

## **RIVERSIDE: AUDIT & ADVISORY SERVICES**

July 16, 2012

To: Robert Haddon, Director  
Center for Nanoscale Science and Engineering

Subject: Center for Nanoscale Science and Engineering Audit

Ref: R2012-02

We have completed our limited audit of the Center for Nanoscale Science and Engineering in accordance with the UC Riverside Audit Plan. Our report is attached for your review. We will perform audit follow-up procedures in the future to review the status of management action. This follow-up may take the form of a discussion or perhaps a limited review. Audit R2012-02 will remain open until we have evaluated the actions taken.

We appreciate the cooperation and assistance provided by your staff. Should you have any questions concerning the report, please do not hesitate to contact me.

Michael R. Jenson  
Director

Attachment

Xc: Audit Committee Members  
CNAS Executive Assistant Dean Garrison  
BCOE Assistant Dean Hartney

UNIVERSITY OF CALIFORNIA AT RIVERSIDE  
AUDIT & ADVISORY SERVICES  
MEMBER OF ASSOCIATION OF COLLEGE & UNIVERSITY AUDITORS

INTERNAL AUDIT REPORT R2012-02  
CENTER FOR NANOSCALE SCIENCE AND ENGINEERING  
JULY 2012

Approved By:

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**UC RIVERSIDE  
CENTER FOR NANOSCALE SCIENCE AND ENGINEERING  
INTERNAL AUDIT REPORT R2012-02  
JULY 2012**

**I. MANAGEMENT SUMMARY**

Based upon the results of work performed within the scope of the limited review, it is our opinion that, overall, the Center for Nanoscale Science and Engineering's (CNSE) system of internal controls is operating satisfactorily and generally in compliance with University policies and procedures.

Positive observations include:

- CNSE has consistently used the Nanofabrication Facility (NFF) Feeder System in processing monthly recharges, except in processing adjustments when the Web Recharge System is used.
- Payroll cost transfers affecting the Federal grants and the Nanofabrication Facility as recommended in audit R2011-A had been processed and recorded in CNSE's financial ledgers.
- The curtailment of staff overtime has significantly decreased staff payroll by as much as \$67,000 annually.

We observed some areas that need enhancement to strengthen internal controls and/or effect compliance with University policy:

- Recharge rates for UC/UCR users and external rates for non-UC users were developed during the NFF's initial year using budgeted amounts for Years 1 and 2. The rates need to be reviewed to ensure compliance with UC policy. (Observation III.D.2)
- The Director's travel expense reimbursement claims were approved by the Management Services Officer who reported directly to the Director. The department recently took corrective action by modifying its accountability structure. (Observation III.E.2)

These are explained in greater detail in Section III of this report. Minor items that were not of a magnitude to warrant inclusion in the report were discussed verbally with management.

## II. INTRODUCTION

### A. PURPOSE

UC Riverside Audit & Advisory Services, as part of its Audit Plan, performed a limited review of the Center for Nanoscale Science and Engineering to evaluate compliance with certain University policies and procedures, efficiency and effectiveness of selected operations and adequacy of certain internal controls.

### B. BACKGROUND

The Center for Nanoscale Science and Engineering was established at UCR in October 2000, with carbon, silicon, and biological materials as its initial focus. A Distinguished Professor serves as CNSE's Director. CNSE operates a Nanofabrication Facility that provides services both to UC and non-UC customers.

Over the years, the CNSE has received funding from the Defense Advanced Research Project Agency (DARPA), Department of Energy, and Defense MicroElectronics Activity (DMEA). Also, CNSE was awarded contracts by other Universities.

CNSE is jointly administered by the Bourns College of Engineering (BCOE) and the College of Natural and Agricultural Sciences (CNAS). CNSE has an administrative staff complement of four full-time employees. Also, there are five development engineers, six graduate student researchers, four academic appointees, and four student employees, for a total of 23 employees.

### C. SCOPE

Audit & Advisory Services reviewed selected records supporting transactions that occurred between January and December 2011, and examined procedural controls relating to the following major administrative areas:

#### 1. **Internal Controls**

We evaluated administrative and accounting procedures and internal controls based on management responses to the internal control questionnaire and verification of selected areas.

#### 2. **Financial Management**

We performed a financial analytical review of expenditures for fiscal years 2008-2009, 2009-2010, 2010-2011, and 2011-2012 (as of

12/31/2011). This included identifying unusual trends or fluctuations including the reasons for any variances.

### **3. Contracts and Grants**

We reviewed the notices of award of three Federal contracts and grants, and two contracts with Universities. We verified the amounts awarded, the annual budgets, any restrictions on spending, and the most recent financial statements/ledgers. We selected 15 payroll cost transfers valued at \$33,366 and 12 non-payroll cost transfers valued at \$33,803 and reviewed for compliance with Federal regulations and University policy. Contract and grant expenditures reviewed were performed in conjunction with our review of non-payroll expenditures.

### **4. Nanofabrication Facility**

We reviewed the revenues and expenditures of the NFF Fund 60136 and identified any unusual trends or fluctuations, and the reasons for such variances. We reviewed the calculation of recharge and billing rates and compliance with UC policy.

### **5. Non-Payroll Expenditures**

We selected and reviewed a judgmental sample of 23 non-payroll expenditures totaling \$1,040,942. The sample consisted of 10 travel transactions totaling \$15,477, five sub-contract payments totaling \$815,859, and eight other non-payroll expenditures totaling \$209,606.

We identified the sub-contracts from the notices of awards of Federal contracts and grants, and verified the amounts and expiry dates of the sub-contracts. Also, we reviewed the payments made to each sub-contract to determine if total amounts did not exceed the budgeted amounts.

### **6. Payroll Expenditures**

We performed an analytical review of payroll expenditures for the last three and current fiscal years. No detailed payroll testing was performed; a recent audit (R2011-A) included a review of CNSE's payroll.

#### **D. INTERNAL CONTROLS AND COMPLIANCE**

As part of the review, internal controls were examined within the scope of the audit.

Internal control is a process designed to provide reasonable, but not absolute, assurance regarding the achievement of objectives in the following categories:

- effectiveness and efficiency of operations
- reliability of financial reporting
- compliance with applicable laws and regulations

Our substantive audit procedures were performed in March to June 2012 (not inclusive). Accordingly, this evaluation of internal controls is based on our knowledge as of that time and should be read with that understanding.

### **III. OBSERVATIONS, COMMENTS, AND RECOMMENDATIONS**

#### **A. Internal Controls**

We reviewed and evaluated the CNSE's overall organizational structure and controls to ensure that these are conducive to accomplishing their business objectives through the completion of the Internal Control Questionnaire (ICQ).

Our review did not disclose any exceptions.

#### **B. Financial Management**

CNSE is primarily funded by Federal contracts and grants. Expenditures for the current and last three fiscal years (FY) are presented below:

Fiscal Year	Expenditures
2011-2012 (12/31/2011)	2,695,943
2010-2011	6,309,912
2009-2010	3,423,702
2008-2009	7,209,252

The fluctuations in spending depend upon the amounts of contracts and grants awarded and their corresponding expiry dates. No deficits were identified in any contracts and grants. Likewise, no unusual trends in expenditures were detected that could not be explained.

### C. Contracts and Grants

Over the years, CNSE has received funding from the Defense Advanced Research Project Agency (DARPA), Department of Energy, and Defense MicroElectronics Activity (DMEA). Likewise, CNSE was awarded contracts by two universities. Active funds and their remaining balances as of 12/31/2011 are as follows:

Fund	Description	Start Date	Cumulative Award
	FEDERAL		
22447	FDP Department of Energy- Haddon 4/13	4/15/2004	\$ 2,144,700
25602	DMEA 3D Electronics - Haddon 12/13	6/11/2010	6,580,000
25603	DMEA Spintronics - Haddon 3/14	9/29/2010	4,221,800
	Sub-Total		\$12,946,500
	PRIVATE		
58689	Georgia Institute of Technology - Haddon 8/14	9/1/2008	492,000
58723	North Dakota University System - Haddon 6/13	7/1/2008	800,000
	Sub-Total		1,292,000
	TOTAL		\$14,238,500

We selected 15 payroll cost transfers valued at \$33,366 and 12 non-payroll cost transfers valued at \$33,803 and reviewed for compliance with Federal regulations and University policy. Contract and grant expenditures reviewed were performed in conjunction with our review of non-payroll expenditures. Generally, justifications for the cost transfers had supporting documentation and the cost transfers were processed within 120 days of the original charge.

### D. Nanofabrication Facility

#### 1. Summary

The NFF was established in FY 2005-2006 and had started operations in January 2006. The NFF is housed in a 2,500 square feet facility that provides basic clean room and nanofabrication capability for the campus and external users. Revenues and expenditures for the NFF are recorded in Fund 60136.

Our observations are discussed below.

## **2. Recharge and Billing Rates**

Recharge rates for UC/UCR users and external rates for non-UC users were developed during the NFF's initial year using budgeted amounts for Years 1 and 2. The rates need to be reviewed to ensure compliance with UC policy.

### COMMENTS

When the rates were developed in FY 2005-2006, Year 2 (FY 2006-2007) projected direct costs for internal rates were \$313,721 of which \$185,864 were for salaries and benefits (S&B). By Year 3 (FY 2007-2008), operating costs were \$312,002. The following FY 2008-2009, this increased to \$501,529 of which \$300,969 were for S&B. In FY 2010-2011, S&B costs were \$345,270 and for the current fiscal year, S&B costs are projected to total \$403,000, twice as much as the amount used (\$195,864) in the initial rate calculations.

For the first five fiscal years, from FY 2005-2006 thru FY 2009-2010, the rates appeared to be reasonable with operating costs being recouped with revenues exceeding expenditures. However, beginning FY 2010-2011, expenditures exceeded revenues by \$112,736 and for FY 2011-2012, as of 3/31/2012, expenditures exceeded revenues by \$57,486. By fiscal year-end 6/30/2012, expenditures are projected to exceed revenues by \$67,800.

UC Business & Finance Bulletin A-56, Academic Support Unit Costing and Billing Guidelines, states that: "Recharge activity shall be operated on a no-gain/no-loss basis. Any surplus or deficit occurring in any one year shall be corrected by adjustment of rates in the succeeding year to achieve a break-even balance at the succeeding year end. Every effort should be made to ensure that year-end surpluses or deficits do not exceed one month of the recharging unit's activity."

### RECOMMENDATIONS

The recharge and external billing rates should be recalculated to reflect the increasing costs of operating the NFF. Annually, the rates should be reviewed to determine their reasonableness and compliance with the provision of BFB A-56 on operating the recharge activity on a no-gain/no-loss basis.

## MANAGEMENT RESPONSE

The rates for the Nanofabrication Facility were set in 2005/2006 and due to skillful management, served the facility well during its early years. Initially the Nanofabrication Facility was heavily subsidized by CNSE to allow the user base to develop, as it was necessary to begin operation with a staff complement that would be sufficient to ensure the safe and efficient operation of the Unit. The staffing and rates have remained unchanged since that time and as the user base has developed the recharge process has recovered a larger fraction of the costs and the facility was approaching a breakeven point at the beginning of the decade.

Since that time the subsidies through Federal grants have been disallowed, there has been a decline in the user base due to faculty separations and faculty hiring in Nanotechnology has slowed - as a result annual revenues have begun to fall: \$515K (2009), \$524K (2010), \$453K (2011).

Nevertheless there is very little elasticity in the user rates. The UCR Nanofabrication user rates are very similar to those at other UC campuses, such as UCLA, UCI and UCSB, but many faculty are unhappy with the fact that UCR does not offer a monthly cap on the charges for large users. Given the current deficit this is not possible but any attempt to raise the rates would likely drive more users to other UC campuses for cleanroom services.

The CNSE cleanroom operation is about to expand to encompass the operation of the MS&E cleanroom and while this may necessitate the hiring of additional staff we initially plan to operate at the same staff level. The increased capability, together with new UCR faculty and CNSE subsidies should allow the CNSE Nanofabrication Facility to make the transition to an enlarged facility.

At this time the uncertainties in the operation make any review of the rates futile and after discussion with EVC Dallas Rabenstein we have decided to maintain the current rate structure. We will seek a rate review when the MS&E cleanroom tools are placed in service.

## E. Non-Payroll Expenditures

### 1. Summary

Non-payroll expenditures and its percentage to total expenditures for the current and last three fiscal years are presented below:

	2011-2012	2010-2011	2009-2010	2008-2009
Facility & Administrative Cost Recovery	492,819	1,090,820	828,027	1,223,260
Sub-Contracts	902,675	1,747,995	14,914	1,777,976
Other Non-Payroll Expenditures	354,494	1,412,219	833,288	2,062,693
Total Non-Payroll Expenditures (NPE)	1,749,988	4,251,034	1,676,229	5,063,929
Total Expenditures (TE)	2,695,943	6,309,912	3,423,702	7,209,252
% of NPE to TE	65%	67%	49%	70%

Note: FY 2011-2012 amounts were as of 12/31/2011.

More than half (50%) of non-payroll expenditures were for payments on sub-contracts with other universities and the campus assessment for indirect cost overhead or facility and administrative cost recovery.

We selected and reviewed a judgmental sample of 23 non-payroll expenditures totaling \$1,040,942. The sample consisted of 10 travel transactions totaling \$15,477, five sub-contract payments totaling \$815,859, and eight other non-payroll expenditures totaling \$209,606.

We identified the sub-contracts from the notices of awards of Federal contracts and grants, and verified the amounts and expiry dates of the sub-contracts. Also, we reviewed the payments made to each sub-contract to determine if the total amounts did not exceed the budgeted amounts.

Transactions were reviewed for validity, reasonableness, proper approvals, completeness of supporting documentation, and compliance with applicable University policies.

Generally, non-payroll expenditures including payments on sub-contracts, were properly approved, documented, supported by receipts and/or properly approved purchase orders and invoices, and complied with applicable University policies. Internal controls on processing accounts payable and purchasing transactions appear adequate.

However, we noted a travel-related observation as discussed below.

## **2. Approval of Travel Reimbursement Claim**

The Director's travel expense reimbursement claims were approved by the CNSE Management Services Officer (MSO) who reported directly to the Director.

UC Business and Finance Bulletin G-28, *Policy and Regulations Governing Travel*, provides that "The Travel Expense Voucher should not be approved by a person who reports directly or indirectly to the traveler."

The department recently took corrective action by modifying its accountability structure designating high-level individuals in the Bourns College of Engineering and College of Natural and Agricultural Sciences Dean's Offices to review and approve the travel expense vouchers of the CNSE Director.

## **F. Payroll Expenditures**

CNSE salaries and benefits account for 30% to 50% of total annual expenditures. Total payroll expenditures for the last three fiscal years were \$2.1 million in FY 2008-2009, \$1.7 million in FY 2009-2010, and \$2 million in FY 2010-2011. Payroll expenditures for FY 2011-2012 are projected at \$1.9 million. Internal controls on payroll processing appear to be adequate.