should be done on a priority basis. The Enterprise/IPO should establish the priority criteria and the Center would identify specific projects subject to Enterprise review. This review would be conducted as part of the normal budget process.

Investments/Life Cycle Costs – How are we addressing Life Cycle costs? Efficient management of the institution demands that we manage to life cycle costs not on a year to year basis. Generation of full cost budgets need to include life cycle cost considerations in the decision making process. NASA may need to establish a Return on Investment (ROI) metric for decisions. Is there to be a capital or working capital fund, or a mechanism for creating one? Can NASA create a working capital fund to "borrow" from to make capital investments? Investment returns from programs at the Centers could then be paid back into the fund for new activities.

NASA does not anticipate the creation of working capital funds in the context of establishing a reservoir for future investments. Each center will have a long-term capital investment line item as well as possibly some level of capital investments in Service and/or G&A pool accounts. There will be a review process to agree on the total capital investments at each center. The Enterprise/IPO will lead the process with the participation of other interested Enterprises and functional offices.

As a trigger for consideration (typically specific criteria will be included in POP guidance during budget formulation), any investment item of $500 thousand or more should be reviewed.

In addition, the NASA Capital Investment Council may provide strategic guidance and review investments through the annual budget process.

High Cost Environmental Activities – How will long-term, high-cost expenses related to environmental compliance (e.g., Plum Brook decommissioning) be handled? An activity such as Plum Brook decommissioning, which involves significant costs over an extended period of time, is expected to be treated as a capital investment project in the Research, Technology, and Investment budget line item area.

Capital/Strategic Investments – What is the Agencywide process for review of capital investments? What criteria are applicable to difference types of capital items?

Typically, capital investments are to be developed by Centers and reviewed through Enterprise/IPO's. Specifically:

> Direct project items will be budgeted and accounted for in project budgets and reviewed as part of the overall project.
>
> Service Pool investments are expected to be integrated into Service Pool rates and reviewed by Center management.
>
> G&A investments are expected to be integrated into G&A rates and reviewed by Center and Enterprise management for Center G&A and Agency management for Corporate G&A.

Other capital investments such as items that materially impact Service or G&A pool rates may be budgeted as separate projects/initiatives in the Research, Technology, and Investment budget line item area.

If a capital investment would materially affect pool (service or G&A) rates, and then the investment may be established as a separate project/initiative in the Research, Technology, and Investment budget line item area.

8.0 Financial System Capabilities

Implementation of full-cost management in NASA requires critical cost management system capabilities. (See related information under the Requirements Phase.)

8.1 Issue

Are NASA's current systems adequate to support full-cost management?

8.2 Resolution

The prototyping and Agencywide first year test phase demonstrated that NASA's systems are not adequate to support full-cost management. Because of system inadequacies, detailed cost accounting becomes very labor intensive. Such labor is not available now, nor expected to be available in the future. While after-the-fact cost finding techniques were adequate for the minimal level of cost accounting required during prototyping, such techniques cannot support operational full-cost management, budgeting, and accounting. NASA has determined that timely and efficient implementation of full-cost management requires new standard system capabilities. These capabilities will be acquired through the IFM initiative. The multi-year IFM initiative is expected to result in a new integrated system. The IFM system implementation is expected to coincide with implementation/operation of full-cost management.

9.0 G&A Allocation Basis/Bases

As noted earlier, direct costs are costs that can be obviously and/or physically linked to a particular project. Service costs are costs that cannot always be readily or immediately linked to a project, but subsequently can be traced to a project, based on service consumption or usage. G&A costs, however, are support costs that cannot be linked to a specific project based on direct association or consumption-type usage in an economical manner. Because G&A costs are significant, there is a need for NASA to develop and adopt a reasonable, consistent, economical allocation approach for the assignment of such costs to projects. The challenge is to identify a G&A cost allocation

approach that (1) provides a reasonable linkage between cost incurrence and the benefiting activity or cost objective and (2) is economically feasible.

9.1 Issue

What is the most appropriate basis for allocation of G&A costs to projects?

9.2 Resolution

Three bases for allocation of G&A costs have been identified -- cost (direct costs and service costs), obligation authority, and direct labor, measured in terms of direct Full Time Equivalent (FTE) civil service personnel and direct on-site contractor personnel. Each basis was evaluated in terms of the extent to which there is a recognizable cause-effect relationship between changes in the allocation basis and G&A costs. Based on the foregoing criterion, direct labor was selected as the basis for allocation of G&A costs to projects. In other words, in comparing the three bases, changes in on-site direct labor appear to most clearly cause changes in Center G&A costs. To illustrate, as the number of on-site personnel increases, the major components of G&A costs, such as support labor, roads, library, and related services can be expected to increase.

The increase is more proportionate using FTE as a basis, rather than using cost or obligation authority. While none of the bases is perfect, FTE appears to best reflect the cause-effect relationship.

In addition to cause-effect characteristics, NASA evaluated the economical feasibility of the several allocation approaches. The FTE approach is complicated by the inclusion of on-site contractor direct labor (FTE-type data) in the basis. Several managers indicated potential complications with the gathering of this data, particularly in light of NASA's plans to increase its performance based contracting activity. It is anticipated that NASA Centers can obtain required project direct FTE-type data on contractors that NASA is housing on its Centers. Some estimates, however, may be required. Such refinements are expected to be developed analytically by NASA Centers, as appropriate. With regard to a cost-based approach, NASA managers also noted potential complications with recent NASA contract consolidations and the related availability of Center specific project direct cost data. Some of these contracts are expected to involve potentially hundreds of contractor staff at a NASA Center (Kennedy) with the contract and related cost data flowing directly through another Center (Johnson). Such arrangements indicate potential difficulties in establishing a Center specific cost basis for G&A distributions that can be readily validated.

After careful evaluation, NASA has determined that the labor FTE basis is the most appropriate and economically feasible basis for G&A allocations.

10.0 Consistency in G&A Pool Content and Allocation Basis

Agencywide standardization initiatives often introduce different complications/ challenges at certain component organizations. A basic question many Agencywide standardization initiatives introduce, particularly one such as the full-cost initiative, involves whether each Center should be required to use the same rules and methodologies, or whether Centers should be allowed modifications. On one hand, a requirement that the content of each Center's G&A pool should be the same and each Center should use the same G&A allocation basis helps support less complex and more easily understandable cost metrics across the Agency and helps to ensure a degree of consistency and comparability of cost data among Centers, thereby enhancing the utility of cost information at an Agencywide level. On the other hand, providing Centers the flexibility to modify G&A pool contents and/or allocation basis to accommodate perceived Center-unique features can be regarded as a means to enhance the utility of cost data at the Center level.

It should be noted that private sector companies follow a variety of practices with regard to cost accounting. Federal contractor practices must adhere to certain basic Federal cost accounting standards but these standards allow considerable variation. For example, companies include a variety of costs in G&A cost pools and use a variety of bases for allocating G&A-type costs. Companies also report a variety of internal approaches for units within companies, particularly companies that have relatively autonomous, decentralized divisions or components. It is important to point out that such companies and divisions often focus on other cross division comparative measures of performance, in particular profits and/or profit contribution margins are often used for intra-company comparisons. Federal agencies generally do not have such a common denominator (profits) for comparative information. Agencies must develop other intra-agency metrics.

10.1 Issue

Should the basic contents of each Center's G&A pool be the same and should all Centers use the same basis for allocation of G&A costs to projects?

10.2 Resolution

The advantages to be gained from consistency and comparability of cost data among Centers appear to outweigh the advantages of additional flexibility. Therefore, each Center has been directed to (1) have the same basic G&A pool content and (2) use the same basis for allocation of G&A costs to projects for external reporting purposes. Such an approach does not preclude a Center from making modifications to G&A pool content and/or allocation basis for internal analysis purposes.

G&A Approval – Who has the final approval for G&A categories?

Categories – The NASA CFO have final approval for G&A categories and related defintions. In this context, categories refer to the types of activities that are allowed to be included in G&A.

Approval process – What is the approval process for Center G&A funding levels?

The Center Director establishes the Center G&A funding, but obtains the approval of the related Enterprise/IPO for such funding. The Enterprise/IPO will provide the opportunity and organize a forum for all Enterprises (and required functional offices) to participate in the approval process.

The actual approval process for G&A rates and the validation of Service Pool rates should be conducted as part of the larger POP process. Generally, speaking rates should be determined prior to the conduct of a POP, applied by the Center during the POP, and adjusted as a result of the decision process prior to the start of the operating year.

Other Enterprises Role – How do Enterprises/IPO's include other Enterprises in the decision process for G&A?

Enterprise/IPO's are expected to integrate other Enterprises, as necessary, into Center G&A processes through an oversight board or group that would be led by the Enterprise/IPO and include representatives from all Enterprises with significant work occurring at a Center.

Functional Office Role – What roles do individual functional offices play in the evaluation process for G&A?

Functional offices provide strategic guidance through the Enterprise/IPO structure and monitor the Enterprise/IPO and Center implementation of that guidance. Functional offices also assess the implementation of their function across all centers, benchmark activities within their scope, and stimulate cost effective performance at individual centers.

Long Term Investment Included in G&A Costs – Are investment costs funded as a separate project or is some portion included in G&A rates?

All long-term investments should be approved using a separate process that is conducted similar to the G&A rates approval process described earlier. It is important that all Enterprises associated with a center participate in the process since the funding source will be determined based on a benefiting Enterprise basis. For example, if a

Center is associated with multiple Enterprises, there may be a sharing of funding among Enterprises. (Investment costs may be funded through G&A and/or as a separate project. Separate projects may be established if the investment significantly/materially impacts the G&A rate.)

Lead program manager role in G&A rates – What role do lead program managers/ supporting Centers have in determining G&A rates? (See Program/Project Manager Authority Section.)

11.0 Center Service Pools

In contrast to G&A costs, service costs can be linked or traced to a project. The issue is one of timing -- service costs cannot always be initially, readily and/or immediately linked to a project, but subsequently can be traced based on service consumption. Mission and organization differences among Centers directly impact the number and content of Centers' service pools and, unlike the case of G&A content, there may be both commonality and variances among Centers in terms of the number and, in certain limited areas, the content of service pools. To illustrate, most Centers have a form of information technology service activity, which can be assigned to projects based on usage

11.1 Issue

Should each Center have the same service pools?

11.2 Resolution

Based on initial prototype test and Agencywide test information, there will be seven standard service facilities and related services, information technology services, publishing services, science/engineering services, fabrication services, test services, and wind tunnel services. It is also expected that each Center will not necessarily need all seven of the standard service pools, i.e., not all Centers offer wind tunnel services. In such instances, Centers are expected to establish service for use in assigning costs to benefiting projects in the absence of consumption data. Furthermore, it is likely that certain Centers will need one or more pools in addition to, or in lieu of, the standard to pools to reflect mission and/or organization differences.

Funding & charging process – What is the approval process for service pool funding levels? Charging mechanisms?

Funding – Center service pool funding levels are developed by service pool managers with input* from customers, reviewed within Center management and

approved by Center Directors. Such funding is validated by Enterprise/IPO's and functional offices and optimally approved for rate purposes prior to the POP.

*It is anticipated that there would be an interactive exchange of information among service pool managers and customers.

Charging – Service pool charging mechanisms are based on consumption and selected by Center management from the NASA CFO specified standard set of charging mechanisms. Charges are cost-based and consistently applied across the customer base. Exceptions to approved charging mechanisms must be approved through the Enterprise/IPO by the NASA CFO.

IPO Role – What is the role of the Enterprise/IPO in approving service pool rates?

The Enterprise/IPO serves a dual role in service pool activities. In the short term they represent the aggregate of customers rather than having each individual customer involved in the service pool negotiation matters. In the longer term, they represent an approval authority for the strategic implication of the service activities. In that regard they validate rates and provide cross-center comparative evaluation of differing service capabilities, ensure that services are consistent with strategic guidance and periodically bench marked against other Centers, and potential/actual private providers. Enterprise/IPO's focus on strategic implication of the service pools, including capital costs and determinations that may warrant future strategic redirection.

Other Enterprises Role – How do Enterprise/IPO's include other Enterprises in the decision process for service pools?

Enterprise/IPO's must provide an opportunity for each of the supported enterprises to participate in the validation of rates and the assessment of the strategic implications. This participation will be negotiated between the enterprises on a service pool by service pool level.

Functional Office Role – What roles do individual functional offices play in the evaluation process for service pools?

Functional organizations should provide strategic guidance related to their specific areas of expertise through the Enterprise/IPO structure and monitor the Enterprise/IPO and Center implementation of that guidance.

Service content/rate coordination – How do Centers coordinate service pool contents/rates with IPO's/programs/other Centers?

Once the rates have been approved, each Center should identify its rate structure and pricing level to all customers. This communication should be performed at the program/

project level where requirements were generated. Such communication is expected to occur during the budget formulation and execution processes, as well as, during day-to-day operations through a variety of mechanisms, including periodic financial system reports and query capabilities.

Service Content – Do service pool rates reflect operations costs only, or do they include some additional investment/re-investment funding? Who determines such funding?

Service pool rates reflect all costs both operations and where specifically authorized, investment costs.

Lead program manager role in Service Pool rates – What role does lead program managers/supporting centers have in determining service pool rates?

Lead program managers do not have a specific role in determining service pool rates, but influence such rates by specifying required quantities and qualities of services. Service rates are determined by Centers based on customer demands and Center Director/approval process.

12.0 Definition of Full-Cost

Federal managerial cost-accounting standards allow appropriate flexibility in implementation to meet management requirements. Such standards allow agencies to report certain high-level administrative costs that occur during the reporting period as unassigned costs--costs that are not assigned to cost objectives. The basis for such reporting focuses on the potentially weak linkage between such costs and agency outputs. This product costing focus, coupled with a related concern with “burying” such perceived fixed overhead costs within output reporting, allow agencies an exception to more complete full-cost accounting.

12.1 Issue

Should NASA include all costs in its projects?

12.2 Resolution

Yes, NASA should include all costs in its projects. The benefits of full disclosure and full accountability, as well as, the anticipated benefits of a rigorous, complete, NASA implementation of full-cost accounting, budgeting, and management far outweigh the additional work of assigning all costs to NASA projects. In addition, NASA plans to report/disclose high level and other administrative (G&A) costs separately in related financial reporting. Such reporting should eliminate any related concerns with "burying" administrative costs in output reporting.

NASA has decided to pursue an aggressive approach to full-cost accounting, budgeting, and management to optimize program and mission performance from anticipated budget resources. This philosophy is predicated on the management principle that relevant, reliable cost information should be provided to Agency managers to support improved decision making and management and that cost-based management will lead to better mission performance.

Under NASA's approach, all costs will be linked to programs and projects, unless an element of cost bears little or no causal relationship to NASA projects during the current reporting period. If such costs occur, NASA plans to report them as costs unassigned to projects. Such costs, which include certain capital costs and environmental clean up costs that do not relate to the current period of project performance, are expected to be reported at the Agency, Enterprise and/or Center level, consistent with related Federal standards. NASA has evaluated the exceptions to full cost recognized in the Federal standards and has decided that all NASA costs which are related to the current performance period should be linked (directly or indirectly) to programs and projects. (In addition, to the extent possible, certain costs that relate to future or past periods may also be aligned with NASA cost objects as appropriate.)

NASA's approach supports the principle that any NASA cost should in some way, even though the linkage may be weak, support NASA's programs, projects, and related missions. All NASA costs should be directly or indirectly related to NASA programs, projects and/or missions.

13.0 Grants

NASA Centers compete with other organizations, such as educational institutions, non-profit organizations, and other Centers for research project funding. Proposals are evaluated in terms of technical content as well as cost. Because of the flexibility inherent in Federal requirements regarding cost-accounting principles and standards for institutions of higher education and nonprofit organizations, concerns have been raised concerning the comparability of cost data between such institutions and NASA's Centers. With the advent of full-cost accounting, additional concerns have been expressed regarding cost data comparability and, specifically, concerns that the cost of projects proposed by NASA Centers

in the future may appear higher in cost than previously, thereby, putting Centers at a competitive disadvantage.

13.1 Issue

How should full-cost principles be applied to the costing of Centers' research (grants) project proposals, without putting Centers at a competitive disadvantage with institutions of higher education and non-profit organizations?

13.2 Resolution

After a study by a specially convened team and a review of the study results by the Capital Investment Council, NASA decided that all costs associated with performance under grants must be identified and recognized. The planned standard NASA approved is that such costs should be accumulated and included either within the specific project level activity that encompasses the research grant or certain costs may be included as an identifiable component of G&A.

While this standard approach is likely to be followed over the long term, because full cost practices are still being tested, Centers (such as Goddard Space Flight Center) may decide to experiment with this issue from two perspectives – the standard approach and an alternative approach which may warrant testing in the Center environment. Subsequent analyses should serve to identify the approach which should be implemented NASA-wide.

14.0 Headquarters Budget

A Headquarters budget team lead by the Headquarters Code C Chief Financial Officer studied key aspects of full cost budgeting related to Headquarters and related NASA and Enterprise activities. The team recommended that all Agency, Headquarters, and Enterprise G&A functions be combined into a "corporate" G&A. The corporate G&A pool would include Headquarters costs such as rent and security; Headquarters (including Enterprise) salaries, training, awards, and travel, and; Agency functions performed at Centers. Corporate G&A would be allocated based on direct civil service labor.

Two Agency Service Entities, the NASA Administrative Computer Center (NACC), the Space Operations Management Office (SOMO) have been established. Services will be provided on a full cost basis. As in the case of Headquarters functions performed by a Center, Agency Service Entity costs may include G&A costs, if material. The team will continue to evaluate corporate G&A content to identify additional functions/services, which can be provided on a direct or service pool basis.

The team also studied the issue of internal "pricing" of services and recommended that in cases where one Center is performing work for another Center, the price of such services should be based on the performing Center's full cost, including G&A costs, but only if material. All of the team's recommendations were accepted.

14.1 Issue

Should agencywide initiatives, such as Small Business Independent Research (SBIR), be included in Corporate G&A?

14.2 Resolution

There are four alternative approaches to the treatment of agencywide initiatives. Such activities could be included in:

- Corporate G&A
- A "Lead" Enterprise
- All involved Enterprises
- A new category, in addition to the four Enterprises

Because of the programmatic nature of agencywide initiatives, inclusion in Corporate G&A was eliminated. Also, it was decided that the creation of a fifth category, equivalent to the four Enterprise Budget Line items, solely for agencywide initiatives would be inconsistent with the underlying logic of the basic budget structure. The designation of a "Lead" Enterprise for agencywide initiatives would be inconsistent with how these initiatives are managed. Accordingly, it was decided that agencywide initiatives such as SBIR, Historically Black Colleges and Universities (HBCU), IFMP, and academic activities would be listed under the Project Level for the Investment Program Level for each Enterprise. Data on the total cost of an initiative such as IFMP could be presented in the form of a supplemental schedule showing total cost by Enterprise.

15.0 Staff Flexibility

NASA has had a long-standing, unencumbered ability to assign its workforce to key Agency activities to support safe, successful mission performance. An ability to maintain flexibility to manage workforce without an appropriation constraint or without inordinate levels of administrative oversight is an issue that requires specific resolution before full cost implementation planning can be finalized.

15.1 Issue

How can NASA retain its workforce/funding flexibility and achieve workforce/funding adjustments between programs/projects in NASA's planned full cost environment?

15.2 Resolution

The following language has been drafted to support workforce/funding flexibility: "Notwithstanding any other provisions of law, the National Aeronautics and Space Administration is hereby authorized to transfer personnel and funding (personnel, benefits, and related support resources) among its programs, projects, and/or activities (and between and/or among appropriations, budget line items and/or other accounts) as required for the safe, successful accomplishment of agency missions. In addition, the

National Aeronautics and Space Administration shall not be constrained in the timely, effective transfer of personnel and related funding, by externally required operating plan or similar control mechanisms. The National Aeronautics and Space Administration shall report on the transfer of personnel and related funding among its programs, projects, and/or activities to the Congress in subsequent periodic annual financial reporting."

16.0 Safety and Mission Assurance (SMA) Costs

Many SMA-related costs are currently funded through institutional sources such as Research and Program Management, Research Operations Support, and Engineering and Technical Base. Under full cost practices, changes are required.

16.1 Issue

What SMA costs should be funded by G&A, specific projects, or Office of Safety and Mission Assurance (OSMA) programs?

16.2 Resolution

In broad terms, Center-wide SMA activities should be funded in G&A. Safety and mission assurance activities tied to a specific project, such as in-line programmatic and safety and mission assurance, should be included in project costs. Costs of approved support to OSMA should be tied to OSMA technical programs.

Examples of SMA costs to be included in G&A include:

- Response to required NASA-wide SMA policy and management initiatives, such as Annual Operating Agreements and safety audits;
- Institutional (non-project-specific) Center SMA activities, including civil service time and travel. Activities include:
  - Institutional and facility safety
  - Process improvement
  - Alert coordination function

- Lessons learned documentation
- Mishap reporting
- NASA Safety Reporting System interface
- SMA workforce development and training
- Civil service time and travel associated with Agencywide SMA related meetings
- Agencywide review and comment on proposed policies
- Time, travel, and contractor costs for investigation of Center's institutional mishap
- Budget development
-

SMA costs to be associated with specific projects consist of lifecycle costs of performing a project, including risk. Examples include:

- In-line programmatic SMA activities, including training to support program specific needs
- SMA for program/project-specific facilities
- SMA for multi-use facilities operating under service activity arrangements
- Program/project independent safety assessments
- Time and travel for investigation of a program/project mishap

Centers that deal with numerous small research projects may elect to place SMA support for these projects under Center G&A when (1) projects are relatively small, and (2) a project's short planning notice and period of performance are not amendable to discrete planning in NASA's Program Operating Plan (POP) process, and (3) total SMA cost does not significantly affect the Center's G&A rate. Directly charging SMA costs to a project is still the preferred approach. If a project grows in size, the period of performance extends into the planning horizon for the next POP cycle, or the effort evolves into a development project, SMA costs should be included as a direct project cost.

Examples of specifically-requested SMA support provided by a Center to OSMA include:

- Contractor and materials costs for approved OSMA technical programs
- Civil service time, training, and travel associated with approved OSMA technical programs
- Contractor and civil service time and travel for specific, non-NASA-wide assessment and policy development support to OSMA, e.g., membership on process verification and other OSMA review and assessment teams, and OSMA policy development support.