November 23, 2004

TO: Officials-in-Charge of Headquarters Offices Directors, NASA Centers

FROM: Administrator

SUBJECT: Independent Technical Authority

Through the NASA Transformation efforts, we continue to implement the recommendations of the President's Commission on Implementation of U.S. Space Exploration Policy and reflect NASA's ongoing efforts to apply the findings and recommendations of the Columbia Accident Investigation Board across the Agency. As part of the Transformation, I delegated Technical Authority to the Chief Engineer, authorizing him to further delegate this authority using a technical warrant system. The Chief Engineer has developed a system that will provide a robust and independent technical authority with responsibility and accountability to establish, approve, and maintain technical requirements, processes, and policy.

Therefore, we will implement Technical Authority in accordance with the policies and procedures contained in the enclosed draft NASA Policy Directive 1240.4, NASA Technical Authority, and draft NASA Procedural Requirements 1240.1, NASA Technical Warrant System. These documents are applicable across the Agency effective November 23, 2004. The Chief Engineer will have selected the first warrant holders and will issue the warrants by December 14, 2004, along with realignment of service pools to permit successful execution of an independent Technical Authority throughout the Agency.

NASA is challenged to renew our technical conscience--a deep personal sense of responsibility for the technical work we perform. Putting these policies into practice is key to successful, safe, and reliable operations and missions.

In the near future, the Chief Engineer will visit each of you to discuss the details of this policy.

Sincerely,

Sean O'Keefe

Enclosures
Officials-in-Charge of Headquarters Offices

Deputy Administrator/Mr. Gregory
- Assistant Deputy Administrator, Internal Operations/Ms. Hilding
- Executive Officer for Integrated Financial Management Program/Mr. Ciganer
- Associate Deputy Administrator for Systems Integration/Ms. Kleza
- Advanced Planning and Integration Office/Mr. Seery
- Chief of Staff/Mr. Schumacher
- White House Liaison/Mr. Jezierski
- Chief Scientist/Dr. Garvin
- Chief Health and Medical Officer/Dr. Williams
- Director of Advanced Planning/Dr. Elachi
- Chief of Safety and Mission Assurance Officer/Mr. O’Connor
- Chief Education Officer/Dr. Loston
- Inspector General/Mr. Cobb
- Associate Administrator for Exploration Systems Mission Directorate/Adm. Steidle
- Associate Administrator for Space Operations Mission Directorate/Mr. Readdy
- Associate Administrator for Science Mission Directorate/Mr. Diaz
- Associate Administrator for Aeronautics Research Mission Directorate/Dr. Lebacqz
- Chief Financial Officer/Ms. Sykes
  - Office of Procurement/Mr. Luedtke
  - Office of Small and Disadvantaged Business Utilization/Mr. Thomas
- Chief Information Officer/Ms. Dunnington
- Chief Engineer/Mr. Geveden
  - Deputy Chief Engineer/Mr. Cantrell
  - Associate Administrator for Institutions and Management/Mr. Jennings
  - Office of Human Capital Management/Ms. Novak
  - Office of Infrastructure, Management, and Headquarters Operations/Mr. Sutton
  - Office of Diversity and Equal Opportunity/Dr. Hayden-Watkins
  - Office of Security and Program Protection/Mr. Saleeba
- General Counsel/Mr. Wholley
- Chief of Strategic Communications/Vacant
  - Office of Public Affairs/Mr. Mahone
  - Office of Legislative Affairs/Mr. Forsgren
  - Office of External Relations/Mr. O’Brien

Directors, NASA Centers

Ames Research Center/Mr. Hubbard
- Dryden Flight Research Center/Mr. Petersen
- Glenn Research Center/Dr. Earls
- Goddard Space Flight Center/Dr. Weiler
- Jet Propulsion Laboratory/Dr. Elachi
- Johnson Space Center/Gen. Howell
- Kennedy Space Center/Mr. Kennedy
Langley Research Center/Gen. Bridges
Marshall Space Flight Center/Mr. King
Stennis Space Center/Adm. Donaldson

cc:
Office of the Administrator/Ms. Gaines
Executive Secretariat/Mr. Box
Head of NSSC/Mr. Arbuthnot
Responsible Office: Office of the Chief Engineer

Subject: NASA Technical Authority

1. POLICY

a. Purpose:

(1) To define Technical Authority policy in NASA.
(2) To provide the process for delegating Technical Authority.
(3) To define the roles, responsibilities, and accountability of NASA entities involved in Technical Authority.

b. Definition:

(1) Technical Authority – Technical Authority is the authority, responsibility, and accountability to establish, approve, and maintain technical requirements, processes, and policy.

c. Policy:

(1) Technical Authority for technical requirements and processes directly affecting the safe and reliable operation of NASA products and missions is delegated from the Administrator to the Chief Engineer.
(2) Technical Authority shall be executed independently in the support of mission-related programs and projects without organizational or financial control by such programs and/or projects.

(3) A system of Technical Warrants shall be used to further delegate Technical Authority from the Chief Engineer. The technical warrant holders are to be proven subject matter experts with mature judgment.

(4) The Technical Authority delegated by Technical Warrants shall be exercised independent of Program/Project control by: (a) being funded independently from Program and Project funding, (b) not reporting to a Program or Project Manager, and, (c) holding authority for technical matters under its cognizance separate from any program management structure.

2. APPLICABILITY

This NPD is applicable to NASA Headquarters and all NASA Centers, including Component Facilities.

3. AUTHORITY

42 U.S.C. 2473 (c)(1) Section 203 (c)(1), et. seq., of the National Aeronautics and Space Act of 1958, as amended.

4. REFERENCES

a. NPR 1000.3, The NASA Organization
b. NPD 8700.1, NASA Policy for Safety and Mission Success

5. RESPONSIBILITY

a. The NASA Chief Engineer is the NASA Technical Authority responsible for all technical requirements and matters affecting safe and reliable operation of NASA products and missions.

b. The NASA Chief Health and Medical Officer is the NASA Technical Authority responsible for all health and medical requirements and matters.

c. The NASA Technical Authority shall be responsible for:

(1) Establishing and maintaining all technical requirements, products, processes, and policies.
(2) Delegating independent technical authority through the NASA Technical Warrant System to individuals for the conduct of technical work and providing performance evaluations of these individuals, and

(3) Serving as the Office of Primary Responsibility for Technical Authority.

d. The NASA Chief Safety and Mission Assurance Officer is responsible for assuring compliance with technical requirements established by the NASA Technical Authority.

e. Mission Associate Administrators are responsible for providing adequate resources for conduct of NASA mission-related engineering and safety-related work conducted under the cognizance of program and project management.

f. Headquarters Center Executives shall monitor the conduct of Technical Authority at their activities and will advise the Chief Engineer of any issues affecting successful execution.

g. Center Directors shall be responsible for facilitating the work of the Technical Authorities at their Center including providing for organizational separation of the independent Technical Authority from the direct Program and Project supervisory chain as well as the financial systems that allow the Technical Authority to conduct work independent of direct Program or Project funding.

h. NASA Technical Warrant Holders shall be responsible for executing the authority delegated in their Warrants diligently and dispassionately, and with primary attention to the quality, completeness, applicability, timeliness and clarity of technical work accomplished under their cognizance.

i. Program and Project Managers shall comply with the Technical Authority’s technical requirements necessary to ensure safe and reliable operations and missions.

j. The NASA Operations Council shall be responsible for provision of adequate funding for the NASA Technical Authority separate from direct programmatic and project funding.

6. DELEGATION OF AUTHORITY

Delegation of Technical Authority shall be accomplished by Technical Warrants.

7. MEASUREMENTS

The NASA Chief Engineer, the NASA Chief Health and Medical Officer and the NASA Chief Safety and Mission Assurance Officer shall provide assessments of the application of this directive.

8. CANCELLATION
None

Internal issue 3 of 11/23/04.

NASA Administrator/ Chief Engineer

ATTACHMENT A: (TEXT)
None.

(URL for Graphic)
None.
NASA Procedural Requirements

NPR: 1240.1 interim draft

Effective Date: November 23, 2004 (interim draft)
Expiration Date: June 6, 2005

NASA Technical Warrant System

Responsible Office: Office of the Chief Engineer
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<thead>
<tr>
<th>Chg#</th>
<th>Approved</th>
<th>Description/Comments</th>
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<td>Initial Draft</td>
<td>11/23/04</td>
<td>Interim issue</td>
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Check the NASA Online Database Information Notice (NODIN) Library to verify that this is the correct version before use:

NASA Technical Warrant System

NPR: 1240.1 (interim draft)

Effective Date: November 23, 2004 (interim draft)
Expiration Date: June 6, 2005

NASA Technical Warrant System

Responsible Office: Office of the Chief Engineer

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Preface

P.1 PURPOSE

This NPR provides responsibilities, procedures, and processes for delegating technical authority from the NASA Administrator to individuals to establish, approve, and maintain technical requirements, processes, and policy.

P.2 APPLICABILITY

This NPR is applicable to NASA Headquarters and NASA Centers, including Component Facilities.

P.3 AUTHORITY

42 U.S.C. 2473 (c)(1) Section 203 (c)(1), et. seq., of the National Aeronautics and Space Act of 1958, as amended.

NPD 1240.4, NASA Technical Authority

P.4 REFERENCES

14 CFR 1200 et seq., National Aeronautics and Space Administration

NPR 1000.3, The NASA Organization

NPR 7120.5, NASA Program and Project Management Processes and Requirements

NPD 8070.6, Technical Standards

P.5 CANCELLATION

None

Rex Geveden
NASA Chief Engineer

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CHAPTER 1. NASA Technical Warrants

1.1 Goal

The goal of the NASA Technical Warrant system is to establish and execute a standard, formal process for delegating technical authority from the Chief Engineer to competent experienced individuals conducting and overseeing high-risk technical work in order to assure safe and reliable operations.

1.2 Objectives

As mandated in the National Aeronautics and Space Act of 1958, as amended, NASA's objectives are the successful conduct of the Nation's aeronautical and space activities for peaceful and scientific purposes. NASA's Strategic Plan, which lays out NASA's detailed responsibilities in fulfilling this mandate, is executed through the application of competent and sound technical principles. Technical Warrants are a key part of ensuring that these responsibilities are effectively and efficiently carried out. Also necessary is a deep personal sense of responsibility for safe and reliable operations and missions on the part of those performing technical work for NASA that would be provided by the development of a "Technical Conscience."

1.3 Scope

The NASA Administrator has delegated Technical Authority to the Chief Engineer as identified in NPR 1000.3A, The NASA Organization. Per NPD 1240.4, NASA Technical Authority, the Technical Authority is responsible for all technical requirements affecting safe and reliable operation of NASA products. This technical authority is further delegated from the NASA Technical Authority to Warrant Holders by Technical Warrants. Technical Warrant Holders (TWHs) are proven NASA experts in their warranted area such as:

1.3.1 Systems – TWHs at the total systems level will be systems engineering experts who have the authority, responsibility and accountability to establish, monitor, and approve technical standards/requirements, processes, products, policies, and variances for their assigned systems. At the systems level, TWHs provide the checks and balances on the execution of technical work conducted in support of mission-related programs and projects. TWHs at the systems level will utilize technical area or discipline TWHs as required and appropriate.

1.3.2 Disciplines – TWHs for disciplines are subject matter experts in particular technical disciplines who have the authority, responsibility, and accountability to establish, approve, and maintain technical standards/requirements, processes, products, policies, and variances for their assigned technical area.

1.4 Process
2.1 Administrator

The Administrator’s delegation of Technical Authority included the provision for the Chief Engineer to utilize the Technical Warrant System to further delegate this Authority.

2.2 NASA Officials Authorized to Grant Warrants

Within their areas of responsibility, the NASA Chief Engineer and the NASA Chief Health and Medical Officer shall:

a. Approve TWHS. The Chief Engineer will make available a list of individuals who hold Technical Warrants along with their area of responsibilities.

b. Develop metrics and performance measures for the effectiveness of the implementation of their Technical Warrants.

c. Provide input to the annual performance appraisal of their TWHS.

d. Apply the Technical Warrant System consistently across the Agency.

2.3 Chief Safety and Mission Assurance Officer

The Chief Safety and Mission Assurance Officer shall:

a. Conduct reviews and obtain Objective Quality Evidence (OQE) as necessary to provide assurance that individuals and activities involved in Technical Authority have complied with all requirements, standards, directives, policies, and procedures.

b. Provide the OQE and the results of these reviews to both the performing activities as well as the activities conducting verification, validation, and certification functions (e.g. FRR, etc.).

2.4 Mission Directors

Within their areas of responsibilities each NASA Mission Office shall:

a. Provide leadership and be accountable for all engineering and technical work done by their Mission Directorate, Centers, and affiliated activities.
b. Ensure that all programs, projects and activities within their cognizance adhere to good engineering practice.

c. Ensure that financial and personnel resources are aligned with independent Technical Authority.

2.5 Headquarters Center Executives

For their Centers, each Headquarters Center Executive shall:

a. Develop and implement a plan to monitor the conduct of Technical Authority.

b. Advise the Chief Engineer of any issues affecting successful execution of Technical Authority.

2.6 Center Directors

Within their areas of responsibilities each NASA Center Director shall:

a. Provide leadership for all engineering and technical work conducted by their Center.

b. Develop a working agreement between each Center technical competency and the Agency Warrant Holder for that competency.

c. Develop a "technical conscience" at the Center that includes accountability for sound technical decisions and the ability to raise engineering issues and concerns affecting safe and reliable operations, that cannot be resolved through programs or projects at the Center, to the Agency Technical Warrant Holders.

d. Ensure that all Programs, projects, and activities within their cognizance adhere to good technical practices.

e. Ensure that Technical Warrant Holders do not have a supervisory reporting chain to Program and Project Management.

f. Ensure that financial and personnel resources are aligned with independent Technical Authority.

g. Work to develop, train, and maintain a competent technical workforce to ensure that:

(1) NASA sustains and exercises NASA technical core equities, critical skills, and competencies.

(2) NASA retains its core, inherently Governmental technical competencies.

(3) Waste and redundancy are eliminated.

(4) There is career progression in engineering and technical competencies including the TWHs succession planning.

2.7 Technical Warrant Holders

TWHs are subject matter experts in their systems or their technical disciplines. Within the areas defined by the warrant, TWHs:
a. Provide leadership and are accountable for all technical standards and requirements.
b. Exercise integrity and discipline in providing sound technical judgments.
c. Establish and maintain technical policy, technical standards, requirements and processes.
d. Support Program and Project Managers by providing the engineering, technical standards, technical products, and advice necessary to ensure safe and reliable operations.
e. Develop and maintain technical area expertise and personal credibility through professional development, certifications, and new technology awareness.
f. Approve the consideration of risk, failure, and hazard analysis in providing technical requirements.
g. Evaluate technically acceptable alternatives and perform associated risk and value assessments.
h. Ensure technical products are in conformance with technical policy, standards, and requirements. Where they are not, identify and approve any non-conformance via an engineering variance (i.e. change, waiver, or deviation).
i. Assure technical principles, capabilities, and concepts meet defined technical standards and requirements.
j. Provide activities conducing verification, validation, certification functions (e.g. FRR, Assurance, etc.) and their approval on the technical requirements in their areas.
k. Develop personnel requirements and succession planning.
l. Ensure lessons learned are captured and available to others.
m. Interface with other TWIs promoting communications throughout the Agency technical community to ensure appropriate individuals and organizations are aware of technical issues.
n. Interface with the Science, Technology, Human Resources, and Education communities of NASA.
o. Maintain technical competency and expertise along with the resources needed in order to effectively perform their duties.
p. Establish a subordinate network of technical/engineering agents, technical/engineering managers and other technical organizations as necessary to fulfill their responsibilities across the Agency with accountability remaining with the TWI.
q. When performing their warranted function, TWIs will charge to a G&A service pool as will their engineering agents, engineering managers and others who are performing technical work for the TWI in the execution of the warrant functions.
r. Identify future resources needed to properly execute their responsibilities.

2.8 Comptroller
The Comptroller shall establish and maintain an Agencywide G&A Service Pool with charging mechanisms that shall provide funding necessary for independent exercise of the Technical Authority of the TWHs.

2.9 Program and Project Managers

Program and Project Managers will rely on the systems TWH as a part of the Program and Project Managers’ analysis, evaluation, and decision-making process in work that involves determining, applying, modifying, or a variance from technical standards and requirements. TWHs agreement is required prior to the Program or Project’s application of technical standards and requirements and any alteration thereof necessary to ensure safe and reliable operation. Program and Project Managers will modify their documentation and procedures as necessary to ensure that TWH concurrency is obtained. In the event of a disagreement, both the Program or Project Manager and the TWHs will explore alternatives that would allow both parties to achieve mutual agreement. Should a failure to reach agreement occur after all acceptable alternatives have been examined, the TWH shall refer the issue to their Warranting Technical Authority while the Program or Project Manager shall refer the issue up their chain of authority.
3.1 NASA Technical Warrant Format

Technical Warrants will generally follow the samples enclosed. Each Warrant will include at least the following information:

a. Name of the System(s) or Technical Area(s) being warranted.
b. A unique number.
c. Name and location of the individual receiving the warrant.
d. Type of warrant.
e. Signature block for the grantor.
f. Reference to the NPR which covers their responsibilities.
g. Scope of responsibility.
h. Limitations on their Authority, if any.
i. Signature block for the recipient acknowledgement.
j. Attachments may be included if necessary to define the Warrant.
CHAPTER 4. Technical Warrant Administrative Controls

4.1 Identification System

Configuration of NASA Technical Warrants shall be controlled through an identification system maintained by the NASA Office of the Chief Engineer. Each Technical Warrant issued by the Technical Authority will include a serial number indicating the discipline or system applicability, the technical warrant, and any revisions to the warrant provisions. Example: "ENG-STRUCT- TD- 2" would be the second revision to the Structural Discipline Area Warrant. The Office of the Chief Engineer shall maintain and make available a current master list of Technical Warrants issued within NASA.

4.2 TWH Support Identification

Technical Authority delegated through a NASA Technical Warrant may not be re-delegated by the TWH to other individuals. As noted previously, the TWH is expected to have a network of technical/engineering support such as trusted agents, technical/engineering managers, and other technical resources across the Agency and Industry to execute the work under the Warrant. The TWH will post the list of those supporting at the same location where the Chief Engineer maintains the list of Warrants and TWHs. The supporting tree will be comprised of individuals having the requisite technical expertise, organizational independence as necessary, experience, and maturity to perform the work that the TWH needs in order to execute the Technical Warrant appropriately. In all instances, authority and accountability remain with the TWH.

4.3 Center Administration

Center Directors, in executing their responsibilities, may create an administrative organization, such as a Technical Authority Manager, to assist the TWHs and to provide for effective communications. The documentation for such an organization will be provided to the Chief Engineer for concurrence.
APPENDIX A: Sample Technical Warrants
Technical Warrant Sample

ENG-SC-TD-1
December 15, 2004

Ms. Jane Doe
Engineering
NASA Center
xxxxxxxxxx, xxxxxxx 12345-6789

Dear Ms. Doe:

You are the NASA warranted technical authority for Spacecraft Charging. Your signature on this letter acknowledges your understanding and acceptance of the authority, responsibility, and accountability of a Technical Warrant Holder as specified in the NASA Procedural Requirements 1240.1, NASA Technical Warrant System. The scope of your technical authority is outlined in the enclosed Scope of the Technical Warrant for Spacecraft Charging. This letter is your warrant of technical authority and is effective as of the date above and until revoked by letter.

This warrant does not circumvent your responsibilities to your operational Chain of Authority. However, it does provide you with the authority and accountability to directly access the Chief Engineer without fear of administrative repercussion in issues affecting safe and reliable operations. Under this technical warrant, I will monitor and assess your exercise of technical authority. I will provide input to your annual performance evaluation and may take non-punitive action to withdraw this technical authority for any reason at any time.

Please return this signed letter in the enclosed self-addressed envelope.

Cordially,

Rex Geveden
Chief Engineer

Enclosures

Acceptance:

Jane Doe
Spacecraft Charging Technical Warrant Holder

(date)

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to verify that this is the correct version before use:

http://odes.bldrdoc.gov/Libraries/150603900001224/contents.html
Scope of the Technical Warrant for Spacecraft Charging

The scope of the Technical Warrant for Spacecraft Charging includes:

- Requirements relative to Charging, both internally and externally, of spacecraft in-flight through a plasma environment, whether in Earth or other planetary environments.
- Protection methods of minimizing the detrimental effects of spacecraft charging.
- New technologies in spacecraft charging protection.
- Supporting integrated spacecraft characterizations for charging protective systems.
- Electrostatic discharging technologies, tools, and methods.
Mr. John Doe  
Engineering  
NASA Center  
xxxxxxxxx, xxxxxxx  98765-4321  

Dear Mr. Doe:  

You are the NASA warranted technical authority for the Star Shuttle Systems. Your signature on this letter acknowledges your understanding and acceptance of the authority, responsibility, and accountability of a Technical Warrant Holder as specified in the NASA Procedural Requirements 1240.1, NASA Technical Warrant System. This letter is your warrant of technical authority and is effective as of the date above and until revoked by letter. 

This warrant does not circumvent your responsibilities to your operational Chain of Authority. However, it does provide you with the authority and accountability to directly access the Chief Engineer without fear of administrative repercussion in issues affecting safe and reliable operations. Under this technical warrant, I will monitor and assess your exercise of technical authority. I will provide input to your annual performance evaluation and may take non-punitive action to withdraw this technical authority for any reason at any time. 

Cordially,  

Rex Geveden  
Chief Engineer  

Acceptance:  

John Doe  
Star Shuttle Systems Technical Warrant Holder  

(date)