

July 10, 2018

DR. EDWARD DENNIS
Chair, Department of Chemistry/Biochemistry
0601

**Subject: *Recharge Centers – Cryoelectron Microscopy Recharge Facility
Report 2018-06B***

The final report for Recharge Centers – Cryoelectron Microscopy Recharge Facility, Report 2018-06B, is attached. We thank all members of the department for their cooperation and assistance during the review.

Because we were able to reach agreement regarding management action plans in response to the audit recommendations, a formal response to the report is not requested. The findings included in this report will be added to our follow-up system. We will contact you at the appropriate time to evaluate the status of the management action plans.

UC wide policy requires that all draft reports be destroyed after the final report is issued. We also request that draft reports not be photocopied or otherwise redistributed.

David Meier
Director
Audit & Management Advisory Services

Attachment

cc: Steven Boggs
 Judith Bruner
 Alexander Bustamente
 Steven Ford
 Nilo Mia
 Pierre Ouillet
 Robert Rome
 Cheryl Ross
 Steven Ross
 Elizabeth Simmons

UC San Diego

AUDIT & MANAGEMENT ADVISORY SERVICES

Recharge Centers - Cryoelectron Microscopy Recharge Facility
Report No. 2018-06B
July 2018

FINAL REPORT

Performed By:

Unita Herrick, Senior Auditor
Christa Perkins, Associate Director

Approved By:

David Meier, Director

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I. EXECUTIVE SUMMARY

Audit & Management Advisory Services (AMAS) has completed a review of the Cryoelectron Microscopy Recharge Facility as part of the approved audit plan for Fiscal Year 2017/18. The objective of our review was to evaluate whether the recharge mechanism for the CryoEM Facility provides for appropriate cost recovery, mitigating risks associated with financial deficits or potential overcharges to federal customers.

Based on our review, we concluded that CyroEM recharge practices provided for cost recovery of the equipment. However, we noted that current recharge practices could result in the appearance of overcharges to federal customers because the facility has operated at a significant surplus for the last five fiscal years. At the same time some customers were not billed at the full recharge rate, indicating inconsistencies in our accounting practices.

Controls such as physical and electronic access and separation of duties, over the recharge process were effective and adequate to provide safeguards over assets, recharges, billings and collections. However, we noted that the CryoEM's processes for ensuring consistency between the Scheduler and billing documentation could be improved. Management Action Plans to address these findings are summarized below:

A. Recharge Billing

1. Management will revise the billing process to ensure that customers are billed in a manner that conforms to Cost Accounting Standards (CAS) and University policy.
2. If arrangements are negotiated to provide faculty free use of equipment, such arrangements will be documented and quantified; and usage will be tracked. One possibility may be to document and track unbillable usage as institutional cost sharing. The Financial Analysis Office will be consulted to ensure that accounting for the usage meets federal requirements.
3. Management will record the actual hours the equipment is utilized (including all non-maintenance time) to preserve the integrity of the usage data.

B. Recharge Surplus

1. Management will submit a revised recharge rate proposal to address the ongoing surplus, correct any equipment depreciation variances, and to include new expenses.
2. Management will confer with the UCSD Costing Policy Manager to: ensure that recharge rate policy is applied properly to the new proposal; ensure that recharges are consistent with CAS and University policy; and evaluate whether any of the cumulative surplus balance should be rebated to customers.

C. Billing Computation

1. Management will revise processes to ensure that billed hours per the Billing File match the Scheduler, with any adjustments fully documented.
2. The written procedures will be revised accordingly.

Observations and related Management Action Plans are described in greater detail in section V. of this report.

II. BACKGROUND

Audit & Management Advisory Services (AMAS) has completed a review of the Cryoelectron Microscopy Recharge Facility as part of the approved audit plan for Fiscal Year 2017/18. This report summarizes the results of our review.

University of California (UC) Business and Finance Bulletin (BFB)-A-56, *Academic Support Unit Costing and Billing Guidelines*, provides guidelines for establishing the costs of goods and services which are to be recharged to extramural and University funded activities by academic department support units. It also provides standards to achieve compliance with University policies and federal government regulations for assessing costs to each user of those goods or services and for assuring equitable treatment regardless of financial sponsor. University Policy BFB-A-47, *University Direct Costing Procedures*, sets forth general procedures for direct costing in order to improve uniformity and consistency in the recording of direct costs throughout the University.

In addition, the University Contract & Grant Manual states that it is the University's policy to follow the federal cost principles for federal awards. Proper costs under federal awards must be reasonable, allocable, consistent, and allowable. One of the tests of allowability of costs under these principles is that they must be given consistent treatment through application of those generally accepted accounting principles appropriate to the circumstances. UC San Diego (UCSD) Policy and Procedure Manual (PPM) 150 – *Cost Accounting Standards Compliance* further supports the consistent treatment of costs by confirming that UCSD adheres to Cost Accounting Standards (CAS)¹ requiring “Consistency in Estimating, Accumulating, and Reporting Costs.” This policy also states that UCSD shall comply with the certain fundamental requirements of CAS as they relate to federally sponsored programs, including “Practices used in estimating costs in pricing a proposal shall be consistent with the cost accounting practices used in accumulating and reporting costs.”

The UC San Diego Department of Chemistry and Biochemistry supports a number of research facilities that provide access to high-end instrumentation analysis, where researchers are charged for their use of these facilities through a recharge system, at rates approved by the Campus Recharge Rate Review Committee. The Cryoelectron Microscopy (CryoEM) Facility is one such facility, housed in Bonner Hall, which utilizes specialty microscopes that freeze samples to -180°F to preserve the structure of the samples for viewing under magnification. Additional instrumentation allowed data to be collected and analyzed via the microscope.

According to the August 2009 initial recharge rate proposal, the funds for the establishment of the CryoEM facility came from a federal grant, UCSD matching and startup funds, and private gifts. The recharge proposal also stated that the funds were made available to establish the facility with the understanding that the facility would become self-supporting. Equipment in the initial proposal included the FEI Tecnai G2 Sphera Transmission Electron Microscope (Sphera) and the FEI Tecnai G2 Polara Transmission Electron Microscope (Polara), both of which had been in use since 2005, as well as

¹ The Cost Accounting Standards Board (CASB), an independent legislatively-established board within the executive branch of the federal government, provides guidelines on cost accounting practices, referred to as Cost Accounting Standards (CAS). In 1994, CAS imposed four standards on universities receiving significant awards from federal agencies with the intent to prevent the charging of unallowable costs to federal awards, to standardize University costing practices, and to standardize requirements for recipients of federal funds.

a file server, two computers and a printer. The recharge rate in effect during our review included three additional instruments which were added in 2015:

- Talos Arctica – a cryoelectron microscope purchased by a researcher from another unit, and added at 10% to the recharge facility.
- Vitrobot – a device used to prepare samples for use in the cryoelectron microscopes.
- SciTEM – an ultra-low volume liquid handling system specifically configured for dispensing multiple liquid samples onto transmission electron microscopy grids.

Recharge and external billing rates, once approved, were published on the recharge facility's website and the user application form, and entered in to the internal billing system. All users of the facility were required to register via an electronic application process, providing a recharge index (for internal customers), billing information, and project information prior to using the facility. The index number was also programmed in to the internal billing system, based on the user profile established once the user's application was approved. For non-recharge (external) customers, the UCSD Office of Contracts and Grants Administration facilitated the execution of a service agreement outlining terms of use and the rates. Recharge rates for external users were set at 1.45 times the rate of the recharge rate for internal users. The internal and external hourly rates for equipment in the recharge facility summarized in the table below was approved on March 20, 2017 but was effective July 1, 2016:

Scope	UCSD Internal Recharge Rate	External Rate
Arctica	\$160.00	\$232.00
Polara	\$148.80	\$215.76
Sphera	\$64.80	\$93.96
Vitrobot	\$40.00	\$58.00
SciTEM	\$55.54	\$80.53

Labor charge for assistance to use the scopes was included in the recharge rate at \$144 per hour for UCSD clients and \$208.80 for external clients.

Microscope use time was pre-arranged with the Facility Manager and logged using the online UCSD Cryo-electron Microscope Scheduler/Booking System (Scheduler). Only the Facility Manager had the ability to update scheduled times in the Scheduler. A Billing Clerk extracted and downloaded a data file showing Instrument, Project, User, Start/End times, Description, and Duration of use in to an Excel file for each fiscal month. A pivot table parsed user data by machine use and project, which the Billing Clerk used to compute billable hours by project and to create the recharge file as part of the billing file². After download and data entry were complete, the Billing Clerk emailed the billing file to the Facility Manager, Co-Director and the Financial Analyst and marked the document complete in the shared billing file. The Facility Manager approved, or corrected, if necessary, the hours extracted for billing before the Accounting Analyst uploaded the file to the UCSD Integrated Financial Information System (IFIS) for recharges. The Billing Clerk also updated data for the external billing system for non-UCSD customers. The Financial Analyst billed External customers through the accounts receivable module in the UCSD Integrated Student Information System (ISIS).

² The billing file is an Excel document with tabs for downloaded Scheduler, pivot tables by instrument/project, and director assistance, list of outside users by instrument, the recharge report and a check sheet for verifying the recharge report.

This recharge facility reported approximately \$350,000 in income for the fiscal year ending June 30, 2017, approximately 10% of which was revenue from external customers. For external billings, the controls in ISIS (for billing) and IFIS (for recording receipts) provided for separation of duties and hierarchies of authorization. The Financial Analyst generated quarterly and annual reports of Income and Expenses to evaluate the adequacy of the recharge rates to confirm that the facility was not running in deficit.

III. AUDIT OBJECTIVE, SCOPE, AND PROCEDURES

The objective of our review was to evaluate whether the recharge mechanism for the CryoEM Facility provides for appropriate cost recovery, mitigating risks associated with financial deficits or potential overcharges to federal customers. In order to achieve our objective, we performed the following:

- Reviewed Business and Finance Bulletin (BFB)-A-47—University Direct Costing Procedures;
- Reviewed BFB-A-56—Academic Support Unit Costing and Billing Guidelines;
- Reviewed the Office of Management and Budget's (OMB) Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards and OMB Circular A-21;
- Interviewed the following:
 - personnel in Chemistry and Biochemistry and the Recharge Facility, including the co-directors and recharge billing personnel
 - Facility users
 - Financial Analysis Office (FAO) Costing Policy Manager;
- Completed the internal control questionnaire for cash and recharges;
- Reviewed Scheduler and recharge documents;
- Re-computed the recharge amount on a sample of scheduled events and compare to billed amounts;
- Reviewed the recharge reports and operating statements;
- Evaluated the reasonableness of assumptions in the most recent recharge rate change requests;
- Evaluated the recharge billing to determine whether discounts to certain researchers resulted in overcharges to other customers; and
- Determined how discounts were reflected in billing documents.

IV. CONCLUSION

Based on our review, we concluded that CyroEM recharge practices provided for cost recovery of the equipment. However, we noted that current recharge practices could result in the appearance of overcharges to federal customers because the facility has operated at a significant surplus for the last five fiscal years. At the same time some customers were not billed at the full recharge rate, indicating inconsistencies in our accounting practices.

Controls such as physical and electronic access and separation of duties, over the recharge process were effective and adequate to provide safeguards over assets, recharges, billings and collections. However, we noted that the CryoEM’s processes for ensuring consistency between the Scheduler and billing documentation could be improved.

Opportunities for improvement are discussed in further detail in the balance of this report.

V. OBSERVATIONS REQUIRING MANAGEMENT ACTION

A.	Recharge Billing
All internal customers were not being charged the same rates for identical services provided.	
Risk Statement/Effect	
The recharge facility’s billing process increased risk of overcharges to federal customers, understatement of the recharge revenue, and non-compliance with CAS and University policy.	
Management Action Plans	
A.1	Management will revise the billing process to ensure that customers are billed in a manner that conforms to CAS and University policy.
A.2	If arrangements are negotiated to provide faculty free use of equipment, such arrangements will be documented and quantified; and usage will be tracked. One possibility may be to document and track unbillable usage as institutional cost sharing. FAO will be consulted to ensure that accounting for the usage meets federal requirements.
A.3	Management will record the actual hours the equipment is utilized (including all non-maintenance time) to preserve the integrity of the usage data.

A. Recharge Billing – Detailed Discussion

During our review, we observed that some internal customers were not charged the published rates for services provided. In one case, this occurred as a result of an employment offer made to one researcher. The offer effectively provided the researcher with up to two days of use on the Sphera and Polara scopes for fiscal year 2014/2015, 2/3 discount on the rate for fiscal year 2015/2016, and 1/3 discount on the rate for fiscal year 2016/2017. Additionally, the recharge rate that the researcher had been charged up to June 30, 2017 was the rate that was in effect when her hiring offer was made in 2013, which was \$60/ hour for the Polara and \$26 for the Sphera. To align the discounted rates with the recharge rates for billing purposes, the machine time used was artificially altered in the billing system to reflect reduced time used to compute the effective cost of using the scopes at the prevailing rate. For example, in March 2017 where the investigator used the scope for 40 hours, the time reflected on the

billing was 10.75 hours.³ By not recording the full time used, March 2017 recharge revenue was understated the by \$4,352.

Similarly, the Co-Director was not billed for the scope times and scheduled time was not reported in the billing file; and his collaborators were billed at 50% of the prevailing rates. In this case, we were advised that the scope use cost was offset by the Co-Director’s financial contribution towards the maintenance agreements for the two scopes and the 50% not charged to the collaborators was deemed allocated to the Co-Director, but not recharged. A third investigator’s hours were not reported or billed for using the Arctica microscope; however, in this case, the time used on the scope was equivalent to the 90% of scope use that was not allocated to the recharge facility.

As a result of these practices, recovery of costs to operate the machines were borne by other users and different federal grants were charged differently based on the user. This practice was non-compliant with the consistency requirements of CAS and University policy. The recharge revenue was understated and the process to compute billable hours lacked transparency.

B.	Recharge Surplus
The CryoEM Recharge has operated at a surplus for several years, and recharge rate revisions have not adequately addressed the surplus.	
Risk Statement/Effect	
Surpluses place the University at risk for disallowances in the event of a federal audit.	
Management Action Plans	
B.1	Management will submit a revised recharge rate proposal to address the ongoing surplus, correct any equipment depreciation variances, and to include new expenses.
B.2	Management will confer with the UCSD Costing Policy Manager to: ensure that recharge rate policy is applied properly to the new proposal; ensure that recharges are consistent with CAS and University policy; and evaluate whether any of the cumulative surplus balance should be rebated to customers.

B. Recharge Surplus – Detailed Discussion

University policy (BFB-A-56) 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 breakeven 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." The UCSD Recharge Rate Review Committee has agreed upon using two months of the recharging unit's activity as a basis for evaluating whether surplus balances need to be addressed.

³ 10.75 hours X \$148.80 = 40 hours X \$60 X 2/3 = \$1,600. Unrecorded scope use = 29.25 hours; unrecorded recharge income = \$4,352.

Requests to change rates of established activities, or requests to add rates for new goods or services of established activities, must include a recharge rate proposal. Additionally, unrelated business income is a type of income resulting from sales of goods or services to individuals or non-University entities. If sales are not substantially related to University educational or research purposes, proceeds from the sales are considered to be unrelated business income and are subject to Federal income tax reporting requirements.

Our review of the income and expenses for the Cryo-EM Recharge Facility for the fiscal years 2013 through 2017, as summarized in the table below, shows that the recharge facility has had a surplus at each year end since June 30, 2012.

Fiscal Year (FY)	Expense Total	Recharge Income	Revenue	Current FY Net	Balance Carry Forward At 6/30/xx	Two Months Allowance	Surplus Exceeds Two Month Allowance
Balance at 6/30/2012					14,281		
FY 2013	75,730	67,549	1,323	(6,858)	7,423	12,622	No
FY 2014	77,998	117,196	704	39,901	47,324	13,000	Yes
FY 2015	183,015	162,141	3,522	(17,352)	29,973	30,503	No
FY 2016	257,129	258,748	21,282	22,901	52,874	42,855	Yes
FY 2017	301,920	314,693	35,741	48,513	101,387	50,320	Yes

We also noted that, if the scope usage time for all users had been recorded correctly, the surpluses for fiscal years 2015 through 2017 would have been even higher. Our analysis showed that at least five recharge rate change proposals have been submitted since 2012. Four of the five rate change proposals requested rate increases, despite showing surpluses at year-end. The fifth proposal added new equipment in to the recharge facility but kept the recharge rates for the existing equipment unchanged.

Additionally, two new pieces of equipment were added to the recharge facility in fiscal year 2015/2016 and the depreciation basis for another piece was increased. These events plus the recharge facility surplus should have triggered a recharge rate review at the end of fiscal year 2016/2017, but new recharge rate proposals were not submitted. We were advised by the Accounting Analyst that they were building in a reserve as they expect to lose some funding when the co-Director retires at the end of fiscal year 2017/2018. However, accumulating a surplus is not in conformance with UC recharge policy which states that, except for working capital for equipment replacement, recharges units should operate on a breakeven basis.

The facility has been approved to purchase two more cryoelectron microscopes. The first one was expected to be operational by late Spring 2018. The second scope was scheduled to be installed in fiscal year 2018/2019. New recharge rates will be proposed to recover the cost of the new equipment.

C.	Billing Computation
Data obtained from the Scheduler did not reconcile to the Billing file to support the accuracy of hours billed, and adjustments to Scheduler hours to calculate the billed hours were not documented.	
Risk Statement/Effect	
The billable hours were not adequately supported to confirm accuracy of the billings.	
Management Action Plans	
C.1	Management will revise processes to ensure that billed hours per the Billing File match the Scheduler, with any adjustments fully documented.
C.2	The written procedures will be revised accordingly.

C. Billing Computation – Detailed Discussion

The schedule downloaded to support the billing did not match the downloaded Scheduler file provided by the Financial Analyst. We noted the following discrepancies between the Scheduler file and the billing files. In some cases, these discrepancies resulted in unbilled hours.

Month	Entries per Scheduler	Entries per Billing File	Discrepancy in Hours	Other Notes
January	93	89	32	32 hours billed that were not in Billing File
February	151	150	1	1 hour not billed
March	172	165	135	120 hours recorded in April 2017; 8 hours billed that were not in Billing File; and remaining 7 hours unbilled. ⁴

The Billing Clerk advised that she revised the billing statements based on an emails she had received from the Facility Manager. However, no notation was made in the billing file to indicate how she received the billing information. The Billing Clerk provided us with copies of the emails, which supported most of the revisions.

In addition, for each user/group, the Billing Clerk entered the total hours per machine in to the Recharge entry form in the billing file. In the date fields, she entered the first time the scope was used in the month as both the start and end dates of the usage. The Billing Clerk stated that she was advised to enter the dates this way. We confirmed that these were the instructions for date entry in the “CryoEM Recharge Guideline”. The date entry method did not alter the number of hours, but was confusing, when a researcher used the scopes over several days. The number of hours were more than 24 hours, which could not have occurred if the start and end dates were the same.

⁴ A Scheduler session lasting 120 hours was started on March 29, 2017 and extended in to April 2017. The hours were included in April 2017 Scheduler hours.