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PATENT POLICY AND ITS EFFECT ON TECHNOLOGY REPORTING[1]

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Introduction

For 20 years the U.S. government has been moving toward a uniform policy regarding patent rights to inventions made in the course of Federally sponsored research and development. Originally that policy favored public retention of the right to such patents. Consensus now exists that private ownership of such patents provides a stronger incentive to develop the invention and, hopefully, assure its fullest use. With this intent, the Patent and Trademark Amendments of 1980 (PL 96-517) gave to nonprofit organizations (including universities) and small businesses the right to elect title to inventions made while engaged in Federally funded research and development. By Presidential Memorandum this policy was extended in February 1983 to all organizations conducting R&D for the Federal government, to the extent not otherwise precluded by other legislation.[2]

This paper examines the effect of this policy on NASA's new technology reporting system which provides the underlying information base for much of NASA's Technology Utilization Program. The paper reviews applicable Federal policy over the last 20 years, compares the recent changes with NASA's traditional policy, and evaluates implications of these changes.

A Review of Federal Policy

The first effort to establish a general government patent policy was the Presidential Memorandum and Statement of Government Patent Policy issued by President Kennedy on October 10, 1963. This memorandum stated that, while

uniformity may not be possible or desirable, greater consistency was needed. The policy statement recognized that timely commercialization is an important factor in considering how best to protect the general public interest:

> This statement of policy seeks to protect the public interest by encouraging the Government to acquire the principal rights to inventions in situations where the nature of the work to be undertaken or the Government's past investment in the field of work favors full public access to resulting inventions. On the other hand, the policy recognizes that the public interest might also be served by according exclusive commercial rights to the contractor in situations where the contractor has an established nongovernmental commercial position and where there is greater likelihood that the invention would be worked and put into civilian use than would be the case if the invention were made more freely available.

As this policy statement indicates, there was considerable room for interpretation. It did, however, create a general presumption that patent rights should remain with the government, as a first option.

In 1971 President Nixon issued a Presidential Memorandum and Statement of Government Patent Policy which reiterated that a single policy would be inappropriate since circumstances among Federal agencies vary considerably. The major change from the 1963 policy statement was the "additional authority" given to heads of departments and agencies "to grant ownership or exclusive use to their contractors on inventions arising from Government funded research where it is deemed necessary to create an incentive for further development and marketing."[4]

The shift in policy favoring private ownership of patents was given further impetus by the 1978 report of the Advisory Subcommittee on Patent and Information Policy of the Advisory Committee on Industrial Innovation created by President Carter's Commerce Department. This group concluded that private ownership would encourage innovation and was, therefore, in the national interest.[5]

By 1980 Congress had become sufficiently convinced to enact this policy into Public Law 96-517. However, only nonprofit organizations and small business firms (as defined by the Small Business Administration) were given the right to elect to take title to inventions arising during Federally funded R&D.[6] On February 18, 1983, President Reagan issued a memorandum directing the heads of executive departments and agencies to extend this policy to all organizations.[7] The "Fact Sheet" accompanying this memorandum states that "[e]xperience has shown that, in most instances, allowing inventing organizations to retain title to inventions made with Federal support is the best incentive to obtain the risk capital necessary to develop technological innovations."[8]

Comparing NASA Patent Policy and PL 96-517

Section 305 of the National Aeronautics and Space Act of 1958 states that inventions made during work under a NASA contract become the exclusive property of the U.S. government unless this right is specifically waived by NASA.[9] This waiver option represented an apparent liberalization from atomic energy research policy under which government retention of ownership of inventions was virtually exclusive.[10] The implementing regulations for this waiver option stated that:

> Among the most important goals thereof are to provide incentives to foster inventiveness and encourage reporting of inventions made under NASA contracts, to provide for the widest practicable dissemination of new technology resulting from NASA's programs, and to encourage the expeditious development and adoption of this new technology for commercial purposes.

The general effect of Public Law 96-517 and the associated Presidential Memorandum has been to transfer the waiver option from NASA to its contractors. Organizations conducting R&D under a NASA contract no longer need the space agency's approval to take title to inventions resulting from their

work. However, they must take positive action by filing a disclosure notice, followed by notification to elect title.[12]

The new law also affects the time limits for reporting and patenting inventions. PL 96-517 requires disclosure of each invention to the appropriate Federal agency "within a reasonable time after it is made."[13] Recently issued Federal Acquisition Regulations (FAR) establish a procedure for implementing PL 96-517, including specific time requirements. Contractors will be required to disclose inventions to the appropriate Federal agency within two months after the invention has been reported to "contractor personnel responsible for patent matters."[14] Within twelve months of such disclosure, the contractor must decide whether to retain title. The contractor then has two years following election to file for a patent.

In comparison, NASA's new technology reporting procedures allowed six months from the time the invention was made until NASA was notified. Following notification, the contractor had up to six additional months to elect to take title and then another six months in which to file for patent.[15]

Thus, the new Federal Acquisition Regulations allow the contractor more time for invention disclosure and patent application than has NASA's new technology reporting procedure. Under FAR, no time limit is specified for reporting inventions to contractor patent personnel, and after this reporting, the contractor has up to three years to apply for a patent--as opposed to one year under past NASA practice.

Furthermore, FAR uses a more narrow definition of what must be reported. Only patentable inventions must be reported, whereas NASA has required reports on inventions, innovations, improvements and discoveries. The broader definition has enabled NASA to be informed about innovations (such as new software) which may not be patentable but could be important in other applications.[16]

Table 1 summarizes this comparison of new FAR procedures and NASA new technology reporting practices:

TABLE 1.
A COMPARISON OF INVENTION REPORTING AND
PATENTING PROCEDURES (FAR) WITH NASA NEW TECHNOLOGY REPORTING*

	from PL 96-517NASA	NASA New Technology Reporting
o What must be reported	patentable inventions	inventions, innovations, improvements, discoveries
o When reported:		
to contractor (internally)	unspecified	unspecified
to agency	within 2 mos after disclosure so contractor patent personnel	within 6 mos after invention
o When patent election made	within 12 mos after disclosure	within 6 mos after report
o When patent application made	within 2 years after election	within 6 mos after election

*Note: NASA's procurement regulations conform to recently issued FAR amendments covering PL 96-517 and the Presidential Memorandum. This table contrasts the systems.

Effects of PL 96-517

It is still too early to assess definitely the full impact of PL 96-517, which became effective in July 1981. The best measure would be a comparison of commercial applications of government sponsored inventions before and after July 1981. Tracing inventions from first reporting to commercial application is a process beyond the scope of this study, as sufficient time has not elapsed for such a longitudinal analysis. A related factor clouding currently available data is the lag between application and reporting. Indeed, many of the inventions reported after July 1981 may not yet be "elected" or had patents applied for. As a result, a comparison of applications for patent or

notification before and after July 1981 may tend to underestimate the number of applications ultimately occurring since the passage of PL 96-517.

Recognizing the shortcomings in data availability, one means of assessing the law's effect is to compare the number of times NASA contractors have elected title to inventions before and after July 1981. Although neither the FAR measures nor previous NASA regulations specify a time for reporting inventions to contractor personnel, one may assume that substantial lags are unlikely where the contractor recognizes potential commercial value. That is, if we assume that the time between invention and electing title is relatively brief, a comparison of the number of title elections reported provides a first approximation of the influence of the law.[17]

Within NASA, this comparison reveals that the policy change has been accompanied by a decline in title elections. During the two years prior to July 1981, individuals, small businesses, nonprofits and universities requested patent waivers on 22 inventions. During the first two years the law was in full effect, July 1981 through June 1983, NASA records reveal only two cases where these entities elected title to inventions made under NASA contract or grant.[18] (See Table 2.)

TABLE 2.
REQUESTS FOR WAIVER OF NASA PATENT RIGHTS, July 1979-June 1981, OR ELECTION OF PATENT TITLE, July 1981-June 1983—Organizations Under NASA Contract/Grant Subject to PL 96-517

Period	Individual or Small Business	Not For Profit	University	TOTAL
July 1979-June 1981	17	1	4	22
July 1981-June 1983	0	1	1	2

Is this decline from 22 to two the result of PL 96-517? It may well take another five to seven years to provide a fully satisfactory answer. It appears that PL 96-517 may have removed an incentive for reporting inventions to NASA. Prior to the law, obtaining a patent waiver from NASA was an essential step to acquiring title to the invention. With passage of the law, this step is by-passed. As a result, contractors no longer have this incentive to report inventions to NASA. Nevertheless, the contract still requires that innovations be reported, and the law still requires that inventions subject to patent be disclosed.

As part of this study, the Denver Research Institute contacted representatives from the General Counsel's offices of the National Science Foundation (NSF), the U.S. Department of Agriculture (USDA), and the Department of Health and Human Services (HHS). All three agencies apparently have experienced increases in reporting, although only two attributed the increase to PL 96-517.[20]

From 1982 to 1983 invention disclosures at NSF have climbed from an annual average of around 110 to 150. These disclosures are required of NSF contractors whether they plan to seek patents or not. Prior to passage of the law, NSF was lenient in granting patent waivers. It is not clear that the recent upswing in reporting can be attributed to PL 96-517.

At USDA and HHS, increases in reporting have been attributed to passage of the law. USDA has a policy of retaining agency rights to inventions. There, not more than one invention was reported per year prior to July 1981. Since the law has come into effect, 31 inventions have been reported for election to title. HHS reports that total inventions, including internal inventions by employees, have risen from around 300 per year to 500-600 per year.

None of these three agencies--NSF, USDA, or HHS--is comparable to NASA in terms of its clientele who conduct research under contract or grant. (See Attachment 1, Federal Obligations for Total Research and Development, By Agency and Performer: Fiscal Year 1983.) Nearly all of the extramural research and development programs of these three agencies are conducted in universities or other not-for-profit institutions, whereas 62 percent of NASA's extramural research and development is conducted by industrial firms.

Based on an admittedly nonspecific set of data, it appears that invention reporting has increased since passage of PL 96-517. The NASA experience with title elections is an exception to this. No data have been made available which illustrate the law's effect on commercialization of new technologies or innovation in general. The correlation between innovation, reporting, and commercialization is not proven and, therefore, it is not safe to assume that increases in one area correspond to increases in the others.

Data on New Technology Reporting

Although the relationship between patent law/procedures and NASA's New Technology Reporting Program has yet to be fully correlated statistically, the basic trend of new technology reporting to NASA is down during the period that PL 96-517 has been in effect. The total decline amounted to nearly 20 percent. (See Table 3.)

TABLE 3.
REPORTABLE NEW TECHNOLOGY ITEMS RECEIVED, CONTRACTOR AND IN-HOUSE

NASA Field Center	July 1979-June 1981	July 1981-June 1983
Marshall	643	388
Lewis	304	289
Langley	732	583
Kennedy	56	80
Johnson	654	495
JPL	723	547
Goddard	189	133
Ames	98	235
TOTALS	3,399	2,750

Another indicator of technology reporting activity is the number of requests received by NASA Field Centers for Technical Support Packages (TSPs). TSPs are the more detailed, technical back-up descriptions prepared for each "tech brief" that is published in Tech Briefs. Their purpose is to provide sufficiently detailed engineering/scientific information so that potential users can make an informed judgment about the desirability of further investigation of the item. TSPs are mailed to those who request them, usually on the basis of returning a reader interest card enclosed in the issue of Tech Briefs that contains the abstract of the particular technology. Since the "tech briefs" are derived from new technology items reported by NASA in-house laboratories and contractors, they represent a delayed measure of technology reporting--based upon the user's perspective. Table 4 shows the same time periods—two years before and two years following the effective date of PL 96-517. In addition, the third column shows the second full year when the new law was in effect.

TABLE 4.
REQUESTS FOR TECHNICAL SUPPORT PACKAGES

Field Center	July 1979-June 1981	July 1981-June 1983	July 1982-June 1983
Marshall	297,853	66,587	15,007
Lewis	7,589	2,440	559
Langley	24,334	9,780	5,018
Kennedy	3,424	1,585	396
Johnson	21,298	13,870	7,639
JPL	60,835	32,391	13,770
Goddard	6,960	6,467	1,575
Ames	6,975	5,864	2,753
TOTAL	429,268	138,984	46,717

There has been a dramatic decline in TSP requests, from before to after the law's effective date, and an even more dramatic fall-off the second year--a further decline of nearly 51 percent from the previous year (July 1981-June 1982). These data suggest that the climate for reporting new technology within the NASA system has deteriorated, possibly because of the lack of incentives or leverage to stimulate it. They also suggest that what was reported proved to be of less interest to potential users as there were far fewer requests.

Conclusion

Some conclusions are straightforward. Federal policy, which once supported public ownership, now favors private rights to inventions made under Federal sponsorship. The law embodying this shift is less stringent (or complete) in reporting requirements than previous NASA policy. Time limits

for reporting inventions and applying for patents have been extended. The definition of reportable items has been narrowed. Since passage of the law, fewer title elections have been reported to NASA, though invention reporting at several other agencies primarily catering to university-based research and development has increased. New technology reporting to NASA has fallen substantially. Is it significant that neither of the contractors electing title to NASA-sponsored inventions in the two-year period July 1981-June 1983 was a small business? In the two years prior to July 1981, 17 individuals or small businesses requested patent waivers.

Other conclusions are more speculative. The law may be responsible for the decline in both patent and new technology reporting at NASA, perhaps because it relaxed reporting standards and removed an incentive to report. Other factors could influence invention reporting. What correlation is there between the type of work done and the number of inventions reported? Are some technical endeavors more prone to lead to inventions than others? Could changes in endeavor from year to year—not to mention the volume of activity—lead to changes in the number of inventions reported? Also, how do the policies and practices of contractors influence reporting? Some contractors are more assiduous in their reporting than others.

There remain too many unanswered questions to be able to assure that the recent changes (PL 96-517 and the Presidential Memorandum), in conjunction with proposed changes (such as S.64) will not adversely affect NASA's new technology reporting efforts. Indeed, what early data are available suggest substantial negative impact. Before postulating recommended avenues for action, it is useful to recapitulate those elements of the new patent policy which undermine new technology reporting in NASA, and to assess why they appear to have that effect.

First, PL 96-517 and the proposed extension via S.64 repeal Section 305 of the National Aeronautics and Space Act of 1958 which provides the basis for new technology reporting. This charter legislation was worded to expand what new technology was to be reported beyond that typically covered in traditional patent matters. Since the revised legislation (PL 96-517 and the proposed S.64) is directed at patent policy, broader concerns of new technology reporting are basically ignored, yet its basis in legislative authority is removed. This clearly weakens NASA's leverage to obtain the kind of new technology reporting that has been the foundation of NASA's Technology Utilization program.

Second, the more limited definition of what is to be reported (innovations that are patentable) provides no basis for an agency to require broader technology reporting and thereby substantially reduces reporting. A significant number of applications from NASA's Technology Utilization program have involved non-patentable applications such as management practices, computer software, or incremental modifications of processes or procedures. For example, a review of all new technology items published in NASA Tech Briefs, Volumes 5-8 (1981-84) show that 68.6% represent items not patented; when restricted to items reported only by contractors, that ratio rises to 78.9%. See Table 5, below. Only the organized efforts of the Technology Utilization program, of which new technology reporting is a key element, provide a broad awareness of such technology that otherwise would not come to the attention of widely diverse potential users.

TABLE 5.
NEW TECHNOLOGY ITEMS PUBLISHED
IN NASA TECH BRIEFS, VOLUME 5-8
(1981-1984)

Source	New Technology Items Published		
	Patented	Not Patented	Total
In-house	275	170	445
Contractor	280	1045	1325
Total	555	1215	1770

Third, the time limits for reporting by contractors under the recently promulgated Federal Acquisition Regulations permit up to three times as long from reporting to patent action. First disclosure by the contractor to the agency may be delayed for an undetermined period until the contractor officer responsible for patents is officially notified. This creates a circumstance in which substantial delay can occur in making the broader community of potential users aware of an innovation. In addition, defensive behavior by contractors is encouraged whereby innovations considered marginal by the contractor remain unreported to prevent unforseen benefits to potential competitors. That is, there would be neither incentive nor leverage from the agencies to stimulate such reporting and, thereby, greater awareness. It should be noted that this problem is not as acute for agencies such as the National Science Foundation, the Department of Health and Human Services, or the U.S. Department of Agriculture where the research clientele consists primarly of universities and affiliated not-for-profit groups. They do not feel the same power of economic competition as do the bulk of NASA research and development contractors.

In summary, although the data available are fragmentary and far from definitive, when combined with nearly 20 years of technology utilization

experience and the logical impact on NASA of the implementing regulations for the new patent policy, the overall effect is to undermine the new technology reporting process and, thereby, weaken NASA's Technology Utilization program.

Avenues For Action

Consideration of the various options for the action that NASA officials might take to avoid damage to their new technology reporting system must be assessed within the context of the administrative and political "climate" within which these issues are embedded. Irrespective of what action NASA officials elect to take, a fundamental tenet needs to be made forcefully at the outset: the principal goal of recent and proposed patent law change is the same as that of NASA's new technology reporting system namely, the timely and effective commercialization stemming from Federally-sponsored/conducted research and development. The fact that this goal has been at the center of NASA's new technology reporting and technology utilization systems for over 20 years, and has been pursued with reasonable success, should earn NASA a reasonably unbiased hearing as the issue is dealt with by higher political levels in both the Administration and the Congress.

Another factor needs to be emphasized: although consistency has its value, the drive for uniformity across Federal agencies with respect to patent practices tends to ignore important variations which are necessary to viable and productive programs—in this case the Technology Utilization program. Three factors seem to have been given insufficient attention in the process of both legislative consideration, and in interagency efforts to arrive at subsequent regulatory framework. The first two are assumptions which seem to be reasonable, but which are not supported by actual experience: (1) that industry aggressively pursues all/most "good" innovations and (2) that the innovator is the best judge of an invention's potential. The third is the apparent

lack of consideration given to the detrimental impact on NASA's new technology reporting system and its subsequent impact on technology utilization and technology transfer. The third item has been dealt with above so a few words are in order on the two assumptions.

The extensive literature on how innovation flourishes and is brought to commercialization is replete with instances where companies have turned their backs on innovators within their respective organizations, sometimes leaving to competitors or others to capitalize on such decisions. However, what is true and pertinent to the administration of patent policy is that the exclusive use of an invention is more apt to stimulate its development through incentives and more favorable terms for financing than if the invention is acquired on a nonexclusive basis. In this sense, the private sector is the more likely candidate for exploitation of innovation. But the blanket transfer of patent rights to the private sector in no way assures commercialization.

The general thrust of the new patent policy assumes that the initiator (individual or institution) of an idea is best placed to assess its potential, and to act upon it. Again, the history of innovation and experience in NASA's Technology Utilization program does not bear this out. Often, the individual or institution where a new idea is first generated (and perhaps even applied) is either not motivated or is unable to perceive how such an innovation might be applied in totally different institutional or substantive applications. Therefore, the means by which to best assure widest possible application is to make that information available as broadly as possible. This program of awareness does not necessarily have to intrude on the rights of the inventor or patent rights holders. These are reasonably safeguarded under the new technology reporting system even as it provides a wide opportunity to broadcast the existence of the innovation.

Finally, it needs to be emphasized that NASA's new technology reporting system, even under the best of circumstances, is somewhat fragile. It cannot work effectively as an automatic, mechanical reporting system. It is most effective where a sense of personal responsibility is exhibited by both contractor officials and NASA contract monitors. It depends a great deal upon an informal network of personal association and communications. However, with rare exception, these networks are most unlikely to be established if there is no formal requirement for such in the contract instrument.

In summary, the general administrative/political climate in which NASA must seek some "relief" from the general direction of current patent policy is one in which there is a strong consensus for shifting patent ownership to the private sector. This policy reflects NASA's general practice, and both the new legislation and NASA policy share the common goal of stimulating the timely commercialization of innovations growing out of Federally sponsored research and development. However, in the process little serious consideration has been given, outside of NASA, for the unintended impact on NASA's new technology reporting system--possibly as a result of an incomplete understanding of the breadth of that system or a less than full appreciation of the complexity of the innovative process.

In light of this "climate," NASA appears to have three options, which could be pursued independently or in conjunction with one another:

(1) supplement and expand current efforts to obtain relief by modification in the Federal Acquisition Regulations or through an exemption produced in legislation, possibly through one of NASA's authorization committees in either the House or the Senate;

(2) concentrate efforts to preserve Section 305(b) in various legislative versions of new patent legislation (such as S.64 in order to retain the statutory basis for new technology reporting; and

(3) accept the potential loss of authority in Section 305 of the National Aeronautics and Space Act of 1958 and shift the statutory basis for new technology reporting to Section 203(a)(3) which is the basis for the Technology Utilization program, retaining the technology reporting regulations and contract language as it has been prior to the issuance of the Federal Acquisition Regulation changes.

Each of these options has important risks attached to it--some of an inherent nature, and others depending upon how the administrative/political climate is at the particular time action is initiated. The following is a brief assessment of the pros and cons on each.

Until the Administrator has been brought in to deal aggressively with this issue, it cannot be considered to be beyond the reach of administrative settlement. However, this assumes that the Administrator judges the issue to be worthy of significant attention and time, and that the point in the development of the issue has not been passed where his strong involvement can be used to best advantage. Clearly, NASA has a "good" case for having some relief, perhaps in terms of an exception to the rules issued under the most recent edition of the FAR. A statutory exclusion would be more effective, but obviously more difficult to obtain. Sympathetic action from NASA's authorizing committees is a potential opportunity, but must be assessed in view of other legislative priorities. The key questions here are: (1) should the

Administrator be involved personally and to what extent, and (2) when is the best time for such involvement?

Given the fact that the administration is solidly behind the extension of PL 96-517 through such legislative instruments as S.64 (although it is not investing a great deal of political capital), efforts to save the totality of Section 305 of the National Aeronautics and Space Act of 1958 may be more than one can reasonably expect. Legislative action as of early April 1985 strongly suggests that there is little apparent opposition to prevent eventual enactment of S.64 in some version. Therefore, the most likely route to preserve NASA's new technology reporting system is to demonstrate the need for some modest amendment and seek the legislative assistance neccesslogy reporting system is to demonstrate the need for some modest amendment and seek the legislative assistance neccessary to accomplish this. This could be met by the simple amendment of Section 206 in S.64 so that Subsection 305(b) of the National Aeronautics and Space Act of 1958 is excluded from the repealing authorization.

Another avenue to accomplish this same purpose would be, through one or both NASA authorizing committees, to exclude Section 305(b) from such repeal, assuming such legislation had passed. This option would shift the scene of discussion from the Administration setting to that of the Congress, where it might receive a somewhat different hearing, given the cast of principal actors. The same arguments would be valid in support of NASA's position as in the first option, but they could easily appear in a context where the requested change appears to be substantially less.

Finally, if both options one and two are unsuccessful, or in the instance where NASA officials conclude that either option involves unacceptable levels of political conflict, there is a strong rationale for continuing the new technology reporting requirements more or less intact but citing Section

203(a)(3) as the statutory basis for this type of reporting. Since new technology reporting always has been broader than reporting purely for patent matter considerations, and since this section provides the basis for the Technology Utilization program which depends so much upon new technology reporting, such a shift would have solid basis in both logic and practice. It appears, in retrospect, that Section 305 is the general statutory basis principally because of the subsection (b) being located there as a traditional administrative convenience in relating to contracting and patent matters. A good argument could be made that NASA continue its new technology reporting system and requirements in both regulations and contract language, including the penalty for withholding payments under such authority, and that such authority is rightfully exercised because of the substantive relationship between new technology reporting as a principal underpinning of the Technology Utilization program. This will not deter really agressive opponents from challenging the authority, merely because NASA has had somewhat different practice over the past 20 years. Conceivably, a contractor could claim that the "new" system was operationally in conflict with patent law (if something similar to S.64 became law). Presumably, the argument would be that disclosure under new technology reporting would be detrimental to the company or inhibit <u>its</u> successful commercialization of an innovation, perhaps by being forced into a hurried decision regarding patenting. The legal ramifications need to be examined. However, NASA's handling of the new technology reporting function over the past 20 years has been done in a fashion which strongly demonstrates its ability to avoid such conflicts, including the unwanted disclosure of proprietary information or industrial secrets. Ostensibly, the burden of proof would be on the plaintiff to demonstrate that NASA would be unable to fairly and effectively administer the new technology reporting

system under the new patent policy. In one sense, this latter option is the "easiest" since it would avoid an immediate political confrontation. It would also delay such a confrontation although once the policy was established it probably would be challenged by the Department of Commerce as well as one or more contractors.

Of course, NASA can take no action whatever on one of two assumptions: (1) that the preliminary data which show a drop in patent waivers/election to title is a momentary aberration and will shortly be reversed, or that the drop off in new technology items reported is totally unrelated to the climate created by PL 96-517 and considerations of extension of that legislative policy; or (2) that the new technology reporting system, even though it might be substantially undermined, is not of sufficient value to make a significant effort at retaining a relatively high level of activity. The latter would presume some substitute means for accessing new technology development by contractors, and would presume a shift in the structure and emphasis of how technology transfer is to be accomplished, or would consider a formal, organized Technology Utilization program in NASA as no longer needed.

FOOTNOTES

1. Data collection and early portions of this paper were contributed by Dr. Lawrence J. MacDonnell currently Director, National Resources Law Center, University of Colorado, and by Mr. Joel Johnson, Strategic Planning Staff, American Broadcasting Company.

2. Memorandum and Statement of Government Patent Policy issued by President Ronald Reagan February 18, 1983. Hearings have been held in the U.S. Senate Judiciary Committee on S.2171 to provide a statutory base for this policy.

3. Memorandum and Statement of Government Patent Policy issued by President John F. Kennedy October 10, 1963.

4. Memorandum and Statement on Government Patent Policy, issued by President Nixon on August 23, 1971.

5. Draft Report of the Advisory Subcommittee on Patent and Information Policy of the Advisory Committee on Industrial Innovations established as part of the Domestic Policy Review, December 20, 1978.

6. PL 96-517

7. Op. cit.

8. Ibid.

9. Note: NASA policy currently reflects both PL 96-517 and the Presidential Memorandum and Statement of February 18, 1983.

10. This AEC policy related principally to all research and development on atomic energy; observers indicate that other research sponsored by AEC was less restricted in terms of patent and license practice.

11. 14 CFR 1245.103.

12. Note: NASA may "reserve" retention of patent rights under certain circumstances, e.g., where an invention is critical to advances in aerospace technology that requires broad use for public benefit.

13. 202(c)(1).

14. Implementing regulations to date are to be found in recently consolidated Federal Acquisition Regulations; for example, 48CFC Ch. 1, Federal Acquisition Regulations; Final Rule, 52.227-11 Patent Rights Retention by the Contractor (short form) as published in Federal Register, Vol. 49, No. 63 (March 30, 1984), p. 12969 ff.

15. Interim Patent Waiver Regulation Amendments to 14CFR1245.1 of July 1981, Federal Register, Volume 48, Number 96, pp. 22132-22133.

16. An item may be "subject to patent" but not legally patentable because of prior publication or some other bar. Therefore, one can draw a legal distinction between an innovation that substantially qualifies for patent, but fails to meet other requirements. NASA's new technology reporting also includes improvements that are clearly not patentable, e.g., software and management/business techniques.

17. Note: Anecdotal evidence from interviews in NASA Field Centers suggests that contractors may not be fully sensitive to potential commercial applications.

18. Beginning July 1981 the measure used for comparative purposes is the number of times small entities reported taking title to inventions. Not all contracts were updated immediately to include the new clause, but request for waivers from organizations affected by PL 96-517 would be accorded the same treatment as if the clause were included.

19. Data on applications for patent waivers were compiled from the docket cards of the Inventions and Contributions Board at NASA. The data exclude: (1) applications by businesses listed in Dun & Bradstreet as exceeding 500 employees or $10 million in sales, (2) applications by the California Institute of Technology, which include applications by the Jet Propulsion Lab (JPL), (3) voided applications, and 4) applications for advanced waivers, which are blanket waivers not specific to a particular invention.

20. Discussions by Joel Johnson, DRI, with Ms. Lucy Petit, General Counsel's Office, National Science Foundation and by Richard Chapman with Howard Silverstein, General Counsel's Office, U.S. Department of Agriculture; and LeRoy Randall, General Counsel's Office, U.S. Department of Health and Human Services; April 4, 1985.

21. From quarterly reports, NASA Technology Utilization Report, NASA Form 1484; data re-cast for comparison of two year period before and after PL 96-517 went into effect (i.e., July 1979-June 1981 and July 1981-June 1983).

22. Ibid.