



AUDIT AND ADVISORY SERVICES

Commercialization of Intellectual Property Audit

Project No. 16-682

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Paul Alivisatos
Vice Chancellor
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Vice Chancellor Alivisatos:

We have completed our audit of commercialization of intellectual property processes as per our annual service plan in accordance with the Institute of Internal Auditors' *Standards for the Professional Practice of Internal Auditing* and the University of California Internal Audit Charter.

Our observations with management action plans are expounded upon in the accompanying report. Please destroy all copies of draft reports and related documents. Thank you to the staff of the Intellectual Property and Industry Alliances Office for their cooperative efforts throughout the audit process. Please do not hesitate to call on Audit and Advisory Services if we can be of further assistance in this or other matters.

Respectfully reported,

Wanda Lynn Riley
Chief Audit Executive

cc: Assistant Vice Chancellor Carol Mimura
Interim Senior Vice President and Chief Compliance and Audit Officer John Lohse
Associate Chancellor Khira Griscavage
Assistant Vice Chancellor and Controller Delphine Regalia

**University of California, Berkeley
Audit and Advisory Services
Commercialization of Intellectual Property**

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OVERVIEW

Executive Summary

The objectives of the campus intellectual property commercialization program derive from university policies as well as technology transfer frameworks and practices established by a number of university consortiums and industry organizations. There is an alignment of principles across these various sources that emphasize the primary objective of enabling the broadest benefit and good that can derive from university inventions in addition to any commercial objectives.

Audit and Advisory Services (A&AS) completed our audit of commercialization of intellectual property (IP) processes as part of our annual service plan for FY 2016. The overall objective of our audit was to assess the adequacy of procedures and controls designed to mitigate certain key risks associated with the management of campus IP derived from research and associated efforts to seek commercial applications for such IP.

Campus procedures and controls related to the commercialization of IP appear adequate to mitigate key risks associated with business processes and program objectives. Given recent and anticipated continued growth of the campus patenting and licensing activity, we noted two opportunities for the Office of Technology Licensing (OTL) to further strengthen its position to effectively promote and manage the campus IP portfolio.

- Enhance operational and compliance support processes, including (i) the development of expanded reporting and protocols for accounts receivable (A/R) management, and (ii) the further development and dedication of resources to support contract management and compliance oversight activities, such as OTL sponsor and federal reporting obligations and milestone reporting by licensees. Currently, these activities are managed by the individual licensing officers with support by their licensing specialists and other OTL staff. Given the increasing volume of activity managed by OTL, the importance of ensuring adequate management of portfolio compliance, and the fact that licensing officer expertise is optimized by evaluating and negotiating new opportunities, additional support in these areas appears prudent.
- Develop a plan to address the risk of operating deficits due to unreimbursed patent expenses, underlying timing differences in patent expense and income, and a degree of uncertainty associated with licensing revenues. One option might entail reserving a percentage of any in-year positive net income retained in strong revenue years. In addition, we note an opportunity to further consider overall OTL costs and funding needs in patent application filing and licensing agreement pricing decisions. This is especially important for those cases that entail the assumption of a higher degree of financial risk, such as when the campus incurs fees and expenses without the assurance of timely reimbursement.

Management agrees with the audit observations and has developed management action plans to address the risks noted.

Source and Purpose of the Audit

A&AS completed our audit of commercialization of IP processes as part of our annual service plan for FY 2016. The overall objective of our audit was to assess the adequacy of procedures and controls designed to mitigate certain key risks associated with the management of campus IP derived from research and associated efforts to seek commercial applications for such IP.

Scope of the Audit

Our audit included an assessment of procedures and controls related to the management and commercialization of IP effective during FY 2016, specifically those related to inventions. Procedures and controls related to copyright were not included in the scope of our audit based on an assessment of its lower risk and impact to the campus. Areas of audit focus included elements of the end-to-end IP business process, including

- procedures to ensure the execution of patent acknowledgment forms by employees and others covered by patent policy and the handling of potential conflicts and exemptions;
- the negotiation of IP rights clauses in research funding agreements to ensure their alignment with university policies and the appropriate escalation of exceptions;
- the invention disclosure intake and evaluation process, including the management of patent filing deadlines and confidentiality requirements, and the due consideration of relevant factors in determining whether to file for patent protection;
- those aspects of the patent filing and maintenance process managed by the campus such as patent filing strategy and continuation decisions (activities primarily managed by external patent counsel and other external parties were not in scope);
- licensee due diligence, agreement terms, and monitoring procedures to ensure that campus financial and reputational risks and inventor conflicts of interest are mitigated, that the agreement provides a fair benefit to the inventor and campus, and that equity and exclusive license terms are in accordance with policy requirements;
- consideration and management of obligations to the research sponsor throughout the lifecycle of the invention;
- the management of invention, patent, and licensing information to ensure the confidentiality, completeness, and accuracy of records and reports;
- management monitoring and oversight procedures throughout the lifecycle; and
- patent and license-related financial and accounting procedures performed by the campus including accounts receivable management and procedures to ensure that campus distributions from patent income are used in accordance with patent policy. As outlined below, the campus transitioned the primary management of patent accounting activities to Innovation Alliances and Services at the UC Office of the President in January 2015; UC Office of the President processes were not evaluated as part of this audit.

Our audit procedures were focused on central campus processes and included interviews and walkthroughs of procedures and controls with Intellectual Property and Industry Alliances Office (IPIRA) management; staff from both the OTL and the Industry Alliances Office (IAO); Sponsored Projects Office (SPO) management; and Campus Shared Services Human Resources/Academic Personnel Support (CSS HR/APS) managers. We reviewed process-related documentation, including recent financial and licensee progress/milestone tracking reports used by management, and relevant university and campus policies, procedures, and training/guidance

materials. In addition, we performed testing of a small sample of patent acknowledgment forms and federal reports to verify their completion and performed limited analysis of campus invention-related data in the Patent Tracking System (PTS) used by campus. Our procedures were designed to evaluate the design (versus the ongoing operating effectiveness) of current processes to mitigate risks associated with the areas in scope of our audit and did not include either a detailed review of specific patent applications or research or licensing agreements or an overall assessment of campus compliance with relevant laws, regulations, and policies. Our audit assessment was as of June 2016.

Background Information

The objectives of the campus IP commercialization program derive from university policies as well as technology transfer frameworks and practices established by a number of university consortiums, industry organizations, and federal and state law. There is an alignment of principles across these various sources that emphasize the primary objective of enabling the broadest benefit and good that can derive from university inventions in addition to any commercial objectives. The university policies and guidelines most central to the scope of this audit include: the current university patent policy (issued October 1, 1997), and the Business and Finance Bulletin G-40, *University Patent Program*, the *University Licensing Guidelines* (revised February 1, 2012), and the Contracts and Grants Manual, Chapter 11 – “Intellectual Property and Related Matters”. These policies also establish certain procedural and compliance imperatives. Other sources of compliance requirements are rooted in research sponsor agreements or federal patent law and regulations (for federally sponsored research and IP rights arising from federally sponsored research or with personnel, equipment or facilities at the Lawrence Berkeley National Laboratory [LBNL]).

Campus IP commercialization (technology transfer) activities are managed by IPIRA, which consists of the OTL and the IAO. The OTL manages agreements with industry in the outgoing direction and the IAO manages industry agreements in the incoming direction. Under the UC patent policy, IP rights related to inventions arising from research performed in the scope of UC employment and/or using campus facilities or funds are assignable to the university. When a principal investigator or other researcher believes that the outcomes of their research have resulted in an invention, they are required to inform the OTL (or the LBNL technology transfer office when a professor has a dual appointment between the LBNL and the UC Berkeley campus and the invention is made with DOE funding in the scope of his or her employment with LBNL.) This audit pertains only to inventions that are managed by the UC Berkeley OTL. Within the framework of the program’s larger objectives, OTL licensing officers are then responsible for working with the principal investigator (or the lead inventor) to determine whether patent protection and commercialization should be pursued based on an evaluation of the underlying technology, its broader relevant technology and patent landscape, industry interest, funding sources, and its assessed commercial potential. OTL is responsible for end-to-end lifecycle coordination and management for the invention, including potential patent prosecution, patent management, licensing activities, and licensee management. Certain activities are managed externally but with coordination by OTL, including: the patent prosecution (interactions with United States and foreign patent offices) by external patent counsel; patent accounting (including patent and licensing revenue, patent costs, licensee billing and distributions of revenue) by the Office of the President; and the payment of patent maintenance fees, which are managed by a third-party. The IAO and the OTL operate in a technology “pull and push” mechanism to support the Berkeley research enterprise by bringing in corporate sponsored research funding,

thereby facilitating commercial uptake of Berkeley inventions. The OTL licensing staff supports the IAO by assisting with the IP terms in corporate sponsored research agreements that are signed in the IAO. The IAO plays a pivotal role in expanding campus IP commercialization opportunities through their management of broader relationships with industry but was not included in the scope of our audit. IPIRA and certain IAO activities were covered separately in an audit of business partnerships conducted in spring 2016 by RSM US LLP on behalf of A&AS.

In 2014, IPIRA developed a number of goals related to the further development of funding and licensing opportunities. Over the past three years, OTL has opened an average of 210 cases per year, up from an annual average of 140 in the prior three year period. In FY 2015, OTL's IP portfolio included 1,675 active inventions, generating royalty and fee income of approximately \$7 million, excluding an annualized portion of \$87.5M of income received instead in 2011 as a single lump sum accelerated payment known as a "royalty monetization" of patent royalties under an IP license.

Summary Conclusion

Campus procedures and controls related to the commercialization of IP appear adequate to mitigate key risks associated with business processes and program objectives. Given recent and anticipated continued growth of the campus patenting and licensing activity, we noted two opportunities for OTL to further strengthen its position to effectively promote and manage the campus intellectual property portfolio.

- Enhance operational and compliance support processes, including (i) the development of expanded reporting and protocols for A/R management, and (ii) the further development and dedication of resources to support contract management and compliance oversight activities, such as OTL sponsor and federal reporting obligations and milestone reporting by licensees. Currently, these activities are managed by the individual licensing officers with support by their licensing specialists and other OTL staff. Given the increasing volume of activity managed by OTL, with the managed case volume having increased by approximately 50% over the past six years, and the importance of ensuring adequate management of portfolio compliance, additional support in these areas appears prudent. As of March 2016, receivables outstanding more than 60 days totaled just under \$5 million on forecasted FY 16 revenues of approximately \$10 million.
- Develop a plan to address the risk of deficits associated with patenting and licensing activities. Over the past number of years, the OTL has run an accrued deficit balance position of approximately \$2.5 million (not including additional in-year deficits due to department payroll and non-payroll expenditures) that we understand was accumulated over a number of years due to unreimbursed patent costs since OTL's inception. In May 2016, this historical deficit was paid down; however, there are underlying factors that may potentially give rise to the risk of future deficits. In addition to unreimbursed patent expenses, other factors potentially contributing to the risk of future deficits include the fact that patent and operational expenses in a given year may not be fully offset by net income given underlying timing differences in patenting and licensing activities, as well as a degree of uncertainty associated with licensing revenues. One option for addressing this risk that management may wish to consider is to reserve a percentage of any in-year net income above in-year costs to fund potential future in-year deficit balances in the

event they occur. Related to this, we also note an opportunity to further consider overall OTL costs and funding needs in patent application filing and licensing agreement pricing decisions. This is especially important for those cases that entail the assumption of a higher degree of financial risk, such as when the campus incurs fees and expenses without the assurance of timely reimbursement in cases where equity is accepted in partial lieu of fees or when there is no identified licensee.

Management agrees with the audit observations and has developed management action plans to address the risks noted.

SUMMARY OF OBSERVATIONS & MANAGEMENT RESPONSE AND ACTION PLAN

Operational and Compliance Procedures

Observation

Through IPIRA's efforts to expand campus intellectual property and licensing opportunities, the activities managed by the OTL have undergone a period of growth, with the managed case volume increasing by approximately 50% in the past six years. We noted the following opportunities to assess and enhance operational and compliance support processes given this growth in activity and portfolio size:

- *Accounts receivable management* — The management of past due licensee receivables, such as decisions regarding when or if to send letters of warning and notification of breach, is currently at the discretion of individual technology licensing officers and the Assistant Vice Chancellor of IPIRA. They allow for this approach given their concerns that a strict collections protocol and timeline may not be appropriate in many cases and could damage fledgling start-ups' ability to raise funds, the licensee's broader relationship with the campus, and the prioritization by UC and the campus of entrepreneurship and support for startups. A/R aging reports are distributed to the licensing officers on monthly basis; however, the current aging report does not provide a breakdown of items over 90 days outstanding to facilitate this evaluation. As of March 2016, receivables outstanding more than 90 days totaled just under \$5 million, comprised of approximately \$3.2 million in rebilled patent costs and \$1.7 million in licensing fees and royalties. To help ensure the active management of A/R as well as the reasonableness of collection decisions and timelines, formal protocols for A/R management and more detailed analyses of aging receivables appear prudent.
- *Compliance support activities* — There are certain key timelines and actions required by contractual terms or federal regulation that both licensees and OTL must comply with throughout the lifecycle of an IP case; these include, for OTL, sponsor and federal reporting obligations, and for licensees, progress reports that describe commercial diligence, including attainment of commercial milestones, the date of first commercial sale, the quantities and locations of sales, and royalties due. These requirements are monitored and managed by the individual licensing officers with support by their licensing specialists as part of their larger responsibilities. Because of the increasing volume of activity managed by OTL and the importance of ensuring adequate management of portfolio compliance, we note an opportunity to enhance contract management and compliance support. Potential options to consider include expanding the use of PTS to calendar and monitor key dates or case status; and/or dedicating staff time to assist in contract management and compliance oversight.

Management Response and Action Plan

By far, IP costs that have not been reimbursed by startup companies constitute the largest portion of the outstanding receivables that are discussed in the findings in this report. Because of the importance of supporting campus startup companies to UC's mission and inherent uncertainties in early stage company cash flows, payment timelines are often extended. Startup companies are

equity-rich but cash-poor. As a way to help startup companies to obtain the IP rights they need to attract funding, Berkeley startup licenses often include an equity component as partial consideration for the IP license (in lieu of an all-cash fee). The potential of significant equity realization events (after acquisition or IPO) and the goal of providing services and assistance to entrepreneurs are factors to be considered in making risk-management decisions, including the risk of non-reimbursement of patent costs by startup companies.

A general approach to managing costs incurred to obtain patent rights has been in place for many years; in the last few years, group vetting of exceptions to the approach has also been required before a licensing manager can make a final decision.

Going forward, in addition to continuing the established process, management will further enhance A/R portfolio management procedures to entail the use of detailed A/R reports available in PTS to enable:

1. the quarterly preparation of an overall A/R portfolio analysis, with explanations of past due amounts, and
2. formal periodic assessment and decision-making regarding strategies for resolution (e.g., collect, write-off, restructure contract, defer action, etc.).

IPIRA will also attempt to hire a contract compliance manager in 2017 and/or will retain the services of UC Office of the President accounting to assist in this regard.

These process enhancements will be implemented by July 1, 2017.

Portfolio Lifecycle and Budget Management

Observation

By policy, the campus patent office is expected to be at least partially funded by net patent income (after mandatory distributions to the inventor, the campus, and other parties). In May 2016, the OTL paid down an accrued deficit balance position of approximately \$2.5 million that we understand was accumulated over a number of years due to unreimbursed patent costs since OTL's inception. As of the close of fiscal year 2016, there remains a deficit balance position of approximately \$2 million that is associated with fiscal year 2016 OTL operating expenses. It is expected that this amount will be reduced, but not eliminated once fiscal year 2016 royalty income is applied.

Related to this, we understand that revenues and costs can significantly vary year-over-year depending on in-year patenting activity, licensing opportunities and terms, and licensee commercialization success. Further, expenses in a given year may not be fully offset by net income given underlying timing differences and a degree of revenue uncertainty. To help ensure that the OTL does not accumulate future deficit balances, IPIRA and Vice Chancellor for Research Office (VCRO) leadership should consider reserving a percentage of any in-year net income above in-year costs to fund future in-year deficit balances in the event they occur.

In addition, although decisions regarding patent strategies and licensing terms are necessarily based on the merits of each individual invention and its anticipated market potential, we also note an opportunity for the further consideration of the OTL's in-year costs and funding

requirements in these decisions to further mitigate the likelihood of future operating deficits. This is especially important for those decisions that entail the assumption of a higher degree of financial risk, such as the acceptance of equity from licensees in partial lieu of fees or in the case of “at risk” patent applications (i.e., when there is no identified licensee). In addition, the ongoing maintenance of certain patents may not be warranted where a licensee has not been found and/or where other patents (e.g., foreign filings) are no longer relevant to a licensee’s strategy. Similarly, the continuation of licensee agreements may not be justified in cases of material breach or non-performance under the agreement. Because patent costs continue to be incurred throughout the patent lifecycle with negative impact on overall portfolio net income, it would be prudent for management to perform periodic assessments of the entire portfolio of patents and licensing agreements to evaluate whether the campus should continue to protect the underlying IP or terminate agreements to allow for the remarketing of the IP when appropriate.

Management Response and Action Plan

New IP licensing revenue is distributed each year according to the UC patent policy. Our position is that the historical deficit (based on unreimbursed patent costs) was paid down many-fold with historical distributions, including the payment to campus of \$13 million from windfall royalty monetization revenue amounts in 2011. Under patent policy, this amount was designated as “OTL office/admin share” (and accordingly should have been distributed and recorded to the OTL ledger), but was retained at the central campus level instead.

The IPIRA AVC is currently working with the VCRO budget director to determine procedures for addressing and managing the risk of potential future deficits. Specific plans will be determined with the input of the Campus Budget Office (CBO). As of December 2016, the VCRO budget director has contacted the CBO to request their engagement. The target completion date to develop these plans is July 1, 2017.

In addition, as outlined in the response to the first observation above, in recent years we have enhanced the vetting process for certain higher risk/higher cost patent filing decisions. Periodic assessments to confirm that patents should be maintained are also performed, and action is taken if necessary (e.g., the abandonment of foreign filings if no longer relevant to a licensee’s strategy). The procedures and timelines for these assessments will be re-emphasized with campus technology licensing officers by July 1, 2017.