Introduction

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Throughout most of its history, the National Advisory Committee for Aeronautics (NACA) was known as the most important and productive aeronautical research establishment in the world. The task that NACA received from Congress was simple: to supervise and direct the scientific study of the problems of flight with a view to their practical solution (P.L. 63-271).[1] Between its creation in 1915 and its change to the National Aeronautics and Space Administration (NASA) in 1958, the NACA published more than 16,000 technical reports which were sought out by aeronautical engineers both in the United States and abroad. Many of these reports are classics in the field of aeronautics and are still used and referenced; the data contained in these reports are essential to understanding the fundamentals of aeronautical research and design.

The NACA developed a reputation for efficiency and effectiveness that was so widespread that it came to be viewed as something of a model for research and later as a model for implementing a program for federally funded civilian research and development (R&D). The NACA offered science, technology, and a system for coupling knowledge with people who would use it in the field.

This system laid the foundation for the United States to dominate the world commercial transport sector. It is a part of the tradition that NASA inherited in 1958 from the NACA. Mindful of the importance of linking knowledge with the user, the National Aeronautics and Space Act of 1958 as passed by the 85th Congress specifically requires the NASA Administrator to "provide the widest practicable and appropriate dissemination of information concerning its activities and the results thereof" (P.L. 85–568).[2] This stipulation serves as the agency's charter to disseminate information.

During its 31-year existence, NASA has landed men on the Moon, placed a variety of satellites in orbit, sent probes to the far reaches of the solar system, helped keep the nation at the forefront of aeronautical research, collected untold amounts of data, and generated an incredible amount of information in the process. NASA has created a variety of programs to help manage its data and information and to comply with its congressional mandate.

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These programs and strategies are the focus of this symposium issue of *Government Information Quarterly.*

In the lead article, Wallace O. Keene, Assistant Associate Administrator for Information Resources Management, NASA Office of Management, discusses the complexity of managing information in a mission agency such as NASA by detailing the legal and regulatory complexities associated with the agency's primary product, scientific and technical information. Mindful that scientific and technical information (STI) is critical to the competitive position of the United States in the world community, Keene describes the infrastructure of information resources management: the organizational interfaces, the formal and informal mechanisms associated with the production, transfer, and utilization of knowledge within NASA, and some thoughts on the future.

For years, NASA has been conducting programs that have contributed to the expansion of human knowledge of phenomena in space and have helped us understand more about our home planet, Earth. In the process, more than 6,000 gigabytes of digital data have been collected from NASA science missions. James L. Green of the National Space Science Data Center (NSSDC), NASA Goddard Space Flight Center, Greenbelt, Md., provides a general overview of the agency's approach to the management of these data and focuses on the new NSSDC online interactive systems that are used extensively over international computer network to access these data.

The NASA STI Program is part of the NACA legacy. During the most active period of STI activities in the federal government, the NASA STI program came to represent some of the government's most creative thinking and planning for information dissemination and management. Van A. Wente, recently retired as Director of the NASA Scientific and Technical Information Division, NASA Office of Management, presents an abbreviated history of the program and its organization. Knowledge acquisition, production, processing, dissemination, and evaluation are the focus of his presentation. He concludes with a discussion of the major policy issues facing the program and some plans for the future.

The dissemination of NASA STI is being transformed by the ongoing revolution in electronic information and computer and information technologies. An overall strategy on the dissemination of NASA STI is needed if the potential of new electronic technologies is to be fully realized. Gladys A. Cotter, newly appointed Director, Scientific and Technical Information Division, NASA Office of Management, outlines the direction of the NASA STI Program for the 1990s and describes how these new technologies are and will be applied to make NASA STI more accessible and its dissemination more efficient and effective.

Congress has charged NASA with the task of stimulating the widest possible use of the vast storehouse of technology developed from its aeronautical and space activities and programs. NASA seeks to meet this responsibility through its technology utilization program. Lester J. Rose, recently retired as assistant head of the Technology Utilization and Applications Office, NASA Langley Research Center, Hampton, Va., describes the infrastructure, operation, management, and evaluation of the program. The aim is to broaden and accelerate the technology transfer process and to gain thereby a substantial dividend on the national investment in aerospace research in the form of new products, new business, and new jobs. In nearly three decades of operation, more than 30,000 secondary applications of NASA aerospace technology have emerged from this program.

Since its creation in 1958, NASA has developed and maintains a special relationship with the country's elementary, secondary, and postsecondary educational institutions. To preserve

the role of the United States as a leader in aeronautical and space science and technology, NASA continues to do its part to promote scientific and technological literacy and to train and otherwise help prepare the cadre of students who will become tomorrow's engineers and scientists. Science and engineering educators require specialized information, and Robert W. Brown, Director of the Educational Affairs Division, NASA Office of External Relations, lists the issues facing science and technology education; describes the content and diversity of the NASA educational programs that are designed to capture student's interest in science, mathematics, and technology at an early age, and to maintain their interest throughout higher learning; and continues with a discussion of proposed changes and program improvements. He concludes with a focus on how NASA intends to help the nation produce the 36 percent increase in engineers and scientists that will be needed by the year 2000.

Open access to the results of scientific inquiry and discovery, the recognition of these as intellectual property, government funded R&D, and the need for government to withhold or restrict the flow of STI for reasons of national security and economic well-being have combined to create a number of legal issues and precedents. Robert F. Kempf, Associate General Counsel for Intellectual Property, NASA Office of General Counsel, looks at the legal implications and issues surrounding intellectual property such as patent rights, copyrights, and trade secrets. He details the dramatic changes in the law and federal government policy relating to intellectual property rights and the transfer and commercial use of federally funded technology that have occurred during the past decade. His thoughts for the future are based on more than 30 years experience in dealing with the issues.

Ours is an open program. Since the early days of the U.S. space program, Americans and people from all nations have become fascinated by NASA's numerous launches, unprecedented achievements, and breath-taking photography from outer space. In the course of these events, NASA has developed a variety of programs for working with the media and hence with the public. James W. McCulla, Director of Media Services, and James F. Kukowski, Chief, Internal Communications, NASA Office of Communications, describe the various programs that are designed to communicate the results of NASA research, programs, and related activities to the NASA community, the media, and the public.

The growth of STI and federal STI systems is being guided by uncoordinated policies resulting in inefficiencies. Such being the case, the ability of STI systems to serve the needs of users would be questionable in spite of the fact that it is the responsibility of the federal government to promote prompt, effective, reliable, and systematic transfer of science and technology information. In the final paper, this writer looks at some of the key issues and options relating to the management of federal STI and the challenges facing federal STI programs.

In compliance with its congressional mandate of widest and most practicable dissemination of information, NASA has created a variety of programs to meet this requirement. To facilitate and supplement the information presented in this issue, an appendix has been added that contains a listing of the types of products and services available from NASA information programs. A second appendix is a list of acronyms and abbreviations used in these articles.

Two thoughts in closing: First, a publication such as this is an enormous undertaking that represents the untiring efforts of numerous individuals. We particularly thank the contributors; without their efforts there would be no publication. In addition, Wallace O. Keene

and Van A. Wente are recognized especially for their efforts in framing this issue. Second, if the readers of this issue finish with a better understanding of NASA and its approach to information management and dissemination, then we can take delight in knowing that our efforts have been put to good use and our mission has been accomplished. We hope this has been the case.

NOTES AND REFERENCES

1. *The Naval Appropriations Act,* 1916 (P.L. 63–271).
2. *The National Aeronautics and Space Act of 1958* (P.L. 85–568).