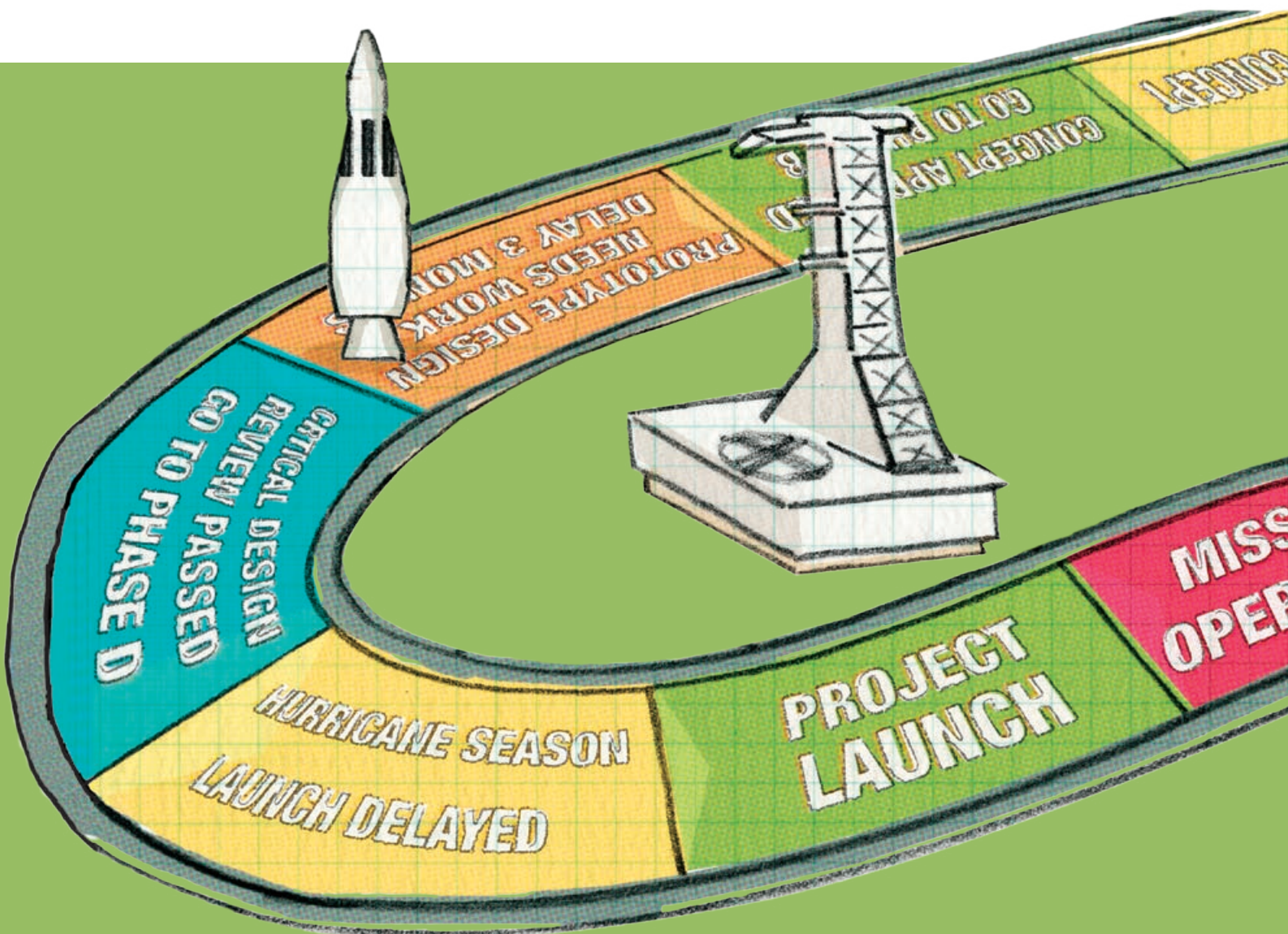


A Look Under the Hood of NPR 7120.5D

BY MIKE BLYTHE

NASA's space flight programs and projects are highly visible national priorities. The Agency's strategic plan articulates these space flight goals and the timetable for reaching them. Program and project management translates the strategy into the actions needed to achieve these goals. So NPR 7120.5D, which defines the requirements for effective program and project management, is an essential contributor to the Agency's ability to fulfill its mandate.



COMMON PROCEDURES AND TERMINOLOGY ACROSS CENTERS WILL INCREASE OUR EFFICIENCY AND REDUCE THE RISK OF ERRORS DUE TO MISUNDERSTANDINGS. THEY WILL ALSO LAY THE GROUNDWORK FOR TIGHTLY INTEGRATED ROBOTIC AND HUMAN MISSIONS ON THE MOON, MARS, OR THE INTERNATIONAL SPACE STATION IN THE FUTURE.

Why Revise 7120.5D?

The new revision of NPR 7120.5D is part of a realignment of governing documents within NASA designed to increase accountability and general clarity about management process requirements. When NASA revamped its governance model in 2005 in response to the long-term challenge posed by the Vision for Space Exploration, it became essential to bring NPR 7120.5D into conformance with the Agency's new direction.

Some of the changes to the document respond to external reviews of NASA's performance over recent years. For instance, the establishment of a technical authority and the protection of dissenting opinions have their roots in the findings and recommendations of the Columbia Accident Investigation Board Report. Defining and standardizing key decision points in the project approval process acknowledges the Government Accountability Office's recommendations about best practices in knowledge-based acquisition. Most important, though, the thorough internal review process that accompanied this revision makes it a compendium of NASA's nearly fifty years of knowledge about the most successful practices for space flight program and project management.

How Does the Governance Model Affect Programs and Projects?

The NASA governance model describes a management structure that employs checks and balances between key organizations to ensure that decisions have the benefit of different points of view and are not made in isolation. NASA has adopted two basic authority processes: the programmatic authority process and the technical authority process. The programmatic authority process is largely described by the roles and responsibilities of the NASA Associate Administrator, Mission Directorate Associate Administrators, and program and project managers.

The technical authority process provides for the selection of individuals at different levels of responsibility who offer independent views of matters within their areas of expertise. The term "Technical Authority" refers to such an individual,

but it is also used (without capitalization) to refer to all elements of the technical authority process taken together. A key aspect of the technical authority process is that Technical Authorities (TA) are funded independently of programs and projects. Their responsibilities include approving changes to, and waivers of, all TA-owned requirements; and serving as members of program/project control boards, change boards, and internal review boards. The technical authority process ensures that the golden rule of the governance model—projects don't check their own work—has sound implementation through processes and procedures.

What Is Different This Time?

Beyond supporting the new governance model, the new 7120.5D accomplishes a number of "firsts." For the first time in NASA's history, the program/project life-cycle and milestone reviews that occur across the Agency have been integrated for both human and robotic missions. There is also now a common set of terms, so a critical design review (CDR) means the same thing at one center as it does at another.

This does not mean that the milestones for human and robotic missions are now identical in every phase across the life cycle; manned missions will still have Mission Management Team meetings, for instance, while robotic missions will not. But the missions are standardized and synchronized to the greatest extent possible. This will offer myriad benefits for NASA. Common procedures and terminology across centers will increase our efficiency and reduce the risk of errors due to misunderstandings. They will also lay the groundwork for tightly integrated robotic and human missions on the Moon, Mars, or the International Space Station in the future.

Program and project reviews are essential for approving, conducting, managing, and evaluating space flight programs and projects. In preparation for these reviews, programs and projects conduct internal reviews to establish and manage the program/project baseline. These internal reviews are the decisional meetings where the programs/projects solidify their plans, technical approaches, and programmatic commitments.

Major technical and programmatic requirements and performance metrics are assessed along with the system design and other implementation plans. After completing the internal work, a Standing Review Board (SRB) conducts independent life-cycle reviews. Independent reviews are conducted under documented agency and center review processes.

The document also offers a phase-by-phase breakdown of all program and project management requirements across the life cycle, so every requirement includes answers to the questions “who,” “what,” and “when,” defining roles and responsibilities along with their places in the life cycle. NPR 7120.5D defines two types of requirements—programmatic requirements and management process requirements—that apply to programs and projects. 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. Management process requirements focus on how NASA does business and are independent of any particular program or project.

How Do Projects Get Approval?

The new 7120.5D introduces two new concepts: key decision points, when approval is given to proceed to the next life-cycle phase, and the Decision Authority, the responsible official who provides that approval.

The key decision point (KDP) is defined as the event where the Decision Authority makes a decision on the readiness of the program/project to progress to the next phase of the life cycle. KDPs serve as gates through which programs and projects must pass. Within each phase, the KDP is preceded by one or more reviews, including the governing Program Management Council review. For programs and Category I projects, the Associate Administrator is the Decision Authority. For Category I projects, this authority can be delegated to the Mission Directorate Associate Administrator. For Category II and III projects, the Mission Directorate Associate Administrator is the Decision Authority. Category assignments are based on a project’s life-cycle cost estimate and their priority level.

How Are Dissenting Opinions Protected?

NASA teams must have full and open discussions based on all relevant facts in order to understand and assess issues. In keeping with NASA’s core values of teamwork and integrity, diverse views are to be fostered and respected in an environment of integrity and trust with no suppression or retribution. Unresolved issues of any nature—programmatic, safety, engineering, acquisition, or accounting—should be quickly elevated to achieve resolution at the appropriate level. At the discretion of the dissenting person(s), a dissenting view

is identified and presented to the next level of programmatic and/or technical management. If the dissenter is not satisfied with the process or outcome, he or she may request referral to the next highest level of management. The dissenter has the right to take the issue upward in the organization, even to the NASA Administrator if necessary. Dissenting opinions raised by a Technical Authority are handled by the technical authority process.

How Is Compliance Ensured?

Center management holds the primary responsibility for ensuring programs/projects comply with NASA institutional documents such as 7120.5D. Each center does this by preparing and documenting its institutional engineering, program/project management, and safety and mission assurance standards and practices. At a minimum, each Center Director is responsible for preparing and executing a center implementation plan for

- Project management standards and practices
- Engineering standards and practices
- Safety and mission assurance standards and practices
- Technical authority standards and practices
- Traceability and conformance of center standards and practices to NASA policies and procedures
- The system used to verify that these standards and practices are employed by programs and projects at the center

How Does This Fit Within the Big Picture?

The intent of all these changes is to clarify lines of authority, to streamline processes and procedures across the Agency, and ultimately to give NASA the program and project management structure it needs to implement the Vision for Space Exploration. Given the thoroughness of the review process that accompanied this revision, the team has done its best to devise a document that helps program and project teams do their jobs, rather than adding levels of unworkable bureaucratic interference. The real test of its effectiveness lies ahead. ●



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