DOE/IG-0479

AUDIT REPORT

MANAGEMENT OF PATENT AND LICENSING ACTIVITIES AT DEPARTMENT-OWNED CONTRACTOR-OPERATED LABORATORIES

AUGUST 2000

U.S. DEPARTMENT OF ENERGY
OFFICE OF INSPECTOR GENERAL
OFFICE OF AUDIT SERVICES

August 11, 2000

MEMORANDUM FOR THE SECRETARY

FROM: Gregory H. Friedman (Signed)
Inspector General

SUBJECT: INFORMATION: Report on "Management of Patent and Licensing Activities at Department-Owned Contractor-Operated Laboratories"

BACKGROUND

The Department of Energy (Department) maintains an extensive complex of laboratories to help execute its statutory missions. The 24 laboratories, with a combined budget of over $7 billion, conduct research in energy sciences and technology, high energy physics, global climate change, genomics, superconducting materials, accelerator technologies, environmental sciences, and super-computing in support of the Department's mission.

During the 1980s, a series of statutes was enacted to accelerate the transfer of Government-funded technology to the private sector for development and commercialization. One such statute, the 1989 National Competitiveness Technology Transfer Act (Technology Act) required the Department to establish technology transfer as a mission at each of its contractor run laboratories. In implementing this Technology Act requirement, the Department utilized the patent waiver authority to allow all contractors operating the Department's laboratories to obtain title to inventions created while conducting Department-sponsored research. Additionally, Department laboratories have extensive authority to transfer technology by licensing inventions to third parties. Under current contract arrangements, the inventor shares in all royalties collected. During Fiscal Year 1999, the Department's laboratories were granted 505 patents and received about $10 million through royalty payments from licensing activities.

The increasingly broad missions of the national laboratories, combined with their stepped-up involvement in technology transfer, have had the effect of developing new and improving existing technologies that will benefit the public. However, these changes have also led to confusion regarding patent infringement and competition with the private sector. In fact, responsible Department officials believe competition is inherent when transferring new technologies from the Federal laboratory to the private sector. The new technologies introduced may interfere with and possibly displace existing or emerging technologies already in use. The Department believes that successful technology transfer programs can, and will likely, lead to complaints from entities adversely affected.

One such complaint was the subject of an April 1999 report by the minority staff of the Committee on Science of the U.S. House of Representatives. That report, titled *Spinoff or Ripoff?*, discussed a patent dispute between the Lawrence Livermore National Laboratory (Livermore) and Time Domain Corporation of Huntsville, Alabama. In essence, Time Domain

alleged that Livermore competed unfairly and further damaged Time Domain by seeking to develop and license technology that had been improperly patented by Livermore. Two Members of Congress brought this to the attention of the Office of Inspector General.

Since publication of *Spinoff or Ripoff?*, the issues surrounding the Time Domain complaint have been subjected to extensive review by several organizations. In June 1999, the Department's Technology Transfer Working Group (Working Group) completed a comprehensive review of technology transfer policies and procedures. The Working Group's report included recommendations for simplifying complaint resolution and for minimizing the likelihood that Department laboratories would compete with the private sector. In addition, the University of California, which manages Livermore for the Department, commissioned a task force of legal, technical, and business experts to evaluate the Time Domain allegations. The task force completed its review in October 1999, reporting that while certain internal procedures could be improved, Livermore's conduct in the Time Domain case was appropriate. Finally, in November 1999, the U.S. Patent and Trademark Office upheld Livermore's patent claims.

While the Office of Inspector General determined that the specifics of the Time Domain complaint had received credible, comprehensive review, we were concerned about the potential for additional complaints, in light of the Department's increased role in technology transfer and the laboratories' expanding missions. Consequently, the objective of the audit was to determine whether Departmental controls for patents and licensing were working as intended and provided protection of stakeholder (taxpayer, inventor, and technology user) interests.

RESULTS OF AUDIT

While Departmental controls were operating as intended, we noted that the number of complaints related to patents and licensing had increased in recent years. These complaints appeared to result, in part, from confusion and misunderstanding relating to patent infringement and competition with the private sector. These are serious concerns which, if not addressed on an ongoing basis, can undermine the relationship between the Department's laboratory system and the private sector.

In 1999, the Secretary established the Technology Transfer Working Group to serve as the lead organization to oversee technology transfer policy and procedures, including those governing patents and licensing. Since its inception, the Working Group has made a number of improvements, including two initiatives designed to assist the private sector when disputes related to the Department's technology transfer activities arise. First, each laboratory was to assign an ombudsman to serve as a focal point for industry and the public and to resolve complaints and disputes. Second, to facilitate resolution of complaints, the Working Group encouraged increased use of collaborative alternative dispute resolution techniques.

Although these two initiatives are positive steps, additional factors appeared to be contributing to the number and severity of complaints. Specifically, there appeared to be a misunderstanding regarding the authority of Government laboratories to use the patents of others in their research and development activities. Also, there was confusion regarding Departmental contractors' competing with the private sector. To further strengthen the

Department's administration of patents and licensing activities, we recommended that the Technology Transfer Working Group address these issues and propose administrative and/or legislative actions to clarify Government laboratories' role in interacting with the private sector.

MANAGEMENT REACTION

The Chair of the Technology Transfer Working Group took exception to the Office of Inspector General observation that the number of complaints had increased in recent years. He asserted that compared to the large and increasing amount of technology transfer activity, complaints were "relatively rare." The Chair also stated that the Department was currently implementing corrective actions that would satisfy our recommendations.

The text of the Chair's statement is included as Appendix 1 of this report. Our response is on pages 9 and 10.

Attachment

cc: Deputy Secretary
Under Secretary
Under Secretary, NNSA

Management Of Patent And Licensing Activities At Department-Owned Contractor-Operated Laboratories

TABLE OF CONTENTS

Overview

INTRODUCTION AND OBJECTIVE

The Department of Energy maintains an extensive complex of laboratories to help execute its statutory missions. These 24 laboratories conduct research in energy sciences and technology, high energy physics, global climate change, genomics, superconducting materials, accelerator technologies, environmental sciences, and super-computing in support of the Department's mission. Over $7 billion was budgeted in Fiscal Year 1999 for the operation of these laboratories.

During the 1980s, a series of statutes was enacted to accelerate the transfer of Government funded technology to the private sector for development and commercialization. One such statute, the 1989 National Competitiveness Technology Transfer Act (Technology Act) required the Department to establish technology transfer as a mission at each of its contractor run laboratories. In implementing this Technology Act requirement, the Department utilized the patent waiver authority to allow all contractors operating the Department's laboratories to obtain title to inventions created while conducting Department-sponsored research. Previously, as required by the Bayh-Dole Act, only University and non-profit contractors operating the Department's laboratories were allowed by contract to take title to inventions created while conducting Department-sponsored research. Prior to these acts, titles were owned by the Department. The thrust of this effort has been to ensure that the potential benefits to society of the Department's research and development efforts are transferred to the commercial sector as quickly as possible.

Licensing inventions developed by Department-owned laboratories to third parties is one method of transferring technology to the private sector. Department laboratories have extensive authority to transfer technology, provided that marketing any invention does not jeopardize national security or violate specific contractual agreements or public law. Under current contract arrangements, the inventor shares in all royalties collected. Remaining royalties up to 5 percent of the laboratory's budget go to the laboratory, after the inventor's share and patent and licensing costs are deducted. Royalties in excess of 5 percent of the laboratory's budget are split, with 25 percent going to the laboratory and 75 percent to the Treasury. During Fiscal Year 1999, the Department's laboratories were granted 505 patents and received about $10 million through royalty payments from licensing activities.

Patents Granted and Licensing Royalties for Fiscal Year 1999

Laboratory	Patents	Royalties (in millions)
Livermore	86	$1.6
Sandia	108	.5
Oak Ridge	57	1.5
Brookhaven	19	2.8
Argonne	34	.9
Others	201	2.5
Total	**505**	**$9.8**

The Office of the Assistant General Counsel for Technology Transfer and Intellectual Property in Headquarters, and individual patent groups in the field are responsible to represent the Department in patent and licensing matters. Patent attorneys in these organizations provide guidance and interpretation of Department policies and procedures to the laboratories with regard to inventions. Additionally, in 1999, the Secretary established the Technology Transfer Working Group (Working Group) to serve as the lead organization to oversee and resolve technology transfer policy, procedures, and issues, including those governing patents and licensing.

The objective of this audit was to determine whether Department controls for patents and licensing were working as intended and provided protection of stakeholder (taxpayer, inventor, and technology user) interests.

CONCLUSIONS AND OBSERVATIONS

The controls established by the Department for patent and licensing activities at Sandia, Lawrence Livermore, and Oak Ridge National Laboratories were working as intended. Nonetheless, the Department has recently experienced an increase in the number of allegations against its national laboratories relating to patent and licensing activities. All reasonable costs associated with responding to these complaints are likely to be allowable under the contract and thus, reimbursed by the Department. One complaint was the subject of an April 1999 report by the minority staff of the Committee on Science of

the U.S. House of Representatives. That report, titled *Spinoff or Ripoff?*[1], discussed a patent dispute between the Lawrence Livermore National Laboratory (Livermore) and Time Domain Corporation of Huntsville, Alabama. In essence, Time Domain alleged that Livermore competed unfairly and further damaged Time Domain by seeking to develop and license technology that had been improperly patented by Livermore.

Since publication of *Spinoff or Ripoff?*, the issues surrounding the Time Domain complaint have been subjected to extensive review by several organizations including the Department's Technology Transfer Working Group. In June 1999, the Working Group recommended two initiatives designed to assist the private sector when disputes related to the Department's technology transfer activities arise. First, the Working Group recommended that each laboratory assign an ombudsman to serve as a focal point for industry and the public and to resolve complaints and disputes. Second, to facilitate resolution of complaints, the Group encouraged the use of collaborative alternative dispute resolution techniques.

Although these two initiatives are positive steps, two factors appear to be contributing to the number and severity of complaints. Specifically, there appears to be a misunderstanding regarding the authority of Government laboratories to use the patents of others in their research and development activities. Also, there is confusion regarding Departmental contractors' competing with the private sector. To further strengthen the Department's administration of patents and licensing activities, we recommend that the Technology Transfer Working Group address these issues and propose administrative and/or legislative actions to clarify Government laboratories' role in interacting with the private sector.

The Office of Inspector General (OIG) and the General Accounting Office have issued several audit reports with recommendations to further strengthen the Department's administration of patents and licensing activities. These reports are briefly described in Appendix 2.

(Signed)
Office of Inspector General

[1] The report's complete title was *Spinoff or Ripoff? Technology Transfer at Department of Energy National Laboratories: The Development & Commercialization of Micropower Impulse Radar at Lawrence Livermore National Laboratory-A Report by the Democratic Staff, Committee on Science, U.S. House of Representatives Washington, DC-April 9, 1999.*

Management Of Patent And Licensing Activities

DEPARTMENT AND CONTRACTOR CONTROLS

A review of controls established by the Department for patent and licensing activities at Sandia, Lawrence Livermore, and Oak Ridge National Laboratories indicated that required control mechanisms were in place and were working as intended. To test the Department's management control process, we examined 55 active licenses at the Sandia, Lawrence Livermore, and Oak Ridge National Laboratories. In total, the OIG reviewed nine control processes, including reporting procedures on invention disclosure, election to retain title, licensing, and commercialization of inventions. The three contractors, with minor exceptions, were conducting their patent and licensing activities in accordance with applicable Departmental policy and contractual requirements. Appendix 3 sets forth a detailed schedule of the controls examined.

In addition, the Department and its contractors had established systems to monitor and track patent and licensing activities. For example, all three laboratories used Sandia-developed software to provide comprehensive data needed to demonstrate that controls relating to patent and licensing activities were in place and functioning as intended. The Department and its contractors also collected and evaluated patent and licensing information from disclosure through licensing. When submitting patent applications, the Department has generally followed the practice of relying on the Patent and Trademark Office (PTO) for identifying related patents or publications. This avoids duplication of search effort. The PTO spends approximately 50 percent of its patent application processing time for such searches. From the records reviewed, we were able to determine that in 43 of 55 patent applications the three laboratories had disclosed to the PTO related patents or publications. With regard to the other 12 applications, documentation in the files was not sufficient to make such a determination and may have resulted from searches not turning up any related patents or publications.

The three contractors also operated within funding limits established by the Department. By contract, the Department reimburses its laboratories for technology transfer activities. Reimbursements for all such activities, including patent disposition and licensing, are limited to either one-half or one percent of annual laboratory operating budget levels. A review of contractor expenditures indicated that each of the three national laboratories expended less than the authorized limitation. The following table shows the dollar limitation and actual expenditures for Fiscal Year 1999.

Technology Transfer Costs
For Fiscal Year 1999

	Limit		Actual Expenditures
	Percentage	Dollar	
Sandia	1.0%	$14M	$7.1M
LLNL	1.0%	10M	4.1M
ORNL	0.5%	3M	1.5M

STAKEHOLDER CONCERNS

While contractor controls were operating as intended, the number of complaints related to patents and licensing had increased in recent years. These complaints, in part, appeared to result from confusion and misunderstanding relating to patent infringement and competition with the private sector. These are serious concerns which, if not addressed on an ongoing basis, can undermine the relationship between the Department's laboratory system and the private sector.

Private Sector Complaints

There have been a number of allegations that the laboratories have infringed on existing patents and did not properly respect the intellectual property rights of others. The Department and its contractors have disputed many of these claims, but the increasing number of complaints is an indication of the uneasy relationship, in some cases, between the private sector and Government laboratories. Examples[2] of complaints that have been made include:

- A dispute involving *Time Domain Corporation* of Huntsville, Alabama, and Livermore. Time Domain maintained that the key Livermore Micropower Impulse Radar (MIR) patent was invalid and should not have been granted because of a previous invention by a Time Domain inventor.

- An allegation from *Silicon Designs Inc.* (SDI) that stated that EG&G Mound employees had access to SDI's Small Business Innovative Research (SBIR) data through Los Alamos National Laboratory and that these same EG&G Mound employees made use of SDI's SBIR data for "private gain."

[2]The Office of General Counsel provided information to the OIG on case histories and attempts to resolve each of these complaints. The scope of the OIG review did not include validating this information or conducting audit steps to determine the validity of the underlying complaints.

- A complaint from *Ultratech Stepper Corporation* (UTS), a photolithography equipment manufacturer, alleged that a consortium of Department laboratories illegally disclosed its intellectual property to the public and that previous complaints have been ignored.

- A claim from *Ventana* that Livermore exclusively licensed a technology, involving a biotechnology technique allowing the use of inexpensive nucleic acid probes to study intact chromosomes for genetic abnormalities, that has widespread utility, in contravention of Department guidelines.

- An assertion from *Biosource*, of Worcester, Massachusetts, that Livermore filed patent applications that did not disclose Biosource's Intellectual Property, even though Livermore was aware of its existence.

- An allegation from *Blasting Analysis International*, Inc. (BAI), of Allentown, Pennsylvania, that Livermore has provided intellectual property, which has been exclusively licensed to BAI, to BAI's clients at no cost, causing BAI to lose customers.

Management officials told us that the number of complaints relating to laboratory competition with the private sector has increased in the last year. Since Department laboratories have only been actively involved in technology transfer for about 10 years, the typical time period for new technology to reach the market place, the level of complaints is expected to increase further.

The number and handling of stakeholder complaints by the Department has also been an issue raised by the legislative branch. In a December 6, 1999, letter 29 Members of Congress suggested that the Department require its contractor-operated laboratories to implement expedited dispute resolution procedures, and that these procedures be made available to complainants listed in the letter. The Department advised the Members that new dispute resolution processes were being implemented to help prevent complaints from escalating.

Contributing Factors

We identified at least two factors that contributed to the increase in complaints. First, there is a general lack of recognition or understanding that government laboratories can, in fact, infringe on existing patent rights. In addition, key statutes and policy governing the laboratory interaction with the private sector appear to be in conflict with one another.

Infringement

Based on complaints received by the Department, it appeared the private sector believes that government laboratories may not infringe upon the patent rights of others. However, the Department's agreements with its laboratory contract operators suggest exactly the opposite. Specifically, Federal Acquisition Regulations, which have the force of law and are incorporated in each laboratory contract, provide that:

> *The Government authorizes and consents to all use and manufacture of any invention described in and covered by a United States patent in the performance of this contract or any subcontract at any tier.*

In essence, Department contractors are authorized to use patents of others in their mission-related research and development activities. However, when infringement is alleged, as for all Federal agencies, the Federal Government is the responsible party. To put the frequency of such action into perspective, in the last 15 years the Department has paid only about $20,000, involving one case, for copyright infringement.

As they perform mission-related research, laboratories may also create a new technology that has commercial use. While Department laboratories are allowed to license such technologies to outside parties, licensees are responsible for determining whether the licensed technology infringes on existing patents.

Competition

Another factor contributing to the number and severity of complaints has been the confusion regarding government laboratories' interaction and competition with the private sector. In this regard, two current policy directives appear to be in conflict with one another.

Under the Atomic Energy Act of 1954, Government laboratories can conduct research for other agencies or other parties (commonly referred to as "work-for-others") when private sector facilities are inadequate to that purpose. Similarly, the Economy Act of 1932 provides for a determination that includes a statement that the "supplies or services cannot be obtained as conveniently or economically by contracting directly with a private source." Additionally, the Federal Acquisition Regulation provides that "Federally Funded Research and Development Centers" may not compete with the private sector in response to a Federal agency's request for proposals. This restriction is clearly specified in DOE Order 481.1, in which it is stated that, "the work requested will not place DOE and its contractor in direct competition with the domestic

private sector." An objective of the order was to provide access for non-Departmental entities to highly specialized or unique Departmental facilities, services, or technical expertise where private sector facilities are inadequate.

More recently, the Department's missions have been expanded by public law to more fully use its extensive network of innovative research laboratories. As a result of statutes such as the Technology Act, Government laboratories have become more actively involved in the development and commercialization of federally funded research. Laboratories have been encouraged to facilitate collaboration among Federal laboratories, state and local governments, universities, and the private sector in order to assist the transfer of technology to the marketplace. Relevant statutes and regulations make technology transfer a mission of the laboratories, and, unlike the "work-for-others" program, give no express proscription against competing with the private sector. In fact, responsible Department officials believe competition is inherent in the transferring of new technologies from the Federal laboratory to the private sector. The new technologies introduced may interfere with and possibly displace existing or emerging technologies already in the private sector. The Department believes that successful technology transfer programs can, and will likely, lead to complaints from some entities adversely affected by the displaced economic activities.

The broadening of the missions of the national laboratories and their involvement in technology transfer have had the effect of developing new and improving existing technologies that will benefit the private sector. However, these changes have also led to confusion regarding patent infringement and competition with the private sector.

RECOMMENDATIONS

To clarify the role of the Department in technology transfer and to further address the increasing number of complaints from the private sector, we recommend that the Chair of the Technology Transfer Working Group, working with the General Counsel:

1. Determine what alternatives are available to resolve conflicting statutes relating to competition with the private sector;

2. Work with Department elements, stakeholders and other interested parties to determine which alternative(s) is most viable to address this issue;

3. Seek, if necessary, clarification or legislative resolution to the non-competition versus competition dichotomy; and

4. Develop a methodology for communicating the Department's technology transfer procedures and practices to stakeholders. Particular care should be exercised in explaining issues related to patent infringement and competition.

MANAGEMENT REACTION

The Chair of the Technology Transfer Working Group agreed that patent and licensing internal controls were working as intended but took exception to the Office of Inspector General observation that the number of complaints had increased in recent years. The Chair stated that he was unaware of any statistics to corroborate this position. He asserted that compared to the large and increasing amount of technology transfer activity, complaints were "relatively rare." The Chair also stated that the Department was currently implementing corrective actions that would satisfy our recommendations.

The text of the Chair's statement is included as Appendix 1.

AUDITOR RESPONSE

Our observation that complaints were increasing was based in part on numbers of such complaints made directly to the Office of Inspector General. Our decision to conduct the audit included consideration of these cases. We also noted that recent Department actions, including the establishment of an ombudsman function at each major laboratory to resolve technology transfer complaints and disputes, would be an unnecessary and inefficient use of resources if such incidents were "rare." Further, the Department's Assistant General Counsel for Technology Transfer and Intellectual Property advised us that the number of complaints relating to patent infringement or unfair competition had increased in the last year. He also expected complaints to increase in the future.

The Chair cites corrective actions currently underway as the result of Technology Transfer Working Group reforms. While these actions are positive, they will not fully resolve the issues raised in our report. Management asserted that planned Working Group actions to "minimize the likelihood and perception of DOE laboratories competing with the private sector" met the intent of OIG recommendations 1 through 3. Essentially, these actions suggest

utilizing existing policies and procedures to relieve the tension of a perceived conflict regarding laboratories competing with the private sector. They do not, however, provide for identifying alternatives to resolve the confusion regarding Department contractors competing with the private sector and, if necessary, elevating the issue to the Congress.

Similarly, Working Group actions to "make partnership opportunities more accessible, easier to identify and quicker to initiate" do not fully meet the intent of OIG recommendation 4. Planned actions are directed toward improving the Cooperative Research and Development Agreement negotiation and approval process, developing a partnership package, and encouraging technology transfers using the power of the internet. The purpose of the OIG recommendation was to have the Department develop a methodology to communicate patent infringement and competition policy, practices, and issues to all stakeholders and not market a contracting process.

The Department needs to develop a more complete action plan in order to fully comply with the recommendations in this report.

DEPARTMENT OF ENERGY
Washington, DC 20585

July 12, 2000

OFFICE OF THE SECRETARY

MEMORANDUM FOR THE INSPECTOR GENERAL

FROM: DAVID HEYMAN
SENIOR ADVISOR

SUBJECT: Draft Report on the Department's "Management of Patent and Licensing Activities at Department-Owned Contractor-Operated Laboratories"

The Department has reviewed the Audit Report on *Management of Patent and Licensing Activities at Department-Owned Contractor-Operated Laboratories* and believes the report's primary conclusion that "Departmental controls (are) operating as intended" is consistent with the findings of the Department's own system-wide review of technology transfer policies and procedures, *Partnering for Success: A Review of DOE Technology Transfer Policies and Procedures* (June 1999).

The Department takes exception however to the observation that "the number of complaints related to patents and licensing had increased in recent years." We are unaware of statistics to corroborate this statement. Indeed, the small number of complaints relative to the large and increasing amount of activity is rather remarkable. Specifically, for a system where several hundreds of American companies have taken licenses to technology from DOE laboratories; where several thousand Cooperative Research and Development Agreements (CRADAs) have been consummated with companies, universities and with state and local governments; and where tens of thousands of hours of laboratory researcher time have been made available to address technical problems of American small businesses, complaints are relatively rare.

IG Recommendations

Last fall, Secretary Richardson initiated several reforms to strengthen DOE's technology partnership programs. We are pleased that most of the reforms are currently being implemented. Recommendation #7 of the Technology Transfer Working Group's (TTWG) Report to the Department's R&D Council, "Partnering for Success: A Review of DOE Technology Transfer Policies and Procedures," addresses the IG report's recommendations 1-3. Recommendation # 3 of the TTWG Report addresses the IG report's recommendation 4. We expect to complete the implementation of these reforms this fall.

Appendix 2

REPORTS RELATED TO PATENT AND LICENSING ACTIVITIES

Office of Inspector General Reports:

- *Audit of Administration of Cooperative Research and Development Agreements at DOE National Laboratories*, (DOE/IG-0373, May 19, 1995). Efforts to manage cooperative research and development agreements (CRADA) at three national laboratories (Lawrence Livermore, Los Alamos, and Oak Ridge) did not ensure that the following four DOE policy goals were met: (1) joint work statements; (2) statements of work; (3) CRADA milestones; and (4) valuation of partner contributions to a CRADA.

- *Administration of Conflict of Interest Relating to Technology Transfer at Los Alamos National Laboratory*, (DOE/IG-0319, January 12, 1993). Contrary to Department and laboratory policies, Los Alamos employees engaged in apparent conflicts of interest in their outside activities. Specifically, they appeared to make decisions as Los Alamos employees, use Government resources, and take privileged information to further their personal financial interest in their respective spin-off business.

- *Technology Transfer Program at Martin Marietta Energy Systems, Inc.*, (ER-BC-93-01, November 25, 1992). Improvements in management controls were needed with respect to the adequacy and accuracy of official records on licensing agreements, royalty income, and periodic reporting to senior Energy Systems and Department officials on program activities and accomplishments.

- *Recovery of Costs Related to Patent Rights Waived to Contractors or Inventors*, (DOE/IG-0247, December 1987). The Department has not recovered all patent application and prosecution costs for waivers granted to management and operating contractors and employee-inventors as required by Department Order 2110.1.

General Accounting Office Reports:

- *Technology Transfer: Reporting Requirements for Federally Sponsored Inventions Need Revision*, (GAO/RCED-99-242, August 12, 1999). GAO concluded that federal agencies and their contractors and grantees were not complying with provisions on the disclosure, reporting, retention, and licensing of federally sponsored inventions under the regulations implementing the Bayh-Dole Act and Executive Order 12591. In addition, GAO found that the databases for recording the Government's royalty-free licenses are inaccurate, incomplete, and inconsistent and that some inventions are not being recorded at all. As a result, the Government was not always aware of federally sponsored inventions to which it has royalty-free rights.

- *Technology Transfer: Number and Characteristics of Inventions Licensed by Six Federal Agencies*, (GAO/RCED-99-173, June 18, 1999). GAO reported that the six agencies (NIH, Army, Navy, Air Force, DOE, and NASA) reported that they granted a total of 866 licenses and received $107.5 million in royalties during Fiscal Years 1996 through 1998. Most of the licenses were nonexclusive, most went to small businesses or individuals, and most went to domestic entities.

- *Technology Transfers: Benefits of Cooperative R&D Agreements*, (GAO/RCED-95-52, December 16, 1994). GAO identified that: (1) CRADAs offered opportunities for federal laboratories and industry to collaborate on research while meeting their missions; (2) technology from federal laboratories was transferred to the private sector, resulting in commercial products; (3) R&D programs were advanced; (4) sharing of resources aided federal laboratories and private companies in accomplishing the CRADA's objectives; and (5) some of the CRADAs demonstrated a potential for long-term improvements to our nation's economy, health, and environment.

Other Related Reports:

- *Partnering for Success: A Review of Department Technology Transfer Policies and Procedures*, (June 1999). The Technology Transfer Working Group found that (1) Department laboratories' scientific excellence and engineering capabilities serve as the primary basis for technology partnerships; (2) Technology partnerships play an important role in Department research and U.S. economic activities; (3) The Department's technology transfer programs have effectively facilitated the development of technology partnerships and the commercialization of publicly-funded research; and (4) CRADAs have been major drivers for technology transfer activities at the DOE.

- *A Review of Lawrence Livermore National Laboratory's Patent and Licensing Practices Related to Micropower Impulse Radar*, (October 1, 1999). The task force found that the conduct of the Laboratory with respect to the patenting of MIR technology was appropriate, although some internal procedures could be improved. In addition, the Task Force found that Livermore did not engage in unfair competition with the private sector. LLNL did, however, initially make erroneous representations regarding Federal Communication Commission rules.

Appendix 3

COMPLIANCE WITH PATENT AND LICENSING CONTROLS AT THE THREE LABORATORIES VISITED

	LLNL (16 License Files Reviewed)		**SNL** (23 License Files Reviewed)		**ORNL** (16 License Files Reviewed)	
CONTROLS	YES[1]	NO	YES[1]	NO	YES[1]	NO
1. Appropriate Conflict of Interest statements are signed and included in the license files. (DEAR 970.5204-40)	X		X		X	
2. CO Approval when licensing to any affiliate of the contractor. (DEAR 970.5204-40)	N/A[2]			X[3]	N/A[2]	
3. CO is notified of any work area where contractor intends to request or elect title. (DEAR 970.5204-40)	X		X		X	
4. Communication of all opportunities for research partnering to small business. (DEAR 970.5204-40)	X		X		X	
5. Contractor maintains all records of technology transfer activities. (DEAR 970.5204-40)	X		X		X	
6. Each invention is disclosed to Patent Counsel within two months following notification to contractor. (DEAR Patent Rights Clause)	X		X		X	
7. Contractor notifies Patent Counsel in writing within two years whether or not contractor is planning to retain title to invention. (DEAR Patent Rights Clause)	X		X		X	
8. Contractor gives preference in such a manner as to enhance the accrual of economic and technological benefits to the U.S. domestic economy. (DEAR 970.5204-40)	X		X		X	
9. Related patents or publications disclosed to the Patent and Trademark Office	X		X[4]		X	

[1]An "X" in the column indicates that the appropriate control was in place a majority of the time.
[2]N/A – did not find any examples from our licensing sample.
[3]Both Departmental and laboratory officials were aware of the laboratory's plans to license to an affiliate company, but Departmental approval was not granted.
[4]For 3 of 23 license files, patent records were not available, and for another 6 of 23 license files, it could not be determined whether any related patents or publications existed.

Appendix 4

SCOPE

The audit was conducted from November 1999 through March 2000 at Headquarters; Oak Ridge, Oakland, and Albuquerque Operations Offices; Lawrence Livermore, Sandia, and Oak Ridge National Laboratories; National Institutes of Health (NIH); Office of Scientific and Technical Information (OSTI); and the U.S. Patent and Trademark Office (PTO).

In FY 2000, the Department established the National Nuclear Security Administration (NNSA). A number of the program offices, Operations Offices, and National Laboratories, which were included in this audit, are now part of the NNSA organization. References in the report to the Department of Energy and its activities include the NNSA.

METHODOLOGY

To accomplish the audit objective, we:

- Reviewed laws and regulations relating to patents and licensing;
- Held discussions with Department Headquarters, field, OSTI, and contractor officials to determine their roles and responsibilities related to patents and licensing;
- Held discussions with NIH to determine their patent and licensing process;
- Held a discussion with PTO to determine their review and approval process for patent applications;
- Tested various patent and licensing controls by selecting a representative sample of licenses at the three laboratory sites;
- Analyzed the various management information systems to determine if the Department and its contractors are monitoring and tracking patent and licensing activities;
- Reviewed performance measures in accordance with the requirements of the Government Performance and Results Act; and
- Examined cost data to determine if patent and licensing activities at the laboratories were within the expenditure limitations and if licensing and royalty income was dispersed appropriately.

The audit was performed in accordance with generally accepted Government auditing standards for performance audits. It included tests of internal controls and compliance with laws and regulations to the extent necessary to satisfy the audit objective. Because our audit was limited, it would not necessarily have disclosed all internal control deficiencies that may have existed at the time of our audit. We did not conduct a reliability assessment of computer-processed data because only a limited amount of such data was used during the audit. We discussed the results of the audit with the Chair, Technology Transfer Working Group and the Assistant General Counsel for Technology Transfer and Intellectual Property.

IG Report No. DOE/IG-0479

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1. What additional background information about the selection, scheduling, scope, or procedures of the audit would have been helpful to the reader in understanding this report?

2. What additional information related to findings and recommendations could have been included in this report to assist management in implementing corrective actions?

3. What format, stylistic, or organizational changes might have made this report's overall message more clear to the reader?

4. What additional actions could the Office of Inspector General have taken on the issues discussed in this report which would have been helpful?

Please include your name and telephone number so that we may contact you should we have any questions about your comments.

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