Technical Authority FAQs

1. What is Technical Authority?

Answer

The technical authority process provides independent oversight of programs and projects through the selection of individuals at delegated levels of authority. These individuals are the **Technical Authorities**.

There are three Technical Authorities: Engineering, Safety and Mission Assurance, and Health and Medical

2. Why was Technical Authority established?

Answer

Technical Authority as documented in NPR 7120.5D was adopted to support safety and mission success.   The concept is consistent with the NASA Governance Model and implements recommendation R7.5-1 of the Columbia Accident Investigation Board (CAIB). Specifically, the CAIB recommended the establishment of an independent Technical Engineering Authority that is responsible for technical requirements and all waivers to them and will build a disciplined, systematic approach to identifying, analyzing, and controlling hazards throughout the life cycle of the Shuttle System. The Technical Authority concept is being invoked on all space flight programs and projects, not just for the Shuttle Program.

3. Where does Technical Authority fit into the NASA organizational structure? What is meant by the separation between Programmatic and Institutional Authorities, and where does Technical Authority fit in?

Answer

The following graphic illustrates the separation between Programmatic and Institutional parts of the NASA organization. As is shown, the three Technical Authorities (Engineering, Safety and Mission Assurance, and Health and Medical) are part of the Institutional Authority. This separation is to provide clear roles and responsibilities and to provide a check and balance function between key elements of the organization to promote safety and mission success.

Each of the lines shown below is meant to convey the direct flow of authority from the Administrator to each of the individual authorities. If a difference of opinion were to occur

[**Technical Authority**

between individuals in separate authorities, the dissenting opinion process would apply and the issue would rise up to the next level in each authority sequentially until resolved. If necessary, the issue would rise to the Administrator for a decision. (See also the Section on the Dissenting opinion process.)
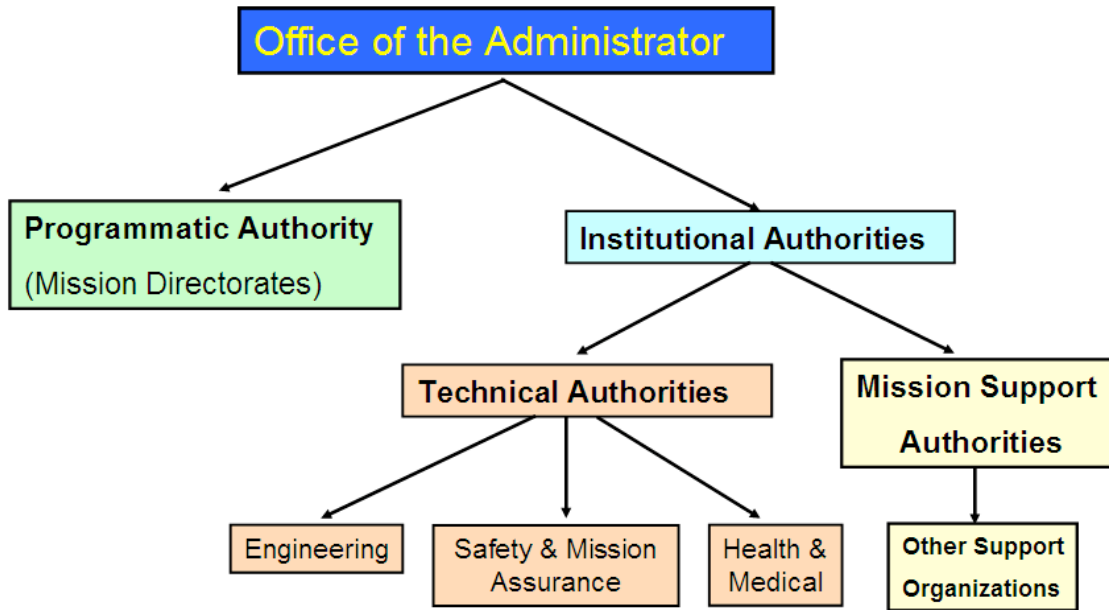
4. Who has Technical Authority?

Only individuals with formally delegated Technical Authority that is traceable to the Administrator have Technical Authority. These individuals are also funded independent of a program or project.

Technical Authority originates with the Administrator who delegates specific responsibilities and authority to the NASA Chief Engineer, the Chief of Safety and Mission Assurance, and the Chief Health and Medical Authority. These Technical Authorities then formally delegate Technical Authority for their area of responsibility down to the Centers.

In most cases this delegation is to the Center Director (or designee) who formally delegates Technical Authority to specific individuals in the Center organization. The Technical Authority for Agency level requirements invoked on Programs is not delegated to the Center Director unless for a single project program.

For programs this authority is delegated directly from the NASA Chief Engineer to the Engineering Director (or equivalent) and from the Chief OSMA to the Center SMA Director and Chief Safety Officer for SMA. For health and medical matters, the Chief Health and Medical Officer delegates specific Technical Authority to the Center Chief Medical Officer.

5. How is the Technical Authority delegated?

Answer

Technical Authority is formally delegated and the delegation delineates key Technical Authority responsibilities.   For Engineering Technical Authorities this delegation will be contained in a Technical Authorities, Position Description and/or Performance Plan.

6. What are the roles of Center LDEs, Engineering Directors, and CD in relation to the Technical Authority at the program, project and element level?

Answer

A fundamental responsibility of a program, project, or element level Technical Authority is to ensure that the associated Programmatic Authority (e.g. the Program Manager or Element Manager) is provided with an engineering community response when Technical Authority direction is given. This means that this Technical Authority must work with the Center senior technical engineer in the appropriate discipline

(Lead Discipline Engineers/Branch Heads), and the Engineering Director as necessary to ensure a sound engineering response is developed. When appropriate this may require establishing an NASA engineering community decision.

The Engineering Director oversees the application, maintenance, and enforcement of technical standards and the application of a disciplined, systematic approach to engineering within the Center. This includes supporting the Technical Authorities in carrying out their responsibilities

The Lead Discipline Engineers support the Engineering Technical Authorities at the Center with input and recommendations in the discipline of their expertise to ensure the proper application and management of discipline-specific engineering requirements and Agency standards.

7. **What are some of the major characteristics, roles, and responsibilities of an Engineering Technical Authority at the program or project level?**

Answer

A Technical Authority at this level:

1. Has formally delegated Technical Authority traceable to the NASA Chief Engineer.

2. Is part of the Center Engineering organization, and the Technical Authority's personnel performance appraisal is signed by Center Engineering management.

3. Is funded separately from the program or project.

4. Is the single point of contact for Engineering Technical Authority at the level of delegated authority.

5. Serves on the change, control, and internal review boards at the level of delegated authority.

6. Provides the program or project with an independent view of matters within his or her respective areas of expertise. (The organizational and funding separation from the program project coupled with the Technical Authority's strong engineering foundation provides the Program or Project Manager with a second point of view.)

7. Works with the Center Engineering Director(s) (or designees), as necessary, to ensure the Engineering Technical Authority direction provided to the program or project reflects the view of the Center engineering community (or NASA engineering community, where appropriate).

8. Is responsible for assuring that changes to and waivers[1] of engineering requirements are submitted to and acted upon by the appropriate level[2] of Engineering Technical Authority.

9. Must serve as an effective part of the overall check and balance system. (This includes conforming to the principle that serves as the foundation of NASA's check and balance system that states "an individual cannot grade his or her own work".

8. What does being the single point of contact for Technical Authority matters at the level of delegated authority mean?

Answer

Being the single point of contact means being the focal point for formal actions between the Programmatic Authority and the Technical Authority the level of level at which your have been delegated authority.

For example, the project would request a Technical Authority disposition of a request for a change to or waiver of a Center or Agency level through the Project Chief Engineer (the Engineering Technical Authority at the project level). The Project Chief Engineer is responsible to provide input to those assessing the request, to ensure that the request was reviewed by the appropriate level of Engineering Technical Authority (at the Center or at the appropriate Headquarters office or designee), and agree that proposed disposition makes sense and is appropriate. The Project Chief Engineer would sign-off on the disposition and provide it to the Project.

If the Project Chief Engineer does not agree with the proposed disposition, resolution would be obtained with the Engineering Technical Authority chain before providing the disposition to the Project.

If the Project does not agree with the disposition and submits a Dissenting Opinion, the Project Chief Engineer would work to obtain resolution at the Project Level. If this is not possible, the Project Chief Engineer and the Project Manager would jointly seek resolution at the next high level of Programmatic and Technical Authority per the NPR 7120.5D Dissenting Opinion Process.

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[1] This FAQ uses the terms "change" and "waiver" in a generic sense to describe this aspect of requirements management. The recent adoption of the term "exception" to describe requirements that are eliminated by the tailoring process because they are not applicable will be handled by the same principles.

[2] Evaluation and disposition of all [non- NPR 7120.5D requirement] change requests and waivers (including waivers of Agency-level requirements and standards must comply with the following:

   a.   The organizations and the organizational levels that agreed to the establishment of a requirement must agree to the change or waiver of that requirement unless this has been formally delegated elsewhere.

   b.   The next higher programmatic authority and Technical Authority are informed in a timely manner of change requests or waivers that could affect that level.

Note: The concept of a single point of contact for a given Technical Authority is explicitly covered in NPR 7120.5D for engineering. The concept applies to all of the Technical Authorities. The individual with delegated Technical Authority responsibility (Engineering, SMA or Health and Medical) for a specific program or project is the single point of contact for the applicable Technical Authority's processes at that level.

9. **What is meant by an Engineering Community and NASA engineering community view**?

The expression engineering community is use to indicate a view that is arrived at by the Center's Engineering organization as a minimum. This is not to be the Technical Authority's personal view. Consultation with the appropriate Lead Discipline Engineer is required. In some instances establishing this view may require consultation with other Centers, the NESC, and/or the Office of the Chief Engineer.

This concept applies to the other Technical Authorities.

10. **Does an engineer matrixed to a program or project have Technical Authority?**

Answer

No, except for the Program or Project Chief Engineer who is also matrixed.

Although a limited number of individuals make up the Engineering Technical Authorities, their work is enabled by the contributions of the program/project's working-level engineers and other supporting personnel (e.g., contracting officers). The working-level engineers are funded by the program/project and consequently may not serve in an Engineering Technical Authority capacity. These engineers perform the detailed engineering and analysis for the program/project, with guidance from their Center management and/or Lead Discipline Engineers (LDEs) and support from the Center engineering infrastructure. They deliver the program/project hardware/software that conforms to applicable programmatic, Agency, and Center requirements. They are responsible for raising issues to the Program/Project Manager, Center engineering management, and/or the Program or Project Chief Engineer (PCE), as appropriate, and are a key resource for resolving these issues. (3.4.2.3)

11. How does the implementation of NPR 7120.5D and Technical Authority affect the responsibilities of the Program or Project Manager?

Answer

The responsibilities of a Program or Project Manager have not been affected by the implementation of Technical Authority. The program or project manager is still ultimately responsible for the success of the program or project in accordance with governing requirements. The responsibilities as stated in NPR 7120.5D are:

1. Program Manager — is responsible for the formulation and implementation of the program per the governing agreement with the sponsoring Mission Directorate.

2. Project Manager — is responsible for the formulation and implementation of the project per the governing agreement with the Program Manager.

Even though the overall roles and responsibilities have not changed, some of the reviews and processes for program or project management have changed.

12. What requirements are the responsibilities of the Technical Authorities?

Answer

Requirements invoked by NASA documents (e.g. NPRs, Standards specified as NASA core or mandatory standards) are the responsibility by the Office that established the requirement unless delegated elsewhere.

Institutional requirements contained in Center documents are the responsibility of the designated Center organization.

13. What is a programmatic requirement and which authority is responsible for them?

Answer

Programmatic requirements focus on the space flight products to be developed and delivered and specifically relate to the goals and objectives of a particular NASA program or project. These requirements flow down from the Agency's strategic planning process. These requirements are the responsibility of the Programmatic Authority.

14. **What is a derived requirement and, which authority is responsible for them?**

Answer

Derived requirements arise from constraints, consideration of issues implied but not explicitly stated in the high-level direction provided by NASA Headquarters and Center institutional requirements, factors introduced by the selected architecture, and the design. Derived requirements are definitized through requirements analysis as part of the overall systems engineering process and become part of the program or project requirements baseline.
(Adapted from Glossary of Defense Acquisition Acronyms and Terms 12th Edition July 2005)

During the development of a program or project, higher level requirements are decomposed and supplemented to create a baseline set of requirements at each level (program, project, element/subsystem, etc.). These derived requirements are the responsibility of the programmatic level that established them unless delegated elsewhere.

15. **Who can waive a derived requirement?**

Answer

Who can waive a derived requirement depends on the organization and level that agreed to the establishment of the requirement.

If the waiver of a project level derived requirement would result in failure to meet an imposed Agency requirement, the project would submit the waiver requesting requirement relief to the lead Technical Authority for the Agency requirement.

If the derived requirement were established by a program or project and the waiver of the requirement did not result in a failure to meet a requirement levied by a higher authority, then the program or project change board could change or waive the requirement.

16. What is the difference in the Technical Authority's role in the changing or waiving a derived requirement and a Technical Authority established requirement?

Answer

The Technical Authority is involved in disposition of changes to and waivers of all Technical Authority requirements. Requests by a change or control board for such a change to or waiver is a request for relief from a Technical Authority requirement invoked on the program/project. The disposition provided by the Technical Authority to such a request is binding. The programmatic Authority can appeal the disposition through the dissenting opinion process

Derived requirements are established by the Programmatic Authority. Changes or waivers of derived requirements are processed through the use of change and control boards. The Technical Authorities are members of these boards and will provide their input as board members during board deliberations. If a Technical Authority disagrees with the decision or action taken by the Board Chair, and the issue rises to the level that warrants a review by higher level management the Technical Authority can request that disagreement be noted for the record and resolved the NPR 7120.5 D dissenting opinion process.

Technical Authority direction related to Technical Authority established requirements is binding on the Programmatic Authority. Upon receipt of such direction, the Programmatic Authority has three choices, accept the Technical Authority disposition, request a review by a higher level of Technical Authority and Programmatic Authority through the Dissenting Opinion process of NPR 7120.5D , or cancel the request for requirement relief.

For such binding direction the Technical Authorities are obligated to resolve any internal differences before providing the direction to the Programmatic Authority.

17. Does the Technical Authority at the Program, Project, or Element level establish any requirements?

> (Note – terms such as "established" or is "responsible" are consciously not being used to avoid the inexact term "owned" since no one really owns a requirement.

Answer

No.

Requirements invoked by NASA documents (e.g. NPDs, NPR, standards specified as NASA core or mandatory standards) are the responsibility of the organization and organizational level that established the requirement unless this has been formally delegated elsewhere.

Institutional requirements contained in Center documents are the responsibility of the designated Center organization.

Derived requirements defined at the program, project, or element level belong to Programmatic Authority at that level.

18.   What is an example of a derived requirement?

Answer

A project determines that it needs to include a pressure in a system. In the design implementation it decides to use a composite overwrap pressure vessel (COPV) that meets Agency level requirement for a safety factor of N. Because of a perceived technology risk, the project decides to impose a safety factor of N+m. In this example the use of a COPV and the additional margin specified are derived requirements of the project's design implementation.

If the project subsequently decides to change the tank design from a COPV to a Titanium metallic pressure vessel, the associated changes in specified requirements can be approved at the project level with notification to the next higher level. Similarly, if the project decides it no longer needs the extra added safety factor (+m) the requirement can be changed at the project level.

However, if the project proposes that the new Titanium tank need only meet a safety factor of N-x 9 (less thab , the NPR 7120.5D waiver principles and NPR 8715.3 would require the appropriate Technical Authority approval.

19. What role(s) does the Technical Authority fill while serving on a program or project board?

Answer

As a member of the program or project board the Technical Authority has two roles.

The first role is to share knowledge and experience with the program/project as a senior, experienced individual and not as the Technical Authority. This role is different and distinct from exercising Technical Authority. The program/project can and should treat this input accordingly.

The second role is exercising Technical Authority when necessary. This would involve being the single point of contact for the program/project for Technical Authority matters at the level of designated authority (e.g. handling the processing of changes and waivers related to Technical Authority requirements). It also could involve raising a Dissenting Opinion on a decision or action by the board.

20. Does a Technical Authority serving on a program or project board have any special status?

Answer

The Technical Authority is involved in the disposition of changes to and waivers of all Technical Authority requirements. Requests by the board for such a change to or waiver is a request for relief from a Technical Authority requirement invoked on the program/project. The disposition provided by the Technical Authority to such a request is binding. The programmatic Authority can appeal the disposition through the dissenting opinion process.

In other areas, the answer is a bit fuzzy but boils down to access. The Technical Authority's membership on all program or project change and control boards is mandated by NPR 7120.5D. This provides the access and knowledge of issues and their context that is necessary to provide the intended effective check and balance function. The Technical Authority 's role as the single point of contact for their respective Technical Authority provides them with ready access to those in the Center and NASA Technical Authority chain.

Serving as members of program or project control boards, change boards, and internal review boards, the Technical Authority can raise a "Dissenting Opinion" if there is a difference between the Technical Authority and the Programmatic Authority that rises to the level that the Technical Authority judges warrants review by the next higher level of Programmatic and Technical Authority

21. **What are the basic choices that a board member can make when polled about an action or decision in a situation where the board Chair is the decision authority and members are advisory?**

Answer

Every NASA employee and team member has a responsibility to clearly express his/her views to the board on which they serve. This is fundamental to the concept of teamwork. It is also necessary if the decision authority is to have the benefit of the varied experience and expertise of the board membership and to have all relevant facts and concerns before making a decision.

The Chair may use different methods to gain an understanding of where the board's membership stands on the various alternate actions or decisions that have been discussed. Many Chairs will choose to poll the members to see how and why each member distilled the discussion into a personal decision on how the board should proceed. In such a poll, a member should vote based on his/her personal conviction as to what is the best course of action or decision. The Chair may then make a decision after considering the various alternatives and poll the membership as to whether they agree or disagree with the decision.

A member has only three choices, agree, disagree **but be willing to fully support the decision,** or raise a Dissenting Opinion.

The choice of a dissenting opinion requires a conscious and personal decision that (1) the decision or course of action should be changed for the good of NASA, (2) that the issue is of such sufficient importance that it warrants review by higher level management, and (3) to specifically request that a Dissenting Opinion be recorded and resolved by the Dissenting Opinion process.

22. Can a proposed decision or action by a program or project proceed in the face of a dissenting opinion by a Technical Authority?

Answer

In general, yes. However, resolution should occur prior to implementation whenever possible.

The Program/Project Manager may proceed at risk in parallel with pursuit of resolution if they deem it is in the best interest of the program/project. In such circumstances, the next higher level of Programmatic and Technical Authority would be informed of the decision to proceed at risk. The rationale for this requirement is that these higher level authorities will be involved in the adjudication of the dissent and should have the opportunity to know before the fact that the action or decision is planned to be implemented on a risk basis.

23. Can a simple graphical illustration of the flow of Technical Authority for programs and projects for each of the three Technical Authorities be provided? Can an example be provided of how Technical Authority will work in a multi-center environment?

Answer

See the accompanying file entitled "Technical Authority (3) Flow Slides"

Note that **the** Technical Authority flow for programs is different from the flow for projects

The reasoning behind this is that multiple centers will be engaged in many programs to take full advantage of the Agency's human and facility resources. In this multi-center environment having the flow of Technical Authority by-pass the Center Director provides Headquarters the role of adjudicating differences between projects at different Centers. This avoids any concerns about a conflict of interest that might arise if the Center Director of the Host Center adjudicated differences between his/her Center and another Center.

24.   Why is the Technical Authority flow for programs different from projects? Why does Headquarters own level 2 (program level) requirements?

Answer

Multiple centers will be engaged in many programs to take full advantage of the Agency's human and facility resources. In this multi-center environment having Headquarters responsible for program level requirements and having the flow of Technical Authority by-pass the Center Director provides Headquarters a role in adjudicating differences between projects at different Centers. This avoids any concerns about a conflict of interest that might arise if the Center Director of the Host Center adjudicated differences between his/her Center and another Center.

25. NPR 7120.5D Paragraph 3.4.2.2.a states:

> **"On some programs and projects the program- and project-level Engineering Technical Authority may also serve as the program or project Systems Engineering Manager or Systems Engineering and Integration Manager; in these instances, the Program or Project Manager concurs on the appointment of the Engineering Technical Authorities."**

How is this compatible with the with the goal of having an effective check and balance system and the Administrator's principle that no one should grade is their own work?

Answer

•   The Technical Authority at the program- and project level has specific roles in requirements management

Agency and Center Established Requirements

Unless specifically delegated elsewhere, the provisions of NPR 7120.5D Paragraph 3.6.3 requires an Engineering Technical Authority outside the program or project level to agree with changes to or waivers of Agency or Center established requirements. This provides an effective check and balance.

Where the program or project level Engineering Technical Authority also serves as a Systems Engineering Manager or Systems Engineering and Integration Manager, the involvement of higher level Technical Authority is required to preserve the intended effective check and balance system. For Agency-level requirements there is no intention to delegate waiver authority to the program/project level Engineering Technical Authority. However this is not codified

in NPR 7120.5D.

Therefore, to cover both Agency-level and Center-level requirements a prohibition will be added to NPR 7120.5 to prevent the delegation of Agency and Center requirement change and waiver authority to the program-project level Technical Authorities. (See delegation below.)

Derived Requirements Established at Higher Levels

For derived requirements established at a higher level of Programmatic Authority (e.g. a requirement derived at the program level that is invoked on the project level), a lower level Programmatic Authority (in this example the project level) would have to get the agreement of the higher level to change or waive the derived requirement. This would require the involvement of the Technical Authority at the higher level. Therefore, an Engineering Technical Authority at the lower level (project level) who also serves as a project Systems Engineering or Systems Engineering and Integration Manager would not be the Technical Authority changing or waiving the requirement. Thus, the Engineering Technical Authority would not be grading his or her own work. Note – There is an inherent assumption here that the higher level of Technical Authority does not also have a Programmatic Authority role (i.e. have a Programmatic and Technical Authority l role). This is addressed in the delegation restrictions discussed below.

Derived Requirements Established at the Level of an Engineering Technical Authority Who Also Serves as Program or Project Systems Engineering or Systems Engineering and Integration Manager

An Engineering Technical Authority having the additional role of a program or project Systems Engineering or Systems Engineering and Integration Manager cannot provide an effective check and balance for derived requirements established at his or her level. Therefore, another Engineering Technical Authority who does not have dual responsibility must concur in these requirement changes or waivers. This is typically done by the Lead Discipline Engineer who was consulted in the establishment of the derived requirement. (See Delegation below.)

Delegation of Engineering Technical Authority

Until the appropriate changes to NPR 7120.5D are made, the following provisions must be included in the formal Technical Authority delegation and Center implementation plans for a program or project level Engineering Technical Authority who also serves as a program or project Systems Engineering or Systems Engineering and Integration Manager:

1. Specific approval of the NASA Chief Engineer for each instance where an Engineering Technical Authority will also serve as the program or project Systems Engineering Manager or Systems Engineering and Integration Manager.

2. A prohibition against the Engineering Technical Authority being or acting as the decision authority on any board (or equivalent) that establishes, waives, or changes requirements derived at the level of delegated Technical Authority unless another Engineering Technical Authority such as the Lead Discipline Engineer who does not have dual Technical Authority/Programmatic responsibility concurs in the change or waiver.

3. A prohibition against the delegation of change or waiver authority for Agency or Center level requirements to an Engineering Technical Authority who will also serve as the program or project Systems Engineering Manager or Systems Engineering and Integration Manager.

Conclusion

With the provisions discussed above an Engineering Technical Authority at the program or project level, permitting an individual with delegated Engineering Technical Authority at the program or project level to also serve as the Systems Engineering Manager or Systems Engineering and Integration Manager still provides an effective check and balance. It is also compatible with the principle that "an individual cannot grade his or her own work".

26.   Who is responsible for the development, approval, and waiver of requirements, and where does the Technical Authority fit in?

Answer

Note- This broad question is answered in a comprehensive manner below.

Part 1 - **Who is responsible for development, approval, and waiver of requirements?**

Background

Consistent with the NASA Governance Model, requirements are established either by a **Programmatic Authority** or an **Institutional Authority**[3] **,** and these requirements can be established at the Agency or Center level or derived at the program/project level.

These requirements can be classified as either:

Management Process Requirements which focus on how NASA does business and are independent of any particular program or project.

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[3] The three Technical Authorities, Engineering, SMA, and Health and Medical, are part of the Institutional Authority. (See Appendix A.)

These requirements are issued by NASA Headquarters, including the Office of the Administrator, Mission Directorates, Mission Support Offices, and Center organizations. They are normally documented in NASA Policy Directives (NPD), NASA Procedural Requirements (NPR), Center Policy Directives (CPD), Center Procedural Requirements (CPR), or Mission Directorate Requirements.

Programmatic Requirements which focus on the products to be developed and delivered and specifically relate to the goals and objectives of a particular NASA program/project.

Programmatic Requirements flow down from the Agency's strategic planning process and may be established by the Office of the Administrator and the Mission Directorates. These requirements flow down to a program. When combined with applicable Management Process Requirements and requirements derived from trade studies, appropriate Programmatic Requirements are invoked on a project. This process repeats itself for the various levels that may exist within the project (e.g. element, system, component, etc.).

The responsibility for development or approval of exceptions, changes, or waivers of a requirement therefore depends on where within these authorities the requirement was established.

NPR 7120.5D provides principles that apply to changes[4] and waivers of requirements for spaceflight programs and projects. These principles which have general applicability[5] are:

The organizations and the organizational levels that agreed to the establishment of a requirement must agree to the change or waiver of that requirement, unless this has been formally delegated elsewhere.

The next higher Programmatic Authority and [Institutional][6] Authority are to be informed in a timely manner of change requests or waivers that could affect that level.

These principles and the principle that states ultimate responsibility for program/project success in conformance with governing requirements remains the responsibility of the Program/Project Manager lead to:

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[4] NPR 7120.5D only uses the terms "change" and "waiver". The recent adoption of the term "exception" to describe requirements that are eliminated by the tailoring process because they are not applicable will be handled by the same principles.
[5] Appendix B contains the reasoning behind these principles.
[6] NPR 7120.5D uses "Technical Authority". The more general term "Institutional Authority" is used here for consistency with the earlier discussion.

Management Process Requirements invoked on a program/project must be met or formally waived by the organization and level that established the requirement unless this authority has been delegated elsewhere.

The program/project (Programmatic Authority) at the level a derived requirement was established is responsible for approving the change to or waiver of the derived requirement.[7] When the waiver of a derived requirement would lead to violation of an invoked Management Process Requirement, the program/project must request a waiver from the appropriate Institutional Authority.

Part 2 - **Where does the Technical Authority fit in?**

The Technical Authority process is invoked on spaceflight programs and projects by NPR 7120.5D. The individual with delegated Technical Authority at the program/project level:

10. Serves on the program/project change, control, and internal review boards at the level of delegated authority. This provides the program/project with an independent view of matters within his or her respective areas of expertise.

    In the event that the Technical Authority disagrees with a decision by the board Chair (Programmatic Authority) and the Technical Authority judges that the issue rises to the level that warrents review by a higher level of management, he or she can invoke the Dissenting Opinion process to initiate the higher level review. It should be noted that the Dissenting Opinion process is available for any team member or NASA employee whatever their position.

11. As the single point of contact for Technical Authority at the level of delegated authority. In this capacity the Technical Authority:

    a. Works with the Center Engineering Director(s) (or designees), as necessary, to ensure the Engineering Technical Authority direction provided to the program/project is well founded and properly coordinate andreflects the view of the Center engineering community (or NASA engineering community, where appropriate).

    b. Is responsible for assuring that exceptions to and waivers of Technical Authority requirements are submitted to and acted upon by the appropriate level of Technical Authority.

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[7] Formal delegation of this responsibility to a lower level is acceptable and consistent with the principles noted above.

Appendix A (Technical Authority FAQ 26)

Programmatic and Institutional Authority

The three Technical Authorities, Engineering, SMA, and Health and Medical, are part of the Institutional Authority.
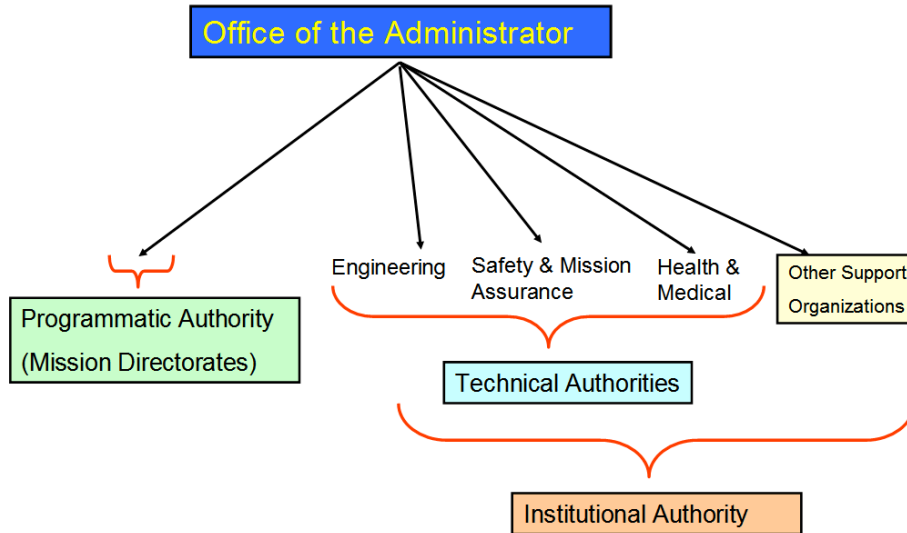
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Office of the Administrator

Engineering   Safety & Mission Assurance   Health & Medical   Other Support Organizations

Programmatic Authority (Mission Directorates)

Technical Authorities

Institutional Authority

Figure 1- Governance Model – Programmatic and Technical Authorities

Appendix B (Technical Authority FAQ 26)

Reasoning Behind Change and Waiver Principles

The change and waiver principles in NPR 7120.5D are:

The organizations and the organizational levels that agreed to the establishment of a requirement must agree to the change or waiver of that requirement, unless this has been formally delegated elsewhere.

The next higher Programmatic Authority and Technical Authority are informed in a timely manner of change requests or waivers that could affect that level.

The reasoning behind these principles includes:

The organization that established the requirement has the best understanding of the reason and rationale behind the requirement and is in the best position to assess whether a requested requirement change or waiver is appropriate and properly justified.

Informing the next higher level of the requested change or waiver ensures that if a higher organizational level is relying on the requirement for some other purpose they are informed and can engage in the discussion.

Appendix C (Technical Authority FAQ 26)

Definitions

Derived Requirements – Derived requirements arise from constraints, consideration of issues implied but not explicitly stated in the high-level direction provided by NASA Headquarters and Center institutional requirements, factors introduced by the selected architecture, and the design. Derived requirements are definitized through requirements analysis as part of the overall systems engineering process and become part of the program/project requirements baseline.

(Adapted from Glossary of Defense Acquisition Acronyms and Terms 12th Edition July 2005)

Dissenting Opinion - A "Dissenting Opinion" is a disagreement with a decision or action that an individual judges is of sufficient importance that it warrants a specific review and decision by higher level management and the individual specifically requests that the dissent be recorded and resolved by the dissenting opinion process.

A "Dissenting Opinion" is a concern that the decision or action is flawed in the dissenter's opinion and should be changed for the good of NASA. In this context NASA should be read broadly to cover mission success, safety, the project, the program, etc.

A "Dissenting Opinion" is not a difference of opinion that might be expressed in a manner such as "I would not do it that way if it were my decision", or "I disagree with the proposed action, but I can live with it**".**

(FAQ reviewed at OCE-OSMA Summit 4/2007)

Engineering Requirements - Engineering requirements are related to the application of engineering principles, applied science, or industrial techniques. These requirements also draw heavily on experience and empirical data from past tests, flights, etc. Engineering requirements are used to establish the basis for a system development and generally require engineering analysis, inspection, or test for verification (OCE sponsored Constellation Requirements Team)

Exception - A written authorization granting <u>permanent</u> relief from a specific, <u>non-applicable</u> requirement.

Non-applicable – not relevant or capable of being applied

Does not include modifiers like it's too hard, expensive, or time consuming; I don't like it; I missed it; etc.
(Standard terminology adopted by OCE and OSMA 1/2007)

Management Process Requirements focus on how NASA does business and are independent of any particular program/project.   (NPR 7120.5D)

Programmatic Requirements focus on products to be developed and delivered and specifically relate to the goals and objectives of a particular NASA program/project. These requirements flow down from the Agency's strategic planning process.
(NPR 7120.5D paragraph 1.1.3)

System - The combination of elements that function together to produce the capability to meet a need. The elements include all hardware, software, equipment, facilities, personnel, processes, and procedures needed for this purpose. (NPR 7120.5D- Glossary)

Technical – 1) Relating to or specializing in industrial techniques or subjects or applied science.

2) Having special and usually practical knowledge especially of mechanical or scientific subject. (Dictionary)

Waiver - A written authorization allowing relief from a requirement.
(Standard terminology adopted by OCE and OSMA 1/2007)