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Report to the Chairman, Subcommittee on Courts, Civil Liberties and the Administration of Justice, Committee on the Judiciary
House of Representatives

April 1987

PATENT POLICY

Recent Changes in Federal Law Considered Beneficial

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Resources, Community, and
Economic Development Division

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The Honorable Robert W. Kastenmeier
Chairman, Subcommittee on Courts, Civil
Liberties and the Administration of
Justice
Committee on the Judiciary
House of Representatives

Dear Mr. Chairman:

In accordance with your request, this report provides information on federal agency implementation and the impact on universities, other nonprofit organizations, and small businesses of recent changes in federal patent policy.

As arranged with your office, we plan no further distribution of this report until 30 days after the issue date, unless you publicly announce its contents earlier. At that time, we will provide copies to the Secretary of Defense, the Secretary of Energy, the Director, Office of Management and Budget, and other interested parties. We will also make copies available to others upon request.

This work was performed under the direction of Sarah P. Frazier, Associate Director. Other major contributors are listed in appendix VII.

Sincerely,

J. Dexter Peach
Assistant Comptroller General

rate for federal inventions was "distressingly low" and that a Statutory Invention Registration's invention protection is adequate for the majority of government-owned inventions. The Congress intended that federal agencies actively use Statutory Invention Registrations.

Results in Brief

Implementation of Public Law 98-620 has been delayed because the Department of Commerce only issued interim government-wide regulations in July 1986. University administrators and small business representatives whom we interviewed stated that Public Law 96-517, has had, and Public Law 98-620 will have, a significant positive impact on their research and innovation efforts.

Federal agencies have implemented the President's memorandum. Most university and small business respondents said that large businesses should have title rights to federally funded inventions and that the President's memorandum has not adversely affected their organizations.

The Departments of Defense and Energy used Statutory Invention Registrations for 12 percent of their Patent Office applications in fiscal year 1986. Eighteen of the 25 university and 5 of the 8 small business respondents we talked with told us that they did not expect their organizations to use Statutory Invention Registrations. Given the small use made of Statutory Invention Registrations and in light of congressional intent, GAO believes the Departments of Defense and Energy should take actions to encourage the use of the Statutory Invention Registration procedure.

Principal Findings

Public Law 98-620 Amendments

Implementation of the Public Law 98-620 amendments to Public Law 96-517 has been delayed because the Departments of Commerce and Energy disagreed over Commerce's proposed regulations that affect Energy's government-owned, contractor-operated facilities.

Administrators at 25 universities stated that Public Law 96-517 has been significant in stimulating business sponsorship of university research, which has grown 74 percent from $277 million in fiscal year 1980 to $482 million in fiscal year 1985 (in constant 1982 dollars). However, many university administrators said that it is too early to measure

issuance fees for a patent. In addition, agencies would have to pay periodic maintenance fees to keep a patent in effect, while no maintenance fees are required for a Statutory Invention Registration. Statutory Invention Registrations also could reduce agencies' patent prosecution work load which, according to an internal Navy study, accounted for 19 percent of Navy patent attorneys' time in fiscal year 1982.

Recommendations

We recommend that the Secretary of Defense and the Secretary of Energy encourage the use of Statutory Invention Registrations by (1) establishing written criteria for determining whether to file for a patent or a Statutory Invention Registration, (2) recognizing Statutory Invention Registrations in their incentive award programs, and (3) establishing annual percentage goals for using the Statutory Invention Registration procedure.

Agency Comments

The final draft of this report was sent to the Departments of Commerce, Defense, and Energy for comment. Commerce concurred with the report's findings and recommendations, stating that it contained a sound analysis based on a balanced collection of data. Defense concurred with the report's findings and first two recommendations, but disagreed with the recommendation that it establish goals for using Statutory Invention Registrations. Energy concurred with the recommendation regarding the incentive award program but disagreed with establishing written criteria and usage goals for Statutory Invention Registrations. Chapter 3 includes a summary of agencies' comments and GAO's response.

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Abbreviations

CFR	Code of Federal Regulations
DOD	Department of Defense
DOE	Department of Energy
GAO	General Accounting Office
GOCO	government-owned, contractor-operated
HHS	Department of Health and Human Services
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
OMB	Office of Management and Budget
PAD	Program Analysis Division
RCED	Resources, Community, and Economic Development Division
SBIR	Small Business Innovation Research
SIR	Statutory Invention Registration
U.S.C.	United States Code

In response to a Public Law 96-517 requirement that the Comptroller General report annually to the Congress on the federal agencies' implementation of the act's title rights provisions, we have issued four reports:

- Patents and Trademark Amendments of 1980 Set the Stage for Uniform Patent Practice by Federal Agencies (PAD-82-32, May 20, 1982);
- Major Federal Research and Development Agencies Are Implementing the Patent and Trademark Amendments of 1980 (GAO/RCED-84-26, Feb. 28, 1984);
- Federal Agencies' Policies and Practices Are in Accordance with Patent and Trademark Amendments of 1980 (GAO/RCED-85-94, Aug. 29, 1985); and
- Patent Policy: Universities' Research Efforts under Public Law 96-517 (GAO/RCED-86-93, April 4, 1986).

Subsequent Title Rights Changes

Since 1980 the government has taken two additional actions to extend title rights to federal funding agreement recipients. On February 18, 1983, President Reagan issued a memorandum on government patent policy to agency heads stating that, to the extent permitted by law, agency policy is to give all funding agreement recipients the title rights to federally funded inventions that Public Law 96-517 gave to nonprofit organizations and small businesses. In effect, the memorandum directed federal agencies to give large businesses, with a few exceptions based on statutory requirements, the right to retain title to their federally funded inventions.

Public Law 98-620, enacted on November 8, 1984, amended Public Law 96-517 by extending its coverage and easing or removing some of its restrictions. The act allows nonprofit and small business funding agreement recipients to take title to (1) novel varieties of sexually reproducing plants and (2) inventions that their government-owned, contractor-operated (GOCO) facilities develop, except that title rights are restricted for Department of Energy (DOE) GOCOs that are primarily dedicated to naval nuclear propulsion or weapons-related programs. The act eased restrictions on when a small business or nonprofit funding agreement recipient is required to disclose an invention to the sponsoring federal agency, the amount of time it has to elect to take title to the invention, and the ability of a nonprofit funding agreement recipient to

determine who conceived the invention first and the use of the SIR application's filing date as evidence of a constructive reduction to practice. If the Patent and Trademark Office determines that the SIR is prior art (existing, publicly known technical information), it would reject the patent application.

A SIR is intended to be less expensive than a patent for the applicant because the Patent and Trademark Office limits its examination to the application's specification of and claims about the invention. (In particular, it does not examine the SIR application's section on prior art, unless a SIR is subject to a Patent and Trademark Office interference proceeding.) Because of the limited examination, the Patent and Trademark Office charges $400 for a SIR's application and issuance fees, while it charges a large business or a government agency $900 for a patent's application and issuance fees.[3] In addition, the Patent and Trademark Office Appropriation Authorization Act (Public Law 97-247, Aug. 27, 1982) requires the Patent and Trademark Office to collect periodic maintenance fees for patents issued after August 27, 1982, but no maintenance fees are required for SIRs. Currently, the first maintenance fee for large businesses and government agencies is $450 and is paid 3-1/2 years after the patent is issued; the second maintenance fee is $890 and is paid 7-1/2 years after the patent is issued; and the third maintenance fee is $1,340 and is paid 11-1/2 years after the patent is issued.

Under 35 U.S.C. 102(b), a patent application must be filed within 1 year after an invention is publicly disclosed in a printed publication or else it cannot be patented. For individuals or organizations who do not need a patent's defensive protection because they do not procure or manufacture large quantities of products that result from their research efforts, public disclosure of an invention by publishing an article in a scientific journal provides a less expensive alternative to filing and prosecuting a patent or a SIR application. Filing a SIR instead of relying on a published article has two advantages: (1) the Patent and Trademark Office recognizes the SIR as of the date that the application is filed while publication of an article could be delayed by the journal's review process and (2) a SIR applicant can participate in a Patent and Trademark Office interference proceeding if a subsequent inventor applies for a patent, while an inventor who relies on public disclosure is not allowed to participate.

[3]Nonprofit organizations and small businesses pay half of the amount that large businesses and government agencies pay for a patent's application, issuance, and maintenance fees, but would pay the same amount for a SIR's application and issuance fees.

To assess the impact of the patent policy changes on universities, other nonprofit organizations, and small businesses, we conducted structured interviews with 25 university administrators who are responsible for sponsored research or patent management and with 8 small business trade association representatives and/or small businessmen. (Apps. I and II list the universities and small business trade associations, respectively.) The questions were designed to elicit the respondents' opinions on whether Public Laws 96-517 and 98-620 have achieved or will achieve stated goals of promoting collaboration between universities and businesses, reducing universities' and small businesses' administrative costs, and encouraging small businesses to participate in federally sponsored research and development efforts. We did not assess whether the laws increased the likelihood that federally funded inventions would be commercialized because university administrators had told us during the audit work for our report, Patent Policy: Universities' Research Efforts Under Public Law 96-517, that it is too early to measure this effect.

To better understand businesses' reasons for sponsoring research at universities, we interviewed executives at 10 firms that sponsor research. These executives were recommended to us by university administrators. We also reviewed federal agency data on research and development obligations and contract awards for fiscal years 1982 and 1985 to assess whether the President's memorandum had adversely affected federal research and development funding for nonprofit organizations and small businesses.

The universities in our sample included 18 of the 19 that provided information for our previous report on university research efforts under Public Law 96-517 as well as 7 other universities drawn from the membership of the Society of University Patent Administrators. We did not interview administrators at other nonprofit organizations because of the limited size of our sample and because universities received almost 80 percent of federal research and development funds that all nonprofit organizations received in fiscal year 1985. The small business representatives were identified by Small Business Administration officials or by small business representatives as being knowledgeable about federal patent policy. Our sample of universities and small businesses is not representative, and our results cannot be generalized to all U.S. universities and small businesses.

Budget (OMB) for approval in January 1986. DOE reviewed these regulations and still objected to the handling of two of the issues it had raised, and it objected to new language that Commerce had added on classified and sensitive inventions.

Commerce subsequently resolved these issues with DOE and obtained OMB's approval to issue the regulations. However, in a letter dated June 2, 1986, the Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, expressed concern about the regulatory review process. In response, Commerce issued an Interim Final Rule on July 14, 1986, which provided for a 60-day public comment period and gave federal agencies a basis for implementing Public Law 98-620. Commerce issued its final regulations on March 18, 1987. A task force of federal agency officials is modifying the Federal Acquisition Regulation to conform with Commerce's regulations.

Title Rights Changes Have Had Minimal Impact on DOD

Army, Navy, and Air Force patent attorneys told us that Public Law 96-517 has had a beneficial impact for some small business and nonprofit contractors because, prior to the act's passage in 1980, these contractors had to have an approved mechanism for commercializing technology to obtain an advance waiver of title rights. Without one, they had to request a deferred determination of title rights on a case-by-case basis.

The patent attorneys said that the President's February 1983 memorandum generally had minimal impact on their procedures because DOD historically had granted large business contractors an advance waiver of title rights to any resulting inventions. However, one important change is that the memorandum removed a previous restriction that federal agencies normally should retain title rights to inventions that concern public health, safety, or welfare. As a result, medical research contractors can obtain an advance waiver for related inventions.

Title Rights Changes Will Affect DOE Procedures

DOE GOCO facilities perform most of DOE's research and development. DOE based its patent policy on legislation, including the Atomic Energy Act of 1954 (42 U.S.C. 2182) and the Federal Nonnuclear Energy Research and Development Act of 1974 (42 U.S.C. 5908), that restricted its ability to give title rights to inventions. However, while Public Law 96-517 had excepted GOCO facilities from its provisions, Public Law 98-620 extended the title rights option to nonprofit or small business operators of GOCO facilities that are not primarily dedicated to DOE's naval nuclear propulsion or weapons-related programs.

circumstances to Commerce in June 1985. These statements cite Public Law 98-620's legislative history as a basis for the exclusions.

Title Rights Changes Affected NASA Procedures

Before 1980, NASA's patent policy was based on the National Aeronautics and Space Act of 1958 (42 U.S.C. 2457), which required NASA to take title to inventions unless it granted a waiver to the contractor. With the enactment of Public Law 96-517, NASA has given small business and nonprofit contractors, including the California Institute of Technology, which operates NASA's Jet Propulsion Laboratory, the option to elect title rights to inventions that they make.

NASA patent attorneys told us that the President's February 1983 memorandum had more of a procedural than substantive impact on large business contractors because, between the mid-1970's and 1983, NASA waived its rights for almost 90 percent of the contractor requests. As a result of the President's memorandum, large business contractors can petition for an advance waiver at the time of contract negotiations. The attorneys said that NASA also streamlined its procedures for reviewing case-by-case waiver requests so that, on average, these requests are processed in 6 instead of 8 weeks. Overall, NASA attorneys estimated that waivers were granted for 99 percent of the requests made since 1983.

Title Rights Changes Have Had Minimal Impact on HHS and NSF

HHS and NSF officials stated that the President's February 1983 memorandum and Public Law 98-620 have had little substantive impact on their patent policies or procedures. Both HHS and NSF principally fund university research, and they began to offer title rights to universities in the 1970's through institutional patent agreements. HHS and NSF obligated less than 5 percent of their estimated research and development budgets to businesses in fiscal year 1986.

Similar to DOD officials, HHS officials stated that the President's memorandum is important because it removed restrictions on public health, safety, and welfare inventions. HHS now can give advance waivers to pharmaceutical firms, which want clear title to any resulting products to justify the substantial costs of product development and testing. The change primarily has resulted in about 30 collaborative agreements between businesses and HHS laboratories.

Most university administrators said federal patent policy changes were one of many factors that have improved their universities' research and innovation efforts in recent years and cited other factors, such as the rapid development of high technology industries and tax credits for businesses that donate research equipment, as being equally or more significant for their universities. However, three administrators stated that Public Laws 96-517 and 98-620 have had the most significant impact for their universities' research and innovation efforts.

The university administrators said that Public Laws 96-517 and 98-620 have stimulated business interest in funding research at their universities from a moderate to a great extent. (See table 2.2.) Nineteen administrators said that business sponsorship of research at their universities has increased as a direct result of the laws. Eighteen said that the number of research funding agreements that their universities have signed with businesses between 1981 and 1985 was much higher than the number that was signed in the previous 5-year period.

Table 2.2: Extent to Which Public Laws 96-517 and 98-620 Have Stimulated Business Sponsorship of University Research

Very great extent	3
Great extent	10
Moderate extent	8
Some extent	4
Little or no extent	0

According to NSF, total business sponsorship of university research grew 74 percent, from $277 million in fiscal year 1980 to $482 million in fiscal year 1985 (in constant 1982 dollars). For 23 of the 25 universities we surveyed (data for the other 2 universities was not available), industrial sponsorship of research more than doubled from $70 million in fiscal year 1980 to $160 million in fiscal year 1985 (in constant 1982 dollars).

The number of federally funded invention disclosures that 23 of the universities reported grew from 908 in fiscal year 1982 to 1,025 in fiscal year 1985. Overall, university administrators said that Public Laws 96-517 and 98-620 have increased to some extent the number of licenses that their universities have negotiated for federally funded inventions.

Table 2.3 shows the university administrators' assessments of the impact of some of the Public Law 98-620 amendments to Public Law 96-517. All of the administrators stated that the amendment removing

new product lines for the company, and they generally sought an exclusive license for any resulting inventions.

Nine executives identified Public Law 96-517 as an important factor that influenced their companies' decisions to increase their sponsorship of university research. Eight executives told us that universities are more receptive to receiving corporate funding, in part because Public Law 96-517 has increased their interest in patenting and licensing technology.

Six executives stated that Public Laws 96-517 and 98-620 had stimulated business interest in funding university research to either a very great or great extent. Seven executives said that the Public Law 98-620 provision removing restrictions on licensing federally funded inventions will have a significant impact on their companies' sponsorship of university research.

Title Rights' Impact on Small Businesses

Overall, the eight small business trade association representatives and/or small businessmen whom we interviewed stated that Public Laws 96-517 and 98-620 have had a significant positive effect on small businesses' research and innovation efforts because small businesses can retain title to any inventions that result from the research. (See table 2.4.) Four of the representatives said that the option to retain title rights has encouraged their firms to bid on federal contracts. Three others said that the title rights provisions are an essential element in encouraging participation in the federal Small Business Innovation Research (SBIR) program,[2] because small businesses that get SBIR funding are assured that they can retain title rights to inventions resulting from the research.

Table 2.4: Impact of Public Laws 96-517 and 98-620 on Small Businesses

Very significant positive impact	2
Significant positive impact	4
Moderate positive impact	2
Some positive impact	0
Little or no positive impact	0

[2]Federal agencies with an annual budget of at least $100 million for research and development performed by outside parties are required to set aside up to 1.25 percent of their budgets for SBIR projects. For our assessment of the SBIR program, see Implementing the Small Business Innovation Development Act—The First 2 Years (GAO/RCED-86-13, Oct. 25, 1985) and Research and Development: A Profile of Selected Firms Awarded Small Business Innovation Research Funds (GAO/RCED-86-113FS, March 21, 1986).

Table 2.6: Respondents' Perceptions on Whether Title Rights Should Be Given to Large Businesses

	University administrators	Small business representatives
Definitely yes	10	3
Probably yes	9	3
Uncertain	4	1
Probably no	2	0
Definitely no	0	1

Nineteen respondents said that large businesses should have title rights because they could more effectively commercialize the technology than the government, particularly because inventors could be actively involved in the process. Twelve respondents favored giving title rights to large businesses because they perceived no reason for distinguishing between universities and small businesses on the one hand and large businesses on the other. Two respondents cited the potential for reduced government procurement costs because the option to retain title rights to resulting inventions may increase business interest in competing for contracts.

Six respondents, including some who were uncertain, expressed concern about giving title rights to large businesses because large businesses do not aggressively commercialize technology. Five respondents said that universities and small businesses should be given a preference over large businesses because universities, which mainly conduct basic research, need a stimulus to commercialize resulting inventions and small businesses are at a competitive disadvantage with large businesses.

There has been concern that the President's February 1983 memorandum would induce large businesses to compete for federal research and development funding against universities and small businesses. However, 15 university administrators and 4 small business representatives stated that the President's memorandum definitely or probably has not had an impact on universities and small businesses. Eight university administrators and two small business representatives were uncertain whether the memorandum has had an impact. Two university administrators and two small business representatives said that the memorandum definitely or probably has had an impact; however, both university administrators who cited an impact said that the President's memorandum has had a positive effect on their universities because businesses are more aware of federal patent policy changes and more interested in sponsoring university research.

"...the Committee expects that the Government will ordinarily use a SIR unless an invention has commercial potential which justifies the expenses of obtaining a patent. While the Committee recognizes that it is sometimes difficult to decide which inventions have such potential, especially in fields where there is fast-breaking research, the Committee wishes to emphasize that an agency's decision on this question should not be based simply on speculation or theoretical possibilities."

The Senate Committee on the Judiciary also noted that, during the 5-year life of the Defensive Publication program, federal agencies filed at least 8,925 patent applications but only one defensive publication application. To monitor agency compliance, Public Law 98-622 requires the Secretary of Commerce to report annually to the Congress on SIRs, including an assessment of federal agency usage of SIRs, resulting cost savings, and their effectiveness in aiding the management of federally developed technology. As of March 20, 1987, Commerce had not issued its first report on the SIR program.

SIR Usage

In fiscal year 1986, the Patent and Trademark Office received 131,403 patent applications and issued 76,993 patents, including more than 1,050 to federal agencies. During the fiscal year, a total of 238 SIR applications were filed, including 187 from federal agencies, 42 from nonfederal sources, and 9 in which the assignment of the SIR's title was not designated. The 238 SIR applications included both original SIR applications and those converted from a patent application to a SIR application after the Patent Office had issued either an initial or final rejection of the patent application.[1] Of the 187 federal SIR applications, 121 were original SIR applications and 66 were patent application conversions.

According to Patent and Trademark Office officials, large businesses filed all of the 42 nonfederal SIR applications. This is not surprising given the results of our survey on the impact of federal patent policy changes on nonprofit organizations and small businesses. Thirteen of the 25 university administrators we interviewed said that their universities were not aware of the SIR procedure, and 6 of the small business representatives said that small businesses generally were not aware of SIRs. Eighteen university administrators said that universities will not use SIRs regularly, primarily because (1) universities do not need defensive patent protection since they do not procure or manufacture products that result from their research and development efforts and (2) their

[1]The primary reason for converting to a SIR is that the Patent and Trademark Office does not review prior art unless an interference proceeding is needed to determine whether a competing invention has priority for patent protection.

Table 3.1: DOD and DOE Patent and SIR Applications in Fiscal Year 1986

Agency	Patent applications	Original SIRs	Conversions	Total SIRs
DOD				
Army	221	70	27	97
Navy	139	38	12	50
Air Force	222	0	15	15
DOE	294	11	11	22
Total	**876**	**119[a]**	**65[b]**	**184[a,b]**

[a]In addition, the Department of Agriculture and the Nuclear Regulatory Commission each filed an original SIR application.

[b]NASA also converted one application from a patent to a SIR.

Source: DOD, DOE, and the Patent and Trademark Office.

Patent and Trademark Office officials told us that they are disappointed in federal agency usage of SIRs to date. The director of the Patent and Trademark Office unit that handles all SIR applications had anticipated that federal agencies would file about 500 original SIR applications per year, but only 121 original applications were filed in fiscal year 1986. The Navy, for example, supported the establishment of the SIR procedure, and the director of the Navy's patent program testified in 1983 that the Navy anticipated using a SIR in approximately 75 percent of the patent applications filed.[2] In fact, the Navy used SIRs for only 21 percent of its Patent and Trademark Office applications in fiscal year 1986. As shown in table 3.1, it filed 38 original SIR applications and 139 patent applications.

Navy patent attorneys told us that the 75 percent usage rate was overly optimistic. They noted that the number of patent applications that the Navy files has dropped from 445 in fiscal year 1982, the year used as a basis for its testimony, to 139 in fiscal year 1986. They also stated that in fiscal year 1986 the Navy publicly disclosed 72 inventions on which it did not subsequently file patent or SIR applications through its Navy Technical Disclosure Bulletin.

[2]In its testimony supporting a 75 percent usage rate, the Navy had requested that an issued SIR not state that it does not have the enforceable attributes of a patent. However, subsection (c) of the SIR provisions (35 U.S.C. 157(c)) requires that a SIR give appropriate notice to the public of its attributes.

With regard to the third concern, an agency saves money because it pays lower Patent and Trademark Office fees and reduces the work load of its patent attorneys. The Patent Office charges $400 for a SIR's application and issuance fees, while it charges $900 for a patent's application and issuance fees. In addition, the federal agency has to determine whether to pay periodic maintenance fees to keep its patent in force while no maintenance fees are required for a SIR. The first maintenance fee for a patent is $450 and is paid 3-1/2 years after the patent is issued.

DOE and DOD patent attorneys told us that the commercial potential of an invention is difficult to assess. DOE patent attorneys said that DOE wants to allow sufficient time to develop and market an invention to potential licensees, so it will normally pay a patent's first maintenance fee. However, the attorneys said that DOE would carefully screen a patented invention's commercial potential before paying the second maintenance fee after 7-1/2 years. Air Force and Navy patent attorneys stated that the Air Force has procedures and the Navy plans to develop procedures that require evidence of business interest in licensing an invention before they pay the first maintenance fees. An Army patent attorney said that, while no centralized determination will be made on whether to pay maintenance fees, criteria are being drafted to assist the subordinate organizations that file patent applications to determine whether to pay the first fees. An agency can reduce its Patent and Trademark Office fees by $500 per application by filing for a SIR instead of a patent and may reduce subsequent maintenance fee costs because they are not required for SIRs.

The second cost savings for an agency is a reduced patent attorney work load. An internal Navy study on how its attorneys spent their time on patent-related activities in fiscal year 1982 found that 13 percent (5,630 hours) was spent on work related to invention disclosures; 68 percent (29,525 hours) was spent on work related to patent applications, including evaluating the inventions for patentability, searching for prior art, and preparing the application paperwork; and 19 percent (8,169 hours) was spent on patent prosecution activities, including amending patent applications and filing appeals and petitions.

While the same application is required for a patent or a SIR, a SIR application can reduce the time that an applicant's patent attorneys spend prosecuting and amending the application. Upon review of an application, a Patent and Trademark Office examiner will approve it or issue an

Table 3.2: DOD and DOE Patenting and Licensing Activity for Fiscal Years 1981-86

	1981	1982	1983	1984	1985	1986
Army						
Patent applications	342	303	266	280	247	221
Patents received	249	235	226	233	220	241
Licenses issued	1	4	5	5	0	1
Patents licensed[a]	1	8	8	10	0	4
Royalty income	$5,454	$30,592	$23,877	$10,300	$5,060	$8,435
Navy						
Patent applications	514	445	373	281	288	139
Patents received	343	344	295	313	253	199
Licenses issued	7	15	9	11	5	0
Patents licensed[a]	7	15	12	22	5	0
Royalty income	$5	$57,935	$28,113	$14,000	$8,410	$6,334
Air Force						
Patent applications	172	238	210	205	216	222
Patents received	149	98	144	204	180	203
Licenses issued	0	0	0	1	2	0
Patents licensed[a]	0	0	0	1	2	0
Royalty income	0	0	0	0	$6,000	$7,299
DOE[b]						
Patent applications	327	380	321	373	269	294
Patents received	232	239	219	298	288	259
Licenses issued	19	7	16	24	24	23
Patents licensed[a]	17	7	16	19	20	37
Royalty income	$262,335	$208,235	$82,450	$53,700	$30,562	$41,680
Total DOD and DOE						
Patent applications	1,355	1,366	1,170	1,139	1,020	876
Patents received	973	916	884	1,048	941	902
Licenses issued	27	26	30	41	31	24
Patents licensed[a]	25	30	36	52	27	41
Royalty income	$267,794	$296,762	$134,440	$78,000	$50,032	$63,748

[a]Patents licensed can differ from licenses issued because a patent could be separately licensed to several licensees or, alternatively, several patents could be licensed as a package to a licensee.

[b]DOE patent applications and patents received do not include those that contractors filed and received on behalf of DOE.

Source: DOD and DOE.

On an annual average for the 6-year period, the Army filed 277 patent applications, received 234 patents, issued 3 licenses on 5 patents, and received royalty income of $13,953; the Navy filed 340 patent applications, received 291 patents, issued 8 licenses on 10 patents, and received royalty income of $19,133; the Air Force filed 211 patent applications,

intent, DOD and DOE patenting and licensing statistics, and potential cost savings, we believe that DOD and DOE should take specific actions to encourage the use of SIRs, which Commerce could assess in its annual report on SIRs to the Congress.

Recommendations

We recommend that the Secretary of Defense and the Secretary of Energy encourage the use of SIRs by (1) establishing written criteria for determining whether to file for a patent or a SIR, (2) recognizing SIRs in their incentive awards programs, and (3) establishing annual percentage goals for using SIRs.

Agency Comments and GAO Response

The Departments of Commerce, Defense, and Energy provided written comments on the draft report that appear in appendixes IV, V, and VI.

Department of Commerce

Commerce agreed with our analysis and recommendations on SIRs and added that its report to the Congress may contain additional information and recommendations.

Department of Defense

DOD concurred with our findings and stated that by July 1, 1987, it plans to develop written criteria for determining whether to file for a patent or a SIR. DOD also stated that it plans to use the same incentive awards for SIRs as it uses for patents. The Army implemented its incentive awards program for SIRs in January 1987; the Air Force intends to publish its incentive awards program for SIRs in May 1987; and, the Navy intends to develop an incentive awards program for SIRs by July 1, 1987.

DOD disagreed with our recommendation that it establish annual percentage goals for using SIRs, stating that the recommendation is premature because (1) SIRs are new and more experience is needed before setting arbitrary percentage goals and (2) the Federal Technology Transfer Act of 1986, which was enacted in October 1986, is intended to encourage the transfer of technology from federal (government-operated) laboratories to the private sector and provide financial incentives to both the federal agency and inventor by allowing them to retain royalty income. Our report notes changes in DOD patent activity, such as the drop in the Navy's patent applications from 445 in fiscal year 1982 to 139 in fiscal year 1986, and the enactment of the Federal Technology

Third, DOD suggested that the report present data on the number of patents that were licensed in addition to the number of licenses that agencies issued. We agree, and we have modified table 3.2 accordingly.

Department of Energy

DOE concurred with our recommendation that it recognize SIRs in its incentive awards program but stated that such a program would have a minimal impact on its patent program because virtually 100 percent of its inventions arise from nongovernmental employees. DOE disagreed, however, with our recommendations that it establish written criteria for determining whether to file for a patent or a SIR and annual percentage goals for using SIRs.

Regarding establishing written criteria, DOE stated that it has had such written guidelines in use since 1985. To support this assertion, DOE provided us its invention evaluation form. We disagree that the invention evaluation form implements our recommendation. The form requires the inventor, contractor attorney, or DOE attorney to provide background information about the invention, its relationship to other inventions, and the potential for commercialization that can be assessed to determine whether to file a patent application. It does not provide uniform written criteria that contractors or DOE field attorneys can use as a standard for deciding, for example, whether an invention has sufficient commercial potential to file for a patent instead of a SIR. DOE also could address in its criteria other policy issues that it mentioned in its comments on the draft report, such as (1) whether SIRs are appropriate for inventions related to its uranium enrichment or radioactive waste management programs, given the possibility that these programs may be privatized in the future, and (2) DOE's obligations to foreign countries for research and development that is jointly funded through international agreements. (DOE could not provide data on the dollars spent on or the numbers of patent applications resulting from research and development sponsored through international agreements in fiscal year 1986.)

DOE disagreed with the recommendation that it establish annual percentage goals for using SIRs, stating that such goals would be arbitrary and that it uses SIRs when, in its judgment, such a course is prudent. We continue to believe that DOE should establish annual SIR usage goals as a means to stimulate its compliance with congressional intent that federal agencies should actively use the SIR procedure. Between 1981 and 1986, DOE licensed about 6 percent of the inventions for which it applied for a patent. In fiscal year 1986, while DOE licensed 37 inventions, it filed 294 patent applications and only 11 original SIR applications. We believe that

National Laboratory, and Sandia National Laboratories). Much of DOE's atomic energy defense research and development is likely to be considered classified or sensitive or is likely to have little commercial potential outside DOE's weapons production program. The SIR procedure may be appropriate for protecting the government's interest in many of the inventions arising from this research.

Small Business Trade Associations Contacted

American Association of Small Research Companies[a]
Issue Commissioner for Innovation, White House Conference on Small Business
Innovation Development Institute
National Coalition for Science and Technology
National Council on Industrial Innovation
Small Business Association of New England

[a]We contacted three businessmen who are members of this trade association.

Table III.2: Disposition of Title Rights for Large Business Operators of DOE's GOCO Facilities

Contractor	Facility or location
Contractor will be able to elect to take title to all inventions	
EG&G Idaho, Inc.	Idaho National Engineering Laboratory
Kaiser Engineers, Hanford[a]	Hanford, Washington
M-K Ferguson Company	Idaho National Engineering Laboratory
Martin Marietta Energy Systems, Inc.	Oak Ridge National Laboratory
Martin Marietta Energy Systems, Inc.[b]	Portsmouth Gaseous Diffusion Plant
Rockwell International	Canoga Park, California
Rust Engineering Corporation	Oak Ridge, Tennessee
West Valley Nuclear Services	West Valley, New York
Westinghouse Hanford Company	Hanford Engineering Development Laboratory
Restricted title rights to inventions (nonproduction facilities)	
EG&G Energy Measurements, Inc.	Nevada Test Site
Reynolds Electrical & Engineering Co., Inc.	Nevada Test Site
AT&T Technologies, Inc.	Sandia National Laboratories
Rockwell Hanford Operations	Hanford, Washington
Restricted title rights to inventions (production facilities)	
Bendix Corporation	Kansas City, Missouri
E.I. du Pont de Nemours and Co.	Savannah River, South Carolina
General Electric Company	Pinellas, Florida
Holmes & Narver, Inc.	Pacific Operations/Nevada Test Site
Martin Marietta Energy Systems, Inc.	Oak Ridge Y-12 Plant
Mason & Hanger-Silas Mason Co.	Pantex, Texas
Monsanto Research Corporation	Mound, Ohio
Rockwell International	Rocky Flats, Colorado
UNC Nuclear Industries	Hanford, Washington
Westinghouse Electric Corporation	Waste Isolation Pilot Plant
Westinghouse Idaho Nuclear Company	Idaho Chemical Processing Plant
Westinghouse Materials Company of Ohio[c]	Fernald, Ohio
No title rights to inventions	
Westinghouse Electric Corporation	Bettis Atomic Power Laboratory
General Electric Company	Knolls Atomic Power Laboratory

[a]Kaiser Engineers, Hanford, replaced J.A. Jones Construction effective March 1987.

[b]DOE approved the transfer of the contract from Goodyear Atomic Corporation to Martin Marietta Energy Systems, Inc., in November 1985.

[c]Westinghouse Materials Company of Ohio replaced National Lead Company, effective January 1986.

AAU REPORT ON TECHNOLOGY TRANSFER

Reprinted, with permission, from the 9/8/86 issue of Higher Education Daily

Spurred by changes in federal policy and by a push from the states to further economic development, university faculty have increased the number of inventions they are patenting, according to a new report.

In an effort to encourage faculty to produce more inventions, most of the 42 universities responding to a survey by the Association of American Universities (AAU) have revised their patent policies within the last two years, with many increasing the amount of royalties faculty can receive from their work.

Fear Academic Freedom But despite the changes, the AAU says many higher education institutions remain leery about placing too much emphasis on the development of technology at the expense of teaching, and many are concerned about losing their academic freedom if they receive too much money from businesses to conduct research.

"Notwithstanding the considerable difference between the profit-making goals of the private sector and the scholarly and educational goals of universities, the two parties each have resources that are needed by the other," the AAU reports. "The university can accept the financial support provided by industry and the industrial sponsor can accept the university's concerns for quality and impartiality in its research. Thus the two can form a respectable and profitable research relationship."

Many universities have found that one of the most productive ways to increase the number of research projects on campus is to revise royalty agreements to allow faculty to receive more money for their inventions, according to AAU.

The University of Michigan, for example, revised its royalty guidelines to allow faculty to keep 50 percent of the first $100,000 an invention earns, 40 percent of the second $100,000, and 20 percent of any amounts over $200,000.

The number of patents at the University of Washington grew from 25 a year between 1978 and 1982 to 75 in the first half of 1985 after similar revisions were made in its program, according to the AAU.

Copies of the report, "Trends in Technology Transfer at Universities: Report of the Clearinghouse on University-Industry Relations" are free from the Association of American Universities, One Dupont Circle, Washington, D.C. (202)466-5030.

Members of SUPA are encouraged to contribute items for this *Newsletter* to Jon Sandelin, Stanford University, 350 Cambridge Ave., Suite 250, Palo Alto, CA. 94306 (415 723-0651).

Society of University Patent
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GAO DRAFT REPORT - DATED JANUARY 7, 1987
(GAO CODE 005724) OSD CASE 7196

"PATENT POLICY: RECENT CHANGES IN FEDERAL LAW CONSIDERED BENEFICIAL"

DOD RESPONSE TO THE GAO DRAFT REPORT

* * * * *

FINDINGS

FINDING A: Public Law 96-517. The GAO observed that in 1971, President Nixon issued a statement of Government patent policy asserting Federal inventions are a valuable national resource, which should be expeditiously developed and used by the private sector for the benefit of the national economy. According to the GAO, in assessing the implementation of this policy, a Federal interagency committee on patent policy reported that, as of the end of FY 1975, the Government had an inventory of about 28,000 patented inventions, but had licensed less than 5 percent of them to businesses. The GAO found that, in response to the report, the Government has taken several actions to stimulate the commercialization of Federal technology and to provide a less expensive alternative to a patent that would protect against patent infringement law suits by subsequent inventors. The GAO further observed that Public Law 96-517 (which was enacted in 1980) gave nonprofit organizations and small businesses the right, with a few exceptions, to retain title to Federally funded inventions they develop. Specifically, the GAO noted that if a nonprofit organization or small business elected to take title to an invention, the Act states that the Government will have a royalty free license to use the invention. The GAO concluded that by forgoing its ownership rights, the Government encourages nonprofit and small business funding agreement recipients (i.e., recipients of Federal contracts, grants and cooperative agreements) to develop and market their Federally funded inventions. (p. 3, Executive Summary; pp. 10-11/GAO Draft Report)

Now on pp. 2 and 8-9.

DoD Response. Concur.

FINDING B: Subsequent Title Rights Changes. Since 1980, the GAO found that the Government has taken two additional actions to extend title rights to Federal funding agreement recipients. First, on February 18, 1983, President Reagan issued a memorandum on Government patent policy to Federal Agency heads stating that, to the extent permitted by law, agency policy should give all funding agreement recipients the title rights to Federally funded inventions that Public Law 96-517 gave to nonprofit organizations and small businesses. The GAO observed that, in effect, the President's memorandum gave most large business contractors the

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Now on pp. 2-3, 10-11, and 28-29.

while publication of an article could be delayed by the journal's review process. The GAO noted that in a report on the Public Law 98-622, the Senate Committee on the Judiciary stated that the commercialization rate for Federal inventions was "distressingly low" and that a Statutory Invention Registration's invention protection is adequate for the majority of Government-owned inventions. The GAO concluded, therefore, that the Congress intended for Federal Agencies to actively use the SIR program. (pp. 3-4, Executive Summary; pp. 13-15, pp. 35-36/GAO Draft Report)

DoD Response. Concur.

FINDING D: Federal Agency Implementation. The GAO found that Federal Agencies have complied with Public Law 96-517, and the President's February 1983 memorandum; however, according to officials of the DoD, the DOE, the Department of Health and Human Services (HHS), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF), implementation of Public Law 98-620 has been delayed because the Department of Commerce and the DOE disagreed over Commerce's proposed regulations that affect Energy's Government-owned, contractor-operated facilities (GOCO). The GAO observed, however, that Commerce issued interim regulations on July 14, 1986, which provides a basis for Federal Agencies to issue regulations that implement Public Law 98-620. The GAO also reported that it was advised by Army, Navy and Air Force patent attorneys that Public Law 96-517 has had a beneficial impact for some small business and nonprofit contractors, while the President's February 1983 memorandum generally had minimal impact on their procedures. (The GAO noted that the DoD historically had granted large business contractors an advance waiver of title rights to any resulting inventions.) According to the GAO, the DoD, the DOE, and the NASA patent attorneys had two concerns about the effect of the Public Law 98-620 amendments on invention disclosures and election of title rights, as follows:

- non-profit organizations and small businesses may not disclose all of their Federally funded inventions because they are obligated to report only inventions that are reported to their patent administrators; and

- the longer period available for a nonprofit or small business funding agreement recipient to elect to take title to an invention can create a problem, particularly because of the university community's emphasis on publishing research results.

The GAO concluded that while it may be too early to measure the effect Public Laws 96-517 and 98-620 have had on the utilization of Federally funded inventions, the title rights changes have had minimal effect on the DoD, the NASA, the HHS, and the NSF. (pp. 19-24/GAO Draft Report)

Now on pp. 16-20.

commercialize the technology than the Government, while 12 respondents favored giving title rights to large business because they perceived no reason for distinguishing between universities and small businesses on the one hand and large businesses on the other. In contrast, the GAO reported that two university administrators and one small business representative stated that large businesses definitely or probably should not be given title rights. In this regard, the GAO noted that six respondents (including some who were uncertain) expressed concern about giving title rights to large businesses because they felt that large businesses do not aggressively commercialize technology. According to the GAO, there has been concern that the President's February 1983 memorandum would induce large businesses to compete for Federal research and development funding against universities and small businesses. The GAO found, however, that 15 university administrators and 4 small business representatives stated that the President's memorandum definitely or probably has not had an impact on universities and small businesses (eight university administrators and two small business representatives were uncertain of the impact). The GAO reported that Federal Agency research and development data indicated that Federal Government obligations for research and development increased from $36.4 billion in FY 1982 to $48.3 billion in FY 1985--all five agencies reviewed increased the percentage of their research and development obligations to nonprofit organizations. The GAO concluded (along with most respondents), that large businesses should have title rights to inventions they develop with Federal funds. The GAO further concluded that the President's February 1983 memorandum has not adversely impacted universities and small businesses. (pp. 31-34/GAO Draft Report)

Now on pp. 24-26.

DoD Response. Concur.

FINDING G: SIR Program Usages. The GAO observed that while the SIR program is available to any applicant, it is aimed at Federal Agencies (particularly Defense, and to a lesser extent, Energy) whose primary objectives are to obtain patents to protect their large procurement programs from other inventors developing and patenting the inventions and subsequently filing infringement law suits against the Federal Agencies. While the Senate Committee on the Judiciary stated that in most cases, Federal Agencies should file SIRs instead of patent applications, the GAO found that SIRs comprised only 11 percent of the DoD and the DOE total applications (883) in FY 1986. In this regard, the GAO reported that during FY 1986, a total of 230 SIR applications were filed including 179 from Federal Agencies, 42 from nonfederal sources, and 9 in which the assignment of the SIRs title was not designated. According to the GAO, 18 university administrators said that universities will not use the SIR program regularly because (1) universities do not need defensive patent protection, and (2) their investigators will continue to disseminate research results publicly through the scientific literature. The GAO further observed that SIR usage varied among the five Federal agencies reviewed, depending in large part on the agency's

- With respect to cost savings, the GAO noted that an agency saves money because it pays lower Patent Office fees and reduces the work load of its patent attorneys. Agency cost savings also reflect a reduced work load for the Patent Office. The second cost savings for an agency is a reduced patent attorney work load. Agency cost savings also reflect a reduced work load for the Patent Office. The GAO noted that, according to Patent Office officials, on average, a SIR will be issued 8 months after the application is filed while a patent takes 23 months; and examiners take three hours on average to review and approve a SIR and 18 hours to review and approve a patent.

The GAO concluded, therefore, that because the SIR program is established in law and because of the potential cost savings of $950 per application plus reduced patent attorney time spent prosecuting patents, Federal Agencies should file for a SIR if defensive protection is the primary reason for the application. (pp. 39-43/GAO Draft Report)

Now on pp. 32-34.

DoD Response. Concur. An additional concern, which does not appear in the report, is whether or not the Patent Office would declare an interference with a SIR. The $950 fee for a patent also may be misleading. The $950 fee includes the first maintenance fee, which is optional and does not have to be paid.

FINDING I: DOD and DOE Licensing Efforts. The GAO observed that the Senate Committee on the Judiciary stated that the decision to file for a patent instead of a SIR should not be based on speculation or theoretical possibilities of the invention's commercial potential. The GAO reported that between FY 1980 and 1985, the DoD and the DOE filed 7,307 patent applications, received 5,705 patents, and issued 228 licenses for inventions. The GAO found, however, that the DoD and the DOE have licensed only about 3 percent of the inventions for which they filed a patent application. The GAO observed that, while the Federal Technology Transfer Act of 1986 is intended to improve the commercialization of Federal laboratory inventions, it is unclear what effect the Act will have because the DoD research and development is mission-oriented and many Defense inventions cannot be readily commercialized in the civilian sector. The GAO also found that the Army, the Navy, the Air Force, and the DOE do not have written criteria for determining when to file a Patent and when to file a SIR, and to date only Navy has drafted implementing procedures. The GAO concluded that the DoD and the DOE should take specific actions to encourage the use of the SIR program. (pp. 43-46/GAO Draft Report)

Now on pp. 34-36.

DoD Response. Concur. It should be noted, however, that the 3% figure for licensed inventions is not supported by the data, which includes the number of licenses granted but not inventions licensed. Since many of the DoD licenses cover more than one invention, the percentage would be higher. The Navy, for example,

is needed before setting arbitrary percentage goals.

In addition, the DoD is concerned that there are some inconsistencies between the objectives of the SIR program and the Federal Technology Transfer Act of 1986, Public Law 99-502. The SIR program was established to provide a less expensive means than patents for protecting Government technology, while the Federal Technology Transfer Act focused on transfering Government technology through patent licensing. SIRs have no rights to license and so cannot be used as a mechanism for transfering technology. Further, since SIRs cannot be licensed and thereby generate income for the Government and inventor, the Federal Technology Transfer Act may inhibit the filing of SIRs. The Act provides financial incentives to both the Government and inventor. Also the decision to file a SIR cannot be made without the inventor's approval because under the Federal Technology Transfer Act, the inventor has the right to retain title if the Government does not file a patent application.

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statutory authorities, and different reasons for filing for patents. For example, Department of Defense procurements primarily involve high volume, repetitive acquisitions of weapons and related supplies. The Department of Energy's procurement program, by contrast, is primarily in research and development, a substantial portion of which is directed toward technologies suitable for commercialization. In addition, the Department of Energy expends considerable research and development funds in areas such as uranium enrichment and radioactive waste management; these technologies are generally not immediately commercially licensable in light of current Federal preemption of these technologies. However, DOE program officials have supported obtaining comprehensive patent protection in such areas in order to facilitate future "privatization" of such technologies if and when Administration policy so dictates. Therefore, a high percentage of the Department of Energy patent applications are filed based on commercial potential. In this regard, the Department of Energy is similar to the National Aeronautics and Space Administration (NASA) in that it generally does not rely heavily on defensive patenting to protect itself from patent infringement suits. In some cases, DOE accomplishes dual objectives in obtaining a regular patent where both commercial use and Government use of the invention are possible.

Ignoring the Department of Defense figures and focusing only on Department of Energy licenses as a percentage of patent applications filed on an average annual basis for the cited fiscal years 1980 through 1985 results in a figure of 5.5 percent for the Department of Energy. The figure for the Department of Defense is 2.0 percent. Comparing Department of Energy licenses granted as a percentage of patents granted on an average annual basis for the cited fiscal years yields a 7.6 percent rate. Moreover, we feel that statistically relating licenses to patent applications filed, rather than to patents granted, is unrealistic, since many patent applications do not become patents and thus are of no commercial value. Further, patent application figures include continuation applications, which are not directed to separate inventions, but which serve to further dilute the cited statistical ratio.

While even a 7.6 percent rate of licenses granted as compared to patents granted may be viewed by some as a low licensing rate, in the absence of a valid, broad-based, statistical comparison of these figures with similar licensing rates or commercialization rates of patented inventions by private parties, any conclusions to be drawn therefrom are seriously flawed. Indeed, given that the vast majority of patented inventions, substantially all of which are privately-owned, are never commercialized, we believe that a 7.6 percent licensing rate is likely to be not at all inconsistent with similar rates for privately-owned patents of commercial concerns. In this regard - and conspicuously absent from the report - are any specific licensing figures from the

SIRs and may cause DOE substantial negotiation problems in the future.

DOE hopes that these comments will be helpful to GAO in their preparation of the final report.

Sincerely,

Harry L. Peebles
Acting Assistant Secretary
Management and Administration

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private sector or a comparison of licensing statistics of agencies other than DOD.

In addition, it must be noted that DOE in recent years has increasingly granted patent waivers to contractors or inventors after DOE has filed for a patent application. Since waivers to specific inventions are granted only where the applicant has commercialization plans, these waivers serve to enhance technology transfer, but are not reflected in the cited licensing statistics. In recent years, approximately 25 percent of patent applications filed by DOE have been either waived to the contractor or inventor or have been licensed. Further, if DOE had filed for SIRs rather than patents on these inventions, almost all of which are contractor employee inventions, neither patent waivers nor patent licenses would be available and technology transfer opportunities would be diminished.

The recommendation that the Secretary of Energy establish annual percentage goals for using the SIR program would result in percentage goals that would likely be arbitrary, and as noted above, would be based on flawed statistical analysis. The Department of Energy uses SIRs and will continue to do so, when, in its judgment, such a course would be prudent; arbitrary percentage goals for filing SIRs would necessarily inhibit agency flexibility and discretion. The Department continues to believe that the cost savings of filing for a SIR rather than a patent are not always sufficient to overcome the negative aspects of the SIR program, one of which is that a SIR has no potential for fostering commercial utilization of an invention. In this regard, it must be noted that the potential cost savings cited in the draft report focus only on patent office filing fees and not on application preparation fees. Since application preparation fees for SIRs are equal to those for patent applications, the potential percentage savings of seeking a SIR rather than a patent is small. In addition, the wholesale filing of SIRs, which the report seems to advocate, could violate DOE's obligations under international agreements to grant a patent license to its cooperating international partners. Whether or not a license under a SIR, which would be meaningless, would extinguish patent infringement liability, there would be no preferred position which could be granted to the other party in return for co-sponsoring research. Intellectual property rights arising from international sponsorship of research are bargained over intensely and are used by agencies of other countries as part of their justifications for supporting such research by their governments. DOE utilizes international agreements to leverage its research dollars, particularly in these times of reduced budgets, and has many such agreements in place. If DOE filed SIRs extensively (which SIRs would convey no exclusive rights to anyone), the apparent justification to our foreign partners of co-sponsoring research with DOE would be diminished. This effect alone could far outweigh the modest cost savings available from

Comments From the Department of Energy

Department of Energy
Washington, DC 20585

FEB 11 1987

Mr. J. Dexter Peach
Assistant Comptroller General
Resources, Community, and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

The Department of Energy (DOE) appreciates the opportunity to review and comment on the General Accounting Office (GAO) draft report entitled "Patent Policy: Recent Changes in Federal Law Considered Beneficial" (GAO/RCED-87-44).

The subject draft report recommends that the Secretary of Defense and the Secretary of Energy encourage the use of Statutory Invention Registrations (SIRs) by (1) directing their General Counsel to establish written criteria for determining when to file a patent and a SIR; (2) recognizing SIRs in their Departmental incentive awards programs; and (3) establishing annual percentage goals for using the SIR program. The Department of Energy considers the implementation of the first and third recommendations unnecessary and unwarranted. Moreover, although the Department intends to implement the second recommendation, that of recognizing SIRs in its incentive awards program, such implementation will have minimal impact on the Department's patent program because virtually 100 percent of the Department's inventions arise from non-government employees.

With respect to the first recommendation, the Department of Energy patent organization already has such written guidelines, in use since 1985 in determining whether to file a patent application or a SIR application.

The third recommendation is based on figures showing that, on an annual average between fiscal years 1980 through 1985, the Departments of Defense and Energy filed 1,218 patent applications per year, but issued "only 38 invention licenses" per year, "about 3 percent of the inventions for which they filed a patent application."

The Department of Energy believes that having its patent and licensing statistics so intertwined with the Department of Defense (DOD) distorts the statistics of both Departments. The Departments in many respects have different missions, different

granted 9 licenses on 12 patents in FY 1983 and 11 licenses on 22 patents in FY 1984.

RECOMENDATIONS

Now on p. 37.

RECOMMENDATION 1: The GAO recommended that the Secretary of Defense and the Secretary of Energy encourage the use of SIRs by directing their General Counsels to establish written criteria for determining when to file a patent and a SIR. (p. 46/GAO Draft Report)

DoD Response. Concur. The Army and Air Force Offices of the Judge Advocate General and the Office of the Navy General Counsel intend to develop written criteria by July 1, 1987, for determining when to file for a patent or a SIR. The Army will publish the written criteria in AR 27-60. The Navy has published interim written criteria in the Office of the Chief of Naval Research memorandum, 5870, Ser OOCCP/01, January 12, 1987, and will determine at a later date whether further guidance is required. The Air Force has decided there is no need nor advantage in publishing their written criteria in a regulation since the Patent Attorneys work directly for the Judge Advocate General. The Air Force Patent Attorneys, however, will be provided written criteria to follow.

Now on p. 37.

RECOMMENDATION 2: The GAO recommended that the Secretary of Defense and the Secretary of Energy encourage the use of SIRs by recognizing SIRs in their incentive awards programs. (p. 46/GAO Draft Report)

DoD Response. Concur. The Army, Navy, and Air Force propose to use the same incentive awards for SIRs as are used in patents. The Army has already implemented an incentive awards program for SIRs, which can be found in AR 672-20. The Air Force incentive awards program for SIRs will be in revision of AFR 900-4, which is expected to be published in May 1987. The Office of the Navy General Counsel will develop an incentive awards program for SIRs by July 1, 1987. The civilian personnel offices within each Naval command will then be requested to incorporate the SIRs incentive awards in their incentive awards program.

Now on p. 37.

RECOMMENDATION 3: The GAO recommended that the Secretary of Defense and the Secretary of Energy encourage the use of SIRs by establishing annual percentage goals for using the SIR program. (p. 46-47/GAO Draft Report)

DoD Response. Non-concur. The DoD recommends reliance upon actions relative to the two prior recommendations to encourage the use of SIRs, and disagrees with the establishment of percentage goals at this time. It is the DoD position that it is premature to consider establishing annual percentage goals for using the SIR because the SIR program is new and more experience

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perception of its need for defensive patenting. The GAO was informed by agency patent attorneys that the primary patent objective for the Army, the Navy, the Air Force, and to a lesser extent, the DOE, is to protect agency procurements from patent infringement law suits, and that the potential commercialization of inventions is a secondary concern. According to the GAO, Patent Office officials are disappointed in Federal Agency usage of the SIR program to date; it had anticipated that Federal Agencies would file about 500 original SIR applications per year. In light of Congressional intent ("....the Committee expects that the Government will ordinarily use a SIR unless an invention has commercial potential which justifies the expenses of obtaining a patent....") the GAO concluded that DOE and DoD should take specific actions to encourage the use of the SIR program. (pp. 36-39/GAO Draft Report)

Now on pp. 29-31.

DoD Response. Concur.

FINDING H: Agency Concerns About the SIR Program. The GAO reported that some of the DoD and the DOE patent attorneys expressed the following concerns about using the SIR program:

- the validity of a SIR as prior art and therefore as a basis for rejecting a subsequent patent application filed by a third party has not been tested in a case before the Patent Office's Board of Appeals or the federal courts;
- a SIR could adversely affect Agency and contractor inventor morale because it does not have the recognition and prestige of a patent; and
- the cost savings of filing for a SIR instead of a patent are not sufficient to overcome the negative aspects of the SIR program.

The GAO presented the following assessment of each of the above concerns:

- The first concern reflects the 1976 decision by the Patent Offices' Board of Appeals that rejected the Defense Publication program. According to the GAO, the Congress addressed this concern by legislatively establishing the SIR program and by stating in the legislative history that the SIR will be "prior art" and a "constructive reduction to practices" under 35 U.S.C. 102(a) and (g), respectively, as of the filing date of the application on which it is based.
- The second concern reflects the newness of the SIR program and a perception that a SIR does not have a patent's prestige and recognition. The GAO observed that agencies have, however, taken some actions to improve this situation.

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DoD Response. Concur.

FINDING E: Title Rights' Impact On Universities and Small Businesses. According to the GAO, administrators at 25 universities stated that the Federal title rights provisions have had a significant positive impact on their universities' research and innovation efforts. In this regard, the GAO noted that according to twenty administrators, since businesses know that universities could take title to Federally funded inventions, they no longer were concerned their research efforts could be "contaminated" by Federal funding with the possibility that a Federal Agency could assert title rights to resulting inventions. In addition, the GAO reported university administrators stated that Public Laws 96-517 and 98-620 have stimulated business interest in funding research at their universities from a moderate to a great extent. Specifically, the GAO reported that with respect to the Public Law 98-620 amendments, the administrators stated that removal of licensing restrictions on nonprofit organizations will be particularly significant. The GAO further reported the eight small business trade association representatives and/or small business men it interviewed stated that Public Laws 96-517 and 98-620 have had a significant positive effect on small businesses' research and innovation efforts because small businesses can retain title to any inventions that result from the research. The GAO further found, however, that the business representatives added that other factors, such as the Federal Small Business Innovation Research program and the 1981 lowering of the maximum capital gains tax rate have had an equal or greater significant effect on small businesses' research and innovation efforts. In addition, the small business representatives indicated that the Public Law 98-620 amendments will not have much effect on small businesses as the Public Law 96-517 restrictions on licensing or assigning rights to inventions only applied to nonprofit organizations. While it may be too early to measure the effect that Public Laws 96-517 and 98-620 have had on the utilization of federally funded inventions, the GAO concluded the three other objectives of Public Law 96-517 are being achieved: (1) encouraging maximum participation of small business firms in Federally supported research and development efforts, (2) promoting collaboration between businesses and nonprofit organizations, and (3) minimizing related administrative costs. (pp. 25-31/GAO Draft Report)

Now on pp. 20-24.

DoD Response. Concur.

FINDING F: Impact of The President's Memorandum. The GAO reported that 19 of the university administrators and 6 of the small business representatives stated that large business definitely or probably should be given title rights to Federally funded inventions they develop. Specifically, the GAO observed that the nineteen respondents stated that large businesses should have title rights because they could more effectively

right to retain title to inventions they developed with Federal funds. Second, Public Law 98-620 (enacted on November 8, 1984) amended Public Law 96-517, by extending its coverage and easing or removing some of its restrictions. The GAO cited, as an example, the Act eased restrictions on when a small business or nonprofit funding agreement recipient is required to disclose an invention to the sponsoring Federal Agency, the amount of time it has to elect to take title to the invention, and the ability of nonprofit agreement recipients to assign title rights to another organization. The GAO further reported, that Public Law 98-620 also transferred responsibility from the Office of Federal Procurement Policy and the GAO, respectively, to the Department of Commerce for issuing Government-wide regulations to implement the act and review Federal Agency exceptions for not giving a nonprofit or small business funding agreement recipient title to an invention. The GAO also reported that in addition to patent policy changes, which give title rights to Federal funding agreement recipients, the Congress has enacted legislation to encourage Federal Agencies to commercialize their inventions. In this regard, the GAO reported that the Federal Technology Transfer Act of 1986 authorizes Federal Agencies to permit a Federal laboratory director to enter into cooperative research and development agreements with nonfederal organizations and to negotiate licensing agreements for laboratory inventions. The GAO concluded that in order to stimulate the use of Federally funded technology, the Government has taken several actions since the enactment of Public Law 97-517, which give most Federal funding recipients the right to retain title to inventions they develop. (pp. 12-13/GAO Draft Report)

Now on pp. 9-10.

DoD Response. Concur.

FINDING C: The Statutory Invention Registration Program. The GAO reported that the Patent Law Amendments Act of 1984, (Public Law 98-662, November 8, 1984) established the Statutory Invention Registration (SIR) program. The SIR program provides inventors with a less expensive and time-consuming alternative (versus a patent) for protecting their rights to use inventions, except that the inventor is not provided with a patent's exclusive right to use an invention over a 17-year period. The GAO observed that while the Congress established the SIR program to be used principally by the DoD and the Department of Energy (DOE), at the request of large businesses the Congress made it available to any applicant. Because the Act states that a SIR has all the defensive attributes of a patent, the GAO reported that, according to Patent Office officials, a SIR and a patent would be treated equally in an interference proceeding. While some individuals or organizations may not need a patent's defensive protection, publishing an article in a scientific journal provides a less expensive alternative than a patent or SIR application. The GAO found, however, that there are certain advantages of filing a SIR instead of relying on a published article. The GAO cited, as an example, the Patent Office recognizes a SIR as of the date that the application is filed,

Comments From the Department of Defense

ASSISTANT SECRETARY OF DEFENSE

WASHINGTON, D.C. 20301-8000

ACQUISITION AND LOGISTICS

(PS/IPQ)

MAR 12 1987

Honorable Frank C. Conahan
Assistant Comptroller General
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

This is the Department of Defense (DoD) response to the draft General Accounting Office (GAO) report, GAO/RCED-87-44, "Patent Policy: Recent Changes in Federal Law Considered Beneficial," dated January 7, 1987, (GAO Code No. 005724) OSD Case No. 7196. The DoD basically concurs with the GAO report. It is, however, the DoD position that it is premature to consider establishing annual percentage goals for using the Statutory Invention Registration (SIR) because the SIR program is new and more experience is needed before arbitrary percentage goals can be set.

The DoD appreciates having had the opportunity to review and comment on the draft report. Specific comments are provided in the enclosure.

Sincerely,

Thomas P Christie
for the
Assistant Secretary of Defense
(Acquisition & Logistics)

Enclosure:
As Stated

Comments From the Department of Commerce

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Productivity, Technology and Innovation
Washington, D.C. 20230
(202) 377-1984

FEB 3 1987

Honorable J. Dexter Peach
Assistant Comptroller General
U. S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Peach:

Thank you for your letter regarding the draft report, Patent Policy: Recent Changes in Federal Law Considered Beneficial (GAO/RCED-87-44). It is an excellent piece of work and contains a sound analysis based on a balanced collection of data. We have three substantative comments.

Now on pp. 18-19.

On page 22, the draft indicates that the U.S. Department of Energy (DOE) submitted statements of analysis and determination of exceptional circumstances to Commerce in June 1985. The Commerce regulation covering this requirement (37 CFR 401), became final on July 14, 1986. Paragraph 401.3(f) of the regulation requires that copies of each determination, statement of fact, and analysis be sent to the Secretary of Commerce within 30 days after the award of each funding agreement to which they pertain. The material provided by DOE in 1985 before the regulation was issued does not meet this requirement.

Now on p. 20.

Page 24 includes the concerns of several agency patent attorneys that the invention reporting requirement of P.L. 98-620 may reduce the number of inventions reported by contractors.

Now on p. 21.

Page 26, however, shows that the number of inventions reported has increased in universities, where the same reporting requirement has been in effect for over five years. We believe the university data shows the value of incentives for inventor reporting and is an answer to the patent attorneys' concerns. A recent study by the American Association of Universities (AAU) supports this conclusion (summary attached).

We agree with your analysis and recommendations on the Statutory Invention Registration. Our report to Congress may contain additional information and recommendations.

We thank you for the opportunity to review this draft.

Sincerely,

D. Bruce Merrifield

D. Bruce Merrifield

Enclosure

Disposition of Title Rights for DOE's GOCO Facilities

Table III.1: Disposition of Title Rights for Nonprofit Operators of DOE's GOCO Facilities

Contractor	Facility or location
Contractor will be able to elect to take title to all inventions	
Iowa State University	Ames Laboratory
University of Chicago	Argonne National Laboratory
Associated Universities, Inc.	Brookhaven National Laboratory
University Research Association, Inc.	Fermi National Accelerator Laboratory
Lovelace Biomedical and Environmental Research Institute	Inhalation Toxicology Research Institute
University of California	Lawrence Berkeley Laboratory
Oak Ridge Associated Universities	Oak Ridge, Tennessee
Battelle Memorial Institute	Pacific Northwest Laboratory
Princeton University	Princeton Plasma Physics Laboratory
Midwest Research Institute	Solar Energy Research Institute
Stanford University	Stanford Linear Accelerator Center
Title rights restricted by the act	
University of California	Lawrence Livermore Laboratory
University of California	Los Alamos National Laboratory
University of Georgia	Savannah River Ecology Laboratory

Universities Contacted

Boston University
University of California[a]
California Institute of Technology
Cornell University
Duke University
University of Florida
Georgia Institute of Technology
Harvard University
University of Illinois
Iowa State University Research Foundation[b]
The Johns Hopkins University
Massachusetts Institute of Technology
Michigan State University
Michigan Technological University
University of Minnesota
Northwestern University
University of Pennsylvania
Purdue University
Stanford University
State University of New York Research Foundation[ab]
University of Texas
University of Utah
University of Washington (Seattle)
Washington University (St. Louis)
Wisconsin Alumni Research Foundation[b]

[a]The university has a centralized patent administration office for all of the state campuses.

[b]Many universities have established separate organizations for patenting and licensing their inventions.

annual SIR usage goals and actual agency performance, which Commerce can report to the Congress in its annual report, will provide the Congress a basis for assessing the SIR procedure's effectiveness.

DOE also identified two other concerns about the report. The first related to its licensing program. DOE stated that (1) its patenting and licensing statistics should be identified separately from DOD's, (2) we should compare the number of inventions that DOE licensed with patents it received rather than with its patent applications, (3) we should compare DOE's licensing program with other federal agencies and private industry to evaluate its effectiveness, and (4) DOE's licensing statistics are underreported to some extent because they do not include inventions that DOE patents and then subsequently waives title rights to the contractor for commercial development. We agree that DOE's patenting and licensing statistics should be discussed separately from DOD's, and we have modified the report accordingly. We disagree, however, that we should compare DOE's licensed inventions with patents it received or DOE's licensing program with other organizations' programs because the report's objective was to assess federal agencies' usage of SIRs rather than to evaluate the success of the agencies' licensing programs. Regarding potential underreporting of licensing data, as discussed in chapter 2, DOE's GOCO contractors petitioned DOE for a waiver of title rights for 135 inventions between October 1977 and June 1985 (equivalent to about 17 inventions per year). DOE is in the process of implementing Public Law 98-620 and the President's February 1983 memorandum for its nonprofit and large business GOCO contractors, respectively. This implementation will give many of its GOCO contractors the right to retain title to most or all of the inventions that they develop without requesting a waiver of title rights from DOE. As a result, DOE's future data will include few instances of DOE patenting an invention and then subsequently giving title rights to its GOCO contractor.

DOE's last concern was that elements of its research and development program are similar to NASA's and different from DOD's so that the SIR procedure may not be appropriate for DOE. We disagree. DOE has a sizable civilian energy research and development program. Of DOE's $5.7 billion budget authority for research and development in fiscal year 1986, its civilian programs comprised 53 percent and its atomic energy defense program comprised 47 percent. However, 178 (61 percent) of DOE's 294 patent applications in fiscal year 1986 came from 5 laboratories that are primarily or totally dedicated to atomic energy defense research and development (Bettis Atomic Power Laboratory, Knolls Atomic Power Laboratory, Lawrence Livermore Laboratory, Los Alamos

Transfer Act. With these changes the 75 percent SIR usage rate that the Navy cited in its 1983 testimony, or even a 50 percent usage rate, may no longer be appropriate.

Overall, we believe that DOD can improve both its licensing of inventions with substantial commercial potential and its use of SIRs for inventions with little or no commercial potential. Between fiscal years 1981 and 1986, DOD licensed only about 2 percent of the inventions for which it filed a patent application. In fiscal year 1986, the Air Force filed 222 patent applications but issued no licenses for its inventions and filed no original SIR applications. To stimulate the use of SIRs, we continue to believe that the establishment of SIR usage goals can provide a documented basis for establishing reasonable usage rates while providing a standard against which to measure an agency's performance. Commerce can assess the agencies' goals and performance in its annual report to the Congress.

While it concurred with our findings, DOD had three concerns. First, in addition to the three agency concerns about SIRs that we listed, DOD is concerned about whether or not the Patent and Trademark Office would declare an interference on the basis of a SIR. In response to this concern, the Patent and Trademark Office's Special Assistant to the Assistant Commissioner for Patents told us that, while no SIR has been involved in an interference to date, Patent and Trademark Office examiners have cited SIRs as references in actions rejecting patent applications. He added that the Patent and Trademark Office physically places SIRs in its search files with patents so its examiners have access to them and that these search files are being computerized.

Second, DOD believes that citing a $950 reduction in Patent and Trademark Office fees per application may be misleading because it includes the first maintenance fee of $450, which is optional and does not have to be paid. DOD patent attorneys stated that the Air Force has implemented procedures and that the Army and the Navy plan to develop criteria or procedures for determining whether to pay the first maintenance fee. Because of these planned actions, we changed the report to reflect the greater likelihood that the first maintenance fee will not be paid for inventions with little or no demonstrated commercial potential. However, we note that DOE states that it will routinely pay the first maintenance fee, but will carefully screen a patented invention's commercial potential before paying the second maintenance fee.

received 163 patents, issued less than 1 license on less than 1 patent, and received royalty income of $2,217; and DOE filed 327 patent applications, received 256 patents, issued 19 licenses on 19 patents, and received royalty income of $113,160.

The number of DOE patent applications is likely to drop in the future once many of its GOCO contractors can retain title to inventions. In addition, the Federal Technology Transfer Act of 1986 is intended to improve the commercialization of government-operated laboratory inventions by authorizing federal agencies to permit their laboratories to enter into cooperative research and development agreements and to negotiate licensing agreements for laboratory inventions. However, it is unclear what effect the act will have because DOD's research and development is mission-oriented and many defense inventions cannot be readily commercialized in the civilian sector.

The Army, the Navy, the Air Force, and DOE do not have written criteria for determining when to file for a patent or a SIR. In its comments on the draft report, DOD stated that the Army, the Navy, and the Air Force plan to develop written criteria by July 1, 1987, and that the Navy issued interim guidance to its subordinate commands in January 1987 that could become final. The Navy's interim guidance states that after the Navy decides that it should protect its interest in an invention by filing a patent or a SIR application, a patent application will be filed unless the invention has no potential commercial use. This guidance conflicts with the Senate Judiciary Committee's intent that federal agencies ordinarily use a SIR unless an invention has commercial potential that justifies the expenses of obtaining a patent. We believe that DOD and DOE should develop written criteria that define the sufficiency of an invention's commercial potential that warrants filing for a patent instead of a SIR.

Conclusion

The primary patent objective for DOD and, to a lesser extent, DOE is to protect agency procurements from patent infringement law suits. While NASA procures systems and materials for its space program mission, the SIR program may be only marginally useful because agency officials state that NASA does not need the large quantities of items that are the basis for defensive patenting.

The Senate Committee on the Judiciary expressed its intent that federal agencies actively use the SIR program and stated that it believed that a SIR's protection is appropriate for most government-owned inventions made by federal contractors and employees. In light of congressional

initial rejection, which requires the applicant to modify the application.[3] Patent and Trademark Office data show that it processed and issued SIRs for 40 of the 121 original SIR applications that federal agencies filed in fiscal year 1986. Of these, 34 were issued without an initial rejection. The Patent and Trademark Office issued final rejections for three federal agency SIR applications during the fiscal year. Patent and Trademark Office data show that it approved only 11 percent of the patent applications without an initial rejection in fiscal year 1986.

Agency cost savings also reflect a reduced work load for the Patent and Trademark Office. Patent and Trademark Office officials stated that, on average, a SIR will be issued about 8 months after the application is filed, while a patent takes about 23 months. Data from the Patent and Trademark Office section that reviews all of the SIR applications show that examiners take 3 hours on average to review and approve a SIR and 18 hours on average to review and approve a patent. A Patent and Trademark Office examiner's review of a SIR is limited to its specifications of and claims about the invention, and a SIR is less likely to be rejected for inadequacies, or, if it is rejected, Patent and Trademark Office officials stated that the application normally is easy to modify.

DOD and DOE Licensing Efforts

An invention's commercial potential is an important consideration in determining whether to apply for a patent or a SIR. As discussed previously, the Senate Committee on the Judiciary stated that the decision to file for a patent instead of a SIR should not be based on speculation or theoretical possibilities of the invention's commercial potential. Table 3.2 shows that DOD and DOE filed 6,926 patent applications, received 5,664 patents, issued 179 licenses on 211 patents, and received royalty income of $890,776 between fiscal years 1981 and 1986. These numbers indicate that DOD has licensed about 2 percent and DOE has licensed about 6 percent of the inventions for which they filed a patent application. However, despite this disparity between patent applications and licenses issued, as we noted earlier, table 3.1 shows that SIRs accounted for only 16 percent of DOD's and 4 percent of DOE's applications to the Patent and Trademark Office in fiscal year 1986.

[3]Patents and SIRs also can get involved in a Patent and Trademark Office interference proceeding, and Patent Office actions can be appealed to its Board of Patent Appeals and Interferences and then to the federal courts.

Agency Concerns About Using SIRs

Some of the DOD and DOE patent attorneys expressed the following concerns about using SIRs:

- The validity of a SIR as prior art and therefore as a basis for rejecting a subsequent patent application filed by a third party has not been tested in a case before the Patent and Trademark Office's Board of Patent Appeals and Interferences or the federal courts. Should a SIR be used for important defensive inventions before the courts have ruled on its validity?
- A SIR could adversely affect agency and contractor inventor morale because it does not have the recognition and prestige of a patent.
- The cost savings of filing for a SIR instead of a patent are not sufficient to overcome negative aspects of the SIR program.

We assessed each of these concerns. The first concern reflects the 1976 decision by the Patent and Trademark Office's Board of Appeals that rejected the Defensive Publication program. The Congress addressed this concern by legislatively establishing the SIR procedure and by stating in the legislative history that the SIR will be "prior art" and a "constructive reduction to practice" under 35 U.S.C. 102(a) and (g), respectively, as of the filing date of the application on which it is based. In addition, Patent and Trademark Office officials stated that patent and SIR applications would be treated equally for determining when an invention was conceived and reduced to practice. It may be that some uncertainty about the validity of a SIR will remain until the courts review a patent interference case in which a SIR is considered prior art. However, because the SIR procedure is established in law, we believe that federal agencies should file for a SIR if defensive protection is the primary reason for the application.

We believe the second concern reflects the newness of the SIR procedure and a perception that a SIR does not have a patent's prestige and recognition because it does not have the enforceable attributes of a patent. Agencies have taken some actions to improve this situation. Shortly after the SIR procedure was initiated, several agency patent attorneys met with Patent and Trademark Office officials to upgrade the appearance of the SIR document. To promote recognition of inventors whose inventions result in a SIR, the Army established the same incentive award procedures and award dollar amounts for inventions that result in patent and SIR applications, effective January 1987. The Air Force and the Navy are in the process of similarly revising their incentive awards programs.

investigators will continue to disseminate research results publicly through the scientific literature. Five small business representatives stated that small businesses will not use SIRs. Instead, because of the significant patent attorney costs associated with preparing and prosecuting a patent or SIR application, small businesses would use their limited resources to pursue patents that give them exclusive rights to inventions. Alternatively, most of the respondents said that SIRs probably or definitely would not adversely affect their organizations.

SIR usage varied among the five federal agencies that we reviewed, depending in large part on the agency's perception of its need for defensive patenting. As shown in table 3.1, DOD filed 89 percent and DOE filed 9 percent of the 121 original SIR applications in fiscal year 1986. Agency patent attorneys told us that the primary patent objective for the Army, the Navy, the Air Force, and, to a lesser extent, DOE is to protect agency procurements from patent infringement law suits and that the potential commercialization of inventions is a secondary concern. NASA, HHS, and NSF filed no original SIR applications in fiscal year 1986. NASA and HHS officials told us that they do not expect to use SIRs because their patent programs' principal goal is commercialization and that, to the extent that they are interested in defensive protection, NASA would rely on publication in its Tech Briefs and HHS would use the scientific literature to publicly disclose technical information about their inventions. (This would establish the inventions as prior art in patent law as of the journal's publication date.) NASA officials added that, while the agency procures systems and materials for its space program missions, it does not need the large quantities of items that are the basis for defensive patenting. NSF officials said that the agency is not interested in patenting. If a funding agreement recipient decides not to take title to an invention, NSF relies on the recipient to disseminate information about the invention through articles published in the scientific literature.

Statutory Invention Registrations

The Congress established the SIR procedure to be used principally by DOD and DOE whose primary patent concern is to protect their procurement programs from patent infringement law suits. DOD and DOE received about 80 percent of the patents that the Patent and Trademark Office issued to federal agencies between fiscal years 1981 and 1986. While the Senate Committee on the Judiciary stated that federal agencies should file SIRs instead of patent applications in most cases, SIRs comprised 16 percent of DOD's and only 4 percent of DOE's applications in fiscal year 1986. Between fiscal years 1981 and 1986, DOD licensed about 2 percent and DOE licensed about 6 percent of the inventions for which they filed a patent application.

Historical Perspective

SIRs provide inventors with a less expensive alternative than a patent for preventing others from patenting an invention. Without the protection of a patent or a SIR, an organization that uses an invention could be sued for patent infringement by another organization that subsequently develops and patents the invention. SIRs are targeted at federal agencies. However, at the request of large businesses, the Congress made them available to any applicant.

The SIR procedure is similar to the Defensive Publication program that the Patent and Trademark Office created administratively in 1968 under 37 CFR 1.139. However, because the Defensive Publication program was not established by legislation, the Patent and Trademark Office's Board of Appeals held in 1976 that a defensive publication was not evidence of prior knowledge as of its filing date under 35 U.S.C. 102(a). In view of this decision, the SIR procedure was legislatively established. Both the Senate Committee on the Judiciary, in its report on Public Law 98-622 (Senate Report 98-663), and the Chairman, Subcommittee on Courts, Civil Liberties and the Administration of Justice, House Committee on the Judiciary, in the House floor debate, stated that SIRs will be "prior art" and a "constructive reduction to practice" under 35 U.S.C. 102(a) and (g), respectively, as of the filing date of the application on which it is based.

The Senate Committee on the Judiciary expressly stated that federal agencies should actively use SIRs. Noting that the rate of commercialization of federal inventions was "distressingly low," the committee stated that it believed that a SIR's invention protection is adequate for the majority of government-owned inventions and that

Our review of federal agency research and development funding data shows that federal government obligations for research and development increased from $36.4 billion in fiscal year 1982 to $48.3 billion in fiscal year 1985. Total obligations to nonprofit organizations were $8.2 billion (22.5 percent) in fiscal year 1982 and $11.2 billion (23.2 percent) in fiscal year 1985. Small businesses received contract awards of $955 million (4.8 percent) in fiscal year 1982 and $1.5 billion (5.8 percent) in fiscal year 1985. All five agencies that we reviewed increased the percentage of their research and development obligations to nonprofit organizations. Similarly, the percentage of small business funding increased for each subject area that the federal procurement data system tracks.

Observations

Federal agencies have complied with the President's February 1983 memorandum; however, implementation of Public Law 98-620 has been delayed. While it may be too early to measure the effect that Public Laws 96-517 and 98-620 have had on the utilization of federally funded inventions, the university administrators and small business representatives we contacted believe three other objectives of Public Law 96-517 are being achieved. University administrators stated that the acts' title rights provisions have encouraged business sponsorship of their universities' research and have reduced their universities' administrative costs. The Public Law 98-620 amendment that removes licensing restrictions on nonprofit organizations will be significant for their universities' innovation efforts. Small business representatives stated that the title rights provisions have encouraged small businesses to bid on government contracts and to participate in the SBIR program.

Most of the respondents stated that large businesses should have title rights to inventions that they develop with federal funds and that the President's February 1983 memorandum has not had an impact on universities and small businesses.

Seven small business representatives said that the SBIR program and federal tax law changes, particularly the 1981 reduction of the capital gains tax rate, were equally or more significant for small business research and innovation efforts than the title rights provisions for federally funded inventions. Overall, the representatives said that Public Laws 96-517 and 98-620 would stimulate small businesses to fund university research or license university inventions only to some extent but would have more impact in stimulating small businesses to participate in state-sponsored research centers that bring universities and businesses together.

As table 2.5 shows, the small business representatives indicated that the Public Law 98-620 amendments will not have much effect on small businesses. While five representatives considered the extension of the title election period significant, only two representatives considered any of the other provisions to be significant. (The Public Law 96-517 restrictions on licensing or assigning rights to inventions only applied to nonprofit organizations.) The representatives did not identify any additional changes specifically related to title rights for federally funded inventions that they believed were needed.

Table 2.5: Impact of Public Law 98-620 Amendments on Small Businesses

	Significant	Little or no impact
Inclusion of novel varieties of sexually reproducing plants	2	6
Inclusion of many GOCO facilities	3[a]	5
Extension of invention disclosure period[b]	1	6
Extension of title election period[b]	5	2
Small business licensing preference	2	6

[a]One representative said that it would have a significant negative impact.

[b]One representative was uncertain about the impact.

Impact of the President's Memorandum

As shown in table 2.6, 19 of the university administrators and 6 of the small business representatives stated that large businesses definitely or probably should be given title rights to federally funded inventions that they develop. In contrast, two university administrators and one small business representative said that large businesses definitely or probably should not be given title rights.

licensing restrictions on universities will be significant for their universities' innovation efforts. About half of the administrators considered significant the amendments that extend the act's coverage to include novel varieties of sexually reproducing plants and ease restrictions on universities' ability to assign title rights to a federally funded invention without obtaining federal agency approval. Only the three universities in our survey that operate GOCO facilities for DOE considered significant the extension of Public Law 96-517 to include GOCOs that are not primarily dedicated to DOE's naval nuclear propulsion and weapons-related programs. The administrators did not identify any additional changes specifically related to title rights for federally funded inventions that they believed were needed.

Table 2.3: Impact of Public Law 98-620 Amendments on Universities

	Significant	Little or no impact
Inclusion of novel varieties of sexually reproducing plants[a]	12	12
Inclusion of many GOCO facilities	3	22
Extension of invention disclosure period	9[b]	16
Extension of title election period	10[b]	15
Easing restrictions on assigning invention	12	13
Removal of licensing restrictions	25	0

[a]One administrator was uncertain about the impact.

[b]One administrator said it would have a significant negative impact.

When asked to comment on the federal agencies' concern about receiving information on invention disclosures and taking title to inventions, most administrators said they did not have a problem in providing timely and reliable information beyond an occasional instance of nonreporting. However, four administrators said they have had a problem in getting this information from university investigators who receive federal research funding. Several administrators said their universities reported the important inventions, including the ones with the most potential for patenting and licensing, but a marginal invention might be missed because a university investigator does not disclose it to the university's patent office.

Corporations Funding Research at Universities

Executives of 10 companies that sponsor university research generally said that their companies had sponsored university research for many years. Most executives stated that their objective was to sponsor the work of a particular university investigator and/or to identify potential

Agency Concerns About Public Law 98-620 Amendments

DOD, DOE, and NASA patent attorneys had two concerns about the effect of the Public Law 98-620 amendments on invention disclosures and election of title rights. First, nonprofit organizations and small businesses may not disclose all of their federally funded inventions because they are obligated to report only inventions that are reported to their patent administrators rather than all inventions that are developed. Second, the longer period available for a nonprofit or small business funding agreement recipient to elect to take title to an invention—2 years instead of 1—can create a problem, particularly because of the university community's emphasis on publishing research results. Under 35 U.S.C. 102(b), a patent application must be filed within 1 year after an invention is publicly disclosed. The patent attorneys stated that the extended title election period is likely to increase cases in which federal agencies face a tight deadline for determining whether to file a patent application because the invention previously was publicly disclosed in a paper or a scientific journal.

Navy and NASA patent attorneys noted, however, that they do not contract extensively with nonprofit organizations and small businesses. They said their concerns would be much greater if the Public Law 98-620 invention disclosure and title rights election provisions were extended to large businesses.

Title Rights' Impact on Universities

Overall, administrators at the 25 universities we surveyed stated that the federal title rights provisions have had a significant positive impact on their universities' research and innovation efforts. (See table 2.1.) Twenty administrators explained that, since businesses knew that universities could take title to federally funded inventions, they no longer were concerned that their research efforts could be "contaminated" by federal funding with the possibility that a federal agency could assert title rights to resulting inventions. Seven administrators cited the reduced administrative burden that has occurred because of the uniform federal patent policy and/or because universities no longer have to apply to federal agencies for a waiver of title rights.

Table 2.1: Administrators' Perceptions of the Impact of Public Laws 96-517 and 98-620 on Universities

Very significant positive impact	7
Significant positive impact	13
Moderate positive impact	5
Some positive impact	0
Little or no positive impact	0

Our report, Energy Management: Effects of Recent Changes on DOE Patent Policies (GAO/RCED-87-5, Dec. 31, 1986), assessed the potential impact that federal title rights changes will have on DOE's GOCO facilities. DOE data show that GOCO facilities generated 7,235 inventions between October 1977 and June 1985 and that GOCO contractors petitioned for a waiver for 135 inventions between October 1977 and December 1985. While DOE headquarters approved a waiver, or a license in one case, for all of the requests it had acted on as of December 1985, DOE took 14 months on average to process the request and issue the waiver.

In response to Public Law 98-620 and the President's memorandum, the Secretary of Energy established a task force in November 1984 and approved its recommendations in February 1985. The DOE task force determined that nonprofit GOCO operators at 11 locations will be able to elect to take title rights to all inventions while nonprofit GOCO operators at 3 locations that are primarily dedicated to naval nuclear propulsion or weapons-related programs will have restricted rights. In addition, the task force determined that large business GOCO operators at 9 locations will be able to elect to take title rights to all inventions, while large business GOCO operators at 18 other locations will have restricted or no rights to take title to inventions. (See app. III.) As of March 20, 1987, DOE had approved modified title rights clauses for nonprofit operators at six GOCO locations, was negotiating with nonprofit operators at three locations, and had not initiated negotiations with nonprofit operators at the other five locations. It plans to issue a regulation establishing criteria and procedures for giving eligible large business GOCO operators advance class waivers of title rights to inventions that their facilities develop, including provisions to minimize any potential conflicts of interest that may arise between a GOCO operator and an affiliate company.

The Secretary of Energy also endorsed a task force recommendation that a class of exceptional circumstances be established that would deny GOCO operators title rights in (1) uranium enrichment, (2) civilian high-level radioactive waste, and (3) classified or sensitive technology under section 148 of the Atomic Energy Act of 1954.[1] Because Public Law 98-620 gives Commerce responsibility for reviewing federal agency exceptions for not giving a nonprofit contractor title to an invention, DOE submitted statements of analysis and determination of exceptional

[1]Section 3131 of the National Defense Authorization Act for Fiscal Year 1987 (Public Law 99-661, Nov. 14, 1986) further addresses the protection of sensitive technical information under 35 U.S.C. 202(a)(ii) and (iv).

Title Rights to Federally Funded Inventions

Federal agencies have complied with the President's February 1983 memorandum; however, implementation of the Public Law 98-620 amendments to Public Law 96-517 has been delayed. University administrators and small business representatives whom we interviewed stated that federal patent policy changes since 1980 have had a significant positive impact on their research and innovation efforts. All of the university administrators considered the Public Law 98-620 amendment that removes licensing restrictions on nonprofit organizations to be significant.

The objectives of Public Law 96-517 include (1) using the patent system to promote the utilization of inventions arising from federally supported research and development; (2) encouraging maximum participation of small business firms in federally supported research and development efforts; (3) promoting collaboration between businesses and nonprofit organizations, including universities; and (4) minimizing related administrative costs. While it may be too early to measure the effect that patent policy changes have had on promoting the utilization of federally funded inventions, the university and small business respondents believe that the other three objectives are being achieved. Most of the respondents also stated that the President's memorandum has not adversely affected universities and small businesses.

Federal Agency Implementation

Our reports, Major Federal Research and Development Agencies Are Implementing the Patent and Trademark Amendments of 1980 and Federal Agencies' Policies and Practices Are in Accordance With Patent and Trademark Amendments of 1980, found that federal agencies have complied with Public Law 96-517 and the President's February 1983 memorandum. However, according to DOD, DOE, HHS, NASA, and NSF officials, implementation of the Public Law 98-620 amendments has been delayed because issuance of Commerce's government-wide regulations was delayed.

Commerce issued a Notice of Proposed Rulemaking in April 1985 and revised its proposed rule on the basis of the comments it received. However, in response to a July 31, 1985, letter from the Chairman and the Ranking Minority Member of the House Committee on Science and Technology, Commerce circulated its proposed final rule to federal agencies in August 1985. In written responses to Commerce in September 1985, DOE raised nine issues, primarily affecting its GOCO facilities, and DOD raised two issues that it believed had not been adequately addressed. Commerce sent its revised regulations to the Office of Management and

Our review was performed in accordance with generally accepted government auditing standards. We conducted the audit work between April and August 1986.

Objectives, Scope, and Methodology

The Chairman, Subcommittee on Courts, Civil Liberties and the Administration of Justice, House Committee on the Judiciary, asked us to assess federal agency implementation and the impact on universities, other nonprofit organizations, and small businesses of three recent federal patent policy changes:

- Public Law 98-620 amendments to Public Law 96-517 regarding title rights to inventions that nonprofit organizations and small businesses developed with federal funds;
- President Reagan's February 18, 1983, memorandum, which extended title rights to all federal contractors to the extent permitted by law; and
- the SIR procedure, which Public Law 98-622 established in 1984.

The Subcommittee also requested that we obtain the views of nonprofit organizations and small businesses in assessing the impact of these changes.

Federal agencies are in the process of implementing the Public Law 98-620 amendments. Commerce issued its Interim Final Rule for government-wide implementation of the act in July 1986, and its final regulations in March 1987. An interagency task force currently is revising the Federal Acquisition Regulation to conform with Commerce's regulations. Because of the delay in issuing government-wide regulations, we subsequently agreed with the Subcommittee to ask nonprofit organization and small business representatives to assess the combined impact of the title rights provisions of Public Laws 96-517 and 98-620 on their respective organizations and then assess the relative significance of several Public Law 98-620 provisions for their respective organizations.

To assess agency efforts to implement subsequent federal patent policy changes and the impact of these changes on agency procedures, we interviewed officials and gathered data from the Army, the Navy, and the Air Force in the Department of Defense (DOD); DOE; the Department of Health and Human Services (HHS); the National Aeronautics and Space Administration (NASA); and the National Science Foundation (NSF). These agencies sponsored 96 percent of the federal research and development that nongovernment organizations performed in fiscal year 1985. We also interviewed officials of Commerce's Office of Productivity, Technology and Innovation, which is responsible for issuing the government-wide regulations implementing Public Law 98-620, and Commerce's Patent and Trademark Office.

assign title rights to another organization.[2] It removed restrictions on how long nonprofit organizations could exclusively license their federally funded inventions without obtaining federal agency approval.

Public Law 98-620 also transferred responsibility from the Office of Federal Procurement Policy and GAO, respectively, to Commerce for issuing government-wide regulations to implement the act and reviewing federal agency exceptions for not giving a nonprofit or small business funding agreement recipient title to an invention.

In addition to patent policy changes that give title rights to federal funding agreement recipients, the Congress has enacted legislation to encourage federal agencies to commercialize their inventions. Public Law 96-517 authorized federal agencies to issue exclusive licenses for their inventions. Between fiscal years 1982 and 1984, federal agencies negotiated exclusive licenses for about 20 percent of all licenses issued. The Federal Technology Transfer Act of 1986 (Public Law 99-502, Oct. 20, 1986) authorizes federal agencies to permit the director of a government-operated laboratory to enter into cooperative research and development agreements with nonfederal organizations and to negotiate licensing agreements for laboratory inventions. The act requires federal agencies to pay government-employee inventor(s) at least 15 percent of any royalties or other income received for an invention up to a maximum of $100,000 per year per inventor.

Statutory Invention Registrations

The Patent Law Amendments Act of 1984 (Public Law 98-622, Nov. 8, 1984) established the Statutory Invention Registration (SIR) procedure. A SIR is intended to provide the holder the defensive rights that a patent provides to prevent others from patenting the invention, but it does not permit the holder to exclude others from making, using, or selling the invention for a 17-year period. If a second inventor of the same invention as claimed in the SIR seeks a patent, the Patent and Trademark Office would initiate an interference proceeding to determine whether the inventions are substantially different and, if not, which inventor developed the invention first. Patent and Trademark Office officials told us that, because the act states that a SIR has all of the defensive attributes of a patent, a SIR and a patent would be treated equally in an interference proceeding, including a review of the inventors' notebooks to

[2]Many nonprofit organizations use another organization to patent and market their inventions. Often they agree to transfer title rights to the marketer.

Introduction

In 1971 President Nixon issued a statement on government patent policy, asserting that federal inventions are a valuable national resource that should be expeditiously developed and used by the private sector for the benefit of the national economy. In assessing the implementation of this policy, a federal interagency committee on patent policy reported that, as of the end of fiscal year 1975, the government had an inventory of about 28,000 patented inventions but had licensed less than 5 percent of them to businesses. In response to the report, the government has taken several actions to stimulate the commercialization of federal technology and to provide a less expensive alternative to a patent that would protect against patent infringement law suits by subsequent inventors. These actions affect inventions made by both the recipients of federal contracts, grants, and cooperative agreements (hereafter referred to as funding agreement recipients) and federal laboratories.

Public Law 96-517

Before 1980 the government had the option to retain title rights to all inventions resulting from federally funded research and development. To obtain title rights to an invention, funding agreement recipients could request a title rights waiver in advance during contract negotiations or on a case-by-case basis after they disclosed the invention to the federal agency sponsoring the research.

The Patent and Trademark Amendments of 1980 (Public Law 96-517, Dec. 12, 1980) gave universities, other nonprofit organizations, and small businesses the option, with few exceptions, to retain title rights to federally funded inventions that they developed.[1] If a nonprofit organization or a small business elected to take title to an invention, the act states that the government will have a royalty-free license to use the invention. By foregoing its ownership rights, the government encourages nonprofit and small business funding agreement recipients to develop and market their federally funded inventions. For inventions with commercial potential, the nonprofit organization or small business normally would file a patent application at the Department of Commerce's Patent and Trademark Office in order to obtain the right to exclude others from making, using, or selling the invention for the patent's 17-year life.

[1]The regulations implementing the Small Business Act (13 CFR Part 121) generally define a small business as having at most 500 employees, although alternative maximum numbers of employees or annual sales are used for some industries.

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the act's impact on commercializing federally funded inventions. Of the Public Law 98-620 amendments, the administrators said that the removal of licensing restrictions on nonprofit organizations will be particularly significant.

All eight small business representatives whom we interviewed stated that Public Laws 96-517 and 98-620 have had a significant positive impact on small businesses. However, they added that other factors, such as the federal Small Business Innovation Research program and the 1981 tax act's lowering of the maximum capital gains tax rate, have had equal or greater significance on small businesses' research and innovation efforts.

The President's Memorandum

Federal agencies have implemented the President's memorandum. Energy officials told us that in response to the memorandum, Energy plans to issue a regulation establishing criteria and procedures for many of the large business contractors of its government-owned, contractor-operated facilities to retain title rights to some or all of the facilities' inventions.

Statutory Invention Registrations

While Statutory Invention Registrations are available to any applicant, they are aimed at federal agencies (Defense, and to a lesser extent, Energy) whose primary objectives are to obtain patents to protect their large procurement programs from other inventors developing and patenting the inventions and subsequently filing patent infringement law suits against the federal agencies. On an annual average between fiscal years 1981 and 1986, Defense filed 1,154 patent applications and licensed 16 inventions, and Energy filed 327 patent applications and licensed 19 inventions. Statutory Invention Registrations comprised 12 percent of their total Patent Office applications in fiscal year 1986.

Defense and Energy patent attorneys expressed concern about using a Statutory Invention Registration because it could adversely affect inventor morale and it will result in only small cost savings for the agency. Agencies have taken some actions to reduce inventors' concern that a Statutory Invention Registration will not receive the recognition of a patent. For example, effective January 1987, the Army established the same incentive awards for Statutory Invention Registrations as are used for patents. Regarding cost savings, the Patent Office's fees for a Statutory Invention Registration are $500 less than the application and

Executive Summary

Purpose

Federal agencies have an inventory of more than 24,000 patented inventions but have had only modest success in marketing them. To stimulate the use of federally funded technology, the government has made several changes in federal patent policy that give most federal funding recipients the right to retain title to inventions that they develop. The government also established a Statutory Invention Registration procedure to reduce the federal patent inventory while protecting federal agencies from potential patent infringement law suits.

The Chairman, Subcommittee on Courts, Civil Liberties and the Administration of Justice, House Committee on the Judiciary, requested that GAO assess federal agencies' implementation and the impact on universities, other nonprofit organizations, and small businesses of three of these changes in federal patent policy:

- the 1984 amendments to Public Law 96-517 regarding title rights to inventions that nonprofit organizations and small businesses developed with federal funds;
- President Reagan's February 18, 1983, memorandum, which extended title rights to all federal contractors to the extent permitted by law; and
- Statutory Invention Registrations, which Public Law 98-622 established in 1984.

The subcommittee also requested that we obtain the views of nonprofit organizations and small businesses in assessing the impact of these changes.

Background

Enacted in 1980, Public Law 96-517 gave nonprofit organizations and small businesses the right, with a few exceptions, to retain title to federally funded inventions that they develop. The 1984 amendments in Public Law 98-620 extended the act's coverage and removed or eased some of its restrictions. The President's memorandum gave most large business contractors the right to retain title to inventions that they developed with federal funds.

Statutory Invention Registrations were designed to provide inventors with a less time-consuming and less expensive alternative to a patent. A Statutory Invention Registration is similar to a patent because it prevents others from patenting an invention, but it differs from a patent because it does not permit the holder to exclude others from making, using, or selling the invention. In its report on Public Law 98-622, the Senate Committee on the Judiciary stated that the commercialization