

OPERATION AND MAINTENANCE OF PLANT

HUMBOLDT STATE UNIVERSITY

Report Number 99-45

February 4, 2000

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ABBREVIATIONS

CPDC	Capital Planning, Design & Construction (previously PPD)
CSU	California State University
HSU	Humboldt State University
MMS	Maintenance Management System
OMP	Operation and Maintenance of Plant
SAM	State Administrative Manual
SUAM	State University Administrative Manual

INTRODUCTION

PURPOSE

Our overall audit objective was to ascertain the effectiveness of policies and procedures related to the administration of the Operation and Maintenance of Plant (OMP) and to ensure that controls addressing current and future facility requirements are in place.

Within the overall audit objective, specific goals included determining whether:

- ▶ the administration and management of the OMP program and facilities planning functions provide clear lines of organizational authority and responsibility;
- ▶ budgeting procedures adequately address OMP funding, ensure that one-time funding allocations are used for their designated purpose, and include procedures to monitor budget versus actual expenses;
- ▶ a comprehensive program is in place that identifies all maintenance/repair requirements including preventive maintenance, facility repairs, deferred maintenance, custodial services, and grounds keeping;
- ▶ the maintenance/repair program includes productivity/performance standards, quality control and employee training to ensure that quality work is performed effectively and efficiently;
- ▶ administrative controls over the maintenance/repair program are adequate, and the maintenance management system includes work order scheduling, costing and control; backlog reports; and productivity tools;
- ▶ non-maintenance work is adequately controlled and fully charged back to the customer in accordance with CSU directives;
- ▶ all non-general fund operations and chargeable costs have been identified in accordance with CSU directives and are fully charged back to the operations;
- ▶ chargebacks are adequately controlled and properly valued;
- ▶ maintenance materials, supplies, and equipment are adequately controlled and properly accounted for;
- ▶ a utilities management program has been established in accordance with CSU policy; and
- ▶ the campus physical master plan is maintained in accordance with CSU policy.

SCOPE AND METHODOLOGY

This review emphasized but was not limited to compliance with state laws, Board of Trustee policies, and Office of the Chancellor and campus policies, letters and directives. June 1998 to date was the primary period of review.

Our primary focus involved the internal administrative and accounting controls over the operation and maintenance of plant functions. Specifically, we reviewed and tested:

- ▶ budget allocation and monitoring procedures;
- ▶ identification of maintenance/repair requirements;
- ▶ work order processing and completion of preventive maintenance tasks;
- ▶ procedures for controlling custodial services and grounds keeping;
- ▶ procedures for controlling and processing chargebacks for non-maintenance work and costs associated with non-general fund operations;
- ▶ procedures for controlling and accounting for maintenance materials, supplies and equipment;
- ▶ implementation of a utilities management program; and
- ▶ maintenance of the campus physical master plan.

BACKGROUND

In response to the systemwide risk assessment conducted during 1996, which included input from officers representing the chancellor's office and each CSU campus, the Board of Trustees directed this review of Operation and Maintenance of Plant at its January 1999 meeting.

The Legislative Analyst's Report on the 1979/80 budget addressed the need to protect the substantial public investment represented by CSU facilities, and the Legislature subsequently directed the CSU to implement a preventive maintenance program on each campus. In December 1979, a CSU Task Force on Plant Maintenance was appointed to explore preventive maintenance needs for the system and concluded that the concept of preventive maintenance was too narrow in scope to accommodate the total maintenance needs of the CSU. Consequently, a concept of "Planned/Programmed Maintenance" was proposed, incorporating preventive maintenance as well as systematic planning and programming. The CSU Executive Council reviewed the task force report and approved the concept in March 1981.

INTRODUCTION

In April 1981, Executive Order No. 343, *Establishment of Planned/Programmed Maintenance*, was issued. It stated that “effective immediately, each campus shall initiate a Planned/Programmed Maintenance Management system that will provide systematic maintenance of State owned campus facilities, program future special maintenance and repair project requirements, identify deferred maintenance needs, and schedule replacement of Group I equipment.”

In 1983, the Office of the University Auditor reviewed *Plant Operations* at eight campuses and issued a systemwide report. The Board of Trustees subsequently accepted the systemwide report and addressed nine implementing actions in Trustees’ Resolution RA 9-83-057. These actions were adopted in CSU directive BA 84-25, *Implementation of Trustees’ Resolution RA 9-83-057 (Plant Operations)*, dated July 25, 1984.

Throughout this report, we will refer to the program as operation and maintenance of plant (OMP). The titles of the departments assigned responsibility for managing CSU campus operation and maintenance of plant include, among others, physical plant and plant operations. At Humboldt State University, Plant Operations manages the OMP program.

OPINION

We visited the Humboldt State University campus from November 1, 1999, through December 10, 1999, and audited the procedures in effect at that time.

In our opinion, the automated work order system was adequate to manage and account for the maintenance/repair program, budget-monitoring procedures were effective, maintenance materials and equipment were adequately controlled, and the utilities management program was established in accordance with CSU policy. Areas needing improvement are addressed in the executive summary.

EXECUTIVE SUMMARY

The purpose of this section is to provide management with an overview of conditions requiring their attention. Areas of review not mentioned in this section were found to be satisfactory. Numbers in brackets [] refer to page numbers in the report.

MAINTENANCE MANAGEMENT PROGRAM [5]

PROGRAM ADMINISTRATION [5]

Oversight over the work order program and preventive maintenance required improvement. Improving oversight over work orders and preventive maintenance helps to reduce the risk of system breakdowns by ensuring that maintenance and repairs are performed on a timely basis.

GROUP I EQUIPMENT [6]

A current listing of Group I equipment programmed for replacement was not maintained. Maintaining such a listing decreases the risk of system breakdowns and deterioration of facilities.

CHARGEBACKS AND NON-MAINTENANCE WORK [7]

Procedures governing reimbursement (chargebacks) to plant operations for services rendered were unsatisfactory. Adequate controls over chargebacks help to ensure complete reimbursement to plant operations for services rendered and may lead to an increase in funds available for maintenance and repairs.

PHYSICAL MASTER PLAN [8]

A thorough reevaluation of the campus physical master plan had not occurred since May 1990. Timely reviews of this plan help to ensure that facilities meet current and future needs.

OBSERVATIONS, RECOMMENDATIONS, AND CAMPUS RESPONSES

MAINTENANCE MANAGEMENT PROGRAM

PROGRAM ADMINISTRATION

Oversight over the work order program and preventive maintenance required improvement.

We found that:

- ▶ As of November 4, 1999, 34% (319/928) of open preventive maintenance work orders were greater than 120 days old, and 37% (487/1309) of all open work orders were greater than 120 days old.
- ▶ As of November 11, 1999, 34% (610/1783) of the preventive maintenance work orders issued for fiscal year 1999/2000 were not completed per the maintenance management system (MMS). Plant operations management subsequently determined that the majority of work orders should have been closed because the work had been completed.

CSU directive BA 84-25, *Implementation of Trustees' Resolution RA 9-83-057*, dated July 25, 1984, states that a work order system that reasonably accounts for all resources within plant operations will be implemented on each campus.

Executive Order #343, *Establishment of Planned/Programmed Maintenance*, dated April 29, 1988, states that each management system shall incorporate a current, comprehensive schedule for all maintenance work to be accomplished in a timely manner.

SAM §20003 states that a satisfactory system of internal administrative control shall include an established system of practices to be followed in performance of duties and functions as well as an effective system of internal review.

The plant operations director stated that the department has been adding modules to the MMS since August 1999 and the management reports were not yet working. He further stated that, during the transition, there was a focus on system implementation versus continuing with the previously defined daily follow up routines which resulted in work order follow-ups falling behind. The chief engineer/energy manager stated that after speaking with the technicians, he learned that the preventive maintenance work had been completed but the work order documentation had not been turned into work control for closure in the MMS.

Less than adequate oversight over work orders and preventive maintenance increases the risk that maintenance and repairs will not be performed on a timely basis and system breakdowns will occur.

Recommendation 1

We recommend that the campus establish procedures to monitor the status and age of open work orders and ensure that all preventive maintenance tasks are completed as scheduled.

Campus Response

We concur. At the time of the audit, Plant Operations had transitioned from an old Maintenance Management System to beta site testing a new Maintenance Management program. During this transition, the portion of the Maintenance Management System (MMS+) that produces management reports was not functioning. At that time we had no practical way of tracking the number or age of open work orders. Since that time the management reports have been made functional and the status of work orders is now managed. For the period July 1, 1999, to date; 5,059 preventative maintenance work orders have been issued of which 4,398 have been completed (87 percent). Of the open work orders, 62 percent are less than 30 days old, 18 percent are 30-60 days old, 12 percent are 60-90 days old, and 8 percent are 90-120 days old. There are no work orders older than 120 days.

GROUP I EQUIPMENT

A current listing of Group I equipment programmed for replacement was not maintained.

Executive Order #343, *Establishment of Planned/Programmed Maintenance*, dated April 29, 1988, states that each management system shall incorporate a current, comprehensive schedule for all maintenance work to be accomplished in a timely manner, including a current annual listing of Group I equipment programmed for replacement.

The director of plant operations stated that the Group I equipment was treated the same as special repair and deferred maintenance such that all items were on the same list without distinction or differentiation. He was not aware of the requirement for a distinct list.

By not maintaining a current list of Group I equipment programmed for replacement, there is an increased risk that all Group I equipment will not be identified and system breakdowns and deterioration of facilities will occur.

Recommendation 2

We recommend that, on an annual basis, the campus prepare a listing of Group I equipment programmed for replacement.

Campus Response

We concur. Our past practice had been to list Group 1 equipment along with Special Repairs and Deferred Maintenance without categorization. We now break our annual list into three distinct categories: Group 1 Equipment, Deferred Maintenance and Special Repairs.

CHARGEBACKS AND NON-MAINTENANCE WORK

Procedures governing reimbursement (chargebacks) to plant operations for services rendered were unsatisfactory.

We found that:

- ▶ Overhead was not being charged to the University Center (a non-general fund operation) and was not applied to non-maintenance work orders charged to the university account, which is used for work totaling less than \$175.
- ▶ Supporting documentation could not be provided to substantiate the 5% overhead rate.
- ▶ Employee benefits were being charged to work orders performed for general fund operations.

CSU directive BA 84-25, *Implementation of Trustees' Resolution RA 9-83-057*, dated July 25, 1984, states that each campus will develop a chargeback system, and campus policy and procedures must ensure the return of all costs to the plant operations budget. Additionally, the policy should include reimbursement for overhead or indirect costs. These latter costs include reimbursements for administrative processing, estimating, supervision, equipment, vehicles, etc., and would normally be calculated and added as a percentage of total costs.

CSU systemwide directive BP 86-69, *Staff Benefits – Billing Rates for Services of General Fund Employees*, dated September 29, 1986 states that billings for services of general fund employees should include staff benefit-type charges in accordance with SAM §8740, and campuses will be responsible for the derivation of benefit rates applicable to their campus. Campuses will also be responsible for complying with SAM §8740.

SAM §8752 indicates that departments must recover full costs whenever goods or services are provided to others.

SAM §20003 states that a satisfactory system of internal accounting and administrative control shall include a system of record keeping procedures adequate to provide effective accounting control over assets, liabilities, revenues, and expenditures.

The plant operations director stated that when the chargeback policy was developed in 1986, it was somewhat political in nature and has not been re-addressed since. He further stated that not charging overhead to the University Center was an oversight and because plant operations contributes to the university account, the inclusion of overhead charges was not considered. Additionally, overhead was originally established as an arbitrary rate whose use has continued; however, the planner estimator scheduler is now tracking actual overhead costs so that this information can be used to develop a more accurate rate.

Inadequate controls over chargebacks reduces the likelihood for complete reimbursement to plant operations for services rendered and the amount of funds available for campus maintenance and repairs.

Recommendation 3

We recommend that the campus:

- a. substantiate the validity of the overhead rate and apply the appropriate rate to all non-maintenance and non-general fund work order costs; and
- b. discontinue charging employee benefits to work performed for general fund operations.

Campus Response

We concur. Plant Operations no longer charges employee benefits to any general fund work order. Plant Operations has been tracking actual overhead costs for work orders in order to update the charge-back rate. At this time we are waiting to implement a new charge-back rate pending the update/rewrite of BA 84-25 by Chancellor's Office staff. Once we receive the updated policy, we believe we can issue a new campus charge-back rate within thirty days.

PHYSICAL MASTER PLAN

A thorough reevaluation of the campus physical master plan had not occurred since May 1990.

PPD SUAM Section II §9009 states that periodically, but not less often than every three years, each campus shall accomplish a thorough reevaluation of all parts of the Physical Master Plan and shall submit a written summary report of the reevaluation to Capital Planning, Design and Construction (CPDC).

The physical services director stated that a reevaluation of the physical master plan had not been performed within the three-year requirement due to the time and money required to complete such a reevaluation.

Failure to complete timely reviews of the campus physical master plan increases the risk that facilities will not meet current and future needs.

Recommendation 4

We recommend that the campus obtain clarification from CPDC regarding the periodic physical master plan reevaluation requirement and comply as instructed.

Campus Response

We concur. Humboldt State requested CPDC clarification in a memo of February 18, 2000. A response from J. Patrick Drohan (CPDC) dated March 16 indicates that a SUAM 9009 revision is underway which will change the three-year requirement to a periodic reevaluation on the basis of “significant academic, environmental or other changes.” This revision was distributed at a subsequent meeting of the Executive Deans. The campus will comply with this revision as requested.

APPENDIX A: PERSONNEL CONTACTED

<u>Name</u>	<u>Title</u>
Dr. Alistair W. McCrone	President
Mark Baker	Supervisor of Building Trades
Mike Bailey	Planner Estimator Scheduler
Ken Combs	Director of Physical Services
Don Christensen	Vice President for Development and Administrative Services
Mike Douglas	Procurement
Charlotte Ferguson	System Administrator
Bruce Hawkins	Manager of Construction Services
Wayne Hawkins	Manager of Grounds and Landscape Services
Kerry Kronick	Chief of Custodial Services
Shirley Messer	University Budget Director
Tim Moxon	Director of Plant Operations
Barbara Ricon	CAIII Work Control Clerk
Rosemary Smith	Customer Services Coordinator
George Wright	Chief Engineer/Energy Manager

The President



HUMBOLDT STATE UNIVERSITY • Arcata, California 95521 • (707) 826-3311

RECEIVED
University Auditor

MAY 01 2000

The California State
University

April 27, 2000

Larry Mandel
University Auditor
The California State University
401 Golden Shore
Long Beach, CA 90802-4210

Dear Larry:

Enclosed you will find our updated responses to the Recommendations of Audit Report Number 99-45, Operation and Maintenance of Plant at Humboldt State University.

We are pleased to report that we have acted on all four recommendations resulting from the audit.

Sincerely,

A handwritten signature in cursive script, appearing to read "Alistair W. McCrone".

Alistair W. McCrone
President
AWM:om

Enclosures (6)

c w/o enclosures: Vice President Christensen

**Response to the Recommendations of
Audit Report Number 99-45
Operation and Maintenance of Plant
at Humboldt State University**

Recommendation 1

We recommend that the campus establish procedures to monitor the status and age of open work orders and ensure that all preventive maintenance tasks are completed as scheduled.

Campus Response:

We concur. At the time of the audit, Plant Operations had transitioned from an old Maintenance Management System to beta site testing a new Maintenance Management program. During this transition, the portion of the Maintenance Management System (MMS+) that produces management reports was not functioning. At that time we had no practical way of tracking the number or age of open work orders. Since that time the management reports have been made functional and the status of work orders is now managed. For the period July 1, 1999, to date; 5,059 preventative maintenance work orders have been issued of which 4,398 have been completed (87 percent). Of the open work orders, 62 percent are less than 30 days old, 18 percent are 30-60 days old, 12 percent are 60-90 days old, and 8 percent are 90-120 days old. There are no work orders older than 120 days. **Enclosure 1** is a "briio query" showing the percentage of open and closed work orders broken down by age. **Enclosure 2** is an actual MMS+ management report of all preventative maintenance work orders 60-120 days old.

Recommendation 2

We recommend that, on an annual basis, the campus prepare a listing of Group I equipment programmed for replacement.

Campus Response:

We concur. Our past practice had been to list Group 1 equipment along with Special Repairs and Deferred Maintenance without categorization. We now break our annual list into three distinct categories: Group 1 Equipment, Deferred Maintenance and Special Repairs. **Enclosure 3** is a copy of our current annual list.

Recommendation 3

We recommend that the campus:

- a. substantiate the validity of the overhead rate and apply the appropriate rate to all non-maintenance and non-general fund work order costs; and
- b. discontinue charging employee benefits to work performed for general fund operations.

Campus Response:

We concur. Plant Operations no longer charges employee benefits to any general fund work order. Plant Operations has been tracking actual overhead costs for work orders in order to update the charge-back rate. At this time we are waiting to implement a new charge-back rate pending the update/rewrite of BA 84-25 by Chancellor's Office staff. Once we receive the updated policy, we believe we can issue a new campus charge-back rate within thirty days.

Recommendation 4:

We recommend that the campus obtain clarification from CPDC regarding the periodic physical master plan reevaluation requirement and comply as instructed.

Campus Response:

We concur. Humboldt State requested CPDC clarification in a memo of February 18, 2000, (**Enclosure 4**). A response from J. Patrick Drohan (CPDC) dated March 16 indicates that a SUAM 9009 revision is underway which will change the three-year requirement to a periodic reevaluation on the basis of "significant academic, environmental or other changes" (**Enclosure 5**). This revision was distributed at a subsequent meeting of the Executive Deans (**Enclosure 6**). The campus will comply with this revision as requested.

DAC:om

Enclosures (6):

- 1) Brio Query work order completion statistic report
- 2) Work Order Aging Report
- 3) Group 1, Special Repair, Deferred Maintenance list
- 4) Memo to J. Patrick Drohan
- 5) E-mail response fro J. Patrick Drohan
- 6) Revised SUAM 9009

DAC:om

4-27-00

THE CALIFORNIA STATE UNIVERSITY
OFFICE OF THE CHANCELLOR

BAKERSFIELD

CHANNEL ISLANDS

May 5, 2000

CHICO

MEMORANDUM

DOMINGUEZ HILLS

FRESNO

TO: Larry Mandel
University Auditor

FULLERTON

HAYWARD

FROM: Charles B. Reed 

HUMBOLDT

SUBJECT: Draft Final Report Number 99-45 on *Operation and Maintenance of Plant*, Humboldt State University

LONG BEACH

LOS ANGELES

MARITIME ACADEMY

In response to your memorandum of May 2, 2000, I accept the response as submitted with the draft final report on the Operation and Maintenance of Plant Audit at Humboldt State University.

MONTEREY BAY

NORTHBRIDGE

POMONA

CBR/cw

SACRAMENTO

Enclosure

SAN BERNARDINO

cc: Dr. Alistair W. McCrone, President

SAN DIEGO

SAN FRANCISCO

SAN JOSE

SAN LUIS OBISPO

SAN MARCOS

SONOMA

STANISLAUS