



**Langley
Policy
Directive**

LPR 7120.4 C

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Subject: Langley Research Center Technical Authority Implementation Plan

Responsible Office: Office of the Director

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Revision History

Version	Date	Description
1A	1/16/2007	Initial Release
Rev A	7/20/2009	Revision incorporating resolution to OCE 2009 audit findings #3, 4, 5, 6 and other updates.
Rev A-1	3/5/2010	Revision to meet compliance to NPR 1400.1
Rev B	9/7/2010	Administrative changes to update references to LPR 7120.6
Rev B-1	11/24/2014	Added Continued-Use Memo
Rev C	3/15/2016	Required five-year review

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P.1 Purpose

This plan documents the implementation of the technical authority initiative at Langley Research Center.

P.2 Applicability

- a. This LPR is applicable to the Langley Research Center.
- b. Technical authority will encompass large and small projects and activities in space flight systems and ground support (FS&GS) projects, advanced technology development projects with deliverables to FS&GS projects, applied research projects with deliverables to FS&GS, and research projects involving high-risk ground systems.
- c. Technical authority will also encompass basic and applied research, other advanced technology development projects, and analysis projects, as designated by the Center Director on a case-by-case basis as recommended by the Center Management Council.

P.3 Authority

NASA Policy Directive (NPD) 1000.0, NASA Governance and Strategic Management Handbook

P.4 Applicable Documents

- a. NPD 1000.0, NASA Governance and Strategic Management Handbook
- b. NPD 7100.8, Protection of Human Research Subjects
- c. NPD 7900.4, NASA Aircraft Operations Management
- d. NPD 8700.1, NASA Policy for Safety and Mission Assurance
- e. NPD 8900.5, NASA Health and Medical Policy for Human Space Exploration
- f. NASA Procedural Requirements (NPR) 7100.1, Protection of Human Research Subjects
- g. NPR 7120.5, NASA Space Flight Program and Project Management Requirements
- h. NPR 7120.11, NASA Health and Medical Technical Authority (HMTA) Implementation
- i. NPR 7900.3, Aircraft Operations Management Manual
- j. NASA-STD 8709.20, Management of Safety and Mission Assurance Technical Authority Requirements
- k. Langley Policy Directive (LAPD) 1150.2, Councils, Boards, Panels, Committees, Teams, and Groups
- l. LAPD 1700.2, Safety Assignments and Responsibilities
- m. LAPD 1710.1, Langley Research Center Aviation Safety Policy
- n. Langley Procedural Requirements (LPR) 1710.16, Aviation Operations & Safety Manual
- o. LMS-CP-7151, Obtaining Waivers for LMS Requirements

P.5 Measurement/Verification

Verification will be accomplished as part of the LaRC Internal Audit process.

P.6 Cancellation

LAPD 7120.4 B-1, effective August 5, 2009

1. Overview

- 1.1 NPD 1000.0 sets up a “checks and balances” organizational model and authorizes the appropriate organizations to maintain technical purview over institutional requirements, which includes approval of deviations/waivers and verification of compliance. The Office of Chief Engineer (OCE) maintains technical purview over engineering requirements. The Office of Safety and Mission Assurance (OSMA) maintains technical purview over safety and mission assurance (SMA) requirements. The Chief Health and Medical Officer (CHMO) maintains technical purview over health and medical requirements.
- 1.2 The checks and balances organization model described in NPD 1000.0 will be put into practice through the implementation of the technical authority initiative developed by the NASA Chief Engineer.
- 1.3 Program/project management (i.e., Programmatic Authority) is responsible and accountable for the safe conduct and successful outcome of their program or project in conformance with governing Programmatic and Institutional Authority requirements. The responsibilities of a Program or Project Manager have not been diminished by the implementation of Technical Authority. The Program or Project Manager is still ultimately responsible for the safe conduct and successful outcome of the program or project in accordance with governing requirements.
- 1.4 The Engineering and SMA Technical Authorities are parallel to program/project management in order to achieve balance in implementing technically sound, safe, and successful projects. Technical Authority (TA) defines the delegation of responsibility for setting and enforcing institutional requirements. TA originates with the Administrator and is formally delegated to the NASA Associate Administrator, then to the NASA Chief Engineer for Engineering TA, the Chief, Safety and Mission Assurance for SMA TA, and then to the Center Directors. The Administrator delegates Health and Medical Technical Authority (HMTA) to the NASA Chief Health and Medical Officer. HMTA may then be delegated to the Center Chief Medical Officer with the concurrence of the Center Director. From the Center Director, TA flows down through the Langley organizations to an individual program or project. On technical matters, the assigned Technical Authorities provide an organizationally and financially independent voice equal to programmatic authority that provides technical direction and oversight and holds the programmatic authority accountable for meeting engineering, SMA, and health and medical requirements.

2. Adherence to NPD 1000.0

- 2.1 For projects identified in P.2, a clear separation of programmatic and technical authority will be maintained. Each designated Technical Authority will be organizationally and financially independent from the program/project programmatic authority. The Technical Authority to the program/project may be matrixed from an engineering organization or the Safety and Mission Assurance Office (SMAO), and will be a direct report of these respective organizations.

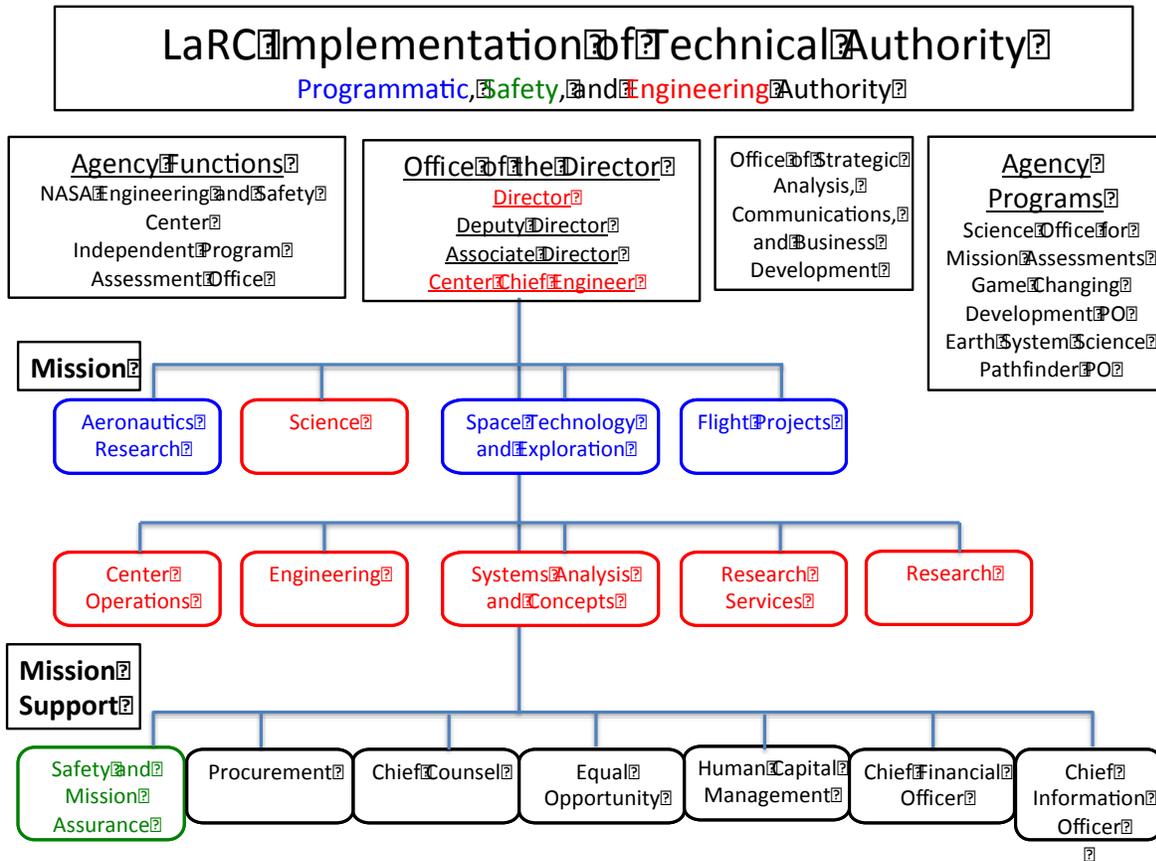


Figure 1: Organizations maintaining technical authority in the areas of engineering (red), safety and mission assurance (green); and programmatic authority (blue)

3. Center Technical Authority

- 3.1 The Center Director is the Technical Authority for Langley Research Center, as shown in Figure 1. The Center Director shall delegate specific Engineering Technical Authority (ETA) responsibilities to members of the Langley engineering and technical communities.
- 3.2 The Center Director shall delegate specific safety and mission assurance technical authority (STA) responsibilities to members of the Langley SMAO. Only those individuals designated as Technical Authorities can exercise technical authority.
- 3.3 The Center Management Council (CMC) has the primary responsibility for the technical content and performance of Center activities to ensure their compliance with program, mission, and Agency objectives. As part of this responsibility, the CMC shall assess program and project compliance with the requirements levied by the technical and programmatic authorities.
- 3.4 The CMC shall provide recommendations to the Center Director for the application of technical authority to non-FS&GS activities outside the scope of this plan.

4. Flow of Engineering Technical Authority

4.1 Engineering Technical Authority (ETA), shown in Figure 2, flows from the Office of the Administrator through the Center Director to each Engineering Director (the heads of the Center Operations, Research Services, Research, Science, Systems Analysis and Concepts, and Engineering Directorates), to the designated Technical Authority for individual programs, projects, and disciplines when the program/project is hosted at Langley.

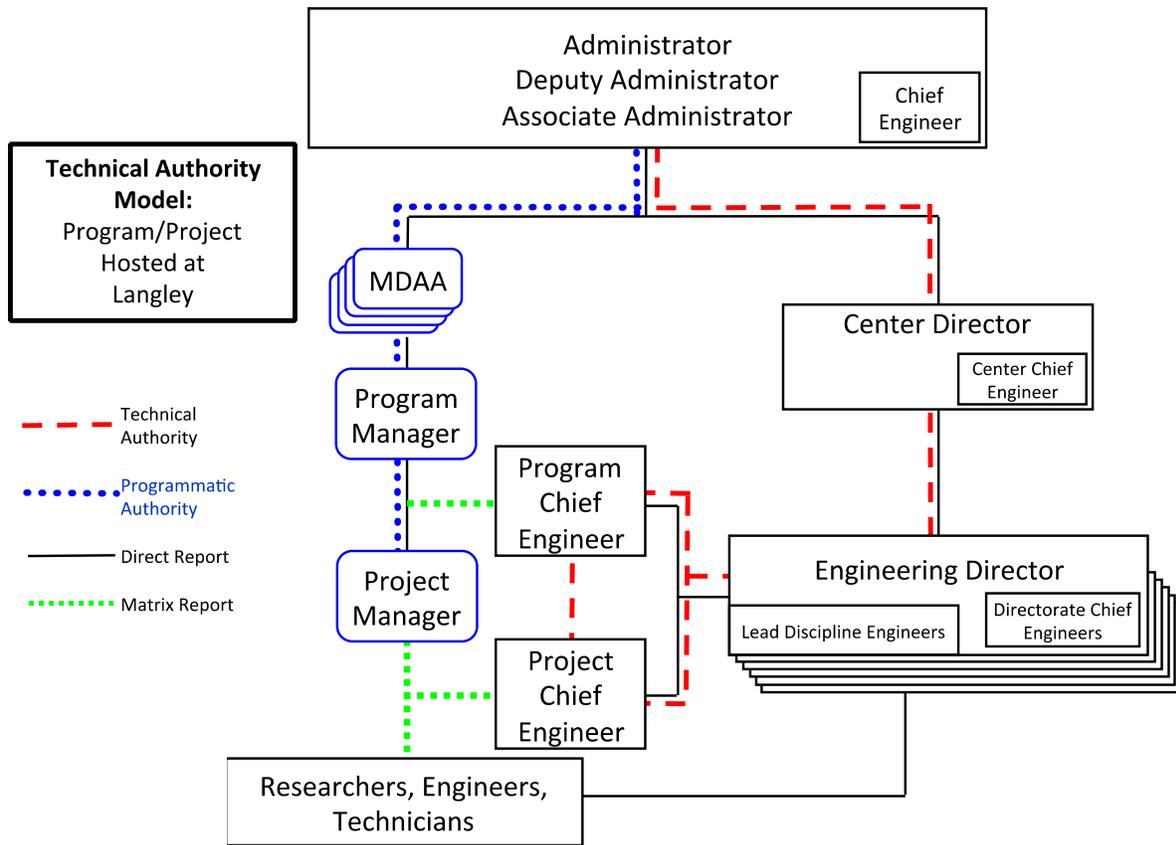


Figure 2: Flow of engineering technical authority when the program/project is hosted at Langley

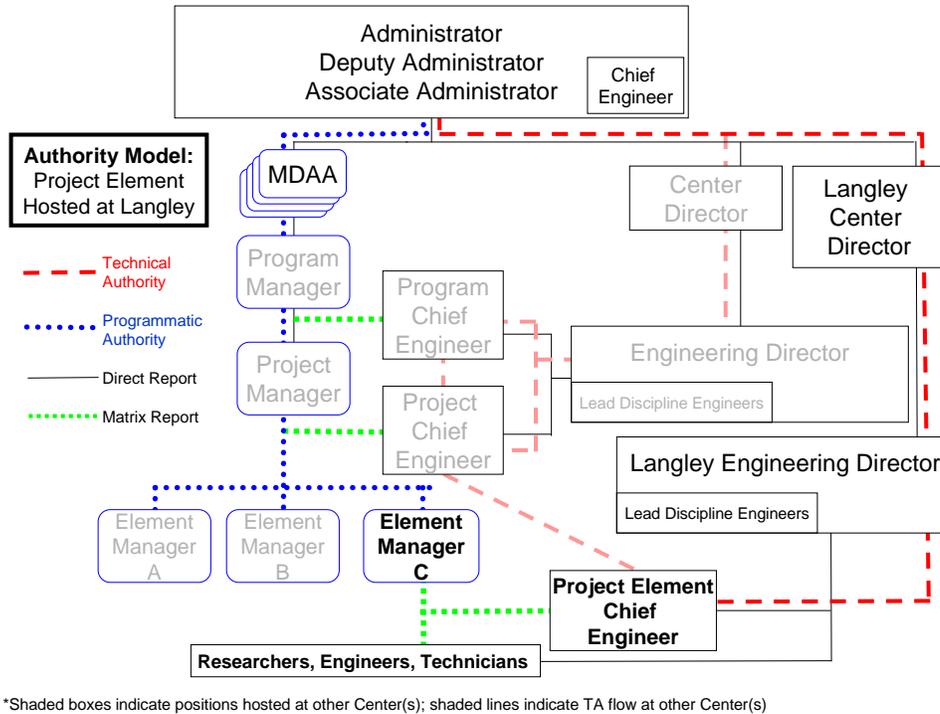


Figure 3: Flow of engineering technical authority when only an element of a project is hosted at Langley

- 4.2 When Langley is hosting a key element of the project, the element will be “projectized.” Examples are: Orion project elements such as the Service Module, Crew Module, or Launch Abort System for the Crew Exploration Vehicle (CEV) project. In these cases, as demonstrated in Figure 3, technical authority flows from the Office of the Administrator through the Langley Center Director and the respective Langley Engineering Director to the designated Technical Authority for the project element (Project Chief Engineer). In addition, there is a second flow of technical authority from the Office of the Administrator through the Center Director and Engineering Director of the Center hosting the project, to the Technical Authority for the project (Program/Project Chief Engineer), to the Langley Technical Authority for the project element (Project Chief Engineer). The Technical Authorities for the project and project element shall integrate the appropriate institutional requirements from the two Centers.
- 4.3 Project personnel shall document deviations of the Engineering Technical Authority flow in the project files.
- 4.4 Engineering Technical Authorities, where a deviation is required, shall work the disposition per the documented procedures at their Centers. Waivers to Langley requirements documents shall be done in accordance with LMS-CP-7151 and the guidance provided in section 9.

5 Flow of Safety and Mission Assurance Technical Authority

- 5.1 The flow of Safety and Mission Assurance Technical Authority (STA) has two possible paths at Langley: one for programs/projects hosted at Langley and one for a project element hosted at Langley. When Langley is the host for a program or a project within a program, as shown in Figure 4, STA flows from the Office of the Administrator through the LaRC Center Director to the LaRC Director, Safety and Mission Assurance Office, and then from the SMAO to the Program/Project Safety and Mission Assurance Officer (PSMAO) who is the designated Technical Authority for individual projects and disciplines
- 5.2 When Langley is hosting a key element of the project, the element will be “projectized.” In these cases, as shown in figure 5, STA flows from the Office of the Administrator through the LaRC Center Director to the LaRC Director, Safety and Mission Assurance Office, and then from the SMAO to the designated Technical Authority for individual projects or disciplines (PSMAO). In addition, there is a second flow of STA from the Office of the Administrator through the hosting program/project (PSMAO) to the designated Project Element SMAO at Langley. The STA flow from the Office of the Administrator to the hosting project’s PSMAO will be in accordance with the hosting Center’s Technical Authority implementation plan. The Technical Authorities for the project and project element shall integrate the appropriate institutional requirements from the two Centers.
- 5.3 Project personnel shall document deviations of SMA Technical Authority flow in the project files.
- 5.4 SMA Technical Authorities, where a deviation is required, shall work the disposition per the documented procedures at their Centers. Waivers to Langley requirements documents shall be done in accordance with LMS-CP-7151 and the guidance provided in section 9.

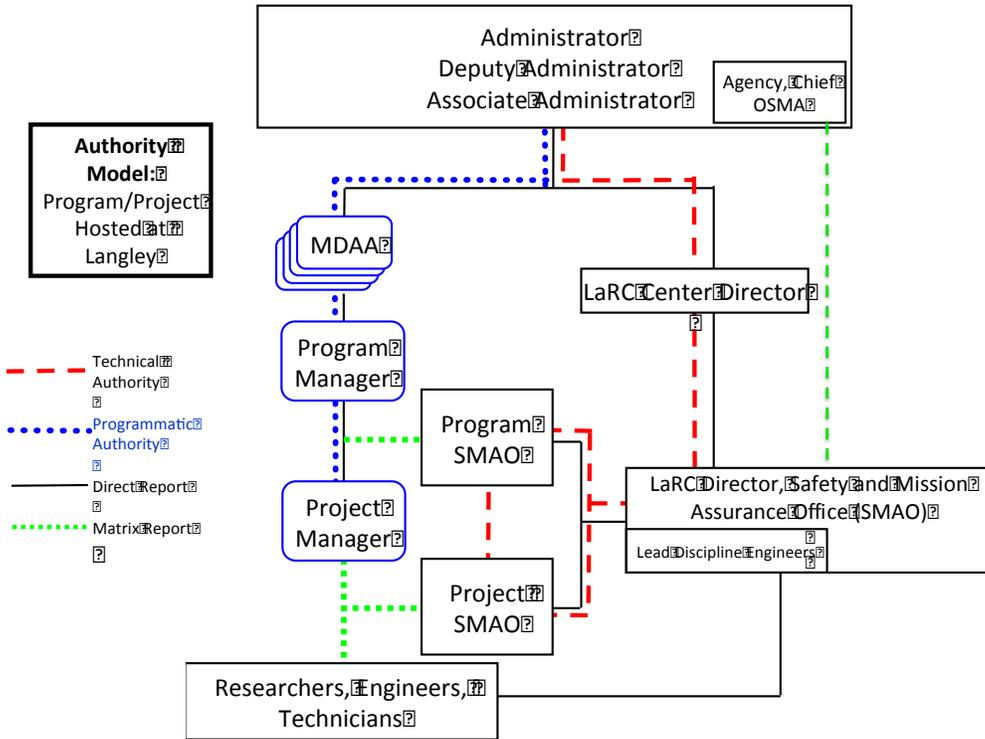
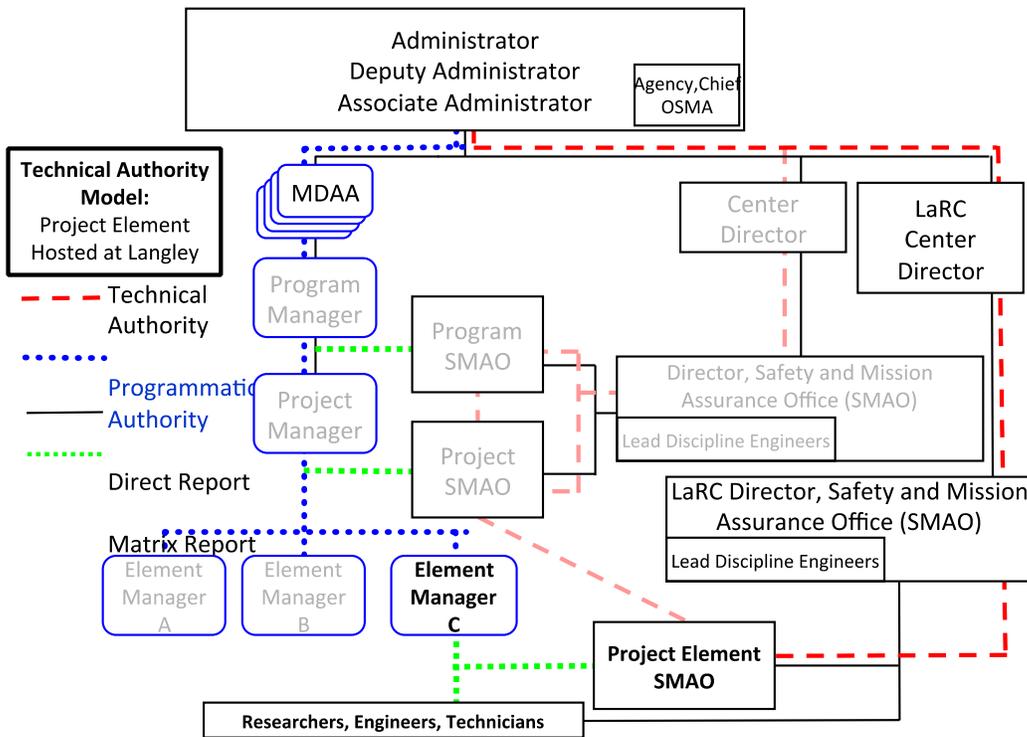


Figure 4: Flow of safety and mission assurance technical authority when the program/project is hosted at Langley



*Shaded boxes indicate positions hosted at other Center(s); shaded lines indicate TA flow at other Center(s)

Figure 5: Flow of technical authority when only an element of a project is hosted at Langley

6 Health and Medical Responsibility Flow

- 6.1 The Center is responsible for assuring that the programs/projects comply with health and medical requirements through the process specified in the Health and Medical Authority (HMA) implementation plan, which is compliant with NPD 8900.5, and NPR 7120.11. The NASA Chief Health and Medical Officer (CHMO) hears appeals of HMA decisions when issues cannot be resolved below the Agency level.
- 6.2 The Center also has a responsibility for the health and medical requirements for the personnel involved with the Center’s aircraft and simulators. Figure 6 shows the flow down of authority for Health and Medical for Aircraft and Simulators at NASA Langley.

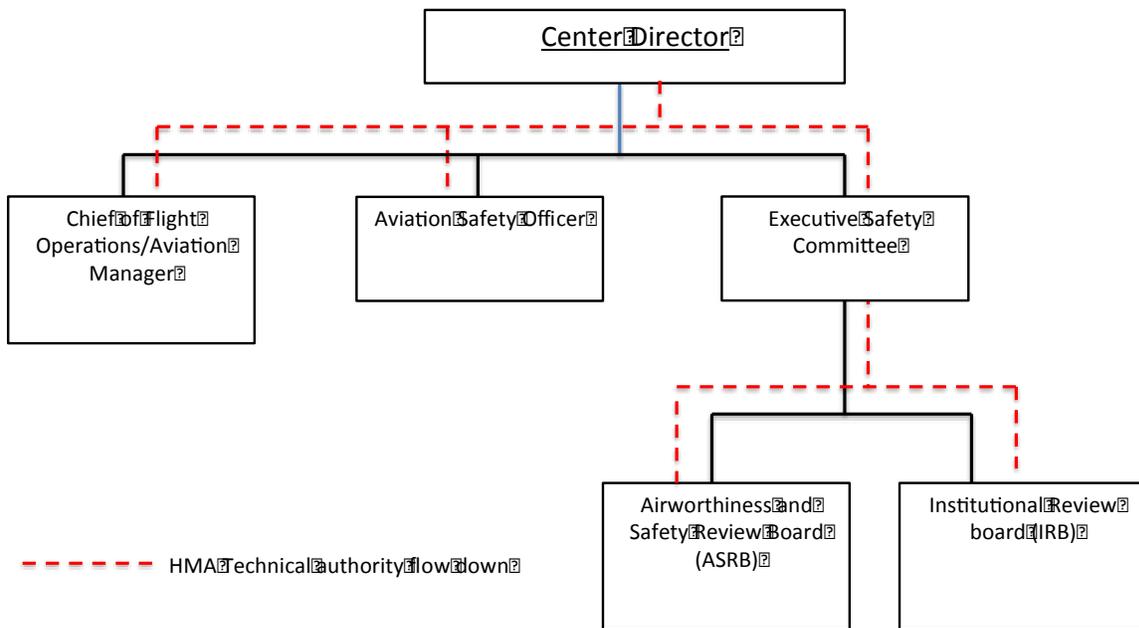


Figure 6: Technical authority flow down for health and medical for aircraft and simulators

- 6.3 Any organization at NASA Langley that desires to conduct aircraft and unmanned aerial vehicle flight research or manned simulator operations must coordinate these activities through the Research Services Directorate (RSD).
- 6.4 Independent oversight of aircraft operations and protection of human research subjects are provided by the Center’s Airworthiness and Safety Review Board (ASRB) and the Institutional Review Board (IRB), respectively. The Agency policy for aircraft is provided in NPD 7900.4 and NPR 7900. The Agency’s requirements for the IRB are provided in NPR 7100.1.
- 6.5 The corresponding health and medical requirements for aircraft personnel at NASA Langley are found in LPR 1710.16. NASA Langley’s ASRB and IRB are chartered via LAPD 1150.2.

- 6.6 In summary, RSD, ASRB, and IRB ensure the health and medical safety of personnel participating as primary aircrew, mission managers, experiment observers, and human subjects involved in the work and research conducted at NASA Langley on board aircraft and in simulators.

7 Roles and Responsibilities for Technical Authority

7.1 Center Director

The Technical Authority for Langley Research Center as designated by the NASA Administrator; responsible for implementing technical authority at Langley in accordance with NPD 1000.0 and guidance from the Office of the Chief Engineer, OSMA, and the NASA CHMO; responsible for developing, maintaining, and assuring compliance to institutional requirements for the safe operation of programs, projects, and project elements at Langley; responsible for the resolution of requests for deviations/waivers from institutional requirements; responsible for the resolution of dissenting opinions.

7.2 Center Chief Engineer

Responsible for overall leadership of the engineering technical authority process (as defined in section 2) for LaRC hosted programs, project elements, and activities, to include policy direction and technical authority process implementation; and advises the Center Director on the resolution of deviations/waivers to institutional requirements and the resolution of dissenting opinions.

7.3 Engineering Director (the heads of the Center Operations, Research Services, Research, Science, Systems Analysis and Concepts, and Engineering Directorates)

The formally delegated Technical Authority for specific engineering technical authority responsibilities in the engineering directorate as designated by the Center Director; responsible for selecting or recommending program/project Technical Authorities and discipline Technical Authorities; responsible for implementing engineering technical authority in the respective Engineering Directorates; responsible for developing, maintaining, and assuring compliance to institutional requirements for safe operations; and as delegated, responsible for the resolution of requests for deviations/waivers from institutional requirements and the resolution of dissenting opinions.

7.4 Directorate Chief Engineer

Responsible for the guidance of the engineering technical authority process in the Directorate to include organizational procedures and the verification of engineering technical authority implementation in the Directorate; and advises the Engineering Director on deviations/waivers of institutional requirements and resolution of dissenting opinions.

- 7.5 The Director of Research Services Directorate is the Center's Chief of Flight Operations/Aviation Manager, who is responsible for flight operations and aviation safety. The responsibilities of the RSD Director include, but are not limited to:

ensuring compliance with the Center Safety Program and defining, proposing, and implementing the management guidelines, processes and procedures necessary to enable safe and effective operations of Langley-assigned aircraft, including appropriate training/certification programs for all functional areas. The responsibilities of the Chief of Flight Operations/Aviation Manager are defined in LAPD 1700.2 and LAPD 1710.1.

- 7.6 The Aviation Safety Officer (ASO) is the focal point for aviation safety matters for the Center Director and the RSD Director. The ASO reports to the Center Director on all aviation safety matters. The responsibilities of the ASO are defined in LAPD 1700.2 and LAPD 1710.1.
- 7.7 Directorate Branch Heads/Lead Discipline Engineers are responsible for the guidance of the engineering technical authority process in the branch, to include organizational procedures and the verification of engineering technical authority implementation, and advise the Engineering Director on deviations/waivers of institutional requirements and resolution of dissenting opinions. The Branch Head is designated as a Lead Discipline Engineer (LDE) functioning as a Technical Authority responsible for the application of discipline specific standards, and as delegated, responsible for the resolution of requests for deviations/waivers from discipline specific requirements. The LDEs are also responsible for supporting the review of processes/activities, such as trend analysis, risk analysis, hazard analysis, and failure mode and effect analysis (FMEA), for their disciplines. For small projects that are primarily focused in one branch, the Branch Head may function as the Project Chief Engineer.
- 7.8 Director, SMAO
The formally delegated Technical Authority for Safety and Mission Assurance (STA); responsible for recommending Program/Project Safety and Mission Assurance Officers to the Center Director and selecting SMA discipline Technical Authorities; responsible for implementing STA; responsible for developing, maintaining, and assuring compliance to institutional safety and mission assurance requirements, practices and policies; and responsible for the resolution of requests for deviations/waivers from SMA institutional requirements and the resolution of dissenting opinions.
- 7.9 Branch Head, Mission Assurance Branch, SMAO
Recommends to the Director, SMAO, a Safety and Mission Assurance Officer for programs and larger projects/elements hosted by Langley. For small projects/elements serves as the Safety and Mission Assurance Officer and assigns a Mission Assurance Manager to implement day-to-day safety and mission assurance activities.
- 7.10 Program/Project Managers
Responsible for the overall success of their programs/projects to include cost, schedule, and program/project requirements within the constraints of institutional

requirements for safe operations; have the authority to make a decision while resolution of dissenting opinions or technical issues are reviewed at the next-higher level of Programmatic and Technical Authority; implement and recognize technical authority in their programs/projects.

7.11 Program/Project Chief Engineer (PCE)

The formally delegated Technical Authority for a program/project as designated by the Center Director (or Engineering Director), responsible for delivering a technically sound and safe product by applying and ensuring the application of institutional requirements and responsible for the development and disposition of program/project deviations/waivers and dissenting opinions. The PCEs are also responsible for the review and approval of processes/activities such as technical readiness assessment, trend analysis, risk analysis, hazard analysis, and FMEA for their programs or projects; and for documenting the results of the review (peer, technical quality, life cycle, etc.) in program/project files.

7.12 Program/Project Safety and Mission Assurance Officer (PSMAO)

The formally delegated safety and mission assurance Technical Authority for a program/project as designated by the Center Director based on recommendations from the Director, SMAO; responsible for delivering a safe product by applying and ensuring the application of institutional safety and mission assurance requirements; responsible for reviewing program/project deviations/waivers and dissenting opinions; and responsible for dispositioning deviations/waivers and dissenting opinions to SMA requirements. The PSMAOs are also responsible for the review and approval of safety and mission assurance processes/activities, such as risk analysis, hazard analysis, and FMEA for their programs or projects.

7.13 Researcher, Engineer, Technician

Responsible for delivering systems, subsystems, and/or components to the program/project that meet the documented requirements, including safety and mission assurance.

8 Selection and Identification of Technical Authorities

- 8.1 The NASA Chief Engineer shall approve the selection of the Engineering Director, Program Engineering Technical Authorities, and Category 1 (as described in NPR 7120.5) Project Technical Authorities.
- 8.2 There will be a designated PSMAO for all programs, projects, and elements hosted by Langley.
- 8.3 For any program and larger projects/elements, the Branch Head, Mission Assurance Branch (MAB) shall assign a PSMAO.
- 8.4 The Langley Director, Safety and Mission Assurance Office, shall approve the selection of PSMAO for any program or larger projects/elements.

- 8.5 The NASA Chief of Safety and Mission Assurance shall approve the selection of a program PSMAO.

9 Deviations/Waivers to Requirements

- 9.1 The Headquarters' Office of the Chief Engineer and OSMA will periodically issue a listing of endorsed standards that must be considered across all NASA programs and projects. A list of the endorsed standards can be found at: <https://standards.nasa.gov/documents/endorsed>. The NASA Chief Engineer has issued delegation responsibilities for some of these endorsed standards to the Center Directors.
- 9.2 The Langley Chief Engineer shall provide information updates and guidance to the Engineering Directorates as revisions to standards occur. It is the responsibility of the Program and Project Managers, Chief Engineers and Chief Safety and Mission Assurance Officers to be aware of these and either implement, tailor or obtain a deviation/waiver. Directorates and Branch Heads are responsible to be aware of these as they apply to the work performed in their respective organizations and ensure these are implemented, tailored or appropriate deviations/waivers submitted. Note that tailoring may result in a deviation.
- 9.3 The evaluation and disposition of deviations/waivers to agency and institutional requirements is the responsibility of the Technical Authority. Technical Authorities shall approve deviations/waivers from requirements at their levels. The organizational level and organizations that agreed with the establishment of the requirement must agree to the deviation from the requirement.
- 9.4 The Technical Authority granting a deviation from the requirement shall notify the Program/Project Manager; the Engineering Director; Langley Chief Engineer; and Langley Director, SMAO, to maintain a common understanding and proper documentation of the requirements.
- 9.5 Once the deviation is agreed to as described above, Program/Project Managers shall approve the deviation consistent with their responsibilities to implement technical authority requirements.
- 9.6 The next higher level of technical, safety and programmatic authority must be informed in a timely manner of each deviation request and the subsequent action taken.

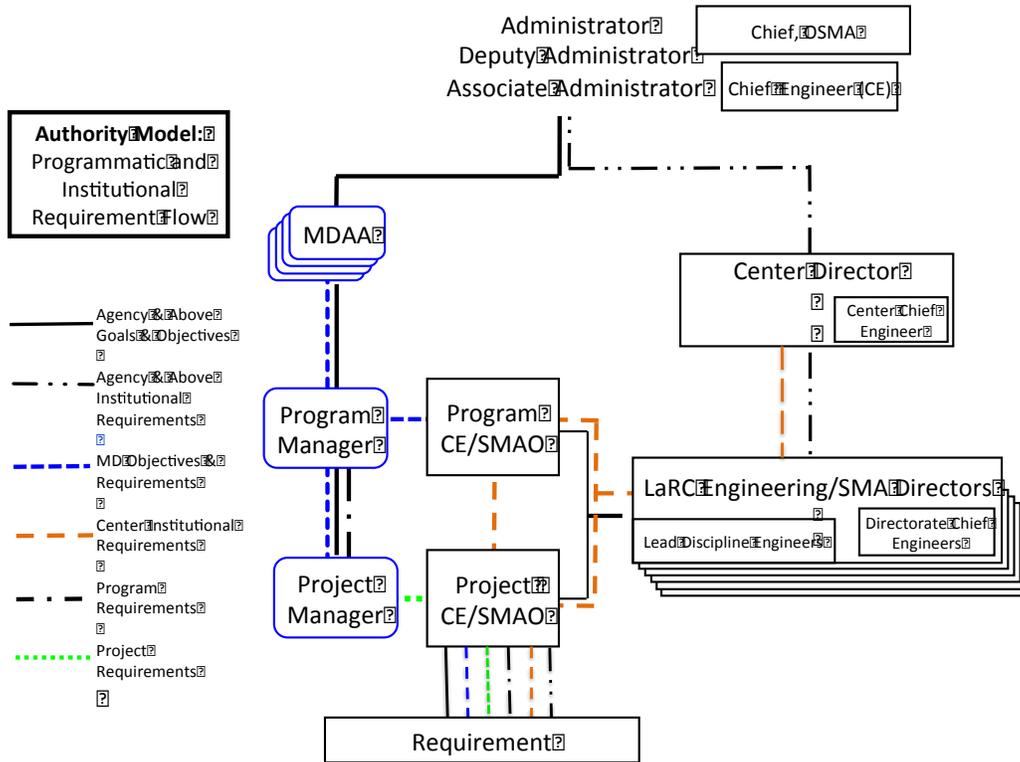


Figure 7: The flow of goals, objectives, and requirements

9.7 Figure 7 illustrates the flow of goals, objectives, and requirements through the programmatic and institutional chains of command. The technical authority to deviate or waive from an Agency or higher institutional requirement is at the Administrator or above, unless specific delegation has been given by the NASA Chief Engineer, NASA SMA Director, or the Administrator. The Langley Office of the Chief Engineer shall maintain these delegation letters for reference. The technical authority to deviate/waive from Center institutional requirements and delegated Agency requirements or standards is at the Center Director.

Table I: Level of deviation/waiver decision authority for institutional requirements

Requirements	Level of Deviation Decision	Examples
Agency and Higher Institutional Requirements	Administrator and above	Executive orders, <i>Human-Rating Requirements for Space Systems</i> (NPR 8705.2A), <i>Planetary Protection Provisions for Robotic Extraterrestrial Missions</i> (NPR 8020.12C), and <i>Systems Engineering Procedural Requirements</i> (NPR 7123.1)
Center Institutional Requirements and Delegated Agency Requirements/Standards	Center Director	<i>Wind-Tunnel Model Systems Criteria</i> (LPR 1710.15), <i>Langley Research Center Pressure Systems Handbook</i> (LPR 1710.40), and; NASA-STD-5002, <i>Load Analysis of Spacecraft and Payloads</i>

- 9.8 Similarly, the authority to deviate/waive from Agency and higher, mission directorate, program, and project goals, objectives, and requirements is at the programmatic level that the goal, objective, or requirement was established.

Table II: Examples and notional programmatic goals, objectives, and requirements

Goals, Objectives, & Requirements	Examples	Level Goal, Objective, or Requirement Established By
Agency and Higher Goals and Objectives	Presidential policy; executive orders; and <i>The Vision for Space Exploration</i>	President, Congress
MD Objectives and Requirements	Enable human Travel beyond low earth orbit; conduct scientific exploration of the Earth, Moon, Mars and beyond; advance the science of subsonic, supersonic, and hypersonic flight	Administrator
Program Requirements	The program shall develop a system to carry humans beyond low earth orbit; the program shall conduct scientific exploration of Earth	Mission Directorate
Project Requirements	The CEV shall have a crew-to-crew communication system that covers the mission envelope; the crew-to-crew communication system shall cover a volume of N km around the CEV; the crew-to-crew communication system shall remain attached to the crew member; the crew-to-crew communication system shall provide simultaneous N-way communications.	Program/Project

10 Dissenting Opinions

- 10.1 Unresolved issues of any nature (e.g., programmatic, safety, engineering acquisition, or accounting) within a team should be quickly elevated to achieve resolution at the appropriate level. At the discretion of the dissenting person(s), a decision may be appealed to the next higher level of management for resolution. Dissenting opinions that are raised by a Technical Authority (whether in the area of engineering, safety, or human and medical) are handled in accordance with the general process described subsequently.
- 10.2 Personnel with dissenting opinions shall present to the appropriate engineering and safety Technical Authorities in a timely manner with all relevant facts, the technical rationale for the differing views (including risks), and the recommendations resulting from each view.
- 10.3 Technical Authorities shall inform management in the technical authority, project/program, and safety and mission assurance chains of accountability in a timely manner of the existence of a dissenting view and the disposition of the dissent.

- 10.4 Teams will have full and open discussions with all the facts made available to understand and assess issues. Issues unresolved within a team should be quickly elevated to achieve resolution at the appropriate level. At the discretion of the dissenting person(s) (level n), a dissenting view is identified and presented to the appropriate engineering and safety Technical Authorities (level n+1).
- 10.5 The Technical Authority shall document the concern in a memorandum. The memorandum is signed by the representative of each view and concurred on by all affected parties. This memorandum is provided to the appropriate engineering and safety Technical Authorities for action. In parallel, copies of the memorandum are provided to the next level engineering and safety Technical Authorities (level n+2), Program/Project Manager, and the Managers of involved management oversight organizations for their information or action as they deem appropriate.
- 10.6 The memorandum will contain three primary components to assist the Technical Authority in making an objective, timely, and correct technical decision: 1) facts that are agreed to by all parties, 2) discussion of the differing positions, rationale, and implications including risk, and 3) the recommendations of each party.
- 10.7 The engineering and safety Technical Authorities' decision/action on the memorandum will be documented and provided to the dissenter and to the managers who were notified of the dissent as noted above. This documentation becomes part of the project record.
- 10.8 If urgent resolution of the issue is required, a team member representing the base recommendation and a team member advocating the dissenting position will make an oral presentation to the next higher level of engineering and safety Technical Authorities (level n+1). The Program or Project Managers, as well as the managers of other involved organizations at the next level (level n+2) are to be notified of the need for urgent resolution of the dissenting opinion and when/where the presentation will be held. In this urgent mode, the oral presentation follows the document format discussed above. Representatives of the affected organizations are in attendance, and their positions are heard. The presentation and resulting actions are documented and are distributed as noted above. This documentation becomes part of the project record.
- 10.9 In either the normal or urgent process, if the dissenting team member is not satisfied with the process or the outcome, the dissenter may request the issue be referred to the next level of engineering and safety Technical Authorities. Ultimately the dissenting team member has the right to take the issue up the organization for resolution including to the NASA Administrator, if necessary.

11 Configuration Control of Technical Authority Implementation Plan

- 11.1 Once signed by the signatories on the front page, this implementation plan will be put under configuration control and maintained in the Langley Management System. Any major changes to the plan will be approved by the NASA Chief Engineer, NASA Chief, Office of Safety and Mission Assurance, and the Langley Center Director prior to implementation. Revisions after the initial baseline that remain compliant with NASA policy directives will be approved by the Center Director. The NASA Chief Engineer and NASA Chief, Office of Safety and Mission Assurance will be informed of the change by the LaRC Chief Engineer.

12 Technical Authority Budget

- 12.1 NASA Langley's Chief Engineer and Director, SMAO are responsible for the Engineering and Safety Technical Authority's budgets, respectively. The status of these budgets will be reported periodically to the Center Management Council and/or Center Leadership Council, as required.

13 Listing of Langley Technical Authorities

- 13.1 The Chief Engineer and the Director, SMAO shall develop and maintain a list of the respective Technical Authority designees. This list will be updated as new programs and projects are added or completed and at least quarterly to account for personnel changes.

Appendix A: Definitions

- A.1. Technical Authority – The delegation of responsibility for setting and enforcing institutional requirements from the Office of the Administrator to the Center Director, and then down through the Langley organization to an individual program or project.

- A.2. Dissenting Opinion – Unresolved issues of any nature.

Appendix B: Acronyms

ASO	Aviation Safety Officer
ASRB	Airworthiness and Safety Review Board
CEV	Crew Exploration Vehicle
CHMO	Chief Health and Medical Officer
CMC	Center Management Council
ETA	Engineering Technical Authority
FMEA	Failure Mode and Effect Analysis
FS&GS	Flight Systems and Ground Support
HMA	Health and Medical Authority
IRB	Institutional Review Board
LMS	Langley Management System
MAB	Mission Assurance Branch
NPD	NASA Policy Directive
OSMA	Office of Safety and Mission Assurance
PCE	Program/Project Chief Engineer
PSMAO	Program/Project Safety and Mission Assurance Officer
RSD	Research Services Directorate
SMA	Safety and Mission Assurance
SMAO	Safety and Mission Assurance Office
STA	Safety and Mission Assurance Technical Authority

Appendix C: Verification Matrix

Req's Para	Requirement	Compliant	Not Compliant
3.1	Director shall delegate specific Engineering Technical Authority (ETA) responsibilities to members of the Langley engineering and technical communities.		
3.2	The Center Director shall delegate specific safety and mission assurance technical authority (STA) responsibilities to members of the Langley SMAO. Only those individuals designated as Technical Authorities can exercise technical authority.		
3.3	The CMC shall assess program and project compliance with technical authority		
3.4	The CMC shall provide recommendations to the Center Director for the application of technical authority to non-FS&GS activities outside the scope of this plan.		
4.2	When Langley is hosting a key element of the project, the element will be "projectized." The Technical Authorities for the project and project element shall integrate the appropriate institutional requirements from the two Centers.		
4.3	Project personnel shall document Technical Authority Flow deviations in the project files.		
4.4	Technical Authorities where a Technical Authority Flow deviation is required shall work the disposition per the documented procedures at their Centers.		
5.2	When Langley is hosting a key element of the project, the element will be "projectized". The Safety and Mission Assurance Technical Authorities for the project and project element shall integrate the appropriate institutional requirements from the two Centers.		
5.3	Project personnel shall document Safety and Mission Assurance Technical Authority Flow deviations in the project files.		
5.4	Technical Authorities where a Safety and Mission Assurance Technical Authority Flow deviation is required shall work the disposition per the documented procedures at their Centers.		
8.1	The NASA Chief Engineer shall approve the selection of the Engineering Director, Program Engineering Technical Authorities, and Category 1 (as described in NPR 7120.5) Project Technical Authorities		
8.3	For any program and larger projects/elements, the Branch Head, Mission Assurance Branch (MAB) shall assign a CSO.		
8.4	The Langley Director, Safety and Mission Assurance Office shall approve the selection of PSMAO for any program or larger projects/elements.		
8.5	The NASA Chief Safety Officer shall approve the selection of a program PSMAO.		
9.2	The Langley Chief Engineer shall provide information updates and guidance to the Engineering Directorates as revisions to endorsed standards occur.		

Req's Para	Requirement	Compliant	Not Compliant
9.3	Technical Authorities shall approve deviations/waivers from requirements at their levels		
9.4	The Technical Authority granting a deviation from the requirement shall notify the Program/Project Manager, the Engineering Director, Chief Engineer, and SMAO Director to maintain a common understanding and proper documentation of the requirements.		
9.5	Program/Project Managers shall approve the deviation consistent with their responsibilities to implement technical authority requirements.		
9.7	The technical authority to deviate or waive from an Agency or higher institutional requirement is at the Administrator or above, unless specific delegation has been given by the NASA Chief Engineer, NASA SMA Director, or the Administrator. The Langley Office of the Chief Engineer shall maintain these delegation letters for reference.		
10.2	Personnel with dissenting opinions shall present to the appropriate engineering and safety Technical Authorities in a timely manner with all relevant facts, the technical rationale for the differing views (including risks), and the recommendations resulting from each view.		
10.3	Technical Authorities shall inform management in the technical authority, project/program, and safety and mission assurance chains of accountability in a timely manner of the existence of a dissenting view and the disposition of the dissent.		
10.5	The Technical Authority shall document the dissenting opinion concern in a memorandum.		
13.1	The Chief Engineer and the Director, SMAO shall develop and maintain a list of the respective Technical Authority designees		

Appendix D: Reference Documents

- D.1. NPR 7123.1, NASA Systems Engineering Procedural Requirements
- D.2. NPR 8020.12, Planetary Protection Provisions for Robotic Extraterrestrial Missions
- D.3. NPR 8705.2, Human-Rating Requirements for Space Systems
- D.4. LPR 1710.15, Wind-Tunnel Model Systems Criteria
- D.5. LPR 1710.40, Langley Research Center Pressure Systems Handbook
- D.6. NASA-STD-5002, Load Analysis of Spacecraft and Payloads