Langley Management System (LMS) Policy Manual LAPD 1000.1

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NASA Langley Research Center (LaRC)
Langley Management System (LMS)

Table of Contents

1 Introduction 3
1.1 Langley Management System Scope 4
1.2 Registration Certificate Scope Statement(s) 4
1.2.1 AS9100 Implementation Documentation Crosswalk 5
1.3 Management System Goals, Objectives, Performance Indicators, and Responsibilities 5
Values 5
1.3.2 Strategy Management Framework 6
1.3.3 Strategic Pillars and Center Level Objectives 7
1.4 Organizational Responsibilities and Structure 8
2.1 Primary Process 1 (PP1): 10
2.1.1 Implementation of the Agency Governance Model within the LMS 10
2.2 Primary Process 2 (PP2): Validate inputs and outputs 12
2.2.1 Implementation of NPR 7120.5 12
2.2.2 First Article Inspection: 12
2.2.3 Product Key Characteristics Identification and Traceability: 13
2.3 Primary Process 3 (PP3): 14
2.3.1 Management Review 14
2.4 Control of Work and Management Processes 16
3.1 Customer Satisfaction 20
3.2 LMS Support Processes 21
3.2.1 LMS Internal Assessment Program 22
3.2.2 Corrective, Preventive, and Improvement (CPI) Action System 22
3.2.3 Documentation Management 24
3.2.4 Records Management 28
3.2.5 Employee Training 28
3.2.6 Internal Communication 30

1 Introduction

The NASA Langley Vision is:

We are innovators enabling…..
On-Demand Air Mobility,
Access to Space for Everyone,
Understanding of Climate Change

At its core is the Center's Mission :

*Langley is a research, science, technology and development center that provides **game changing innovations** to enable NASA to make significant contributions to the Nation.*

*We are leaders in **systems innovation** for expanding air mobility, exploring space, and definitively characterizing the earth's changing climate.*

*Our work spans **fundamental research to mission development and operations** with an eye toward the next generation of **cutting edge ideas** that provide new capabilities or significantly improve performance or cost.*

This Policy Manual describes the Langley Management System (LMS) at NASA Langley Research Center (LaRC). This manual is intended for use by LaRC civil service employees, customers, stakeholders, contractors, internal assessors and external auditors.

The primary objective of NASA LaRC is to deliver effective technical results and services for the public on behalf of the U.S. Government. This manual establishes policies and procedures that govern how LaRC delivers technical results and services to meet employee, customer and stakeholder expectations through effective and efficient management and execution of approved programs and projects. All activities at LaRC are designed to support the LaRC Mission and **therefore the LaRC Quality Policy has <u>its roots in the mission statement</u>** combined with an emphasis on continual improvement and a commitment to meet both internal and external requirements from our customers and stakeholders.

The LaRC Quality Policy:

Langley is a research, science, technology and development center that provides game changing innovations to enable NASA to make significant contributions to the Nation.

In performing this mission, LaRC is committed to comply with internally and externally generated requirements that impact the planning, conduct and review of work. The Center will continue to seek and act on opportunities to improve our system, processes, products, and services.

1.1 Langley Management System Scope

This Policy Manual applies to all direct and enabling functions performed by NASA LaRC civil service personnel to accomplish approved research/development programs and projects. Resident Agency functions or program offices are considered as tenant organizations that are established and managed at the Agency level; therefore their operations (policies, procedures and practices) are generally considered to be part of NASA HQs Management System. Contractor operations are not included in the scope of the LMS. Quality assurance requirements for contractors are assessed on a case-by-case basis and incorporated into the procurement process.

Depending upon the nature, complexity and criticality of the work to be performed, quality assurance requirements dictate that vendors have a quality management system that is compliant to or certified to the current version of the ANSI/ISO/ASQ Q9001 or SAE AS9100 Standards. Each procurement is assessed independently to determine the benefit/requirement of compliance to the Government and the vendor. Compliance is assessed through the provision of quality management system documentation specified in the solicitation. Where deemed necessary, LaRC reserves the right to perform quality management system assessments at any time during the period of performance should the vendor demonstrate difficulty in meeting contractual requirements. Specific Quality Assurance reviews are incorporated in several LMS procedures to ensure the appropriate quality specifications and verification requirements are included in the procurement process for all types of acquisitions (i.e., Purchase Card, Purchase Order, and contract).

Requirements for evaluation and reevaluation of contractors are specified in the Federal Acquisition Regulation and specific, Center level and organizational level, procedures.

Exclusion - Servicing of LaRC Products:

Because the products of LaRC are manifestations of research and technology development and are one-of-a-kind items instead of manufactured products, the servicing of our products is not in the scope of the Langley Management System ISO 9001/AS9100 registration. Some of our technology may be licensed by others in order to manufacture products, but in that case the licensee is responsible for servicing the products.

1.2 Registration Certificate Scope Statement(s)

ISO 9001 applicability:

All civil service activities associated with design, analysis, development, and delivery of aerospace vehicle systems technologies and scientific research of all planetary atmospheres.

AS9100 applicability:

Processes and services that support the design, development, fabrication, component assembly, and system installation of flight hardware, flight software, and associated ground support equipment interfacing with flight hardware and flight software.

1.2.1 AS9100 Implementation Documentation Crosswalk

The relationship between AS9100 requirements and the Agency, Center and Organizational level policies, procedures and other instructional documentation is defined in the AS9100 Implementation Documentation Crosswalk (https://lms.larc.nasa.gov/as9100_doc_crosswalk.cfm). This crosswalk is maintained as part of the LMS Directives Management program.

1.3 Management System Goals, Objectives, Performance Indicators, and Responsibilities

NASA Centers are expected to pursue ways to conserve resources and improve processes and procedures in ways that serve the Center's and the Agency's needs while optimizing their contributions to achieving NASA's Mission. LaRC has developed its Strategy Management Framework to align Center-level objectives and initiatives that serve to integrate and focus mission and mission support activities to successfully accomplish the roles and responsibilities of NASA Centers as defined in NPD 1000.3, "The NASA Organization":

- Provide resources, overseeing the assignment of workforce and facilities.
- Manage Center operations to facilitate program and project execution while ensuring that the statutory, regulatory, and fiduciary compliance requirements for the Center are met.
- Stewardship of institutional assets to include establishing and maintaining the staff and their competency and the facilities required by current and future programs and projects.
- Serve cross -Mission Directorate needs to support the various programs and projects hosted at a Center, in accordance with Agency priorities.
- Center Directors, by means of the Institutional (Technical and Mission Support) Authority vested in them also serve as an important link in theTechnical Authority line. See section 2.1.1.

Values

NASA is privileged to take on missions of extraordinary risk, complexity, and national priority. NASA employees recognize their responsibilities and are accountable for the important work entrusted to them. If good strategic planning provides the long-term direction of our Agency, our shared core values express the ethics that guide our behavior. We value:

Safety - We are committed, individually and as a team, to protecting the safety and health of the public, our team members, and those assets that the Nation entrusts to the Agency.

Excellence - To achieve the highest standards in engineering, research, operations, and management, NASA is committed to nurturing an organizational culture in which individuals make full use of their time, talent, and opportunities to pursue excellence in both the ordinary and the extraordinary.

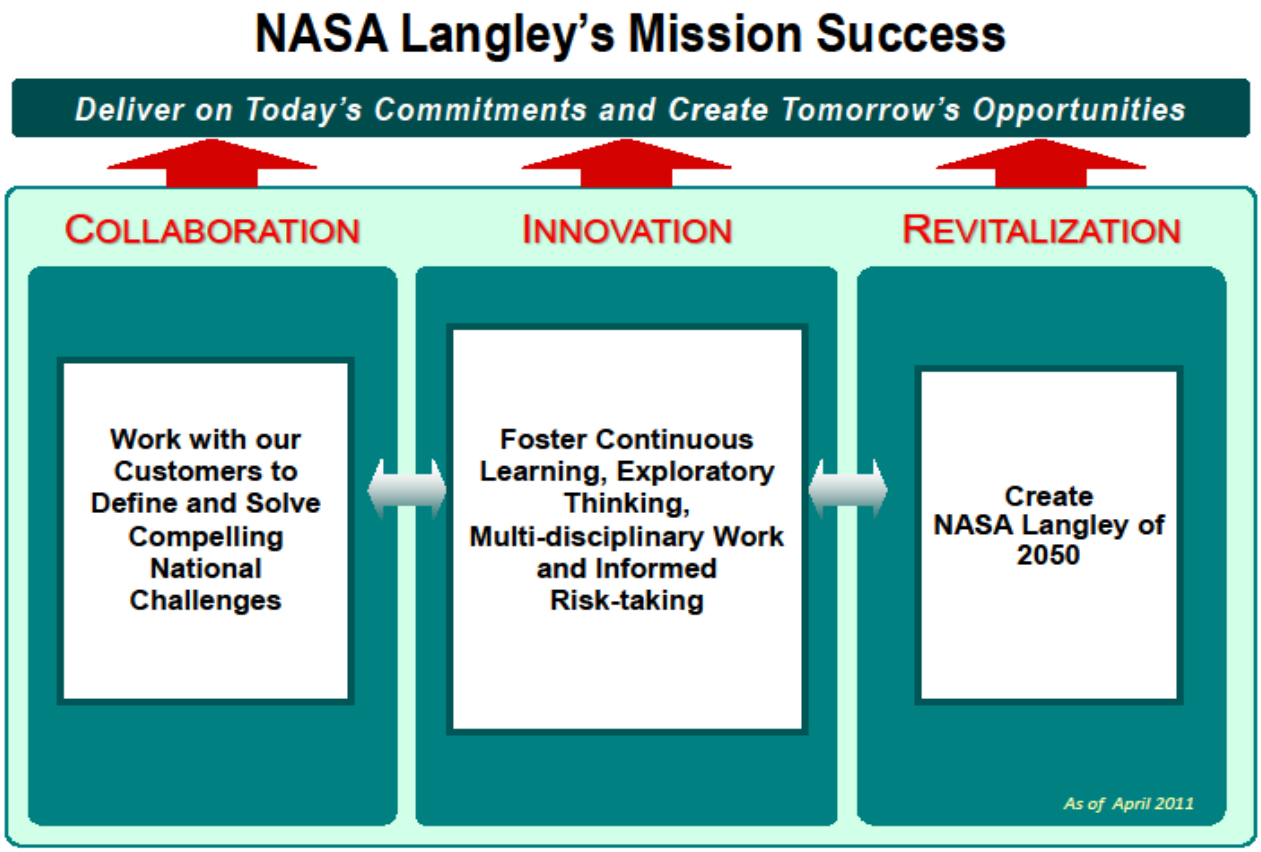
Teamwork - NASA's most powerful tool is a multi-disciplinary team of diverse, competent people across all NASA Centers. We are committed to creating an environment that fosters teamwork and processes that support equal opportunity, collaboration, continuous learning, and openness to innovation and new ideas.

Integrity - NASA is committed to maintaining an environment of trust, built upon honesty, ethical behavior, respect, and candor. Our leaders enable this environment by encouraging and rewarding a vigorous, open flow of communication on all issues, in all directions, among all employees without fear of reprisal. Building trust through ethical conduct as individuals and as an organization is a necessary component of Mission success.

1.3.2 Strategy Management Framework

The framework (figure below) was designed to be an enduring, overarching structure for communication and management of the Center Strategy. Strategic initiatives to support the strategic objectives will continue to evolve as they are implemented.

LaRC Strategy Management Framework



1.3.3 Strategic Pillars and Center Level Objectives

The Strategic Pillars (Collaboration, Innovation and Revitalization) represent key strategies priorities that will guide the Center on needed changes/improvements that must occur for LaRC to achieve its Vision for the future.

Strategic Objectives are defined to provide the focus on actions needed to move the Center forward towards achieving its Vision. Both the Strategic Pillars and Objectives are more enduring in nature; they do not change as programs change. The Strategic Objectives are supported by one or more strategic performance Indicators that when combined with certain key operational metrics are used to assess the effectiveness of the LMS and to identify system level improvement opportunities. See section 2.3 Primary Process 3.

LaRC Strategic Objectives are defined as:

Work with our Customers to Define and Solve Compelling National Challenges.

As a trusted partner, NASA LaRC engages with our customers to address their strategic needs and current priorities. Through consistently meeting our commitments and expanding our unique approaches to delivering on mission needs….We have enhanced our reputation within the Agency and across the Nation.

Foster Continuous Learning, Exploratory Thinking,Multi-disciplinary Work and Informed Risk-taking

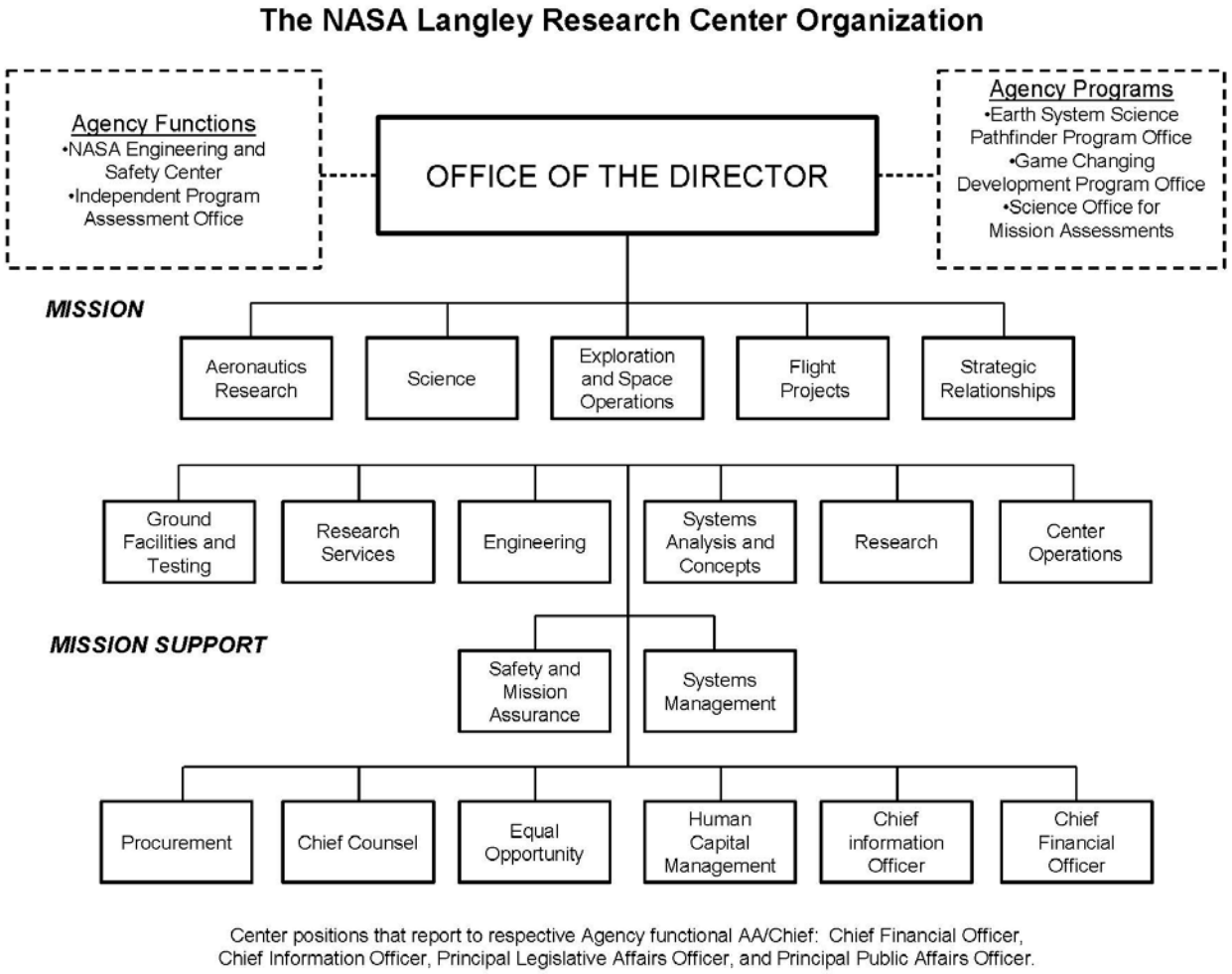
Integrate collective talents to create new value that solves mission challenges. Encourage and reward workforce knowledge enrichment and work practices that promote technical curiosity, creativity and trying unproven ideas in order to achieve break-through mission performance.

Create the NASA Langley of 2050

Transform the Center to enable Langley to make vital contributions to NASA missions in the very long term. Establish a stimulating work environment, processes and infrastructure which reflects the accelerating pace of technology development and the associated societal changes.

1.4 Organizational Responsibilities and Structure

There are approximately 1900 full-time, permanent civil service employees in the LaRC workforce, deployed in the organizational units shown below.



Center positions that report to respective Agency functional AA/Chief: Chief Financial Officer, Chief Information Officer, Principal Legislative Affairs Officer, and Principal Public Affairs Officer.

Each organizational unit (OU) is led by an organizational unit manager (OUM) responsible for leadership, management, and operations. Each OUM ensures that OU commitments are commensurate with resources– that is, people, equipment, budget, and facilities. Objectives for each OU are documented in an Organizational Unit Plan (OUP) reviewed and approved by the Office of Director. The OUP functions as the official mechanism for the definition and approval of organizational changes.

A management representative is a member of the Center Leadership Council having been appointed by the Center Director to provide strategy and guidance to the Center Director and Center senior management on LMS implementation. The Management Representative has freedom to resolve all matters relating to quality ensuring that processes, implementation subsystems and products/services effectively fulfill defined requirements. In addition, the Management Representative reviews and recommends

approval of the following LMS documentation to ensure effective and efficient operations, continual improvement, and desired strategic direction of the Center:

- Policy Manual and Organizational Unit Plans
- Directives, Center and Organizational Procedures

The role involves maintenance of the LMS, resolution of issues relating to the overall system, and performance reporting to senior management. The Management Representative is also responsible for ensuring that mechanisms are in place to effectively and appropriately obtain and address feedback relating to the management system. In addition, it is the responsibility of the Management Representative to ensure that new initiatives are planned and executed so as to maintain the integrity of the management system.

2 Primary and Enabling Processes

The work of LaRC is performed using three primary processes. These primary processes support the implementation of the LaRC Mission Statement; therefore, the successful execution of the primary processes ensures the successful accomplishment of the mission of the Langley Research Center. The primary processes are:

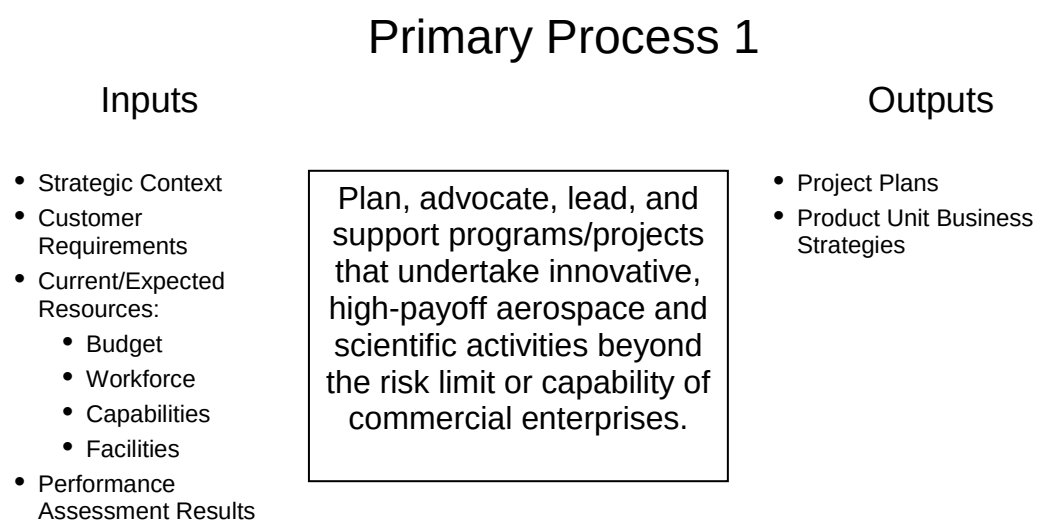
PP1: Plan, advocate, lead, and support programs/projects that undertake innovative, high-payoff aerospace and scientific activities beyond the risk limit or capability of commercial enterprises

PP2: Conduct research, technology, and development work to deliver flight hardware, validated technology, and scientific knowledge in order to meet planned programmatic objectives

PP3: Assess performance against strategic and operational priorities and validate near and long term direction and improvement initiatives

The enabling processes are business processes that support the operations of the Center as a whole and are not tied specifically to any of the three primary processes.

2.1 Primary Process 1 (PP1):



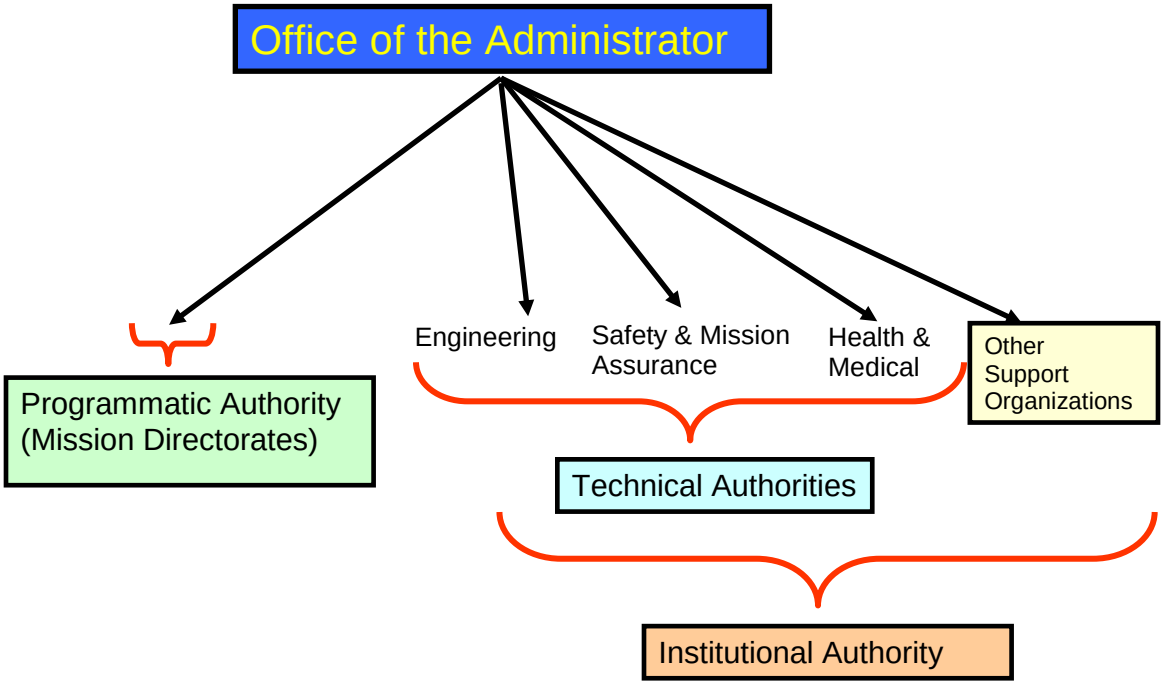
Product Units commit the Center to new work with Center Leadership Council (CLC) approval for more significant commitments. Each OUM has the responsibility to ensure that their OU has the capability to manage and perform work. External and internal agreements required to meet product user and funder requirements are developed by each OUM. It is the responsibility of each OUM to ensure agreements are in place to meet customer requirements and that employees understand those requirements.

Project Managers are accountable for all aspects of project performance and report programmatically to their respective Program Managers. Project Managers have lead responsibility to represent and make decisions for the project. Project Managers have the responsibility to set priorities within the project and the ability to reallocate funds to meet these priorities. They determine what work is to be accomplished in support of Program goals by control of the funding based upon established metrics for the program and budgetary constraints. They can recommend cancellation or other changes to their Program Manager. The Project Managers should work closely with the Product Unit and Core Resource Unit Managers in reaching these decisions, but the final decision rests with the Project and Program Managers.

2.1.1 Implementation of the Agency Governance Model within the LMS

NASA Policy Directive (NPD) 1000.0, “Governance and Strategic Management Handbook,” separates Programmatic and Institutional Authorities, describes governing councils, articulates strategic management principles, and establishes technical authority. Technical Authority sets up a “Checks and Balances” organization model and authorizes Engineering, Safety and Mission Assurance, and Health and Medical to maintain technical purview over requirements and any waivers. NPD 1000.0 also assigns responsibility for policy direction for NASA Engineering, as well as program and project management, to the NASA Chief Engineer.

The “Checks and Balances” organization model described in NPD 1000.0 is put into practice through the implementation of the technical authority initiative developed by the NASA Chief Engineer.



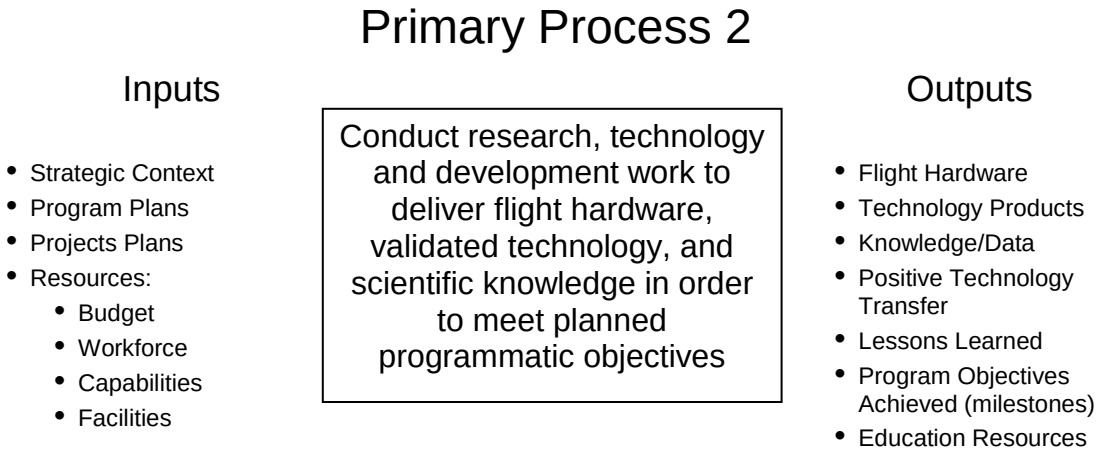
Programmatic and Institutional Authority

Technical Authority is the parallel to program/project management that is required to achieve balance in implementing safe and successful projects. Technical Authority defines the delegation of responsibility for setting and enforcing institutional (make it safe) requirements, from the Office of the Administrator to the Center Director and then down through the Langley organization to an individual program or project. On technical matters, the assigned Technical Authority provides an organizationally and financially independent voice equal to programmatic authority.

Technical Authority shall encompass large and small projects and activities in flight systems and ground support (FS&GS) projects, advanced technology development (ATD) projects with deliverables to FS&GS projects, applied research projects with deliverables to FS&GS, and research projects involving high risk ground systems. Technical Authority shall also encompass basic and applied research (BAR), other ATD projects, and analysis projects as designated by the Center Director, on a case by case basis as recommended by the Center Management Council.

A clear separation of programmatic and technical authority must be maintained. Each designated Technical Authority will be organizationally independent from the program/project programmatic authority. The Technical Authority shall be matrixed to the program/project from a technical authority organization and is a direct report of that technical authority organization.

2.2 Primary Process 2 (PP2): Validate inputs and outputs



Product Unit and Core Resource Unit Managers have the responsibility to ensure the technical performance is consistent with the milestones of the program plans and project plans. Core Resource Unit Managers lead in determining how the work is to be performed. They also provide the people and facility resources necessary to accomplish the work and supervise and direct the research staff. They should work closely with the Product Unit and Project Management office staff in developing appropriate project/task plans and specify the funding resources required. While the Project Managers have the final say in what is to be done, the Core Resource Managers have lead responsibility for determining how it is to be done, how much workforce is required, what workforce competencies are required, how much it will cost, and whether the required people and facility resources are available.

2.2.1 Implementation of NPR 7120.5

The Center institutionalizes NPR 7120.5, “NASA Space Flight Program and Project Management Requirements,” at Langley through a set of LMS documents: LPR 7120.5, “Space Flight Project Practices Handbook” and LPR 7120.7, “Space Flight Independent Life Cycle Review Procedural Requirements.” These documents serve as the basis for all NPR 7120.5 applicable projects and activities and those activities defined as projects in the compliance requirements of LPR 7120.5. All non-NPR 7120.5 and non-LPR 7120.5 activities can tailor the documents as appropriate for the particular activity only with the approval of the appropriate programmatic and technical authorities.

2.2.2 First Article Inspection:

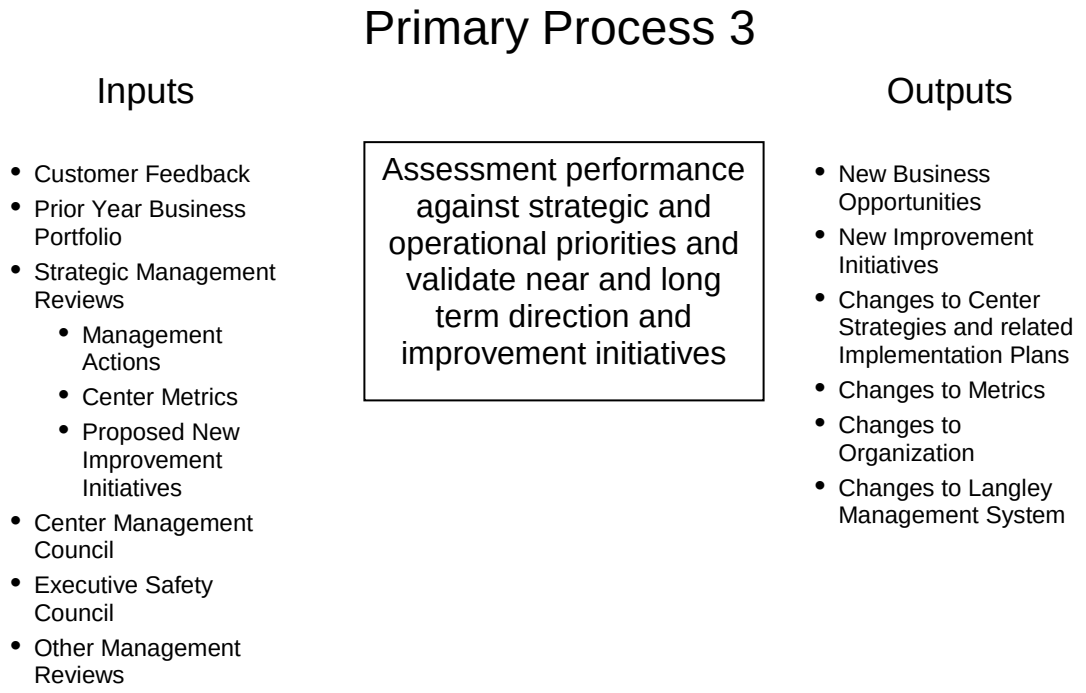
“First Article Inspection,” as defined within SAE AS9100 requirements, normally applies to the first deliverable of a multiple production run of a given product. The Center work activities that fall within the scope of “critical and complex” per NPD 8730, Appendix A work (as previously referenced) differs in that for flight hardware development, the first production run is the normally a “one of” prototype. However, LaRC policies and procedures integrate and meet the intent of the standard through

our rigorous verification and validation (simulations, etc.) requirements that are implemented before any flight articles are delivered to fly.

2.2.3 Product Key Characteristics Identification and Traceability:

"Key Characteristics" (KC) is a thread throughout product design, output requirements, project planning and for work that is outsourced, the procurement process. Key Characteristics represent the most important/critical requirements for form, fit or function for any deliverable that represents "critical and complex" work that has been described within the LMS registration scope for SAE AS9100 applicability.

2.3 Primary Process 3 (PP3):



2.3.1 Management Review

The Center Leadership Council (CLC) is the LaRC executive body providing both strategic and tactical leadership to the Center. The CLC addresses issues of significant importance to include decisions regarding Center policy, strategy, planning, goals, metrics, and resources. The CLC sets priorities, ensures balance of resources and integration of activities across the Center; resolves conflicts; authorizes new business; promotes strategic and systems thinking as well as product/customer-focused business approaches; and maintains an ongoing focus on technical excellence.

Functioning as the highest level governing body of the Center, the CLC sessions also allow for other specific discussions on relevant subject matters deemed critical to Center near and long term strategy-based efforts. Typical weekly CLC meetings are focused on the operational leadership of the Center. These sessions highlight key issues or critical information that needs to be brought forward to the full leadership body. Operational or strategic topics that require additional, more in-depth discussion or decisions can be delegated to a follow-on meeting of a subset of the CLC membership or may be scheduled for a focused Monthly CLC session. Review materials in support of the Monthly CLC meetings are typically provided to the membership in advance, so that the meetings are dedicated to the necessary group discussion needed to more effectively address the agenda topics.

The Center Management Council (CMC) focuses on delivering on current program/project commitments and meets each third Monday. When there is a fifth Monday in a specific month, the CLC will focus on technical briefings that highlight notable technical accomplishments and work in progress

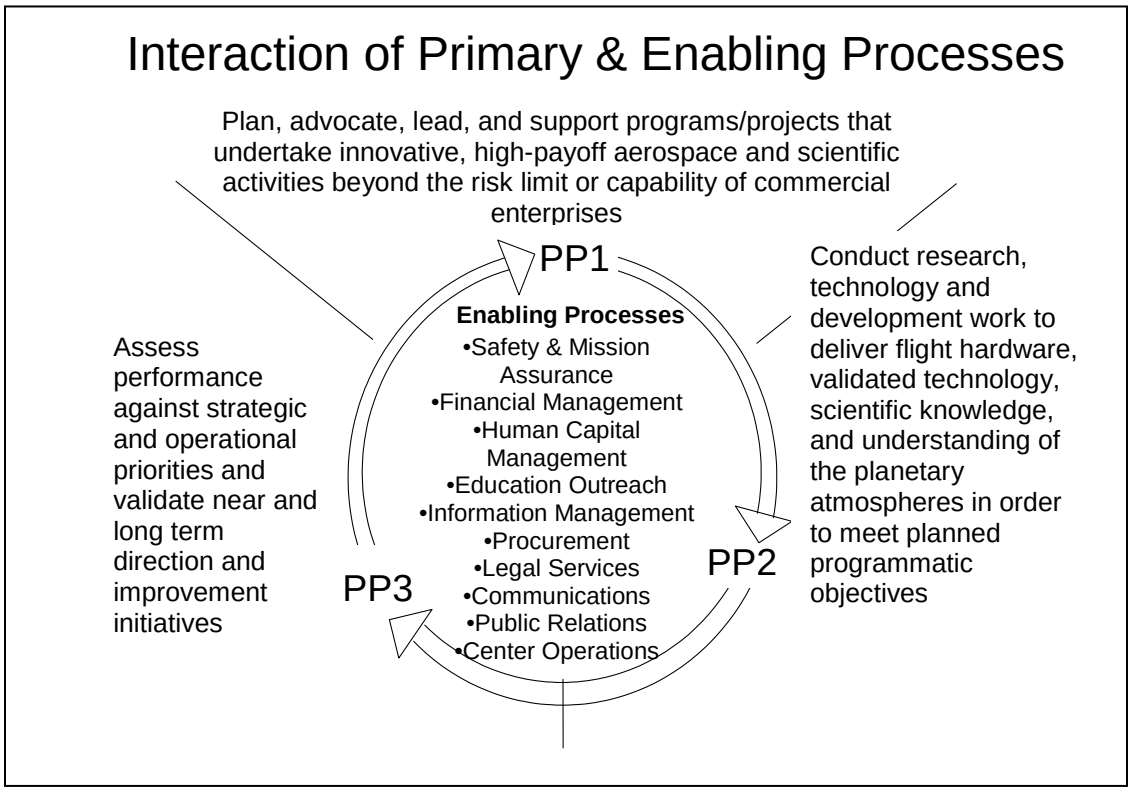
In addition, on a quarterly basis, the CLC conducts Integrated Strategy Management Reviews (which include the Annual Leadership and Mid-Year Senior Leadership Retreats) where the entire strategy and its effectiveness is assessed. Integrated Metrics reviews would be part of these sessions on an annual basis.

Various other forms of management review take place that are focused in specific functional or programmatic areas. One such review is the quarterly Executive Safety Council (ESC) meeting. The ESC is the LaRC executive body providing oversight and leadership of the Center's safety program through the establishment of a standing committee system to focus Center expertise on safety program implementation and improvement. Various other official boards, councils or teams conduct their monthly, quarterly, semi-annual or annual meetings as defined in their charters. Other formal review mechanisms are also defined in LAPD 1150.2, Councils, Boards, Panels, Committees, Teams, and Groups.

In all venues of Management Review, it is management's responsibility to determine which actions should be formally tracked and to ensure they are tracked to closure. Should issues be identified that appear systemic in nature, they may brought forward to the Systemic Issues Review Committee (SIRC) or at any appropriate senior leadership forum.

LMS Management System review topics are integrated throughout this current governance model. The quarterly integrated Strategic Management Reviews and other formal Center review bodies work in complement to ensure a fully integrated system-level review of the overall suitability and effectiveness of the LMS in supporting the Center's mission.

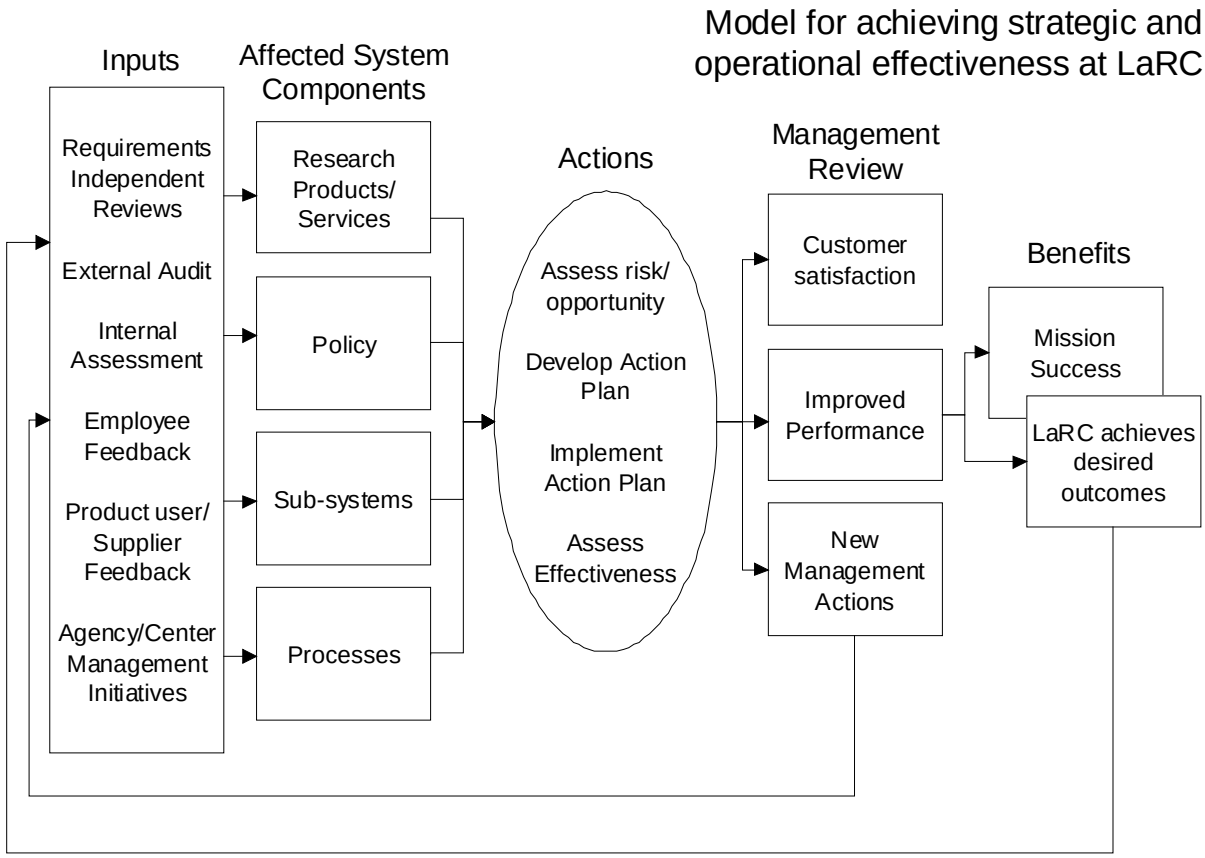
The relationship of enabling processes to the three primary processes is shown in the following figure:



2.4 Control of Work and Management Processes

Procedures and instructions have been developed to ensure that assembly, processing, and mission and support activities are performed under controlled conditions. Work and management procedures control activities performed throughout the Center. Activities span technically focused research, experimentation and development, safety and mission assurance, law, financial and human capital management, outreach, Center operations, and information management.

The following LMS Implementation Model depicts how the Langley Management System effectively supports strategy development and implementation. Inputs/requirements are received from multiple/various internal and external sources. Depending upon the nature of these inputs, any number of management system components may be affected. Inputs are analyzed to determine the scope of impact to the LMS in order to determine the approach to implementation planning that may be required. Where appropriate, formal plans may be developed to ensure an integrated and well-defined methodology to effect needed changes and to assess the effectiveness of that activity once completed. The degree of detail and rigor associated with such plans is determined by the risk and nature of the actions to be taken. Numerous forms of management review take place in varied frequency to assess the effectiveness of Center operations in responding to internal and external inputs that enable the Center to provide optimal capability to our customers and stakeholders. Formal reviews of the management system, as the integrated tool for managing the Center, are performed as described in section 2.3.



Both LMS Suitability in support of Center strategic objectives and the effectiveness of the primary processes are measured using a common set of Center-level Strategic and Operational performance indicators. The relationship of the center-level measures to the LMS primary processes is shown as follows:

LMS Suitability in support of Center Strategic Objectives	Performance Indicators (Strategic)	Primary Processes
COLLABORATION Work with our Customers to define and solve compelling national challenges	• Results from External Customer/Partner Survey o *Customer Satisfaction relating to technical performance, innovation, relevance etc* • Revenue Trends per Integrated Business Strategy o *(to include projections/targets/actual$)* o *Win Rate(s)*	PP1, PP2 and PP3
INNOVATION Foster Continuous Learning, Exploratory Thinking, Multi-disciplinary Work and Informed Risk-taking	• Federal Employee Viewpoint Survey (FEVS) Results and trends • Innovation Cultural Assessment Results/Trends from KEYS instrument • Diversity and Inclusion Survey Results and Trends	PP1, PP2 and PP3
REVITALIZATION Create the NASA Langley of 2050	▪ Facility Condition Index (FCI) Trends ▪ Employee Teleworking Trends	PP2 and PP3
LMS Effectiveness Objectives	**Performance Indicators (Operational)**	**Primary Processes**
Customer Relations Technical Excellence Efficient Operations	• Project planning/implementation Milestone performance from Center Mgmt Council reviews - trends • Peer Review Results - trends • Baseline (BPR) Performance Review Trends (IT, Facilities, Procurement, Workforce and Technical Authority) • Financial Stewardship Trends from FPMR • Process/Procedure Improvement Trends from Systemic Issues Review inputs • Safety Trends	• PP1, PP2 and PP3 • PP2,PP3 • PP2, PP3 • PP2, PP3 • PP3

Objectives of the enabling processes are identified in specific functional office Organizational Unit Plans. Each management system objective is tied to one or more performance indicator. The effectiveness of the enabling processes is determined as a by-product relating to the overall successful achievement of the Center's mission.

3 Langley Management System Planning and Implementation

The LMS is an integrated system used to meet customer, stakeholder, and employee expectations. The LMS controls the identification of customer, stakeholder, and employee requirements, the development and deployment of a Center plans to meet those requirements, the delivery of products and services according to the Center plans, and measurement of Center performance in relation to its overarching Strategy Management Framework.

The Agency Mission describes program direction. The NASA Strategic Plan, Governance and Strategic Management Handbook, and other management information are used as input for the development of the LaRC Strategy Management Framework. This plan is used to develop competency requirements to meet anticipated program/project needs as defined by the Center Product Units.

The Center's Integrated Strategy Management Framework bridges Agency strategic direction with LaRC's implementation of program and project plans, and delivery of mission support services. The framework also integrates planned actions to ensure balanced execution of Center strategies.

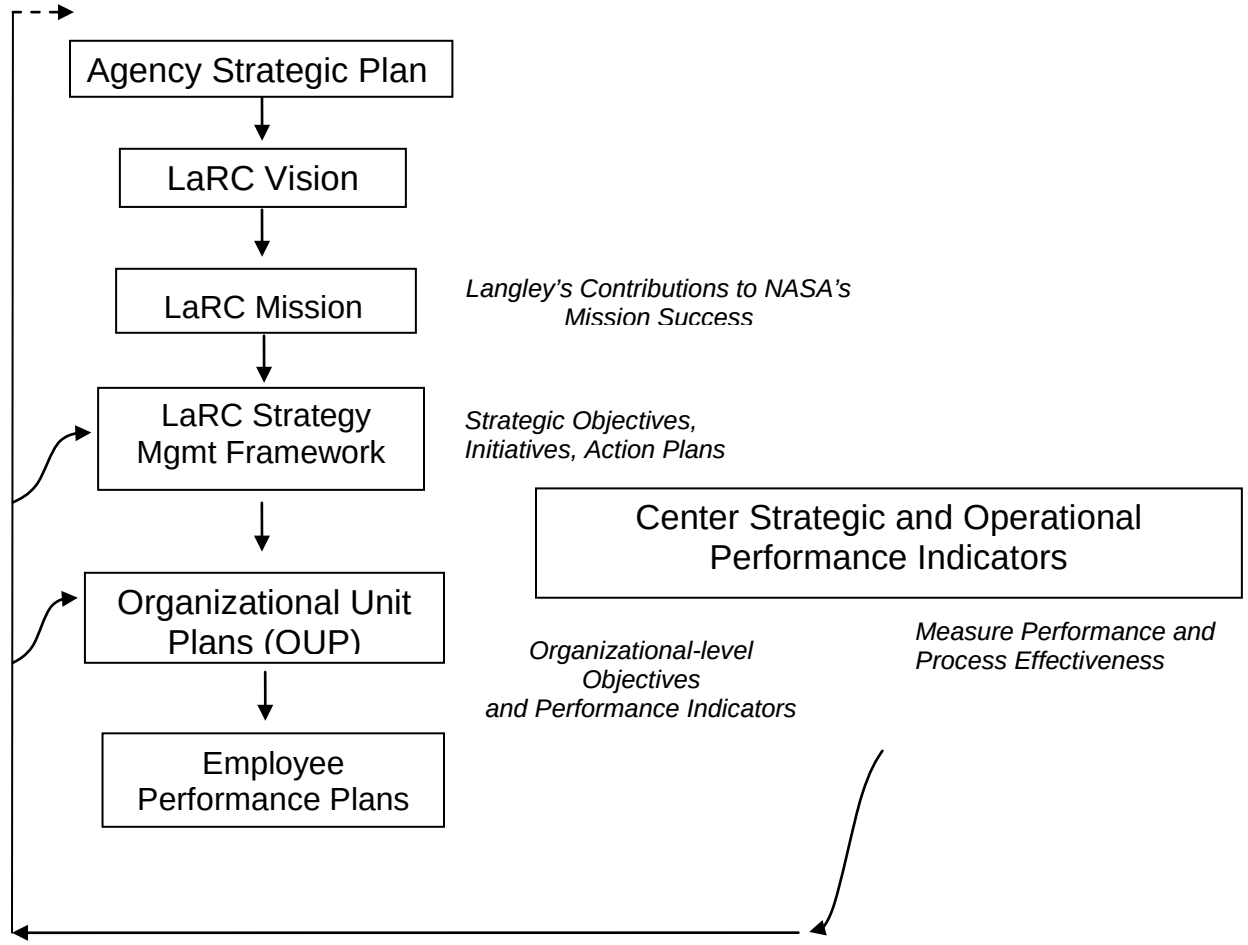
Program and project planning is a necessary activity to control new and unique customer requirements that are not described in the LMS. Program and project plans, design plans, and work authorization documents are all used to enable our employees to meet program and project milestones. .

Progress toward meeting designated program and project commitments is monitored by the Center Management Council (CMC). The CMC has been delegated responsibility to:

a) Provide a forum for LaRC management to review and assess the progress, status, issues, and appropriate compliance of LaRC programs and projects with the current version of NPR 7120.5
b) Facilitate LaRC management decisions, actions, and recommendations relative to LaRC programs and projects
c) Facilitate the identification of systemic Center issues or policies needing corrective, preventive, or improvement actions
d) Assess program and project readiness to enter implementation phase

The following model depicts the ongoing planning process and its implementation at the operational level. The Agency Strategic Plan provides guidance for the development of implementation documents such as the LaRC Integrated Center Strategy Management Framework and Organizational Unit Plans. Progress against established program milestones, organizational unit performance indicators, and Center metrics is monitored to measure process and performance effectiveness.

Langley Planning and Implementation Interface



3.1 Customer Satisfaction

Defining Satisfaction

As a government laboratory, the LaRC business paradigm does not align with traditional views regarding "customer relationships." It is often the case that initiators of the requirements and funders of the work are not the intended users of a final product or service. The Center's primary customers are considered those Agency Mission Directorates that sponsor work to be done in support of Agency programs and projects. In some cases, the Center performs work for others (government agencies, industry, etc.) when mutual benefit and mission alignment exist.

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Monitoring, measuring and improving Customer Satisfaction

Customer satisfaction includes meeting or exceeding customer requirements as well as the relationships that result in trust in LaRC's ability to deliver on its commitments. This is reflected in the Center's agility and adaptability to enhance the overall customer experience. Progress against established success indicators are assessed by the CLC through management review processes.

Results from these Management Reviews are considered along with other input and incorporated in the Center's agenda preparation for the Annual Senior Leadership Retreat as appropriate, and strategic initiatives are renewed or revised, or new initiatives are established. At this time, the Center's strategy is validated and as appropriate, annual improvement initiatives are established.

Center metrics are supported by LaRC organizational units (OU) via the Organizational Unit Plans (OUPs). Within the OUPs, functional roles/responsibilities are defined. Management system objectives aligned with established functional roles are identified and performance indicators to measure effectiveness in meeting these objectives are defined. Each OUM is responsible for the collection, analysis, and application of these data to effect operational improvement within their OU.

Communication and alignment at the employee level are accomplished through the creation of annual performance plans and semi-annual performance evaluations. Performance plans are defined to support the performance indicators of the employee's OU. Effective achievement of employee performance goals enables achievement of OU management system objectives, which in turn supports LaRC's strategic framework. All of which lead to ongoing customer satisfaction.

This relationship is illustrated in the following model:

3.2 LMS Support Processes

Enabling processes are defined in section 2 of this document. These processes are an integral component of Center operations and are essential to the effectiveness of the Center Primary Processes and the achievement of the LaRC's strategic objectives.

Certain enabling processes, however, are tied directly to the implementation of the management system infrastructure and are discussed below:

- LMS Internal Assessment Program
- Corrective, Preventive, and Improvement (CPI) Action
- Documentation Management
- Records Management
- Employee Training
- Internal communication

3.2.1 LMS Internal Assessment Program

The internal assessment function evaluates the ongoing implementation and effectiveness of the LMS. The assessment schedule is planned taking into consideration the criteria listed below:

- Requests for assessments from OUMs
- Changes in organization, products or services
- Changes in direction following management review decisions
- Corrective, preventive, and improvement action trends
- External audit reports
- Prior internal assessment results

It is LaRC policy to reserve assessment resources for those areas where problems occur or where current operations significantly impact mission success.

The importance of independence is understood; therefore, deployment of internal assessors is made based on their knowledge and independence of the activity under assessment. Training requirements for lead assessors are documented in individual Position Descriptions or contract requirements as appropriate for the ongoing staffing of this function.

LMS-CP-2305, “LMS Internal Assessment,” is the LMS procedure that defines the responsibilities and requirements for planning and conducting audits, and reporting results. Internal Assessment schedules are designed to ensure complete system assessment over a 24-month period.

3.2.2 Corrective, Preventive, and Improvement (CPI) Action System

The LMS operates with a decentralized approach to CPI planning and implementation. CPI action systems have been designed to enable continuing improvement of LaRC products and services. This is accomplished through ongoing review and improvement of policies, methods and practices, including related documentation used by all LaRC employees to manage, perform, and verify work. The systems are also used to record, report, and respond to customer, stakeholder, and employee feedback.

Nonconformance data relating to fabricated hardware and LaRC-developed software are monitored for emerging trends. When a procedure or group of procedures fails to yield the expected results, line management is responsible for ensuring that the appropriate CPI assessment is performed. Significant issues are evaluated and, where appropriate, formal CPI actions are taken to improve operations. These inputs are captured and documented.

In order to add value; formal CPI is required when, at a minimum, the issue:

- Is a reasonable candidate for formal analysis
- Has reasonable potential for systemic application
- Represents recognizable risk or improvement opportunity to product, process or system
- Requires obviously more than a specific “fix” to address the issue

So that resources are effectively utilized, criticality, organizational/programmatic risk factors, cost/benefit, and feasibility are criteria used to determine the nature of corrective, preventive, or improvement action taken.

Control of Systems and Components That Fail to Meet Requirements

Control of Nonconforming Products

Products that do not conform to documented requirements are controlled to prevent unintended use or inadvertent delivery. Critical and Complex products (as defined in NPD 8730.5, "NASA Quality Assurance Program Policy") produced by LaRC that do not meet documented requirements are reported through a nonconforming reporting system, such as the LaRC Nonconforming Failure Report (NFR), or a customer-required nonconforming reporting system, as appropriate. When using the LaRC NFR system, users will conform to the requirements of LMS- CP-5507, "Reporting and Disposition of Nonconforming Aerospace Hardware Items and Products." When using a customer-required nonconforming reporting system, LaRC personnel follow specified customer-defined procedures.

Prior to product acceptance, products acquired on contract that do not meet documented requirements are not reported through a nonconforming reporting system. However, after product acceptance, products acquired on contract that do not meet documented requirements are reported through a nonconforming reporting system.

Software and hardware that do not conform to requirements are put under control until the disposition of the product is determined. Management shall deal with the nonconforming product by one or more of the following means:

a) Taking action to eliminate the nonconformity – *rework*
b) Authorizing its use or acceptance by the relevant authority or customer – *use as is*
c) Taking action to preclude its original use or application – *scrap*

Corrected nonconforming products shall be re-verified to demonstrate conformity to the requirements before use or delivery. Nonconforming product details (metrics) are recorded and reported to determine if systemic corrective action is required.

Process Nonconformance

When a process or procedure is not effectively meeting stated objectives, LaRC employees are encouraged to submit LMS feedback to ensure the matter is appropriately analyzed and, if warranted, corrective action taken. They may also raise the issue through established governance structures or directly to the LMS Management Representative.

The procedures and forms used to control CPI action are described in the following documents:

Reference	Document Title	Application
LMS-CP-2303	Corrective, Preventive, and Improvement (CPI) Action Review and Tracking	Performance of work
LMS-CP-5507	Reporting and Disposition of Nonconforming Aerospace Hardware Items and Products	Performance of work
LMS-CP-5643	Fabrication and Inspection Operations Sheets (FIOS) Administration Following Revisions, Operations Changes and Identification of Nonconformances	Performance of work
LMS-CP-5645	Monthly Assessment of Nonconforming Product or Wind Tunnel User Feedback	Performance of work
LF 143	Nonconformance-Failure Report (NFR)	Performance of work

3.2.3 Documentation Management

All LMS policies, procedural requirements, and forms used to perform, verify, and manage work at LaRC are controlled through the LMS Web Site (https://lms.larc.nasa.gov/index.cfm). Standard Operation Documents are controlled through Configuration Management On-line (CMOL).

Agency documents are considered external documents because of the Agency approach taken toward Management System design and implementation requirements for NASA Centers.

Requirements to use external documents to perform work are referenced in various LaRC work authorization documents. It is the responsibility of each OUM to ensure that employees are provided with authoritative and current versions of pertinent external documents enabling them to meet product user, funder, or LaRC requirements.

Agency directives, LaRC directives, Center Procedures (CPs), and Center Interim Directives (CIDs) are those documents that apply to employees in more than one OU. Organizational Procedures (OPs) are used only by employees in a single OU. LaRC management does not permit more than one CP or OP for a specific procedure or sub-process. Branch-level policies and procedures (Branch Practices, or BPs, and Task Descriptions, or TDs) are directives controlled at the branch level. These documents are approved by one level of management above point of use (generally the Branch Head, but may be a lower level of management) and do not require review outside of the Branch prior to approval. Copies of the approved branch-level documents are submitted for posting on the LMS Web site. Operation Documents are used to control work activities performed by small subsets of an OU. Only those procedures for which management controls are warranted are documented.
LMS document review and approval requirements are maintained in LMS-CP-1410.2, “Langley Management System (LMS) Document Control.”

Document control procedures describe the methods for communicating changes or cancellations to LMS documents. Employees are notified of document approvals and changes via LaRC’s official electronic communication system, “@LaRC” (see 3.2.6 Internal Communication). Employees are responsible for preventing use of obsolete documents for the performance of work. Where previous versions of external

documents are required to be used, the circumstances requiring their use are identified.

Methods have been established to ensure periodic review of LMS documentation for ongoing relevance and accuracy as well as to determine whether improvement opportunities exist. Where appropriate, the period and method of the required review are documented in the relevant procedure. These regular reviews are not intended to eliminate the need for continued updating of documents to reflect changes to requirements or to establish needed management controls.

LANGLEY MANAGEMENT SYSTEM DOCUMENT CATEGORIES

External Documentation

Agency Documents
NASA Policy Directives and Charters
NASA Procedural Requirements
NASA Standards
Executive Orders used by NASA

Other External Documents
External documents used to perform work are referenced in LaRC work authorization documents (for example, Memorandum of Agreements, Task Agreements, Fabrication Work Requests). The use of these documents must be controlled by the responsible Langley Organizational Unit Managers.

Internal Documentation

Category 1

Current Operations

LAPD 1000.1 **-** Langley Management System Policy Manual

Category 2

Current Operations

LMS-OUP - Langley Management System Organizational Unit Plan(s)

Category 3

Current Operations

Document Category

LAPD - Langley Policy Directives
LPR - Langley Procedural Requirements
CID - Center Interim Directives
LMS-CP - Center Procedures
LMS-OP - Organizational Procedures
LF - Langley Forms

Category 4

Current Operations

Document Category

LMS-BP - Branch Practices
LMS-TD - Task Description
SOD - Standard Operation Documents

The procedures used to control LMS documentation and data are described in the following documents

Reference	Document Title	Application
LMS-CP-1410.2	Langley Management System (LMS) Document Control	Performance of work
LMS-CP-4108	Updates and Approvals of Changes to Langley Home Page (www.larc.nasa.gov)	Performance of work
LMS-CP-4706	Monitoring and Reporting of Material Analysis and Quality Assurance Testing Results Performed by the Material Analysis and Quality Inspection Lab	Performance of work
LMS-CP-4710	Configuration Management for Facilities	Verification of work
LMS-CP-4890	Construction and Change Assurance for High Risk Facilities	Verification of work
LMS-CP-5510	Aerospace Systems Change Control within Systems Engineering	Performance of work
LMS-CP-5529	Software Configuration Management Planning for Low-, High-, and Critical-Control Software	Performance of work
LMS-CP-5907	Forms Management	Performance of work
LMS-CP-5909	Web Site Development, Deployment, Maintenance, and Removal	Performance of work
LPR 7120.5	Space Flight Project Practices Handbook	Performance of work
LMS-OP-0907	Flight Operations Support Center Configuration Management and Change Control	Performance of work
LMS-OP-0914	Configuration Management and Change Control for Simulator Hardware	Performance of work
LMS-OP-5686	Facility Systems Engineering Project Document Control	Performance of work

3.2.4 Records Management

The Agency defines official permanent and temporary records that must be maintained with their retention, disposition, and archive requirements in NPR 1441.1, "NASA Records Retention Schedules." In addition to the Records Management procedure referenced, assistance for determining what is or is not an official record subject to Center, Agency, and regulatory requirements is available at: http://records.larc.nasa.gov/index.html.

Documentation created or received by all suppliers/contractors in the process of performing work for NASA are considered official NASA records and shall be accounted for, maintained, safeguarded, preserved and disposed of in accordance with NPR 1441.1. Long-term and permanent records are eventually turned over to NASA for appropriate archival/storage. Corporate records of a contractor's intra-company operations are considered as private business and are exempt from this requirement.

All NASA-Owned/Contractor-Held Records shall be readily available for review by customers and regulatory authorities in accordance with contract or regulatory requirements.

It is the responsibility of OUMs to identify official records that must be retained on the Record Form as a result of execution of policies and procedures.

For each OU, the Record Form, Langley Form 192, must be used to identify:

- all official records to be retained
- the responsibility for completion of each record listed
- the retention and archive periods of each record listed
- location where the records are held
- cutoff for Schedule Disposition

Each OUM is responsible for keeping their Record Form current and ensuring that the record retention requirements are met.

The procedure used for the identification, maintenance, retrieval, retention, and/or disposal of LaRC records is described in the following document:

Reference	Document Title	Application
LPR 1440.7	LaRC Records Management Procedural Requirements	Performance of work

3.2.5 Employee Training

All civil service positions are classified by the government based on Federal regulation. As a precondition to placement, all candidates must be qualified to perform the duties of the position. By definition, any individual not qualified for a position may not be considered for placement.

Upon placement or reassignment, all employees are provided with the training necessary to support LaRC's values as described in section 1.3. Training is divided into two categories.

Required/Mandatory Training

Training that is required by Agency policy, Center policy, law, regulation, LaRC management for an employee to perform LaRC-specific work activities safely and effectively, to develop skills needed to perform newly assigned duties, or training mandated by the Center Director for all employees or specific groups of employees. Training mandated by the Center Director is defined on an annual basis.
Examples:

-Training for safety or other certifications
-Training for the operation of specialized and other equipment
-Training required to implement LMS management controls documented in Agency and LaRC policies and procedures
-Contracting Officer's Technical Representative (COTR) training
-New supervisor training
-Ethics
-Safety and security briefings
-IT security

Developmental Training

Developmental training is intended to enhance an employee's existing skill set or training that is intended to develop an employee's skills to perform duties or skills that will be needed to accomplish known future organizational goals. Individual Development Plans (IDP) may be used by employees and their managers to formalize developmental training needs.

Examples:

-Human Resources Consulting
-Bionanotechnology
-Collaborative Engineering
-Academic courses
-Executive programs/fellowships
-Agency Leadership Development Program (LDP)

Other than records required for on-the-job training (OJT), all training records are maintained by the Office of Human Capital Management. Supervisors are responsible for maintaining records of all required OJT.

In addition to ongoing competency to perform work responsibilities, the effectiveness of training received by employees is considered when the immediate supervisor conducts semi-annual performance evaluations.

The procedures used for management of training are described in the following documents:

Reference	Document Title	**Application**
LMS-CP-4312	Individual Development Plan and Required Training	Performance of work
LMS-CP-4316	Training Needs Assessment/Off-Site/On-Site Training	Performance of work

3.2.6 Internal Communication

Equally important to effectively communicating with external stakeholders and customers is the need to ensure that methods are in place to support internal communications relating to functions/activities impacting day-to-day implementation of the LMS. Additionally, to ensure involvement of employees in Center-wide efforts to promote continuing improvement at all levels, communication methods have been defined to provide employee access to information relating to the ongoing effectiveness of the LMS.

A number of written and verbal communication mechanisms are employed at LaRC to ensure effective information transfer. On a weekly basis, each organizational unit submits a summary of key activities that are compiled and posted on "@LaRC," an intranet Web-based application, for review by all employees. Also, the minutes summarizing weekly CLC sessions are posted on the CLC Web site at http://clc.larc.nasa.gov/ or through @LaRC at http://atlarc2.larc.nasa.gov/ .

Regular senior leadership tag ups are held to ensure communications with the full senior management team. OUMs, as members of the CLC, are responsible for relaying pertinent information to their line management, who in turn communicate to employees. Additionally, the Center Director conducts Town Meetings from time to time that provide employees with information and management perspective relating to those activities that impact current and future Center decisions. The Center Director also communicates directly to each employee via e-mails concerning important topics, and periodic "Open Door" sessions with small groups of employees.

The Public Affairs Office (PAO), within the Strategic Relationships Office, is responsible for a primary segment of Internal Communications at Langley. Communications vehicles managed or employed by the PAO to support internal communications can include:

- The "Researcher News" newsletter (online on @LaRC)
- @LaRC
- Exterior message boards
- Telephone message system for urgent or emergency announcements
- E-mail to specific distribution lists (i.e., all OUMs, secretaries)

The Center uses @LaRC as an official means to communicate or provide links to critical information needed by management and employees to assist in the conduct of work at the Center. This site may be accessed at http://atlarc2.larc.nasa.gov/.

Employees may access the LMS Web site through @LaRC or directly at: https://lms.larc.nasa.gov/index.cfm. This site provides access to management system documentation and minutes and presentations for LMS semi-annual management reviews.

Langley is a research, science, technology and development center that provides game changing innovations to enable NASA to make significant contributions to the Nation.

In performing this mission, LaRC is committed to comply with internally and externally generated requirements that impact the planning, conduct and review of work. The Center will continue to seek and act on opportunities to improve our system, processes, products, and services.