

NASA & The National Performance Review

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The views expressed in this article are solely those of the author.

Introduced at a time when faith in the efficacy of government had hit rock bottom and when many citizens perceived the government as grossly incompetent and offensively wasteful, the National Performance Review (NPR) found a willing and receptive audience both within the Beltway and beyond. In proclaiming the arrival of "more for less" government, President Clinton boldly asserted that

Our goal, is to make the entire Federal Government both less expensive and more efficient, and to change the culture of our national bureaucracy away from complacency and entitlement [and instead] toward initiative and empowerment. We intend to redesign, to reinvent, to reinvigorate the entire national government.¹

Certainly the four-pronged thrust of the NPR, grouped under the trendy and poll-tested standard of "entrepreneurial government," was hardly something with which any rational taxpayer

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could disagree. However, while NPR's original good intentions made for effective sound bites and were roundly applauded by many in government, it was not long before some people discerned a more profound mortar uniting in those four bullet points.

NPR's adoption of private sector management techniques *per se* did not cause concern among public administration academics and practitioners alike; indeed, government reform efforts since the New Deal had largely patterned themselves on paradigms of private sector management reorganization and change.² Rather, it was what Ronald Moe called "the unwritten assumptions about government agencies, their missions, and their professional cultures" of NPR that caused deep concern.³ What critics observed was that, whatever its clarion appeal to common sense, NPR constituted a political ideology, a theory of government with a distinct vision. NPR was not simply a program based on "results," but a distinct set of principles that put forth a philosophy of governing and demarcated the legitimate bounds of government action.

Critics charged that in its emphatic results-based approach, NPR not only concealed the incalculable diversity of government functions with pre-cast, one-size-fits-all thinking in an effort to reduce the *cost* of government, but also reduced the very *possibilities* of government. NPR's reductionism is most obvious in agencies whose goals are creative and whose results are often intangible, such as the National Aeronautical and Space Administration (NASA).

NASA's experience under NPR offers an ideal test of the program's theories and practices. NASA's mission, while historically grounded in Cold War competition, is rooted in the possibilities of exploration and its companion, imagination. Indeed, since its inception, NASA has served as a tangible symbol of this nation's ongoing, collective curiosity to explore worlds beyond our own. However, once the cost-cutting and consolidations recommended by NPR have been made, NASA will be at a treacherous crossroads at which increased "efficiency" may undermine safety and, perhaps, more tragically, suffocate the imagination that created and continues to infuse NASA.

The Vision of NPR

NPR was the policy tool that intended to make government run better. Its preoccupation with quantifiable results served the double function of increasing efficiency and restoring public faith. To do this, NPR pursued efforts to cut unnecessary spending, develop budgets based on outcomes, and encouraged federal workers to solve problems on their own. Results governance would provide more efficient agencies, a less expensive government, and eventually greater satisfaction by the customers of the federal government, the public.

The first area that NPR addressed was cutting red tape. All organizations have rules that direct their operations, serve as a frame of reference for employees, and constitute a basis for institution decision-making. NPR proposed to reign-in and pare down the runaway reg-

ulations of government such that the rules would no longer constrain workers from doing their job effectively and efficiently. More importantly, cutting red tape would enable government workers to develop new and more efficient ways of doing their job. The second area that NPR emphasized was the private sector's commitment to putting customers first. President Clinton wrote "putting customers first means insuring that the federal government provides the highest quality service to the American people."⁴ Under NPR, agencies were now expected to identify the people who used government services and ask them if they were satisfied with the level of service they received. Performance measures were to be established so agencies could measure the quality of their work and identify areas where they could improve. By placing the customer first, NPR intended to remove barriers to assistance, make information easily accessible, and provide ways to address customer complaints.

The third aspect of government reform addressed by NPR was the empowerment of frontline employees. NPR described the ingredients of a healthy work environment as, "managers who innovate and motivate, and workers who are free to improvise and make decisions."⁵ The goal of this reform was to help lift the burden of regulations from workers and allow those who were in the trenches, and able to see firsthand what was needed to be done, to make necessary changes. In turn, these changes would facilitate NPR's other goals by cutting red tape and putting customers first. By allowing front line

workers to innovate on their own, necessary changes could be made more quickly and easily, and satisfaction with government goods and services would improve. Finally, government under NPR would do more with less. To do this, agencies would be restructured to eliminate duplication of services and unnecessary participants in the federal workforce. Through strategic cutbacks in excessively "thick" levels of bureaucracy, government would come to run more efficiently. Fewer levels of bureaucracy would also lead to less red tape and hopefully, a more responsive government.

These goals have elicited scorn from critics across the political spectrum. House Majority Leader Dick Armey has been a consistent critic of the initiative and even Democrats on the Hill have become weary of the program, viewing it as groundwork for Vice President Gore's presidential campaign in 2000.⁶ However, the most sustained and sophisticated criticism of NPR has come from public administration academics. Donald Kettle has called their criticism "Madisonian" attacks on the very "Hamiltonian" NPR.⁷

First, in the spirit of Madison's preference for strong checks and balances on executive power, public administration academics attack NPR as a dangerous encroachment on legislative authority. Indeed, the inaugural NPR report chided Congress directly, saying its programs were not "designed at all; the legislative process simply churns them out year after year."⁸ Second, reemphasizing public administration's intellectual foundations, academics argued that the radical differ-

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ence between the public and private sectors denied the possibility that the private sector held any ideal models for the public sector. Without the possibility for entrepreneurial behavior within government, market incentives are vastly inappropriate and no substitute for law. Ronald Moe blasted NPR for "seeking to break the public law basis of the agency's mission and replace it with an 'outcomes' mission orientation as defined by the agency's political chief."⁹ This would confuse lines of accountability precisely at the time when these lines needed to be sharpened and reinforced.

Moe's comments touch on two final criticisms made by public administration academics, namely the substitution of a political model in place of the administrative management paradigm, and the political roots of many "administrative" problems. NPR plainly intends to reduce the authority of administrative management's career civil servants through a two-fold decentralization, one downwards to frontline employees and a second upward to agency heads and other political appointees. However, academics argue that many of the most severe problems in the administrative apparatus are the consequence of political failures. H. George Frederickson wrote, "The problems are power and politics, not bureaucracy."¹⁰ Thus, according to this critique, shifting additional decision-making authority to political appointees would only serve to worsen the situation.

NPR silently delimits the boundaries of government action and dramatically redefines government functions according to the logic of the market. Critics ar-

gue that this market sensibility is not only problematic given their perception of a public-private division, but also for the types of relationships that it produces. The reformulation of social bonds between the government and its citizenry into producer-consumer is a profound shift. It is a new and limited normative order in which only the idea of "the consumer" remains to weakly unite the nation's fractured social infrastructure. It is this conception of national identity for which NPR has advocated.

In this "reinvented" context, what can we reasonably expect from our government? NPR's goals of efficiency and de facto consumption would seem to render government actions which do not produce immediate results, or whose value is high but eludes basic quantification, quite implausible. For example, government initiatives that embody values like imagination and exploration are effectively impossible under NPR, as its understanding of what unites us, namely consumption, precludes non-market-based goals. Agencies whose missions are suggestive of different bonds and whose mandates cannot be readily confined within the strict parameters of market logic may find themselves adrift both in terms of their ability to quantify their outcomes and in justifying their very existence. This is precisely the dilemma in which NASA now finds itself.

NASA

In 1958, amid escalating Cold War tensions, Congress enacted the Space Act and created the National Aeronautics and Space Administration (NASA).¹¹ The

Space Act entrusted NASA with the responsibility of coordinating and executing all American activities in space, with the notable exception of certain military operations under the purview of the Department of Defense.¹² Significantly, the agency's statutory authority required that all its "activities in space be devoted to peaceful purposes for the benefit of all mankind."¹³ NASA was not intended to be a political agent in the Cold War, but an agency that would undertake research that would benefit all of humanity. There can be little doubt, however, that NASA owes a debt to the Cold War's nationalistic tenor, which helped to funnel billions upon billions of federal dollars into its programs.

Congress set out several specific areas for which NASA would be responsible. The first area is broad in scope and stipulates that if NASA undertakes a project, it should contribute to the expansion of human knowledge in space.¹⁴ So long as research deals even in part with space, NASA is the controlling authority. In 1985, Congress enlarged NASA's scope to include the expansion of the human knowledge of the Earth as well.¹⁵ Weather satellites, the Global Positioning System, and communications and mapping of the globe from space also became NASA's responsibility.

To reinforce NASA's civilian focus, the Space Act called on NASA to preserve the role of the United States as a leader in space technology and its application.¹⁶ As we shall see, the implications and execution of this statutory requirement have become increasingly difficult under NPR, where budgets are to be stretched to get the most for each appropriated dollar. The final objective

guiding NASA involved improving the usefulness, performance, safety, and efficiency of space vehicles.¹⁷ Along with improving the vehicles already in existence, NASA was also asked to develop and operate vehicles capable of carrying people and instruments through space.

Perhaps NASA's greatest achievement, however, was its success in inspiring the nation to dream and aspire to goals that were once only the stuff of science fiction. Credit in this regard belongs to President Kennedy who, in three short years after the creation of NASA, made the seemingly impossible goal of sending a man to the moon and returning him safely to earth a national priority. This ambitious task and its successful completion set the stage for many other space programs for NASA. This scenario could have been dramatically different, however, had President Eisenhower's vision of the agency prevailed.¹⁸ In fact, Eisenhower was dead set against manned space flight beyond the single-seat Mercury capsule and consistently dismissed the Apollo program as a "mad effort to win a stunt race."¹⁹

The richness of popular imagination, combined with the apocalyptic undercurrents of nuclear proliferation, forged a powerful movement that drove the nation to seek the limits of technological innovation. NASA's storied history of triumph and tragedy illustrates how imagination can generate inventions that ultimately reshape the way people collectively envision possibilities.²⁰ As our discussion of NPR makes clear, NPR strikes at the heart of this kind of creative enterprise and, in doing so, cuts deep into both the spirit that made NASA possible and NASA itself.

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NASA Integrates NPR

It must be noted that since the formal introduction of NPR in 1993, NASA has been able to implement some of NPR's recommendations in three areas: contracting practices, separation of unnecessary personnel, and consolidation of project sites. NASA routinely contracts for projects that are large, sophisticated, and usually on the cutting edge of technological innovation. NPR recommended that "NASA should insure the selection of the appropriate contract type, and follow through with vigorous post award programs and contract management."²¹ The contract reform entails not only selecting the right contractor, but also ensuring that project delivery remains timely by rewarding or fining contractors according to their adherence to deadlines and performance quotas.

NASA has integrated this recommendation throughout the agency, and its application can best be illustrated in its largest program, the space shuttle fleet. Under an agreement with the United Space Agency (USA), 75 separate contracts were consolidated into a single package within a single company. The contract involves \$6.9 billion in spending over six years and projects seven to eight shuttle flights for each year of the contract.²² The contract includes rewards for savings and fines for overruns during the six-year contract. USA will be able to keep over one-third of every dollar that is saved during the length of the contract.²³ If USA does not meet the goals specified in its contract with NASA, comparable fines would be levied against the company and the contract could be canceled at the discretion of the director of NASA.

This contract has benefited NASA greatly. Since Fiscal Year 1992, operating costs for the shuttle program have been reduced 27 percent.²⁴ NASA has also been able to reduce the number of employees working in the shuttle program by 2,800, a total of \$1 billion in projected savings over five years.²⁵ Moreover, during the same five years that the \$1 billion in savings occurred, USA's turn-around time on space shuttle flights was up 40 percent. This increased efficiency translated into an increase in flights from seven to eight.

Efforts to consolidate tasks and eliminate redundant personnel have also been successful within NASA.²⁶ By consolidating all NASA employees working in a specific area in a single research facility, NASA has taken aggressive steps to eliminate the duplication of work that was being done among nine facilities. Instead of having engineers work on propulsion systems in Florida, Maryland, Alabama, and California, these employees are all now working at the Jet Propulsion Laboratory in California, a move that saved NASA \$1.98 million.²⁷ The consolidation allows workers to directly coordinate their activities and limit mistakes and waste due to errors in the transmission of information across the agency. Non-essential personnel have also been cut: between the years of 1993 and 1997, the overall number of civil servants employed by NASA was reduced by 23 percent. These reductions coincided with an increase in the number of days the shuttle was in orbit, the number of payloads launched, and an increase in the number of shuttle flights.²⁸

Based on these changes, NASA's streamlining efforts would appear to

have achieved a modicum of success. NASA has acted aggressively to cut personnel, consolidate resources, and make its contracting and procurement procedures more efficient. Unfortunately, these achievements are only part of the story.

Beyond Cuts and Consolidation

As the foregoing discussion makes clear, some of NPR's recommendations have proven useful for NASA. Specific streamlining measures have increased the agency's efficiency and have also generated some budgetary savings. However, success has been far from complete. The intersection of NPR principles and NASA's unique mandate has proved complicated. There is a fundamental conflict between the ideals of NPR reforms and the statutory mission of NASA. This rift has left the agency with difficult decisions that not only will affect the safety of NASA's programs, but the very ideals that underscore NASA.

NPR's original report stated that NASA's physical and intellectual resources were not being used to their fullest potential.²⁹ Specifically, the report expressed concern that NASA developed technology for a project with only a single use in mind. By making NASA-developed technology available to private U.S. companies, NPR hoped that more applications, or "spin-offs," could be developed for commercial use. NASA's research has in fact resulted in numerous commercial applications. Cordless tools, smoke detectors, lightweight compound materials used for helmets and sports gear, and quartz-timing crystals for battery powered watches, to name a few, have all been spin-offs of NASA "single purpose" research.³⁰

Given the amount of research and development done by NASA, the potential for the development of new consumer items is very high. However, while private companies benefit greatly by having access to NASA research, these companies are generally unwilling to work jointly on projects which would generate proprietary knowledge and technology. Concerns regarding the lack of exclusivity to the results of the joint research make NPR's technology transfer a risky prospect for most private sector firms.

As a consequence, NASA has institutionalized a research and development program that has little focus on commercial applications for its research.³¹ In order to change this situation, NPR recommended that NASA change its research and development policy to attract private sector firms to joint projects with the space agency. NPR has recommended that participating companies be granted the rights to joint research for a five-year period. Thus, only after the exemption period is over will the results of the joint research be shared with the entire industry.³² This recommendation has yet to be implemented, due in part to the fact that it would require a change in existing legislation. This change is made more difficult and time consuming, as it requires clearance from the several agencies that would be affected by the recommendation.

Another NPR recommendation faces similar problems involving competition in the aerospace industry.³³ In this instance, the forces of globalization and a dramatically changed aeronautics industry affect NASA's ability to implement NPR's recommendation. Increased for-

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eign competition and the divergence of civil and military technologies have contributed to a global industry, with a global infrastructure.³⁴ For example, in today's 'global market, planes are no longer manufactured completely within the United States. Several companies from several countries may contribute parts or technological knowledge to the plane's construction. Consequently, aeronautical innovations developed by NASA or U.S. aerospace companies could potentially spread worldwide, thereby lessening U.S. aerospace manufacturers global competitiveness. This potentiality not only causes problems with U.S. companies ability to compete, but is also conflicts with NASA's statutory mandate. As previously stated, NASA is entrusted with ensuring that the United States is the world leader in aerospace activities. However, remaining the leader in the industry would be impossible if NASA's research were to spread beyond the borders of the U.S. by the same industry with which NPR would like NASA to collaborate.

Formal NPR recommendations, like those concerning technology transfer, are not the only items that have proven difficult for NASA to implement. The application of general NPR ideals can also affect how NASA currently operates, or may operate in the future. Not only do problems arise between NASA and its private sector partners, but between NASA and its international and intragovernmental partners. It is difficult for NPR reforms to be fully integrated into NASA's operations when projects often involve numerous international, commercial, and governmental partners. A prime example of this type of collabora-

tion is the international space station, one of the largest and most ambitious projects ever undertaken by NASA.

The United States may be the leader in this joint venture, but its regulations and operating procedures are hard to press upon NASA's 13 foreign partners; each with their own regulations and operating procedures. Russia, for instance, has fallen behind in the construction of one of the key components needed to start the assembly of the space station. This delay will cost NASA in excess of \$200 million. There are also serious questions as to whether Russia can fulfill the rest of its initial financial obligations to the project. Consequently, NASA will ask Congress to help foot the bill to keep the space station on track. Due to the international nature of the space station project, NPR guidelines will likely be compromised regardless of how well NASA adheres to them.

Even Boeing, the prime US contractor for the space station, is currently walking a fine line of conforming to NPR guidelines. Boeing officials have commented that pressure to build the space station faster, better, and cheaper has left the company without room for mistakes or surprises.³⁵ If NPR cannot tolerate even a modicum of failure, then innovation in any research-based agency is rendered almost impossible. The likely consequence would be the erosion of the most imaginative and innovative components of the agency.

Moreover, the notion that NASA can operationalize the NPR recommendation to make its contracting practices more "competitive" is partly illusory. Given the fact that the NASA's projects require an

extraordinary level of technological and technical expertise, punitive contract cancellations are far more complex than in other government agencies. For example, in the event that Boeing fails to fulfill its contract, NASA will have few, if any, salient alternatives. Most likely, NASA will have already invested tens of millions of dollars in the project, and Boeing will have developed a highly specialized expertise in the project area. In short, there will be no "competitor" to complete the project. This dilemma is exacerbated by the recent wave of massive consolidations in the aerospace agency.

NPR's high value on speed and efficiency have also increased the potential for accidents to occur at NASA, where the margin for error is slim and the cost of errors can be high in both financial and human terms. At the Kennedy Space Center, for example, the number of processing mishaps that involve either personal injury or \$25,000 in equipment damage, have averaged around 60 incidents per year. At the same time, mistakes serious enough to warrant a work stoppage have increased as well.³⁶ It is understandable that accidents of some type or other will occur in a workplace similar to a construction site. However, the trend towards increased work stoppages suggests that some NPR reforms have proved both counter-productive and dangerous.

Further, additional personnel cuts, while saving scarce dollars, also threaten to undermine the efficacy of NASA's programs. A 1998 report by GAO cited that "there was a clear need for NASA to take steps to ensure the availability of a skilled and experienced civil service workforce in sufficient numbers to meet

ongoing safety needs."³⁷ If further cuts are made, safety concerns will be raised. Cuts will also put NASA at risk of losing some of its more precious intellectual and technical resources, as experienced employees are let go to meet employment targets established to make the agency more efficient.

While attempting to understand the relationship of NPR and NASA, we must also realize that NASA has projects that have completion dates that are well into the next century. The international space station, several planetary missions, and a various array of satellites may currently be underway, but their completion and launch dates are still years away. Hence, any potential savings or cost overruns will not be realized until the completion of these projects. The short-term results orientation of NPR makes assessment of these long-term projects difficult.

Tallying the "Results"

NASA has been charged by Congress to be a world leader in space. It is an ambitious role that requires the implementation of calculated risks. NASA has benefited from the efficacy of some NPR recommendations, but it is important to recognize that NASA's role as a research agency cannot be compromised in the name of efficiency and cost-minimization. While some aspects of NPR reforms are clear and have been readily applied, implementation of others has undermined safety, technical and intellectual resources, and the very spirit of the agency.

In a report to the House Committee on Science, the GAO reported on the ability of NASA to formulate goals in accordance with NPR and the Government

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Performance and Results Act (GPRA). In less than glowing terms, the GAO pointed out that NASA's goals were vague and inadequate.³⁸ Given that NASA has had more time than most agencies to bring its operations into NPR's fold, this surely was not the commentary that NASA wanted to hear.

Goals are difficult to define for research and development agencies due to the nature of their activities. Managers often have to choose measures such as dollars spent or people served in order to yield quantitative results for agency programs.³⁹ Unfortunately, NASA has the difficult task of quantifying goals that are not always quantifiable. Of course, it is easy to point to information such as the number of launches in a year, but it is only demonstrative of a small portion of what the agency does. Such a measure does not report on the scientific findings of a 5-year climate study only in its first year, nor can it anticipate the results of experiments yielded from shuttle flights. Often these experiments have been years in the making, and the results will require a significant time frame to understand. Consequently, a measurable result will only be available at the end of the project, if there is one at all.

NASA has difficulty attempting to conform to the NPR rubric. Research and development goals are easy to envision, but their fruition is not always a guarantee. With performance-based reporting to the public, the results may not be in the quantity, but in the quality of the research that is successful. If NPR demands more results for less money, then a research based organization such as NASA may consistently fall short. However, the failure of a specific project does not

mean that successful research was not conducted, or that it was a waste of funds, it only means that the initial application was not successful. In an agency that must reach to the sky and push space technology to its limit, placing restrictions on activities also limits NASA's ability to be the world premier space agency.

Perhaps, then, NASA needs to redefine its mission in more modest terms. This redefinition concurs with the opinion of the Congressional Budget Office (CBO). In a recent report, CBO stated that "improving the way NASA conducts business, buying more for less, is unlikely to produce significant budgetary savings. If NASA's problem is trying to do too much with too few dollars, [then] one solution is to do less."⁴⁰ In other words, in a country taken hostage by a commitment to efficiency, a scaled down NASA may be the only NASA possible.

Conclusion

NASA and NPR are simply not a good match. The problem fundamentally stems from the limited role and function that NPR has assigned to government: the supplying of goods and services to citizen consumers. NASA, by contrast, does not directly "produce" anything for public consumption. Rather, since its founding, NASA has symbolized imagination and a national curiosity to explore and uncover new possibilities through research and development. Given that these kinds of possibilities are not readily quantifiable, they are in jeopardy of being severely curtailed under NPR's imposition of a very different conception of national unity. While simple cost-cutting measures have achieved modest success

at NASA, most NPR recommendations actually have reduced the effectiveness of the agency, impeded the fulfillment of the agency's mission, and undermined the safety of its programs.

It appears that NASA under NPR will continually fall short. Thus, NASA is an agency that now finds itself at serious cross-purposes. While it is charged with the mandate of global leadership in space technology and exploration, it is also denied the proper funding to affect those goals. In addition, NASA is summoned to assist the international private sector with development of commercial technology, but without sacrificing American primacy in the world market.

It is an impossible situation that is already negatively affecting NASA's safe operation. There appear to be three options. First, NASA could take the advice of CBO and limit the scope of its actions. However, such a move would require statutory revision of its mandate and could prove politically unpopular. Second, NASA could continue to attempt to implement NPR reforms and potentially undermine agency safety and confuse its function further. Lastly, NASA has the option of continuing to attempt modification of its implementation of NPR, and potentially erode its budgetary and popular support. Clearly, none of these options are particularly appealing. Unfortunately, no other option is readily forthcoming. Thus, for the time being, NASA's future will remain highly uncertain and contentious, inextricably linked as it is with larger questions that the advent of NPR has occasioned regarding new expectations and possibilities of government. ♦

Endnotes:

¹ *Presidential Documents*, 29 (March 28, 1993): 350.

² Donald F. Kettl, "Reinventing Government? Appraising the National Performance Review," in *Classics of Public Administration*, ed. Jay M. Shafritz and Albert C. Hyde (Fort Worth, TX: Harcourt Brace College Publishers, 1996), 540.

³ Ronald C. Moe, "The Reinventing Government Exercise: Misinterpreting the Problem, Misjudging the Consequences," *Public Administration Review* 54 (1994): 11.

⁴ The National Performance Review, *Creating a Government that Works Better and Costs Less*, (Washington DC: The National Performance Review, September 1994), 31.

⁵ *Ibid.*, 38.

⁶ Anne Laurent, "Revamping Reinvention," *Government Executive*, April 1998, 30.

⁷ Kettl, "Reinventing Government?," 544.

⁸ The National Performance Review, "From Red Tape to Results: Creating a Government That Works Better & Costs Less," in *Classics of Public Administration*, ed. Jay M. Shafritz and Albert C. Hyde (Fort Worth, TX: Harcourt Brace College Publishers, 1996), 535.

⁹ Moe, "The Reinventing Government Exercise," 117.

¹⁰ Kettl, "Reinventing Government?," 547.

¹¹ John M. Logsdon, ed., *Exploring the Unknown: Selected Documents in the History of the U.S. Civil Space Program, Volume 2*. (Washington, DC: Government Printing Office, 1995), 16.

¹² *Ibid.*

¹³ Public Law 568, 85th Cong. 2d. Sess., (29 July 1958) *National Aeronautics and Space Act of 1958*.

¹⁴ *Ibid.*, 2.

¹⁵ *Ibid.*

¹⁶ *Ibid.*

¹⁷ *Ibid.*

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¹⁸ Howard E. McCurdy, "Fiction and Imagination: How They Affect Public Administration," *Public Administration Review* 55 (1995): 501.

¹⁹ *Ibid.*

²⁰ *Ibid.*, 502.

²¹ The National Performance Review, *Accompanying Report: NASA*, (Washington DC: The National Performance Review, September 1993), 5.

²² Beth Dickey, "The Final Frontier," *Government Executive*, March 1997, 14.

²³ *Ibid.*

²⁴ National Aeronautics and Space Administration, *NASA Facts, Space Shuttle*, NASA Document FS-1997-01-005-HQ, (Washington DC: NASA, 1997), 1.

²⁵ Dickey, "The Final Frontier," 16.

²⁶ *Ibid.*, 21.

²⁷ The National Performance Review, Status Report, (Washington DC: The National Performance Review, September 1994), 147.

²⁸ *Budget Request for NASA*, (Washington D.C.: Government Printing Office, 1998), 2-3.

²⁹ The National Performance Review, *Accompanying Report: NASA*, (Washington DC: The National Performance Review, September 1993), 11.

³⁰ National Aeronautics and Space Administration, *NASA Technology Spinoffs*, NASA Document FS-1995-08-004JSC, (Washington DC: NASA, 1995), 1-2.

³¹ The National Performance Review, *Accompanying Report: NASA*, (Washington DC: The National Performance Review, September 1993), 12.

³² *Ibid.*

³³ *Ibid.*, 17.

³⁴ *Ibid.*

³⁵ Beth Dickey, "Out of Orbit," *Government Executive*, August 1998, 39.

³⁶ The National Performance Review, *Accompanying Report: NASA*, (Washington DC: The National Performance Review, September 1993), 20.

³⁷ General Accounting Office, *Federal Downsizing: Agency Officials' Views on Maintaining Performance During Downsizing at Selected Agencies*, GAO/GGD-98-46, (Washington DC: General Accounting Office, March 1998), 35.

³⁸ General Accounting Office, *Managing for Results, Observations on NASA's Fiscal Year 1999 Performance Plan*, GAO/NSIAD-98-181, (Washington D.C.: General Accounting Office, June 1998), 5.

³⁹ Kettl, *Reinventing Government? Appraising the National Performance Review*, (Washington D.C.: Brookings Institution, 1994), 44.

⁴⁰ David C. Morrison, "Low Rent Space," *National Journal* 27 (1995): 1030.

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